DANUBE POLLUTION REDUCTION PROGRAMME

NATIONAL REVIEWS 1998
SLOVAKIA

PROJECT FILES

MINISTRY OF ENVIRONMENT

in cooperation with the

Programme Coordination Unit
UNDP/GEF Assistance

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Preface

The National Reviews were designed to produce basic data and information for the elaboration of the Pollution Reduction Programme (PRP), the Transboundary Analysis and the revision of the Strategic Action Plan of the International Commission for the Protection of the Danube River (ICPDR). Particular attention was also given to collect data and information for specific purposes concerning the development of the Danube Water Quality Model, the identification and evaluation of hot spots, the analysis of social and economic factors, the preparation of an investment portfolio and the development of financing mechanisms for the implementation of the ICPDR Action Plan.

For the elaboration of the National Reviews, a team of national experts was recruited in each of the participating countries for a period of one to four months covering the following positions:

- Socio-economist with knowledge in population studies,
- Financial expert (preferably from the Ministry of Finance),
- Water Quality Data expert/information specialist,
- Water Engineering expert with knowledge in project development.

Each of the experts had to organize his or her work under the supervision of the respective Country Programme Coordinator and with the guidance of a team of International Consultants. The tasks were laid out in specific Terms of Reference.

At a Regional Workshop in Budapest from 27 to 29 January 1998, the national teams and the group of international consultants discussed in detail the methodological approach and the content of the National Reviews to assure coherence of results. Practical work at the national level started in March/April 1998 and results were submitted between May and October 1998. After revision by the international expert team, the different reports have been finalized and are now presented in the following volumes:

Volume 1:	Summary Report
Volume 2:	Project Files
Volume 3 and 4:	Technical reports containing: - Part A : Social and Economic Analysis - Part B : Financing Mechanisms - Part C : Water Quality - Part D : Water Environmental Engineering

In the frame of national planning activities of the Pollution Reduction Programme, the results of the National Reviews provided adequate documentation for the conducting of National Planning Workshops and actually constitute a base of information for the national planning and decision making process.

Further, the basic data, as collected and analyzed in the frame of the National Reviews, will be compiled and integrated into the ICPDR Information System, which should be operational by the end of 1999. This will improve the ability to further update and access National Reviews data which are expected to be collected periodically by the participating countries, thereby constituting a consistently updated planning and decision making tool for the ICPDR.

UNDP/GEF provided technical and financial support to elaborate the National Reviews. Governments of participating Countries in the Danube River basin have actively participated with professional expertise, compiling and analyzing essential data and information, and by providing financial contributions to reach the achieved results.

The National Reviews Reports were prepared under the guidance of the UNDP/GEF team of experts and consultants of the Danube Programme Coordination Unit (DPCU) in Vienna, Austria. The conceptual preparation and organization of activities was carried out by **Mr. Joachim Bendow**, UNDP/GEF Project Manager, and special tasks were assigned to the following staff members:

- Social and Economic Analysis and Financing Mechanisms: **Reinhard Wanninger**, Consultant
- Water Quality Data: **Donald Graybill**, Consultant,
- Water Engineering and Project Files: **Rolf Niemeyer**, Consultant
- Coordination and follow up: **Andy Garner**, UNDP/GEF Environmental Specialist

The **Slovakian National Reviews** were prepared under the supervision of the National Focal Point Coordinator, **Mr. Boris Minarik**. The authors of the respective parts of the report are:

- Part A: Social and Economic Analysis: **Ms. M. A. Petrikova**
- Part B: Financing Mechanisms: **Mr. David Luptak**
- Part C: Water Quality: **Ms. Anna Zekeova**
- Part D: Water Environmental Engineering: **Mr. Juraj Namer**

The Ministry of Environment

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Vienna – Austria, November 1998

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Municipal Sector

Project No. 1-M

Košice - Expansion of Wastewater Treatment Plant 2nd Stage of Construction

Date of first setting up:	4/7/1998	Date of latest upgrade :	

Project Title:	Košice - expansion of wastewater treatment plant 2nd stage of construction

Responsible/Legal Body	
Authority/Company	East-Slovakian Water and Sewage Works, Košice Vodárne a kanalizácie, š.p. Košice
Name	Ing.Jozef Schürger director
Address	Vodárne a kanalizácie, š.p. Košice ul. Komenského 50 04 248 Košice Slovakia
Telephone	00421/(0)95/6333011-15
Fax	00421/(0)95/63 373 00
e-mail	-
Project Target	Municipal and industrial wastewater treatment with the aim of reduction the discharged pollution to the recipient - the river Hornád.
Investment Costs	900.000.000,- Sk
Status of Project	☒ ongoing ☐ planned ☐ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

Košice - expansion of wastewater treatment plant 2nd stage of construction

2 Investor Details

2.1 Authority/Company

Name	East-Slovakian Water and Sewage Works, Košice Východoslovenské Vodárne a kanalizácie, š.p. Košice		
Address	Vodárne a kanalizácie, š.p. Košice ul. Komenského 50 04 248 Košice Slovakia		
Telephone	00421/ (0)95/6333011-15		
Fax	00421/(0)95/63 373 00	e-mail	-

2.2 Contact Persons

Ing. Attres, Ing. Figura

2.3 Advisor/Consultant

East-Slovakian Water and Sewage Works, Košice,
Aquatis Brno, Czech Republic
Firm Mižiè,Ltd.

2.4 Legal/Financial Status

state enterprise

Authority/Company Profile

The main activities of the company are as follows: supply for drinking water to the population and other consumers, public sewerage and wastewater treatment, providing development of water resources, technical and investment development in sanitary engineering, administration, operation and maintenance of waterworks, water supply networks, sewerage systems and wastewater treatment plants, administration, operation, admittance, repair, upgrading and modernization of facilities. In addition, waterworks are engaged in a multitude of secondary and auxiliary activities, e.g. erection of structures and installation services. Waterworks posses their own laboratories serving for the analysis of supplied water quality and for the control of wastewater plants

Number of employees: 2911
Annual revenues: 1442.101.000,- Sk in 1997
Annual expenses: 1477.754.000,- Sk in 1997
Annual profit: - 35.653.000,- Sk in 1997

2.6 Planning/Implementing Extent/Capacity of the Investor

administration, consulting and control services during the period of construction and start up operation of new structures

2.7 Institutions/Enterprises beside the Investor

Project design, consulting firms : Aquatis, Brno, Czech Republic, Inžinierske Stavby Košice, Sigma Hranice, Czech Republic, Bidor,Ltd., Bratislava
Civil construction : Inžinierske Stavby Košice
Technology supply : Sigma Hranice, Czech Republic, Mižiè, Ltd.

3. PROJECT DESCRIPTION

3.1 Project Outline

The construction and expansion of existing wastewater treatment plant of the Košice city consist of biological treatment line based on the existing mechanical treatment line.
The prospective user of the treatment plant will be the East-Slovakian Water and Sewage Works. The location of treatment plant is on the own land of the East-Slovakian Water and Sewage Works at the site of existing treatment plant.

3.2 Primary Needs for the Project

The main goal of the project is to reach the EU effluent standards because the river Hornád (the recipient) is the transboundary watercourse with Hungary.
If the project would not finished it is expected the problems with the water quality in the recipient and the impact on the transboundary pollution.

3.3 Status of Project Preparation

The project is ongoing now, a few finished structures of the treatment line are operating.

3.4 Technology Proposed

The treatment line of wastewater treatment plant consist of activated sludge tanks, clarifiers, pumping station of activated sludge, blowers, transformer station and dewatering of sludge, digestion tanks, holding tanks. sludge and gas management including the boiler-room and automation..

3.5 Ownership of Project Site

The site of plant is in the ownership of the investor.

3.6 Specific project Items

Due to the accident at the treatment plant (digestion tank had been damaged) the structures of sludge treatment were predominantly erected and they are operating, now.

4. Project Effects and Interactions

4.1 Public's Expression of Interest

Design project has already been approved by the legal institutions

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

Recipient is the river Hornád. This river, at the point of discharged wastewaters, is only 20 km from the Hungarian's border, therefore the transboundary effect plays the significant role in this case.

4.4 Primary Effects of Project

There are expected the following positive effects :
local level and regional - improving the water quality in the river Hornád,
international/transboundary level –reduction of the pollution of mass flux, improving the water quality and reduction of the cost of fees payment with respect to Hungary

5. Economic Project Justification

5.1. Economic Project Benefits

It is not possible to justify because of ongoing project. The wastewater treatment plant is under construction.

Employment/income effects	
during construction period	50 - 80 employees
during operation period	50 employees

Other economic benefits

Applying the new treatment technologies, energy savings in operation of waste water treatment plant

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated ?	☒ **yes** ☐ **no**
total investment costs of project	900.000.000,-Sk
planned annual depreciation	54.000.000,-Sk
planned annual operation costs	50.000.000,-Sk
planned annual revenues	167.594.000,-Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	900.000.000,-Sk
Allocation of capital cost	
Land	15.000.000,-Sk
Construction and machinery	870.000.000,-Sk
Planning and supervision	15.000.000,-Sk
Total cost	.-Sk
On an annual basis	.-Sk
Year of cost estimate	.-Sk

Nature of cost estimate (preliminary, adequate, etc.)

preliminary calculation

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)

wastewater treatment 55.000.000,- Sk
collection of wastewater 95.000.000,- Sk

Repair and replacement cost	15.000.000,-Sk
Total operational cost	150.000.000,-Sk
Year of cost estimate	.-Sk

Nature of cost estimate (preliminary, adequate, sources of information)

The calculations of costs are preliminary and they estimated on the basis of the similar costs spent on the operation of sewerage in East- Slovakian Water and Sewage works.

6.3 Estimate of Revenues

Expected annual revenues (in real terms)

expected annual revenue : 167 594 000 .- Sk ( )

Year of estimate :

Nature of estimate (preliminary, adequate, etc.)

Nature of estimation is preliminary and it is based on the present fees for supplied water and drained wastewater for municipalities and industry.

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme			
Sources of funding	**Secured**	**Requested**	**Non- secured**
	Currency [mil. Sk]		
1. Equity of project owner	200	30	
2. National Environmental Fund	15	100	100
3. **Water Management Fund**	15	30	30
4. Public loan – central budget	300	130	130
5. Public loan – regional budget	80		
6. Public grant – central budget			
7. Public grant – regional budget			
8. International loan			
9. International grant			
10. Commercial bank loan			
11.Others sources			
Total funds/requirements	610	290	260

Project No. 2-M

Nitra - Wastewater Treatment Plant

Date of first setting up:	4/23/1998	Date of latest upgrade:	

Project Title:	Nitra - wastewater treatment plant

Responsible/Legal Body	
Authority/Company	West-Slovakian Water and Sewage Works, Bratislava
Name	Západoslovenské Vodárne a kanalizácie, š.p. Bratislava
Address	Západoslovenské Vodárne a kanalizácie, š.p. Bratislava Trnavská 32 826 29 Bratislava Slovakia
Telephone	00421/ (0)7/ 526 75 17
Fax	00421/(0)7/ 542 5284
e-mail	-
Project Target	The aim is the improvement the environment condition of the Nitra city, to ensure the treatment of municipal wastewater with the capacity of treatment plant for the time level 2020. The user of the project will be West-Slovakian Water and Sewage Works, Nitra.
Investment Costs	552.000.000,- Sk
Status of Project	☒ ongoing ☐ planned ☐ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

Nitra - wastewater treatment plant

2 Investor Details

2.1 Authority/Company

Name	West-Slovakian Water and Sewage Works, Bratislava		
Address	Západoslovenské Vodárne a kanalizácie, š.p. Bratislava Trnavská 32 826 29 Bratislava Slovakia		
Telephone	00421/ (0)7/ 526 75 17		
Fax	00421/(0)7/ 542 5284	e-mail	-

2.2 Contact Persons

Ing. Jozef Repík - design engineer and consulting, Hydrocoop, Bratislava
Ing. Jozef Petráš - engineering manager, West-Slovakian Water and Sewage Works, Bratislava,
Ing. Karol Trgióa, Ing. Karol Kománek, Vodohospodárske stavby, a.s. Nitra (civil construction firm)

2.3 Advisor/Consultant

West-Slovakian Water and Sewage Works (ZsVaK) , Bratislava
Hydrocoop, Bratislava
Vodohospodárske stavby, a.s. Nitra

2.4 Legal/Financial Status

state enterprise

Authority/Company Profile

The main activities of the company are as follows: supply for drinking water to the population and other consumers, public sewerage and wastewater treatment, providing development of water resources, technical and investment development in sanitary engineering, administration, operation and maintenance of waterworks, water supply networks, sewerage systems and wastewater treatment plants, administration, operation, admittance, repair, upgrading and modernization of facilities. In addition, waterworks are engaged in a multitude of secondary and auxiliary activities, e.g. erection of structures and installation services. Waterworks posses their own laboratories serving for the analysis of supplied water quality and for the control of wastewater plants

Number of employees : 2878 in 1996
Annual revenues: 1.152.696.000,- Sk in 1996
Annual expenses: 1.044.634.000,- Sk in 1996
Annual profit(loss): -36.337.000,- Sk in 1996

2.6 Planning/Implementing Extent/Capacity of the Investor

administration, consulting and control services during the period of construction and start up operation of new structures

2.7 Institutions/Enterprises beside the Investor

Project design, consulting firms : Hydrocoop Bratislava
Civil construction: Vodohospodárske stavby, a.s. Nitra
Technology supply: ZsVaK OZDV Bratislava, Vodohospodárske stavby, a.s. Nitra
User of the project and operator of plant : West-Slovakian Water and Sewage Works, Nitra

3. PROJECT DESCRIPTION

3.1 Project Outline

The construction and expansion of existing wastewater treatment plant of the Nitra city consist of mechanical-biological treatment line.

The prospective user of the treatment plant will be the West-Slovakian Water and Sewage Works, Nitra. The location of treatment plant is on their own land of the West-Slovakian Water and Sewage Works at the site of existing treatment plant.

The following list of structures summarized their state of completing (f- finished, u- under construction, s- the construction has not started yet , d - the structure has not been designed , yet) :

main sewer to the treatment plant - s,
pumping station on the left bank - s,
the administrative building - u,
grit removal - u,
primary settling tanks - u,
activated sludge tanks (carrousel system) s, d,
clarifiers - s,
effluent flow rate measuring station - s,
thickeners of primary sludge - u,
digestion tanks, sludge holding tanks - u,
building for the sludge treatment processes - s,
thickener for digested sludge / u,
mechanical dewatering - f, at present is under test operation,
sludge dump - f, in test operation,
gas holders - u,
effluent flow rate measuring station for the existing plant- u,
blower station - s.

All this structures are completed or under construction without any installment of treatment facilities such as screens, pumps, mixers, pipes, etc. except the sludge dewatering.

3.2 Primary Needs for the Project

The main goal of the project is to reach the Slovak and EU effluent standards because the river Nitra (the recipient) is the highly polluted watercourse. The design project is re-designed now due to the fact that the production of wastewater was significantly changed and because of necessity to utilize the structures operated at the existing treatment plant.

If the project would not be finished it is expected the problems with the water quality in the recipient and the impact on the transboundary pollution.

At present only a part of municipal wastewater discharged is treating on the existing wastewater treatment plant. The rest ones are treating only mechanically and then by-pass. In addition currently there is a problem with the utilization of dewatered sludge and therefore the sludge is disposal in the territory of plant.

The required effluent quality are as follows :

BSK_5 = 30 mg/l, COD = 100 mg/l, SS = 40 mg/l, $N\text{-}NH_4^+$ = 10 mg/l,
$N\text{-}NO_3^-$ = 25 mg/l, oil material = 2 mg/l.

In the 1991 the construction of new treatment plant was started. In 1994 the civil construction stopped due to the lack of finances. The present situation does not indicate the possibility to complete this project because of the problem to ensure the sources of funds by the investor. In 1997 investor ordered the study in which have been specified the following items :

- evaluation of existing state and its utilization during the operation of old plant,
- inventory of constructed structures and the state of their finishing,
- suggested steps of the plant construction from the point of view of financing and operation,
- the financing requirements of the particular steps.

3.3 Status of Project Preparation

The study and lately the project were created at the end of 80ties. In 1991 these projects was re-designed to reduce the necessary land for the new treatment plant. The final project has not designed all the structures of new treatment plant. Until this time sludge dewatering line has only been finished which it is in test operation, now.

3.4 Technology Proposed

The treatment line of wastewater treatment plant consists of activated sludge tanks, (carrousels) with the simultaneous nitrification - denitrification equipped with fine bubble aeration system. It is not assumed with biological phosphorus removal

3.5 Ownership of Project Site

The site of plant is in the ownership of the investor.

3.6 Specific project Items

Halt of a new plant construction, several stages of its construction, development of the region - increasing the wastewater production, increasing of the total of costs of the new plant - impact of the inflation, the changes conditions of interest, loans etc., the complete upgrading of the old (existing) treatment plant (new aeration system fine bubble aeration system type ASEKO and the 3 blowers Robuschi).

4. Project Effects and Interactions

4.1 Public's Expression of Interest

N/A

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

Recipient is the river Nitra. This river is highly polluted. The ambient water quality is estimated for the year 2020 in following terms of BOD_5 = 6,25 mg/l, COD = 15,7 mg/l, DS = 959,6 mg/l and $N\text{-}NH_4^+$ = 2,3 mg/l.

4.4 Primary Effects of Project

There are expected the following positive effects:

- local level and regional - improving the water quality in the river Nitra,
- international/transboundary level -reduction of the pollution of mass flux, improving the water quality and reduction of the payment of compensation for water pollution discharge with respect to Hungary, improving the aesthetic and recreational characteristics of the Nitra river flowing via the downtown of the Nitra city

5. Economic Project Justification

5.1. Economic Project Benefits

Employment/income effects	
during construction period	N/A
during operation period	N/A

Other economic benefits

Applying the new treatment technologies, energy savings in operation of waste water treatment plant. The total costs were decreased because of the reduction of the land requirements and re-design of the previous project to utilize the structures of the existing plant. However these savings can not be considered because of increasing of civil deliveries costs, materials, etc. as well as the changes in bank interest policy, debts etc.

5.2. Economic Internal Rate of Return (EIRR)	
Has an EIRR been calculated?	☐ **yes** ☒ **no**
total investment costs of project	.-Sk
planned annual depreciation	.-Sk
planned annual operation costs	.-Sk
planned annual revenues	.-Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	.-Sk
Allocation of capital cost	
Land	22.214.506,-Sk
Construction and machinery	.-Sk
Planning and supervision	1.670.516,-Sk
Total cost	552.000.000,-Sk
On an annual basis	.-Sk
Year of cost estimate	.-Sk

Nature of cost estimate (preliminary, adequate, etc.)

preliminary calculation

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)

Repair and replacement cost	.-Sk
Total operational cost	.-Sk
Year of cost estimate	.-Sk

Nature of cost estimate (preliminary, adequate, sources of information)

6.3 Estimate of Revenues

Expected annual revenues (in real terms)

Year of estimate:	

Nature of estimate (preliminary, adequate, etc.)

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme			
Sources of funding	**Secured**	**Requested**	**Non- secured**
	Currency [mil. Sk]		
1. Equity of project owner	77.313		
2. National Environmental Fund	29.7		
3. **Water Management Fund**			
4. Public loan – central budget	71.311		
5. Public loan – regional budget			
6. Public grant - central budget			
7. Public grant - regional budget			
8. International loan			
9. International grant			
10. Commercial bank loan			
11.Others sources			
Total funds/requirements	178.324		

Note:
The rest of the funds are non-secured (552.000 – 178.324 = 373.676 mil. Sk), but they are not specified for the particular type of the fund because of the changes in the input data for the project.

Project No. 4-M

Expansion of Wastewater Treatment Plant Banská Bystrica

Date of first setting up:	5/06/1998	Date of latest upgrade :	

Project Title:	Expansion of wastewater treatment plant Banská Bystrica

Responsible/Legal Body	
Authority/Company	Central-Slovakian Water and Sewage Works, Košice Stredoslovenské Vodárne a kanalizácie, š.p. Banská Bystrica (StVaK)
Name	Ing.¼ubomír Ryša director
Address	Stredoslovenské Vodárne a kanalizácie, š.p. Partizánska 5 975 23 Banská Bystrica Slovakia
Telephone	00421/ (0)88/ 411 12 41
Fax	00421/(0)88/ 744 937
e-mail	-
Project Target	Expansion of existing wastewater treatment plant Banská Bystrica with the capacity of 1500 l/s. The treatment line is mechanical-biological with the population equivalent 110.000. The owner of the treatment plant is StVaK, š.p. Banská Bystrica.
Investment Costs	593.461.000,- Sk
Status of Project	☒ ongoing ☐ planned ☐ emerging concept
Language of Project Documents	☐ German ☐ English ☒ Slovak Summary in English: ☐ yes ☒ no

1 Project Title

Expansion of wastewater treatment plant Banská Bystrica

2 Investor Details

2.1 Authority/Company

Name	Stredoslovenské Vodárne a kanalizácie, š.p. Banská Bystrica (StVaK)		
Address	Stredoslovenské Vodárne a kanalizácie, š.p. Partizánska 5 975 23 Banská Bystrica Slovakia		
Telephone	00421/ (0)88/ 411 12 41		
Fax	00421/(0)88/ 744 937	e-mail	-

2.2 Contact Persons

Ing. ¼ubomír Ryša, director
Ing. Svätoslav Mravec, engineering manager,
Ing. Dušan Floch, the head of the economic department

2.3 Advisor/Consultant

Design firm: Hydrocoop, Ltd. Bratislava
Civil firm: Doprastav, a.s.
Technology supply : HaEm AQUA, a.s.

2.4 Legal/Financial Status

state enterprise

Authority/Company Profile

The main activities of the company are as follows: supply for drinking water to the population and other consumers, public sewerage and wastewater treatment, providing development of water resources, technical and investment development in sanitary engineering, administration, operation and maintenance of waterworks, water supply networks, sewerage systems and wastewater treatment plants, administration, operation, admittance, repair, upgrading and modernization of facilities. In addition, waterworks are engaged in a multitude of secondary and auxiliary activities, e.g. erection of structures and installation services. Waterworks posseses their own laboratories serving for the analysis of supplied water quality and for the control of wastewater plants
Number of employees :1710
Annual turnover: 820.000.000,- Sk in 1997

2.6 Planning/Implementing Extent/Capacity of the Investor

administration, consulting and control services during the period of construction and start up operation of new structures. The own funds for the year 1998: 9 mil.- Sk

2.7 Institutions/Enterprises beside the Investor

Design firm : Hydrocoop, Ltd. Bratislava
Civil firm : Doprastav, a.s. Zvolen
Technology supply: HaEm AQUA, a.s. Dolný Kubín

3. PROJECT DESCRIPTION

3.1 Project Outline

The construction, expansion of existing wastewater treatment plant of the Banská Bystrica consists of the following structures:

mechanical treatment step:
screening,
grit and grease removal,
primary settling tanks,
biological treatment step:
activated sludge system with:
pre-denitrification
nitrification
phosphorus removal (chemical)
sludge management:
sludge thickening
sludge digestion
thickening of digested sludge

The user and owner of the treatment plant is the Central-Slovakian Water and Sewage Works, š.p. Banská Bystrica.

3.2 Primary Needs for the Project

The main goal of the project is to ensure the treatment of all wastewater conveyed by main sewer A. This fact will improve the effluent quality parameters and reduce the total discharged pollution expressed in terms of BOD_5, SS and COD less than 30 % and the removal efficiency of TP will be 90 - 95 % and N-NH_4 90 - 95 %.

The existing wastewater treatment plant is mass and hydraulic overloaded. This fact has a great impact on the effluent quality and thus on river water quality.

3.3 Status of Project Preparation

The project is ongoing now.

3.4 Technology Proposed

The expansion of treatment plant consists of the following technology:
The activation tanks are equipped with fine bubble aeration system – Messner plates. The activated sludge system is designed as the pre-denitrification with nitrification including the biological phosphorus removal. The residue phosphorus will be chemically precipitate. The raw sludge, after the thickening, will be anaerobically stabilized in digestion tanks and dewatered on the beltpresses.

3.5 Ownership of Project Site

The investor Central-Slovakian Water and Sewage Works, Banská Bystrica is the owner of the site where the project is implemented.

3.6 Specific project Items

N/A

4. Project Effects and Interactions

4.1 Public's Expression of Interest

The construction of plant is ongoing project and it was submitted and accepted by all legal institutions.

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

The receptor of effluent is the Hron river.

4.4 Primary Effects of Project

There are the following positive effects:
• local and regional: the expansion of treatment plant will cover the need of treatment of discharged wastewaters to improve the ambient water quality in the Hron river.

5. Economic Project Justification

5.1. Economic Project Benefits

It is not possible to justify because of ongoing project.

Employment/income effects	
during construction period	52 employees
during operation period	N/A
Other economic benefits	
Applying the new treatment technologies will enable to reduce the discharged pollution of treated wastewaters and thus reduced the payment of compensation for pollution discharged to the surface waters.	

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated?	☐ **yes** ☒ **no**
total investment costs of project	593.461.000,-Sk
planned annual depreciation	N/A -Sk
planned annual operation costs	N/A -Sk
planned annual revenues	N/A -Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	593.461.000,-Sk
Allocation of capital cost	
Land	.-Sk
Construction and machinery	.-Sk
Planning and supervision	.-Sk
Total cost	593.461.000,-Sk
On an annual basis	.-Sk
Year of cost estimate	80.000.000,-Sk
Nature of cost estimate (preliminary, adequate, etc.)	
preliminary calculation	

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)	
N/A	
Repair and replacement cost	N/A
Total operational cost	N/A
Year of cost estimate	N/A
Nature of cost estimate (preliminary, adequate, sources of information)	
N/A	

6.3 Estimate of Revenues

Expected annual revenues (in real terms)	
N/A	
Year of estimate:	N/A
Nature of estimate (preliminary, adequate, etc.)	
N/A	

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme

Sources of funding	Secured	Requested	Non- secured
	Currency [10^3 Sk]		
1. Equity of project owner	75.507		
2. National Environmental Fund			
3. **Water Management Fund**	40.000	38.000	
4. Public loan - central budget	308.848	131.106	
5. Public loan - regional budget			
6. Public grant - central budget			
7. Public grant - regional budget			
8. International loan			
9. International grant			
10. Commercial bank loan			
11.Others sources			
Total funds/requirements	424.355	169.106	

Project No. 5-M

Upgrading of Wastewater Treatment Plant Michalovce

Date of first setting up:	4/7/1998	Date of latest upgrade :	

Project Title:	Upgrading of wastewater treatment plant Michalovce

Responsible/Legal Body	
Authority/Company	East-Slovakian Water and Sewage Works, Košice Východoslovenské Vodárne a kanalizácie, š.p. Košice
Name	Ing.Jozef Schürger director
Address	Vodárne a kanalizácie, š.p. Košice ul. Komenského 50 04 248 Košice Slovakia
Telephone	00421/ (0)95/ 6333011-15
Fax	00421/(0)95/ 63 373 00
e-mail	-
Project Target	Expansion and upgrading of existing wastewater treatment plant Michalovce to cover the increased wastewater production and required effluent standards. The city of Michalovce possesses combine sewer system. Existing wastewater treatment plant built in 1968 was designed for wastewater flow rate of 133 l/s. The upgrading will expand the capacity of plant to 250 l/s and in the future up to 350 l/s.
Investment Costs	114.000.000,- Sk
Status of Project	☒ ongoing ☐ planned ☐ emerging concept
Language of Project Documents	☒ Czech ☐ English ☐ Slovak Summary in English: ☐ yes ☒ no

1 Project Title

Upgrading of wastewater treatment plant Michalovce

2 Investor Details

2.1 Authority/Company

Name	East-Slovakian Water and Sewage Works, Košice Východoslovenské Vodárne a kanalizácie, š.p. Košice		
Address	Vodárne a kanalizácie, š.p. Košice ul. Komenského 50 04 248 Košice Slovakia		
Telephone	00421/ (0)95/ 6333011-15		
Fax	00421/(0)95/ 63 373 00	e-mail	-

2.2 Contact Persons

Ing. Škripecky, Šandor

2.3 Advisor/Consultant

East-Slovakian Water and Sewage Works, Košice, INEKO v.o.s. Michalovce, SEVOZA, Ltd. Košice, Centroprojekt Zlín, Czech Republic

2.4 Legal/Financial Status

state enterprise

Authority/Company Profile

The main activities of the company are as follows: supply for drinking water to the population and other consumers, public sewerage and wastewater treatment, providing development of water resources, technical and investment development in sanitary engineering, administration, operation and maintenance of waterworks, water supply networks, sewerage systems and wastewater treatment plants, administration, operation, admittance, repair, upgrading and modernization of facilities. In addition, waterworks are engaged in a multitude of secondary and auxiliary activities, e.g. erection of structures and installation services. Waterworks posses their own laboratories serving for the analysis of supplied water quality and for the control of wastewater plants

Number of employees: 2911
Annual revenues: 1.442.101.000,- Sk in 1997
Annual expenses: 1.477.754.000,- Sk in 1997
Annual profit: - 35.653.000,- Sk in 1997

2.6 Planning/Implementing Extent/Capacity of the Investor

Administration, consulting and control services during the period of construction and start up operation of new structures

2.7 Institutions/Enterprises beside the Investor

Project design, consulting firm: Centroprojekt, a, s. Zlín, Czech Republic,
Civil construction: INEKO v.o.s. Michalovce.
Technology supply: SEVOZA, Ltd., Košice

3. PROJECT DESCRIPTION

3.1 Project Outline

The construction, expansion and upgrading of existing wastewater treatment plant of the Michalovce city consists of the following stages :

- reconstruction of mechanical treatment (screening, grit removal),
- construction of new radial clarifier with diameter 30 m,
- activation tank,
- thickener, sludge treatment with dewatering on centripress,
- reconstruction of existing activation tanks,
- monitoring, control and automation of plant.

The user and owner of the treatment plant is the East-Slovakian Water and Sewage Works. The location of new treatment plant tanks, structures is on the own land of the East-Slovakian Water and Sewage Works at the site of existing treatment plant.

3.2 Primary Needs for the Project

The main goal of the project is to improve the effluent quality parameters, to reduce the pollution impact of treated wastewater discharged to the river of Laborec, which after the confluence with the river of Uh and Ondava creates the Bodrog river. This river is the transboundary watercourse with Hungary.

The existing wastewater treatment plant is mass and hydraulic overloaded. This fact has a great impact on the effluent quality and thus on river water quality and finally it may cause the problems with the transboundary pollution.

3.3 Status of Project Preparation

The project is ongoing now. The activation tank is erected and prepared for installation of air system. The sludge treatment with dewatering (centripress) and clarifier and other structures are under start-up operation from 11/1997.

3.4 Technology Proposed

The upgrading of treatment plant will be implemented in several stages as follows :

- new clarifier,
- new dewatering line with centripress,
- expansion of treatment plant for the wastewater flow rate of 250 l/s :
  - mechanical pretreatment,
  - activation,
  - thickening nad pumping of sludge to digestion,
  - measuring, regulation and control system,
  - power distribution, cables and air systems.

3.5 Ownership of Project Site

The site of plant is in the ownership of the investor East-Slovakian Water and Sewage Works, Michalovce

3.6 Specific project Items

N/A

4. Project Effects and Interactions

4.1 Public's Expression of Interest

Municipality of Michalovce co-financed the upgrading of plant with 5 mil..-Sk coming from the National Environmental Fund as well as industries connected to public sewer system.

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

The sewage generated at the settlements of Kaluža and Viné and recreational area of Zemplinská Šírava is collected and connected to public sewer system of Michalovce.

4.4 Primary Effects of Project

There are the following positive effects:

- local and regional: the expansion of treatment plant will cover the need of treatment of discharged wastewaters generated at settlements Pozdišovce, laškovce, Zalužie, Vinné, Kaluža,
- regional – improving the water quality of the river Laborec, improving the quality of groundwater and surface water in the recreational region of Zemplínska Šírava,
- international/transboundary level –reduction of the pollution of mass flux, improving the river water quality.

5. Economic Project Justification

5.1. Economic Project Benefits

It is not possible to justify because of ongoing project, however the savings of investment costs are not considered.

Employment/income effects	
during construction period	15 - 25 employees
during operation period	10 employees

Other economic benefits

Applying the new treatment technologies will enable to reduce the discharged pollution of treated wastewaters and thus reduced the payment of fees for pollution.

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated?	☒ **yes** ☐ **no**
total investment costs of project	114.000.000,-Sk
planned annual depreciation	6.840.000,-Sk
planned annual operation costs	6.527.000,-Sk
planned annual revenues	41.100.000,-Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	114.000.000,-Sk
Allocation of capital cost	
Land	2.547.000,-Sk
Construction and machinery	.-Sk
Planning and supervision	5.962.000,-Sk
Total cost	.-Sk
On an annual basis	.-Sk
Year of cost estimate	.-Sk

Nature of cost estimate (preliminary, adequate, etc.)

preliminary calculation

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)

wastewater treatment 7.770.000,- Sk/year
collection of wastewater 11.209.000,- Sk/year

Repair and replacement cost	1.450.000,-Sk/year
Total operational cost	23.320.000,-Sk/year
Year of cost estimate	26.000.000,-Sk/year

Nature of cost estimate (preliminary, adequate, sources of information)

The calculations of costs are preliminary and they estimated on the basis of the similar costs spent on the operation of public sewerage in East- Slovakian Water and Sewage works.

6.3 Estimate of Revenues

Expected annual revenues (in real terms)

expected annual revenue: 41.100.000,- Sk/year

Year of estimate:	1998

Nature of estimate (preliminary, adequate, etc.)

Nature of estimation is preliminary and it is based on the present fees for supplied water and drained wastewater for municipalities and industry.

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated? ☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme

Sources of funding	Secured	Requested	Non- secured
	Currency [mil. Sk]		
1. Equity of project owner	45,4	10	
2. National Environmental Fund	1,5	20	20
3. **Water Management Fund**			
4. Public loan - central budget		25	25
5. Public loan - regional budget			
6. Public grant - central budget			
7. Public grant - regional budget			
8. International loan			
9. International grant			
10. Commercial bank loan			
11.Others sources	7,4 (co-financing)		
Total funds/requirements	54,3	55	45

Project No. 6-M

Svidník - Sewer Network and Wastewater Treatment Plant

Date of first setting up:	4/7/1998	Date of latest upgrade:	

Project Title:	Svidník - sewer network and wastewater treatment plant

Responsible/Legal Body	
Authority/Company	East-Slovakian Water and Sewage Works, Košice Východoslovenské Vodárne a kanalizácie, š.p. Košice
Name	Ing.Jozef Schürger director
Address	Vodárne a kanalizácie, š.p. Košice ul. Komenského 50 04 248 Košice Slovakia
Telephone	00421/ (0)95/ 6333011-15
Fax	00421/(0)95/ 63 373 00
e-mail	-
Project Target	Collection and drainage of wastewater form the city of Svidník and settlements joined and their treatment. At present the city of Svidník does not have any treatment of wastewater. Finishing this plant will have a significant environmental impact and improve the river water quality of Ondava.
Investment Costs	410.000.000,- Sk
Status of Project	☒ ongoing ☐ planned ☐ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

Svidník - sewer network and wastewater treatment plant

2 Investor Details

2.1 Authority/Company

Name	East-Slovakian Water and Sewage Works, Košice Východoslovenské Vodárne a kanalizácie, š.p. Košice		
Address	Vodárne a kanalizácie, š.p. Košice ul. Komenského 50 04 248 Košice Slovakia		
Telephone	00421/ (0)95/ 6333011-15		
Fax	00421/(0)95/ 63 373 00	e-mail	-

2.2 Contact Persons

Ing. Škripecký, Ing. Osif Ján

2.3 Advisor/Consultant

East-Slovakian Water and Sewage Works, Košice, Hydroconsult, Letná 27, 040 01 Košice

2.4 Legal/Financial Status

state enterprise

Authority/Company Profile

The main activities of the company are as follows: supply for drinking water to the population and other consumers, public sewerage and wastewater treatment, providing development of water resources, technical and investment development in sanitary engineering, administration, operation and maintenance of waterworks, water supply networks, sewerage systems and wastewater treatment plants, administration, operation, admittance, repair, upgrading and modernization of facilities. In addition, waterworks are engaged in a multitude of secondary and auxiliary activities, e.g. erection of structures and installation services. Waterworks posses their own laboratories serving for the analysis of supplied water quality and for the control of wastewater plants

Number of employees: 2911
Annual revenues: 1.442.101.000,- Sk in 1997
Annual expenses: 1.477.754.000,- Sk in 1997
Annual profit: - 35.653.000,- Sk in 1997

2.6 Planning/Implementing Extent/Capacity of the Investor

Administration, consulting and control services during the period of construction and start up operation of new structures

2.7 Institutions/Enterprises beside the Investor

Project design, consulting firm: Hydroconsult Košice,
Civil construction: Inžinierske stavby Košice, now Ekostav Michalovce,
Technology supply: Sigma Hranice, Czech Republic

3. PROJECT DESCRIPTION

3.1 Project Outline

The construction of mechanical-biological treatment plant is situated in the site of the settlements Stroèín and Mestisko. The main structures of plant are as follows:

- mechanical treatment line,
- biological treatment line,
- sludge treatment and gas management,
- measuring, control and automation of plant.

The local division of East-Slovakian Water and Sewage Works at Svidnik will run this treatment plant. The land used for the treatment plant is now under negotiation with the owners.

3.2 Primary Needs for the Project

The main goal of the project is to erect sewer network and mechanical-biological wastewater treatment plant. The sewerage will serve for the collection and treating the wastewater conveyed from the city of Svidník and adjacent small settlements. The treatment plant will improve the water quality in the sensitive Ondava river, which is classified as the river protected for water supply.

If the treatment plant will not reach the required effluent standards, the impact of pollution may cause the contamination of the main water resource for the city of Svidník. This source is located only 1000 m downstream from the point of wastewater discharging.

3.3 Status of Project Preparation

The project is ongoing now however it was prepared a new design where a different treatment line is assumed.

3.4 Technology Proposed

The wastewater treatment plant is designed as a mechanical-biological wastewater treatment with the following treatment processes :

- mechanical pre-treatment,
- activation tank designed for nitrification and denitrification,
- clarifiers,
- sludge treatment with anaerobic stabilization and biogas management with the boiler-room,
- mechanical dewatering of sludge.

3.5 Ownership of Project Site

There are the problems with the ownership of the land where the treatment plant will have to be built.

3.6 Specific project Items

N/A

4. Project Effects and Interactions

4.1 Public's Expression of Interest

The design project has already been approved by legal institutions.

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

Treated wastewater will be discharged to sensitive Ondava river.

4.4 Primary Effects of Project

There are expected the following positive effects:

- local and regional : treatment of wastewater generated at the city of Svidník and adjacent settlements Nový Orlík, Ladomíra and Kapišová, improving the water quality of the river Ondava, protection of water resource serving for public water supply of Svidník,
- regional and international - improving the quality of the Ondava river will have an positive impact on water quality in the Bodrog river, which may reduce the transboundary pollution transported to Hungary.

5. Economic Project Justification

5.1. Economic Project Benefits

It is not possible to justify because of ongoing project, however the savings of investment costs are not considered.

Employment/income effects	
during construction period	50-70 employees
during operation period	12 employees

Other economic benefits

The new treatment plant will enable to reduce the discharged pollution of treated wastewater and thus reduced the payment of fees for pollution to river basin authority.

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated?	☐ **yes** ☒ **no**
total investment costs of project	410.000.000,-Sk
planned annual depreciation	24.600.000,-Sk
planned annual operation costs	5.300.000,-Sk
planned annual revenues	6.800.000,-Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	410.000.000,-Sk
Allocation of capital cost	
Land	9.500.000,-Sk
Construction and machinery	4.900.000,-Sk
Planning and supervision	5.512.000,-Sk
Total cost	429.912.000,-Sk
On an annual basis	.-Sk
Year of cost estimate	.-Sk

Nature of cost estimate (preliminary, adequate, etc.)

preliminary calculation

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)

collection of wastewater 3.500.000,- Sk/year

Repair and replacement cost	420.000,-Sk/year
Total operational cost	8.300.000,-Sk/year
Year of cost estimate	.-Sk/year

Nature of cost estimate (preliminary, adequate, sources of information)

The calculations of costs are preliminary and they estimated on the basis of the similar costs spent on the operation of public sewerage in East- Slovakian Water and Sewage works.

6.3 Estimate of Revenues

Expected annual revenues (in real terms)

expected annual revenue: 6.800.000,- Sk/year

Year of estimate:	1998

Nature of estimate (preliminary, adequate, etc.)

Nature of estimation is preliminary and it is based on the present fees for water supply and sewerage for municipalities and industries.

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme

Sources of funding	**Secured**	**Requested**	**Non- secured**
	Currency [mil. Sk]		
1. Equity of project owner	94,6	16	16
2. National Environmental Fund	78,2	86	86
3. **Water Management Fund**			
4. Public loan – central budget	55,0	110	110
5. Public loan – regional budget			
6. Public grant – central budget			
7. Public grant – regional budget			
8. International loan			
9. International grant			
10. Commercial bank loan			
11.Others sources			
Total funds/requirements	227,8	212	212

Project No. 7-M

Trenčín - Sewer System and Wastewater Treatment Plant

Date of first setting up:	18/05/1998	Date of latest upgrade:	

Project Title:	Trenčín - sewer system and wastewater treatment plant

Responsible/Legal Body	
Authority/Company	West-Slovakian Water and Sewage Works, Bratislava
Name	Západoslovenské Vodárne a kanalizácie, š.p. Bratislava
Address	Západoslovenské Vodárne a kanalizácie, š.p. Bratislava Trnavská 32 826 29 Bratislava Slovakia
Telephone	00421/ (0)7/ 526 75 14
Fax	00421/(0)7/ 542 5284
e-mail	-
Project Target	The aim of the project is to enable the development of the locality and the protection of groundwater and surface water on the local and regional level. The wastewater treatment plant will treat all the collecting wastewater on the Trenèín right side of the Váh river with the capacity for the time level of 2020 year. The user of the project will be the municipality of Trenèín.
Investment Costs	267.000.000,- Sk
Status of Project	☒ ongoing ☐ planned ☐ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

Trenčín - sewer system and wastewater treatment plant

2 Investor Details

2.1 Authority/Company

Name	West-Slovakian Water and Sewage Works, Bratislava (ZsVaK)		
Address	Západoslovenské Vodárne a kanalizácie, š.p. Bratislava Trnavská 32 826 29 Bratislava Slovakia		
Telephone	00421/ (0)7/ 526 75 14		
Fax	00421/(0)7/ 542 5284	e-mail	-

2.2 Contact Persons

Design firm : Ing. Jozef Stanovský, SB Hydroteam, Ltd. Bratislava
Ing. Jozef Petráš - ZsVaK Bratislava

2.3 Advisor/Consultant

West-Slovakian Water and Sewage Works (ZsVaK) , Bratislava
SB Hydroteam, Ltd. Bratislava

2.4 Legal/Financial Status

state enterprise

Authority/Company Profile

The main activities of the company are as follows: supply for drinking water to the population and other consumers, public sewerage and wastewater treatment, providing development of water resources, technical and investment development in sanitary engineering, administration, operation and maintenance of waterworks, water supply networks, sewerage systems and wastewater treatment plants, administration, operation, admittance, repair, upgrading and modernization of facilities. In addition, waterworks are engaged in a multitude of secondary and auxiliary activities, e.g. erection of structures and installation services. Waterworks posses their own laboratories serving for the analysis of supplied water quality and for the control of wastewater plants

Number of employees: 2878 in 1996
Annual revenues: 1.152.696.000,- Sk in 1996
Annual expenses: 1.044.634.000,- Sk in 1996
Annual profit(loss): -36.337.000,- Sk in 1996

2.6 Planning/Implementing Extent/Capacity of the Investor

administration, consulting and control services during the period of construction and start up operation of new structures

2.7 Institutions/Enterprises beside the Investor

Project design, consulting firms: Hydrocoop, Ltd. Bratislava
Civil firm and/or technology supplier: since this time it has not been chosen
User of the project and operator of plant: West-Slovakian Water and Sewage Works, Trenèín

3. PROJECT DESCRIPTION

3.1 Project Outline

The new treatment plant with mechanical-biological treatment line was designed for the capacity of 41.830.000 P.E. The capacity of mechanical part of treatment step is 520 l/s and biological treatment step - 200 l/s.

The treatment plant consists of the following structures:

- pumping station with combine storm overflow,
- mechanical treatment,
- biological treatment,
- sludge treatment with anaerobic stabilization of sludge, sludge thickening and dewatering,
- automation of the plant,
- administration building and other structures necessary for the proper operation of treatment plant.

In addition of the construction of the plant also a new sewer systems are included in the project as follows:

- separate sewer system for settlements Kostolná - Záreèie,
- main sewer to the pumping station of treatment plant.

The site of the new plant is situated about 2 km to the west from Trenèín city on the confluence of the Záblatský and the Zlatovský creek. The site of a new plant is utilized as an arable land at present.

The prospective user of the treatment plant will be the West-Slovakian Water and Sewage Works, Trenèín.

3.2 Primary Needs for the Project

The main goal of the project is to reach the requirements of the Slovak Decree 242/93 and EU effluent standards. The project assumes the following max. effluent concentrations:

BOD_5 = 30 mg/l, COD = 90 mg/l, SS = 20 mg/l, $N\text{-}NH_4^+$ = 5 mg/l, TP = 3 mg/l.

If the project would not implement the present situation does not change and this fact has a very negative impact on the aquatic environment of the Váh river basin.

Recently the collecting wastewater are conveyed by main sewer with the diameter DN 2600 and discharged to receptor (Zlatovský creek) without any treatment. A part of the end of the sewer system is not completed, yet.

3.3 Status of Project Preparation

The preliminary project was completed in 1994. The final design for the implementation of the project was finished in 1997.

At present the tender is running and the perspective deliver of the construction is under selection. The final design improves the preliminary design and optimizes the treatment line, it reduces the preliminary estimation of the costs and finally it reduces the land requirements for a new treatment plant.

3.4 Technology Proposed

The treatment line is designed as a mechanical-biological treatment plant with biological nutrient and phosphorus removal.

The treatment line consists of: pumping station, mechanical part and biological part. Biological part of treatment is represented by activated sludge system with nitrification-denitrification and biological phosphorus removal. The activation tanks and selected to anaerobic, anoxic and oxic zones. The aeration system is designed as fine bubble systems. MLSS is separated in final clarifier. The flow rate of effluent is measured in Parshall flume. Sludge treatment is represented by thickening of sludge and sludge stabilization (mesophilic digestion) and then by sludge conditioning and mechanical dewatering.

3.5 Ownership of Project Site

The site of plant is not in the ownership of the investor therefore at present this problem is solving.

3.6 Specific project Items

There is the strong public need to improve this state because the present situation limits the inhabitants to connect to sewer system and there are the problems with bad smell (especially during the summer time), aesthetic and recreational problems in receptor, etc.

4. Project Effects and Interactions

4.1 Public's Expression of Interest

The upgrading of the treatment plant has approved by all legal institutions in question.

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

Recipient is the Zlatovský creek. This creek is the tributary of the river Váh. river is highly polluted.
The ambient water quality is estimated for the time after the completing of treatment plant in following terms of BOD_5 = 5,1 (5) mg/l, COD = 15,8 (15,2) mg/l, SS = 15,0 mg/l (15,0) and $N\text{-}NH_4^+$ = 1,0 mg/l.(1). Note, that the quality of the water upstream in creek is written in brackets.

4.4 Primary Effects of Project

There are expected the following positive effects:

- local level and regional - improving the water quality in Zlatovský creek and the Váh, improving the aesthetic and recreational characteristics of the Váh river, the reduction of odor problems especially during summer time,
- international/transboundary level -reduction of the pollution of mass flux, improving the water quality and reduction of the payment of compensation for water pollution discharge with respect to Hungary.

5. Economic Project Justification

5.1. Economic Project Benefits

N/A

Employment/income effects	
during construction period	N/A
during operation period	14 employees
Other economic benefits	
Applying the new treatment technologies, energy savings in operation of waste water treatment plant. The reduction of the payment for the compensation of the discharged waste water to the receptor.	

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated?	☐ **yes** ☒ **no**
total investment costs of project	N/A
planned annual depreciation	N/A
planned annual operation costs	N/A
planned annual revenues	N/A

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	281.781.000,- Sk
Allocation of capital cost	
Land	9.890.000,- Sk
Construction and machinery	
Planning and supervision	7.606.000,- Sk
Total cost	294.946.000,- Sk
On an annual basis	N/A
Year of cost estimate	N/A
Nature of cost estimate (preliminary, adequate, etc.)	
Adequate	

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)	
N/A	
Repair and replacement cost	N/A
Total operational cost	N/A
Year of cost estimate	N/A
Nature of cost estimate (preliminary, adequate, sources of information)	
N/A	

6.3 Estimate of Revenues

Expected annual revenues (in real terms)	
N/A	
Year of estimate :	N/A
Nature of estimate (preliminary, adequate, etc.)	
N/A	

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme

Sources of funding	Secured	Requested	Non- secured
	Currency [10^3. Sk]		
1. Equity of project owner			
2. National Environmental Fund			
3. **Water Management Fund**	10.000		
4. Public loan – central budget			
5. Public loan – regional budget			
6. Public grant – central budget			
7. Public grant – regional budget			
8. International loan			
9. International grant			
10. Commercial bank loan			
11.Others sources			
Total funds/requirements	10.000		

Project No. 8-M

Expansion of Wastewater Treatment Plant Humenné

Date of first setting up:	4/7/1998	Date of latest upgrade:	

Project Title:	Expansion of wastewater treatment plant Humenné

Responsible/Legal Body	
Authority/Company	East-Slovakian Water and Sewage Works, Košice Východoslovenské Vodárne a kanalizácie, š.p. Košice
Name	Ing.Jozef Schürger director
Address	Vodárne a kanalizácie, š.p. Košice ul. Komenského 50 04 248 Košice Slovakia
Telephone	00421/ (0)95/ 6333011-14
Fax	00421/(0)95/ 63 373 00
e-mail	-
Project Target	Expansion of existing wastewater treatment plant Humenné to cover the increased municipal and industrial wastewater production and required effluent standards.
Investment Costs	597.806.000,- Sk
Status of Project	☒ ongoing ☐ planned ☐ emerging concept
Language of Project Documents	☐ German ☐ English ☒ Slovak Summary in English: ☐ yes ☒ no

1 Project Title

Expansion of wastewater treatment plant Humenné

2 Investor Details

2.1 Authority/Company

Name	East-Slovakian Water and Sewage Works, Košice Východoslovenské Vodárne a kanalizácie, š.p. Košice		
Address	Vodárne a kanalizácie, š.p. Košice ul. Komenského 50 04 248 Košice Slovakia		
Telephone	00421/ (0)95/ 6333011-15		
Fax	00421/(0)95/ 63 373 00	e-mail	-

2.2 Contact Persons

Ing. Škripecky, Vancák

2.3 Advisor/Consultant

Hydroprojekt Praha, Department Ostrava, Czech Republic

2.4 Legal/Financial Status

state enterprise

Authority/Company Profile

The main activities of the company are as follows: supply for drinking water to the population and other consumers, public sewerage and wastewater treatment, providing development of water resources, technical and investment development in sanitary engineering, administration, operation and maintenance of waterworks, water supply networks, sewerage systems and wastewater treatment plants, administration, operation, admittance, repair, upgrading and modernization of facilities. In addition, waterworks are engaged in a multitude of secondary and auxiliary activities, e.g. erection of structures and installation services. Waterworks posses their own laboratories serving for the analysis of supplied water quality and for the control of wastewater plants

Number of employees: 2911
Annual revenues: 1.442.101.000,- Sk in 1997
Annual expenses: 1.477.754.000,- Sk in 1997
Annual profit: - 35.653.000,- Sk in 1997

2.6 Planning/Implementing Extent/Capacity of the Investor

administration, consulting and control services during the period of construction and start up operation of new structures

2.7 Institutions/Enterprises beside the Investor

Project design, consulting firm: Hydroprojekt Ostrava, Czech Republic,
Civil construction: Inžinierske stavby Košice, lately Ekostav Michalovce.
Technology supply: Sigma Hranice, Czech Republic

3. PROJECT DESCRIPTION

3.1 Project Outline

The construction, expansion of existing wastewater treatment plant of the Humenné city. It is the mechanical-biological treatment plant. with the capacity of Q = 540 l/s.

The user and owner of the treatment plant is the East-Slovakian Water and Sewage Works. The location of new treatment plant tanks, structures, etc. are situated nearby the existing plant.

3.2 Primary Needs for the Project

The main goal of the project is to improve the effluent quality parameters, to reduce the pollution impact of treated wastewater discharged to the river of Laborec, which after the confluence with the river of Uh and Ondava creates the Bodrog river. This river is the transboundary watercourse with Hungary.
The existing wastewater treatment plant is mass and hydraulic overloaded. This fact has a great impact on the effluent quality and thus on river water quality and finally it may cause the problems with the transboundary pollution.

3.3 Status of Project Preparation

The project is ongoing now. Due to the lack of finances the design project is re-designed to minimize the costs and the expansion of the plant.

3.4 Technology Proposed

The expansion of treatment plant consists of the following structures :

- pumping station of raw wastewater (two stages),
- rectangular primary settling tanks,
- biological treatment step; activated sludge system with the nutrient removal,
- blowers station,
- thickener for the raw primary sludge,
- sludge treatment,
- dewatering of sludge by centrifuge,
- reconstruction of the pumping station for the caprolactan wastewater.

3.5 Ownership of Project Site

Only a part of the plant site is in the ownership of the investor East-Slovakian Water and Sewage Works, Humenné, the rest is under negotiations, now.

3.6 Specific project Items

The construction started in 1989. Since this time only 80 % of civil structures have been completed. In 1993, the project halted because of the lack of funds.

4. Project Effects and Interactions

4.1 Public's Expression of Interest

The construction of plant is ongoing project accepted all the local and state institutions and all them wish to complete the treatment plant.

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

The receptor of effluent is the watercourse of the Laborec river, downstream of Humenné city. There is a sensitive area because this region is utilized for the public water supply (there are two water resources for the settlements Strážske and Michalovce).

4.4 Primary Effects of Project

There are the following positive effects:

- local and regional : the expansion of treatment plant will cover the need of treatment of discharged wastewaters to improve the ambient water quality in the Laborec river,
- regional - improving the water quality of the river Laborec will have positive impact on the water protection in the region serving for the water supply,
- international/transboundary level – reduction of the pollution of mass flux, improving the river water quality.

5. Economic Project Justification

5.1. Economic Project Benefits

It is not possible to justify because of ongoing project.

Employment/income effects	
during construction period	35 employees
during operation period	18 employees

Other economic benefits

Applying the new treatment technologies will enable to reduce the discharged pollution of treated wastewaters and thus reduced the payment of compensation for pollution discharged to the surface waters. New treatment line will reduce the operational treatment costs, as well.

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated?	☐ **yes** ☒ **no**
total investment costs of project	597.806.000,-Sk
planned annual depreciation	35.870.000,-Sk
planned annual operation costs	21.370.000,-Sk
planned annual revenues	51.000.000,-Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	550.000.000,-Sk
Allocation of capital cost	
Land	7.535.000,-Sk
Construction and machinery	34.771.000,-Sk
Planning and supervision	5.500.000,-Sk
Total cost	597.806.000,-Sk
On an annual basis	.-Sk
Year of cost estimate	.-Sk

Nature of cost estimate (preliminary, adequate, etc.)

preliminary calculation

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)

wastewater treatment 13.700.000,- Sk/year
collection of wastewater 9.300.000,- Sk/year

Repair and replacement cost	3.000.000,-Sk/year
Total operational cost	23.000.000,-Sk/year
Year of cost estimate	26.000.000,-Sk/year

Nature of cost estimate (preliminary, adequate, sources of information)

The calculations of costs are preliminary and they were estimated on the basis of the similar costs spent on the operation of public sewerage in East- Slovakian Water and Sewage works.

6.3 Estimate of Revenues

Expected annual revenues (in real terms)

expected annual revenue: 50.280.000,- Sk/year

Year of estimate:	1997

Nature of estimate (preliminary, adequate, etc.)

Nature of estimation is preliminary and it is based on the present fees for supplied water and conveyed wastewater for municipalities and industry.

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme			
Sources of funding	**Secured**	**Requested**	**Non- secured**
	Currency [mil. Sk]		
1. Equity of project owner	35,1	35,0	
2. National Environmental Fund	122,1	100,0	100,0
3. **Water Management Fund**			
4. Public loan - central budget	58,5	200,0	200,0
5. Public loan - regional budget			
6. Public grant - central budget			
7. Public grant - regional budget			
8. International loan			
9. International grant			
10. Commercial bank loan			
11.Others sources			
Total funds / requirements	215,7	335,0	300,0

Project No. 10-M

Topoľčany - Wastewater Treatment Plant Upgrading

Date of first setting up:	4/05/1998	Date of latest upgrade:	

Project Title:	Topo¾èany - wastewater treatment plant upgrading

Responsible/Legal Body	
Authority/Company	West-Slovakian Water and Sewage Works, Bratislava
Name	Západoslovenské Vodárne a kanalizácie, š.p. Bratislava
Address	Západoslovenské Vodárne a kanalizácie, š.p. Bratislava Trnavská 32 826 29 Bratislava Slovakia
Telephone	00421/ (0)7/ 526 75 17
Fax	00421/(0)7/ 542 5284
e-mail	-
Project Target	The upgrading of wastewater treatment plant reduces the problems on the existing treatment plant. The aim of the project is to treat all the collecting wastewater and to reach the required effluent standards.
Investment Costs	34.298.000,- Sk
Status of Project	☐ ongoing ☒ planned ☐ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

Topo¾èany - wastewater treatment plant upgrading

2 Investor Details

2.1 Authority/Company

Name	West-Slovakian Water and Sewage Works, Bratislava (ZsVaK)		
Address	Západoslovenské Vodárne a kanalizácie, š.p. Bratislava Trnavská 32 826 29 Bratislava Slovakia		
Telephone	00421/ (0)7/ 526 75 17		
Fax	00421/(0)7/ 542 5284	e-mail	-

2.2 Contact Persons

Ing. Helena Bursuková - ZsVaK Bratislava
Ing. František Pavlovèín - Hydrocoop, Ltd. Bratislava

2.3 Advisor/Consultant

West-Slovakian Water and Sewage Works (ZsVaK), Bratislava
Hydrocoop, Ltd. Bratislava

2.4 Legal/Financial Status

state enterprise

Authority/Company Profile

The main activities of the company are as follows: supply for drinking water to the population and other consumers, public sewerage and wastewater treatment, providing development of water resources, technical and investment development in sanitary engineering, administration, operation and maintenance of waterworks, water supply networks, sewerage systems and wastewater treatment plants, administration, operation, admittance, repair, upgrading and modernization of facilities. In addition, waterworks are engaged in a multitude of secondary and auxiliary activities, e.g. erection of structures and installation services. Waterworks posses their own laboratories serving for the analysis of supplied water quality and for the control of wastewater plants

Number of employees: 2878 in 1996
Annual revenues: 1.152.696.000,- Sk in 1996
Annual expenses: 1.044.634.000,- Sk in 1996
Annual profit(loss): -36.337.000,- Sk in 1996

2.6 Planning/Implementing Extent/Capacity of the Investor

administration, consulting and control services during the period of construction and start up operation of new structures

2.7 Institutions/Enterprises beside the Investor

Project design, consulting firms: Hydrocoop, Ltd. Bratislava
Civil construction and technology supply: Vodomont, Vodohospodárske stavby, a.s. Ša¾a
User of the project and operator of plant: West-Slovakian Water and Sewage Works, Topo¾èany

3. PROJECT DESCRIPTION

3.1 Project Outline

The upgrading of the treatment plant will be implemented in two subsequent stages.
The first stage is the construction of the new biological treatment step and the other structures and the re-construction of the existing pumping station for the influent.
The second stage is represented by the upgrading of the existing mechanical pre-treatment and primary tanks, existing activation tanks and final clarifiers.
The new biological treatment step consists of the activated sludge system with radial final clarifier ∅ 24 m. The biological treatment step is designed as the denitrification and nitrification system.
The prospective user of the treatment plant will be the West-Slovakian Water and Sewage Works, Topo¾èany. The location of treatment plant is on the own land of the West-Slovakian Water and Sewage Works at the site of existing treatment plant.

3.2 Primary Needs for the Project

The main goal of the project is to reach the Slovak and EU effluent standards because the river Nitra (the recipient) is the highly polluted watercourse.
Receptor of the effluent is the Nitra river. The effluent quality, after the completing the upgrading of the treatment plant, will reach the required effluent standards set by the Gov. Decree 242/93.
The ambient water quality will be the following :
BOD_5 = 7,21 mg/l
COD = 16,58 mg/l
SS = 24,58 mg/l
$N\text{-}NH_4^+$ = 1,36 mg/l
DS = 502,71 mg/l
If the project would not implement it is expected the problems with the water quality in the recipient and the impact on the transboundary pollution.
At present only a part of municipal wastewater discharged is treating on the existing wastewater treatment plant. The rest ones are treating only partially and then by-pass.

3.3 Status of Project Preparation

The project was started in 12/1996 and the planning date of the completing is 10/1998, however there is a lack of finances to finish the upgrading of plant . The upgrading depends on the fact whether or not the necessary sources of funding will be secured.

3.4 Technology Proposed

The upgrading of treatment plant includes a new biological treatment step with the nutrient removal. The total volume of the activated sludge tank is 3200 m^3 (nitrification zone 2140 m^3 and denitrification zone 1060 m^3). The aeration system with fine bubbles consits of 42 Messner plates N3. The pressure air will be produced by the blowers HAFI AERZEN type GM 25S-100, KOMPAKT III, FA 3+1. The operation of the blowers will be controlled by the oxi-probe.

3.5 Ownership of Project Site

The site of plant is in the ownership of the investor.

3.6 Specific project Items

N/A

4. Project Effects and Interactions

4.1 Public's Expression of Interest

The upgrading of the treatment plant has approved by all legal institutions in question.

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

Recipient is the river Nitra. This river is highly polluted. The ambient water quality is estimated for the time after the completing of upgrading in following terms of BOD_5 = 7,21 mg/l, COD = 16,58 mg/l, DS = 502,71 mg/l, SS = 24,58 mg/l and $N\text{-}NH_4^+$ = 1,36 mg/l.

4.4 Primary Effects of Project

There are expected the following positive effects :

- local level and regional - improving the water quality in the river Nitra,
- international/transboundary level -reduction of the pollution of mass flux, improving the water quality and reduction of the payment of compensation for water pollution discharge with respect to Hungary, improving the aesthetic and recreational characteristics of the Nitra river.

5. Economic Project Justification

5.1. Economic Project Benefits

N/A

Employment/income effects	
during construction period	N/A
during operation period	it is expected the reduction with respect to the existing state because of the partially automation of treatment plant operation

Other economic benefits

Applying the new treatment technologies, energy savings in operation of wastewater treatment plant. The reduction of the payment for the compensation of the discharged waste water to the receptor.

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated ?	☐ **yes** ☒ **no**
total investment costs of project	N/A
planned annual depreciation	N/A
planned annual operation costs	N/A
planned annual revenues	N/A

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	N/A
Allocation of capital cost	
Land	N/A
Construction and machinery	N/A
Planning and supervision	1.098.000,-Sk
Total cost	34.298.000,-Sk
On an annual basis	N/A
Year of cost estimate	N/A

Nature of cost estimate (preliminary, adequate, etc.)

preliminary calculation

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)

N/A

Repair and replacement cost	N/A
Total operational cost	N/A
Year of cost estimate	N/A

Nature of cost estimate (preliminary, adequate, sources of information)

N/A

6.3 Estimate of Revenues

Expected annual revenues (in real terms)	
N/A	
Year of estimate:	N/A
Nature of estimate (preliminary, adequate, etc.)	
N/A	

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme

Sources of funding	Secured	Requested	Non- secured
	Currency [10^3. Sk]		
1. Equity of project owner		18.000	10.298
2. National Environmental Fund			
3. **Water Management Fund**			
4. Public loan - central budget	3000		
5. Public loan - regional budget			
6. Public grant - central budget			
7. Public grant - regional budget			
8. International loan			
9. International grant			
10. Commercial bank loan			
11.Others sources			
Total funds/requirements	3000	18000	10298

Project No. 11-M

Rožňava - Expansion of Wastewater Treatment Plant

Date of first setting up:	4/7/1998	Date of latest upgrade:	

Project Title:	Rožòava - expansion of wastewater treatment plant

Responsible/Legal Body	
Authority/Company	East-Slovakian Water and Sewage Works, Košice Východoslovenské Vodárne a kanalizácie, š.p. Košice
Name	Ing.Jozef Schürger director
Address	Vodárne a kanalizácie, š.p. Košice ul. Komenského 50 04 248 Košice Slovakia
Telephone	00421/ (0)95/ 6333011-15
Fax	00421/(0)95/ 63 373 00
e-mail	-
Project Target	The capacity of 63 l/s of existing mechanical-biological treatment plant is not sufficient to ensure the required effluent quality. The present wastewater flow rate is from 140 to 160 l/s. In the 1991 the construction of new wastewater treatment plant was started with the capacity 162 l/s. Investor is the Municipality of Rožòava, the perspective users - the city of Rožòava and industrial producers connected to public sewer network .
Investment Costs	91.605.000,- Sk
Status of Project	☒ ongoing ☐ planned ☐ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

Rožòava - expansion of wastewater treatment plant

2 Investor Details

2.1 Authority/Company

Name	Mestký úrad Rožòava (Municipality of Rožňava)		
Address	Šafárikova 29 048 01 Rožòava Slovakia		
Telephone	00421/ (0)942/ 324506, Mayor 324 837		
Fax	00421/(0)942/ 217 10, 271 26	e-mail	-

2.2 Contact Persons

Mr. Kossuth Ľudovít - the municipality of Rožòava
Ing. Peter Jacko - Ekolines Košice (design and consulting firm)

2.3 Advisor/Consultant

East-Slovakian Water and Sewage Works, Košice, the present operator of treatment plant, the municipality of Rožòava - the investor

2.4 Legal/Financial Status

local government

Authority/Company Profile

The budget of municipal of Rožòava consists of the state participation and the taxes coming from the inhabitants. The number of the employees of municipality is about 50.

2.6 Planning/Implementing Extent/Capacity of the Investor

administration, control services during the period of construction.

2.7 Institutions/Enterprises beside the Investor

Project design, consulting firm: Ekolines, Ltd. Košice
Civil construction: Inžinierske Stavby,a.s. Košice - VDS
Technology supply: Montekos, Ltd. Humenné

3. PROJECT DESCRIPTION

3.1 Project Outline

It is the construction of new treatment line of mechanical-biological treatment plant in the site of existing old treatment plant with the capacity of 162 l/s.
The main structures of plant are as follows:
pumping station and mechanical pre-treatment,
primary settling tank with the diameter 37 m,
biological treatment - 3 carrousel activation systems with clarifiers,
biogas storage,
sludge treatment with anaerobic digestion and storage tanks, mechanical dewatering of digested sludge.
Since September of 1995 has been under test operation but only with 1/3 of the biological treatment step capacity, because only one carrousel activation tank was completed. Due to the problems with the incomplete treatment plant the test operation has been prolonged to 12/31/1998. The location of treatment plant is on the own land of the East-Slovakian Water and Sewage Works at the site of existing treatment plant.

3.2 Primary Needs for the Project

The main goal of the project is to improve the effluent water quality to reduce the discharged pollution to the Slaná River. At present this reduction represent about 110 t/year less in terms of BOD_5 and SS.

3.3 Status of Project Preparation

The project is ongoing now, the most of the structures are finished. The civil part of a new treatment plant is practically finished. The main problem is in the lack of finances to complete the technology supply of the biological treatment line (only 1/3 was delivered).

3.4 Technology Proposed

The treatment line of wastewater treatment plant consist of :

- pumping station,
- mechanical pre-treatment,
- carrousel activation with clarifiers, extended aeration equipped with aeration system Messner plates,
- digestion tank with storage tank
- mechanical dewatering with beltpress CENED 1500

3.5 Ownership of Project Site

The site of plant is in on the existing old treatment plant, it is an ownership of the operator.

3.6 Specific project Items

N/A

4. Project Effects and Interactions

4.1 Public's Expression of Interest

Design project has already been approved by the legal institutions

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

Recipient is the Slaná river. This river flows through the region where the protected natural sources for water supply are situated (Slavec, Plešivec), and the protected region Slovenský Kras.

4.4 Primary Effects of Project

There are expected the following positive effects :
local level and regional – improving the water quality in the Slaná river, ensuring the protection of protected region Slovenský Kras including the protected natural sources of water,
international/transboundary level -reduction of the pollution of mass flux, improving the water quality of the Slaná river which have the impact on water quality of the Rimava (Sajó) river flowing to Hungary

5. Economic Project Justification

5.1. Economic Project Benefits

It is not possible to justify because of ongoing project. The wastewater treatment plant is under construction.

Employment/income effects	
during construction period	20 employees (estimated earning 9500,-Sk)
during operation period	11 employees (estimated earning 8300,-Sk)

Other economic benefits

Applying the new treatment technologies, energy savings in operation of waste water treatment plant, reduction the payment to River Basin Authority of Hron for the compensation for wastewater discharge into surface water.

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated?	☐ **yes** ☒ **no**
Total investment costs of project	91.605.000,-Sk
planned annual depreciation	5.490.000,-Sk
planned annual operation costs	9.260.000,-Sk
planned annual revenues	14.500.000,-Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	91.605.000,-Sk
Allocation of capital cost	
Land	0,-Sk
Construction and machinery	51.476.000,-Sk
Planning and supervision	560.000,-Sk
Total cost	82.965.000,-Sk
On an annual basis	-.-Sk
Year of cost estimate	-.-Sk

Nature of cost estimate (preliminary, adequate, etc.)

preliminary calculation

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)

wastewater treatment 5.600.000,- Sk/year
collection of wastewater 3.740.000,- Sk/year

Repair and replacement cost	500.000,-Sk
Total operational cost	9.340.000,-Sk/year
Year of cost estimate	10.000.000,-Sk

Nature of cost estimate (preliminary, adequate, sources of information)

The calculations of costs are preliminary and they have been estimated on the basis of the expenses spent on the operation of sewerage and wastewater treatment in East- Slovakian Water and Sewage works.

6.3 Estimate of Revenues

Expected annual revenues (in real terms)

expected income from the compensation for wastewater discharges into public sewer network:
14.500.000,- Sk/year

Year of estimate:

Nature of estimate (preliminary, adequate, etc.)

Nature of estimation is preliminary and it is based on the present compensations for supplied water (6,- Sk/m^3) and drained wastewater for municipalities (4,-Sk/m^3) and industry (15,90 Sk/m^3).

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme			
Sources of funding	**Secured**	**Requested**	**Non- secured**
	Currency [mil. Sk]		
1. Equity of project owner	21		16
2. National Environmental Fund	22	30	
3. **Water Management Fund**			
4. Public loan - central budget	31		
5. Public loan – regional budget	80		
6. Public grant – central budget			
7. Public grant – regional budget			
8. International loan			
9. International grant			
10. Commercial bank loan	2		
11.Others sources			
Total funds/requirements	76	30	16

Project No. 12-M

Liptovský Mikuláš - Reconstruction of Wastewater Treatment Plant 2nd Stage

Date of first setting up:	4/24/1998	Date of latest upgrade:	

Project Title:	Liptovský Mikuláš – reconstruction of wastewater treatment plant 2nd stage

Responsible/Legal Body	
Authority/Company	North-Slovakian Water and Sewage Works, Žilina Severoslovenské Vodárne a kanalizácie, š.p. Žilina
Name	
Address	Severoslovenské Vodárne a kanalizácie, š.p. Žilina Bôrická cesta 107 010 23 Žilina
Telephone	00421/(0)89/7635 251-4
Fax	00421/(0)89/46643
e-mail	-
Project Target	The aim of the project is the reconstruction and upgrading of existing wastewater treatment plant Liptovský Mikuláš, improvement of its efficiency and capacity for the higher pollution of wastewater and loading of activated sludge system.
Investment Costs	80.000.000,- Sk
Status of Project	☒ ongoing ☐ planned ☐ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

Liptovský Mikuláš – reconstruction of wastewater treatment plant 2nd stage

2 Investor Details

2.1 Authority/Company

Name	North Slovakian Water and Sewage Works (SeVaK), Žilina Severoslovenské Vodárne a kanalizácie, š.p. Žilina		
Address	Severoslovenské Vodárne a kanalizácie, š.p. Žilina Bôrická cesta 107 010 23 Žilina Slovakia		
Telephone	00421/(0)89/7635 251-4		
Fax	00421/(0)89/46643	e-mail	-

2.2 Contact Persons

Ing. Gaduš

2.3 Advisor/Consultant

North-Slovakian Water and Sewage Works, RŠP, Žilina

2.4 Legal/Financial Status

state enterprise

Authority/Company Profile

The main activities of the company are as follows: supply for drinking water to the population and other consumers, public sewerage and wastewater treatment, providing development of water resources, technical and investment development in sanitary engineering, administration, operation and maintenance of waterworks, water supply networks, sewerage systems and wastewater treatment plants, administration, operation, admittance, repair, upgrading and modernization of facilities. In addition, waterworks are engaged in a multitude of secondary and auxiliary activities, e.g. erection of structures and installation services. Waterworks posses their own laboratories serving for the analysis of supplied water quality and for the control of wastewater plants

Number of employees: 1815 in 1996
Annual revenues: 829.469.000,- Sk in 1996
Annual expenses: 729.479.000,- Sk in 1996
Annual profit : 2.446.000,- Sk in 1996

2.6 Planning/Implementing Extent/Capacity of the Investor

Administration, consulting and control services during the period of construction and start up operation of new structures

2.7 Institutions/Enterprises beside the Investor

Consulting, design firm: BIDOR – Ing. Billý, Bratislava
Construction delivery: SeVaK OZ Lipt. Mikuláš and other firms
The perspective user: SeVaK OZ Liptovský Mikuláš

3. PROJECT DESCRIPTION

3.1 Project Outline

The project covers the construction of the following structures:

- reconstruction of aeration system to fine bubble,
- pumping station for the recirculation and excess sludge and pipelines,
- reconstruction of activated sludge tanks with nitrification and denitrification,
- construction of new clarifiers,
- modification of inlet and outlet structures.

3.2 Primary Needs for the Project

Existing treatment plant does not reach the required effluent standards. The implementation of the project will improve the efficiency of the treatment line and reduce the discharged pollution to the Váh river and sensitive region nearby the Liptovský Mikuláš - reservoir Liptovská Mara.

If the project would not complete it is expected the problems with the water quality in the recipient and the impact on the aesthetics, recreational and fishing characteristics of Liptovská Mara waterworks.

3.3 Status of Project Preparation

The project is ongoing now.

3.4 Technology Proposed

The treatment line of wastewater treatment plant consists of mechanical-biological processes. The reconstruction of the plant is focused on the upgrading of aeration systems and rebuilding the present activated sludge system to the nitrification and the denitrification. It is expected that this upgrading will ensure the savings in the power and operational costs of the plant.

3.5 Ownership of Project Site

The site of plant is in the ownership of the investor.

3.6 Specific project Items

Upgrading of the efficiency of the existing treatment line.

4. Project Effects and Interactions

4.1 Public's Expression of Interest

The implementation of the project will improve the state of the environment and the reduction of discharged pollution to the Váh river.

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

Recipient is the river Váh. This river is a source of water for the Liptovská Mara reservoir.

4.4 Primary Effects of Project

There are expected the following positive effects:

- local level and regional - improving the water quality in the river Váh and reservoir Liptovská Mara,
- the reduction of payment for the compensation of the discharged pollution to the surface water.

5. Economic Project Justification

5.1. Economic Project Benefits

It is not possible to justify because of ongoing project. The wastewater treatment plant is under construction.

Employment/income effects	
during construction period	N/A
during operation period	N/A
Other economic benefits	

Applying the new treatment technologies, energy savings in operation of wastewater treatment plant may be assumed and the reduction of payment compensation for the discharged pollution to the river.

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated?	☐ **yes** ☒ **no**
Total investment costs of project	80.000.000,-Sk
planned annual depreciation	N/A.-Sk
planned annual operation costs	N/A.-Sk
planned annual revenues	N/A.-Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	80.000.000,-Sk
Allocation of capital cost	
Land	.-Sk
Construction and machinery	76.000.000,-Sk
Planning and supervision	4.000.000,-Sk
Total cost	80.000.000,-Sk
On an annual basis	
Year of cost estimate	

Nature of cost estimate (preliminary, adequate, etc.)

preliminary calculation

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)

N/A

Repair and replacement cost	N/A
Total operational cost	N/A
Year of cost estimate	

Nature of cost estimate (preliminary, adequate, sources of information)

N/A

6.3 Estimate of Revenues

Expected annual revenues (in real terms)

expected annual revenue : N/A

Year of estimate : N/A

Nature of estimate (preliminary, adequate, etc.)

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated? ☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme

Sources of funding	Secured	Requested	Non- secured
	Currency [10^3 Sk]		
1. Equity of project owner	6.919	22.000	15.081
2. National Environmental Fund		20.000	20.000
3.Water Management Fund		30.000	30.000
4.Public loan - central budget			
5. Public loan - regional budget			
6.Public grant - central budget			
7. Public grant - regional budget			
8. International loan			
9.International grant			
10.Commercial bank loan			
11.Others sources	8.000	8.000	-
12.Total funds / requirements	14.919	80.000	65.081

Tab.1. Expected effects of current and planned projects and policy measures for municipal hot-spots with respect to reduction of nutrient emissions. ***Scenario No.1.***

No.	Hot Spots/Locality [Name of Catchment]	Receiving water Name river km	Check River Point Upstream river km	Check River Point Downstream river km	Influent at present/ Influent after implementation the project Q_{24} l/s	COD mg/l	BOD_5 mg/l	SS mg/l	N-NH4 mg/l	TN mg/l	TP mg/l	P.E. cap.
HIGH PRIORITY												
1	**WWTP Kosice**	***Hornad***	***Hornad***	***Hornad***	1303,60	266,67	131,68	165,04	N/A	24,14	5,49	247188
		24,3	Krasna n.Hor.	Zdana	1303,60	N/A	150,00	N/A	N/A	27,50	N/A	281578
	[Hornad]		27,0	17,2								
2	**WWTP Nitra**	***Nitra***	***Nitra***	***Nitra***	332,60	414,00	259,00	281,50	24,40	22,84	3,64	124046
		52,5	Luzianky	Cechynce	547,00	N/A	260,00	N/A	N/A	47,67	N/A	204797
	[Vah]		65,1	47,8								
MEDIUM PRIORITY												
3	**WWTP Malacky**	***Malina***	-	***Malina***	54,40	406,00	203,00	186,00	N/A	41,66	9,47	17800
		1,6		Zohor	75,20	1st stage of upgrading				37,25	8,47	22000
	[Morava]	(Malina - 23,6)		4,2	115,7	2nd stage of upgrading				36,64	8,33	33300
4	**WWTP and sewerage Banska Bystrica**	***Hron*** 168,4 - discharge from WWTP, 181,0; 172,1										
		Selciansky creek 2,3; 2,2; 2,1;	***Hron*** Banska Bystrica	***Hron*** Sliac	269,70	350,06	203,36	158,90	N/A	9,65	1,49	78979
		Bystrica 3,2; 2,6; 1,8; 1,5; 0,8	175,8	161,1	536,00	N/A	248,00	N/A	N/A	45,47	10,33	191416
	[Hron]	***Malachovsky creek*** *2,0; 1,6*										
5	**WWTP Michalovce**	***Laborec***	***Laborec***	***Laborec***	222,50	382,90	242,40	191,80	N/A	14,20	3,75	77665
		34,2	Petrovce	Lastomir	350,00	N/A	240,00	N/A	N/A	44,00	N/A	120960
	[Bodrog]		45,1	31,0								
6	**WWTP Svidnik****	***Ondava***	***Ondava***	***Ondava***	37,75	N/A	176,13	N/A	N/A	N/A	N/A	9574
		115,3	upstream Svidnik	downstream Svidnik	58,00	N/A	270,60	N/A	N/A	49,61	N/A	22601
	[Bodrog]		125,1	113,9								

No.	Hot Spots/Locality [Name of Catchment]	Receiving water Name river km	Check River Point Upstream river km	Check River Point Downstream river km	Influent at present/ Influent after implementation the project Q_{24} l/s	COD mg/l	BOD_5 mg/l	SS mg/l	N-NH4 mg/l	TN mg/l	TP mg/l	P.E. cap.
	WWTP Trencin	***Zlatovsky creek***	***Vah***	***Vah***	59,00	508,00	245,60	79,00	8,60	45,03	10,23	20866
7	right side	2,8	Trencin	Opatovce	200,00		145,30			26,64	N/A	41846
	[Vah]	(Vah - 159,6)	165,1	157,2								
	WWTP	***Laborec***	***Laborec***	***Laborec***	312,70	279,70	147,56	88,41	N/A	27,05	6,15	66444
8	**Humenne**	63,4	upstream Cirocha	Brekov	380,00	N/A	150,00	N/A	N/A	27,50	N/A	82080
	[Bodrog]		69,9	59,9								
	LOW PRIORITY											
	WWTP	***Vah***	***Vah***	***Vah***	803,84	579,97	181,39	151,33	24,85	33,25	1,83	209964
9	**Ruzomberok**	314,8	Liskova	Hubova	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	[Vah]		324,9	308,8								
	WWTP	***Nitra***	***Nitra***	***Nitra***	105,50	490,50	292,50	257,50	N/A	53,63	12,19	44437
10	**Topolcany**	93,4	Praznovce	Nitr. Streda	300,0		200,00		N/A	36,67	8,33	86400
	[Vah]		98,0	91,1								
	WWTP	***Slana***	***Slana***	***Slana***	142,90	268,80	134,90	183,10	14,00	26,56	4,03	27759
11	**Roznava**	50,2	upstream Roznava	downstream Roznava	162,00	N/A	140	N/A	N/A	25,67	N/A	32659
	[Slana]		55,3	49,2								
	WWTP	***Vah***	***Vah***	***Vah***	485,0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12	**Lipt. Mikulas**	345,0	upstream L.Hradok	Liskova	498,0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	[Vah]	(end of backwater)	364,6	324,9								
	WWTP	***Stiavnica***	-	***Stiavnica***	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
13	**Ban. Stiavnica**	51,0; 51,6		ustie	117,3	N/A	150,4	1st stage (2000 y.)		17,58	4,00	16200
	[Ipel]			1,1	138,8	N/A	157,1	2nd stage (2020 y.)		17,70	4,02	19300
	WWTP	***Hornad***	***Hornad***	***Hornad***	15,8		220			40,33	9,17	5005
14	**Krompachy**	98,9; 97,2	Kolinovce	downstream Kluknava	40		220			40,33	9,17	12672
	[Hornad]	***Slovinsky creek*** 0,9	100,7	92,1								
	WWTP	***Nosice chanel***			18,20		240,00					6290
15	**Ilava**	18			40,00		250,00					14400
	[Vah]											

No.	Hot Spots/Locality [Name of Catchment]	Receiving water Name river km	Check River Point Upstream river km	Check River Point Downstream river km	Influent at present/ Influent after implementation the project Q_{24} l/s	COD mg/l	BOD_5 mg/l	SS mg/l	N-NH4 mg/l	TN mg/l	TP mg/l	P.E. cap.
	WWTP	***Vah***	***Vah***	***Vah***	123,2	N/A	240	N/A	N/A	44,00	10,00	42578
16	**Hlohovec**	98,9	Hlohovec	upstream Sered	125	N/A	240	N/A	N/A	44,00	10,00	43200
	[Vah]		100,7	81,0								
	WWTP	***Hron***	***Hron***	***Hron***	200,47	342,7	159,91	100,78	15,52	17,51	4,68	46162
17	**Zvolen**	153,3 152,7	Zvolen WWTP	Budca	224		288	264		50	12,00	92897
	[Hron]	***Slatina*** 0,2	153,6	148,2								
	WWTP	***Krivansky creek***	***Krivansky creek***	***Krivansky creek***	92,87	260,9	112,2	90,77	13,23	20,57	1,49	15005
18	**Lucenec**	4,4	upstream Lucenec	downstream Lucenec	207		217	162	39	39,78	2,9	64683
	[Ipel]		5,4	4,2								
	WWTP	***Nitra***	***Nitra***	***Nitra***	123	287	140	243,3	12,1	25,67	5,83	24797
19	**Nove Zamky**	8,8	Nove Zamky	Komoca	265		220			40,33	9,17	83952
	[Vah]		14,5	6,5								
	WWTP	***Kysuca***			89,80	318,40	180,30	167,60	28,20	33,06	4,80	23315
20	**Cadca**	28,1			185,00		180,00			33,00	7,50	47952
	[Vah]											
	WWTP	***Kysuca***			58,40	439,39	207,03	176,40	35,73	37,96	6,32	17410
21	**K. Nove Mesto**	7,1			91		210			38,50	8,75	27518
	[Vah]											
	WWTP	***Orava***			26,70		190,00			34,83	7,92	7305
22	**Turzovka**				30		200			36,67	8,33	8640
	[Vah]											

No.	Hot Spots/Locality [Name of Catchment]	Effluent at present / Effluent after implementation of the project														
		Q_{24}	COD	COD	BOD_5	BOD_5	SS	SS	$N\text{-}NH_4^+$	$N\text{-}NH_4^+$	$N\text{-}NO2^-$	$N\text{-}NO3^-$	TN	TN	TP	TP
		l/s	mg/l	t/year	mg/l	t/year	mg/l	t/year	mg/l	t/year	mg/l	mg/l	mg/l	t/year	mg/l	t/year
HIGH PRIORITY																
1	**WWTP Kosice**	1303,6	51,9	2133,626	19,4	797,540	25,2	1035,980	4,7	193,219	N/A	N/A	9,6	394,66	1,91	78,52
		1303,6	110,0	4522,136	20,0	822,207	24,0	986,648	5,0	205,552	N/A	10,00	8,3	339,16	3,00	123,33
	[Hornad]	designed treatment line : nitrification-denitrification (after 2005 according to Gov.Decree No. 242/93 TP will have to be reduced to 1.5 mg/l)														
2	**WWTP Nitra**	332,6	72,2	757,319	43,8	459,846	47,5	498,027	13,0	136,464	1,16	N/A	17,3	181,04	1,59	16,68
		547,0	60,0	1035,012	20,0	345,004	20,0	345,004	5,0	86,251	N/A	N/A	14,3	246,68	0,50	8,63
	[Vah]	designed treatment line : nitrification-denitrification -biological phophorus removal														
MEDIUM PRIORITY																
3	**WWTP Malacky**	54,40	135,00	231,600	65,10	111,683	73,00	125,236	11,60	19,900	N/A	N/A	31,2	53,60	5,96	10,23
		75,20	100,0	237,151	20,0	47,430	15,0	35,573	10,0	23,715	N/A	N/A	11,2	26,50	5,84	13,85
	[Morava]	designed treatment line : nitrification-denitrification														
4	**WWTP and sewerage Banska Bystrica**	269,7	79,5	676,338	29,1	247,673	40,8	347,270	5,4	46,099	0,19	1,05	7,1	60,64	0,31	2,64
		536,0	80,0	1352,264	20,0	338,066	20,0	338,066	5,0	84,516	N/A	N/A	13,6	230,56	1,50	25,33
	[Hron]	designed treatment line : nitrification-denitrification - biological phosphorus removal														
5	**WWTP Michalovce**	222,5	112,1	786,579	45,4	318,561	36,7	257,515	1,0	7,157	N/A	N/A	7,2	50,52	1,90	13,33
		350,0	80,0	883,008	24,0	264,902	25,0	275,940	5,0	55,188	N/A	N/A	18,5	204,20	3,00	33,11
	[Bodrog]	designed treatment line : nitrification-denitrification (after 2005 according to Gov.Decree No. 242/93 TP will have to be reduced to 1.5 mg/l)														
6	**WWTP Svidnik****	37,8	268,5	319,589	121,0	143,994	100,9	120,126	61,8	73,628	N/A	N/A	32,9	39,12	4.98*	5.93*
		58,0	119,8	219,125	12,7	23,156	35,0	64,018	2,1	3,914	N/A	8,25	14,9	27,22	5,00	9,15
	[Bodrog]	designed treatment line : regeneration-deninitrification-nitrification														

No.	Hot Spots/Locality [Name of Catchment]	Effluent at present / Effluent after implementation of the project														
		Q_{24}	COD	COD	BOD_5	BOD_5	SS	SS	$N\text{-}NH_4^+$	$N\text{-}NH_4^+$	$N\text{-}NO2^-$	$N\text{-}NO3^-$	TN	TN	TP	TP
		l/s	mg/l	t/year	mg/l	t/year	mg/l	t/year	mg/l	t/year	mg/l	mg/l	mg/l	t/year	mg/l	t/year
	WWTP Trencin	59,00	508,00	945,197	245,60	456,969	79,00	146,989	8,60	16,001	N/A	N/A	45,0	83,78	10,23	19,04
7	right side	200,0	90,0	567,648	30,0	189,216	20,0	126,144	5,0	31,536	N/A	N/A	8,0	50,404	3,00	18,922
	[Vah]	designed treatment line : nitrification-denitrification-biological phophorus removal														
8	**WWTP Humenne**	312,7	91,2	899,351	48,0	473,343	32,5	320,492	5,9	58,182	N/A	N/A	16,2	159,753	2,14	21,103
		380,0	125,0	1497,960	35,0	419,429	30,0	359,510	15,0	179,755	N/A	N/A	8,3	98,865	5,00	59,918
	[Bodrog]	designed treatment line : nitrification-denitrification (after 2005 according to Gov.Decree No. 242/93 TP will have to be reduced to 3.0 mg/l)														
LOW PRIORITY																
9	**WWTP Ruzomberok**	803,84	264,8	6713,160	22,2	562,768	37,0	937,186	2,3	57,037	N/A	N/A	24,9	632,255	0,35	8,872
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	[Vah]	The treatment plant completed the upgrading of treatment processes. It is under privatisation project, therefore the present information is not available														
10	**WWTP Topolcany**	105,5	98,1	326,383	58,5	194,632	51,5	171,343	22,3	74,193	N/A	N/A	40,2	133,810	7,68	25,545
		300,0	100,0	946,080	30,0	283,824	25,0	236,520	10,0	94,608	N/A	N/A	11,0	104,069	3,00	28,382
	[Vah]	designed treatment line : nitrification-denitrification														
11	**WWTP Roznava**	142,9	62,0	279,403	27,7	124,830	32,6	146,912	9,5	42,812	N/A	N/A	18,2	82,018	2,90	13,069
		162,0	45,0	229,897	15,0	76,632	25,0	127,721	8,0	40,871	N/A	N/A	7,7	39,338	1,00	5,109
	[Slana]	designed treatment line : carrousel														
12	**WWTP Lipt. Mikulas**	485,0	99,0	1514,201	31,0	474,144	34,0	520,029	24,0	367,079	N/A	N/A	33,6	513,911	0,20	3,059
		498,0	100,0	1570,493	25,0	392,623	27,0	424,033	10,0	157,049	N/A	N/A	20,0	314,099	1,00	15,705
	[Vah]	designed treatment line : nitrification-denitrification														
13	**WWTP Ban. Stiavnica**	21,50	160,80	298,70	55,70	103,51	60,10	111,64	5,65	10,49	N/A	N/A	9,09	16,90	1,04	1,93
		125,2	45,0	177,674	15,0	59,225	20,0	78,966	2,5	9,871	N/A	N/A	20,0	78,966	0,88	3,471
	[Ipel]	designed treatment line : nitrification, denitrification and biological phophorus removal														
14	**WWTP Krompachy****	15,8	247,8	123,451	104,5	52,069	101,4	50,524	20,5	10,210	N/A	N/A	33,4	16,642	5,00	2,491
		40,0	100,0	126,144	18,0	22,706	17,0	21,444	10,0	12,614	N/A	N/A	12,1	15,263	3,00	3,784
	[Hornad]	designed treatment line : nitrification-denitrification														
19	**WWTP Ilava**	18,2	32,0	18,367	3,0	1,722	6,4	3,673	0,9	0,517	N/A	N/A	12,0	6,887	1,40	0,804
		40,0	50,0	63,072	25,0	31,536	30,0	37,843	25,0	31,536	N/A	N/A	30,0	37,843	5,00	6,307
	[Vah]	designed treatment line : carrusel														

No.	Hot Spots/Locality [Name of Catchment]	Effluent at present / Effluent after implementation of the project														
		Q_{24}	COD	COD	BOD_5	BOD_5	SS	SS	$N\text{-}NH_4^+$	$N\text{-}NH_4^+$	$N\text{-}NO2^-$	$N\text{-}NO3^-$	TN	TN	TP	TP
		l/s	mg/l	t/year	mg/l	t/year	mg/l	t/year	mg/l	t/year	mg/l	mg/l	mg/l	t/year	mg/l	t/year
	WWTP	123,2	543,0	2109,683	335,0	1301,554	234,0	909,145	18,3	71,100	N/A	N/A	44,0	170,950	3,00	11,656
15	**Hlohovec**	125,0	100,0	394,200	30,0	118,260	25,0	98,550	10,0	39,420	N/A	N/A	13,2	52,034	3,00	11,826
	[Vah]	designed treatment line : nitrification-denitrification														
16	**WWTP**	200,5	62,9	397,845	17,9	113,038	13,3	84,336	14,0	88,382	0,11	0,65	14,7	93,123	2,68	16,943
	Zvolen	224,0	90,0	635,766	20,0	141,281	20,0	141,281	5,0	35,320	N/A	N/A	15,0	105,961	1,50	10,596
	[Hron]	designed treatment line : nitrification, denitrification and biological phophorus removal														
17	**WWTP**	98,9	80,7	251,651	15,8	49,389	18,8	58,618	10,8	33,549	N/A	N/A	12,3	38,482	1,00	3,118
	Lucenec	207,0	60,0	391,677	8,0	52,224	15,0	97,919	5,0	32,640	N/A	N/A	11,9	77,911	1,00	6,528
	[Ipel]	designed treatment line : nitrification, denitrification and biological phophorus removal														
18	**WWTP**	123,2	39,9	155,021	19,5	75,762	39,0	151,524	2,8	10,879	N/A	N/A	19,3	74,791	3,50	13,598
	Nove Zamky	265,0	90,0	752,134	20,0	167,141	25,0	208,926	10,0	83,570	N/A	N/A	12,1	101,120	3,00	25,071
	[Vah]	designed treatment line : nitrification-denitrification														
20	**WWTP**	89,8	76,2	215,793	24,0	67,966	26,3	74,480	20,4	57,771	N/A	4,54	26,9	76,179	3,70	10,478
	Cadca	185,0	60,0	350,050	20,0	116,683	25,0	145,854	5,00	29,171	N/A	N/A	8,0	46,673	2,70	15,752
	[Vah]	designed treatment line : biofiltration-nitrification-denitrif., partial phosphorus removal														
21	**WWTP**	58,4	119,2	219,531	39,0	71,826	36,2	66,670	27,6	50,831	0,39	8,39	39,3	72,342	4,50	8,288
	K. Nove Mesto	91,0	100,0	286,978	30,0	86,093	25,0	71,744	10,0	28,698	N/A	N/A	27,0	77,340	3,00	8,609
	[Vah]	designed treatment line : biofiltration														
22	**WWTP**	26,7	41,5	34,943	17,1	14,398	21,0	17,682	13,5	11,367	N/A	N/A	24,0	20,208	2,90	2,442
	Turzovka	23,1	50,0	36,424	15,0	10,927	20,0	14,570	4,0	2,914	N/A	N/A	14,0	10,199	0,40	0,291
	[Vah]	designed treatment line : nitrification-denitrification with chemical phosphorus removal														
Total pollution & at present in 10^3 t/year				12,695		5,654		5,218		1,380				2,339		0,290
Total pollution after implementation of the project&				16,275		4,009		4,236		1,269				2,284		0,434
Total pollution reduction in 10^3 t/year				-3,580		1,646		0,98		0,11				0,05		-0,144
Total pollution reduction in %				-28,204		29,108		18,817		8,053				2,349		-49,660

Note : * - P-PO4

** - up to this time the treatment plant is not in operation

& - except WWTP Ruzomberok

- calculated/estimated

Tab.2. Expected effects of planned projects and policy measures for municipal hot-spots with respect to reduction of nutrient emissions *Scenario No.1*

No.	WWTP name/locality	Influent now/ after implementation the project					Effluent now / after			
		Q_{24}	BOD_5	TN	TP	P.E.	TN	TN	TP	TP
		l/s	mg/l	mg/l	mg/l	cap.	mg/l	t/year	mg/l	t/year
HIGH PRIORITY										
1	**WWTP Kosice**	1303,60	131,68	24,14	5,49	247188	18,1	744,34	3,46	142,10
	nitrification-denitrification (after 2005 TP = 1.5 mg/l)						7,2	297,74	3,79	155,64
2	**WWTP Nitra**	547,00	260,00	47,67	10,83	204797	35,8	616,69	6,83	117,73
	nitrification-denitrification -biological phophorus removal						14,3	246,68	2,38	41,11
MEDIUM PRIORITY										
3	**WWTP Malacky**	75,20	N/A	37,25	8,47	22000	27,9	66,25	5,33	12,65
	nitrification-denitrification						11,2	26,50	5,84	13,85
4	**WWTP Banska**	536,00	248,00	45,47	10,33	191416	34,1	576,40	6,51	110,04
	Bystrica	nitrification-denitrification -biological phoph. rem.					13,6	230,56	2,27	38,43
5	**WWTP Michalovce**	350,00	240,00	44,00	10,00	120960	33,0	364,24	6,30	69,54
	nitrification-denitrification						13,2	145,70	6,90	76,16
6	**WWTP Svidnik****	58,00	270,60	49,61	11,28	22601	49,6	90,74	11,28	20,63
	regeneration - denitrification - nitrification						14,9	27,22	7,78	14,23
7	**WWTP Trencin**	200,00	245,60	45,03	10,23	70733	45,03	283,99	10,23	64,52
	right side	nitrification-denitrification -biological phoph. rem.					13,5	85,20	2,25	14,20
8	**WWTP Humenne**	380,00	150,00	27,50	6,25	82080	20,6	247,16	3,94	47,19
	nitrification-denitrification						8,3	98,87	4,31	51,68
LOW PRIORITY										
9	**WWTP Ruzomberok**	803,84	181,39	33,25	7,56	209964	24,9	632,25	4,76	120,70
	nitrification-denitrification						10,0	252,90	5,21	132,20
10	**WWTP Topolcany**	300,0	200,00	36,67	8,33	86400	27,5	260,17	5,25	49,67
	nitrification-denitrification						11,0	104,07	5,75	54,40
11	**WWTP Roznava**	162,00	140	25,67	5,83	32659	19,3	98,35	3,68	18,77
	carrousel						7,7	39,34	4,03	20,56
12	**WWTP Lipt. Mikulas**	498,0	N/A	N/A	N/A	N/A				
	nitrification-denitrification									
13	**WWTP Ban. Stiavnica**	117,3	150,4	17,58	4,00	16200	17,6	65,03	4,00	14,80
	nitrification-denitrification - biological phophorus removal						5,3	19,51	2,76	10,20
14	**WWTP Krompachy**	40	220	40,33	9,17	12672	40,3	50,87	9,17	11,57
	nitrification-denitrification						12,1	15,26	6,33	7,98
15	**WWTP Ilava**	40,00	250,00	45,83	10,42	14400	34,4	43,36	6,56	8,28
	carrousel						13,8	17,34	7,19	9,07
16	**WWTP Hlohovec**	125	240	44,00	10,00	43200	44,0	173,45	10,00	39,42
	nitrification-denitrification						13,2	52,03	6,90	27,20
17	**WWTP Zvolen**	224	288	50	12,00	92897	37,5	264,90	7,56	53,40
	nitrification-denitrification - biological phophorus removal						15,0	105,96	2,64	18,65
18	**WWTP Lucenec**	207	217	39,78	2,9	64683	29,8	194,78	1,83	11,93
	nitrification-denitrification - biological phophorus removal						11,9	77,91	0,64	4,16
19	**WWTP Nove Zamky**	265	220	40,33	9,17	83952	30,3	252,80	5,78	48,26
	nitrification-denitrification						12,1	101,12	6,33	52,86
20	**WWTP Cadca**	185,00	180,00	33,00	7,50	47952	24,8	144,40	4,73	27,57
	carrousel						9,9	57,76	5,18	30,19
21	**WWTP K. Nove Mesto**	91	210	38,50	8,75	27518	28,9	82,86	5,51	15,82
	biofiltration						23,1	66,29	5,69	16,32
22	**WWTP Turzovka**	30	200	36,67	8,33	8640	27,5	26,02	5,25	4,97
	nitrification-denitrification - chemical phophorus removal						11,0	10,41	5,75	5,44

Total pollution at present in 10^3 t/year	5,279		1,010
Total pollution after implementation of the project	2,078		0,795
Total pollution reduction in 10^3 t/year	3,20		0,215
Tototal pollution reduction in %	60,630		21,299

Industrial Sector

Project No. 1a-I

Management of Wastewater in NCHZ Nováky, a.s.

Date of first setting up:	5/27/1998	Date of latest upgrade:	6/01/98

Project Title:	Management of wastewater in NCHZ Nováky, a.s.

Responsible/Legal Body	
Authority/Company	Novácke chemické závody, a.s.
Name	Ing. Ján Kostka Managing director
Address	Novácke chemické závody, a.s. ul. M.R.Štefánika 1 972 71 Nováky Slovak Republic
Telephone	00421/ (0)862/ 468 1111
Fax	00421/(0)862/ 461 138
e-mail	nchzobch@novitech.sk http://www.nchz.sk
Project Target	The aim of the project is to develop the water pollution control model and to make up the optimal warning system of uncontrolled flow of particular organic substances to sewer system
Investment Costs	12.000.000,- Sk
Status of Project	☒ ongoing ☐ planned ☐ emerging concept
Language of Project Documents	☐ Slovak ☒ English ☐ German Summary in English: ☒ yes ☐ no

1 Project Title

Management of wastewater in NCHZ Nováky, a.s.

2 Investor Details

2.1 Authority/Company

Name	Novácke chemické závody, a.s. (NCHZ, a.s.)		
Address	Novácke chemické závody, a.s. ul. M.R.Štefánika 1 972 71 Nováky Slovak Republic		
Telephone	00421/ (0)862/ 468 1111		
Fax	00421/(0)862/ 461 138	e-mail	nchzobch@novitech.sk http://www.nchz.sk

2.2 Contact Persons

Mr. Maaskant, Haskoning, The Netherlands,
Dr. Slobodník, Environmental Institute, Ltd. Koš,
Ing. Schniem, NCHZ, a.s.

2.3 Advisor/Consultant

NCHZ, a.s., Environmental Institute, Ltd. Koš, Kovoprojekt ES Bratislava, Center, Haskoning The Netherlands.

2.4 Legal/Financial Status

joint stock company

Authority/Company Profile

Throughout company's 57 year long presence the company has formed as a producers of production items designed for further processing in various industrial branches. The company's production premises are divided into 5 plants where manufacture of electrolysis products, basic organic chemicals, vinyl chloride, polyvinyl chloride and products of its further processing, as well as calcium carbide and technical gases takes place. The development activities leading to the extension and strengthening of the product portfolio included both the preparation and establishment of working places for PVC processing and the modernization of individual technologies. The execution of technical arrangements has led to the reduction of hazardous substances in wastewater, quantities of which, discharged from the company decreased by 15,1 %.

Profit, sales revenues etc. of the company in 1997 are the following (according to Annual Report 1997 of the Company):

Revenues	3.763.968.000,-Sk
sales	3.420.317.000,-Sk
exports	2.292.881.000,-Sk
gross profit	14.273.000,-Sk
number of employees	2561

2.6 Planning/Implementing Extent/Capacity of the Investor

Administration, consulting and control services

2.7 Institutions/Enterprises beside the Investor

Environmental Institute, Ltd. Koš, Kovoprojekt ES Bratislava, Center, Haskoning The Netherlands.

3. PROJECT DESCRIPTION

3.1 Project Outline

The main goal of the project is to develop the system for the management and control in the field of wastewater treatment.
All these measures will have positive impact on the environment
The perspective user will be NCHZ, a.s.
The territory of realization will be the site of NCHZ, a.s.

3.2 Primary Needs for the Project

the development of the system for the management and control in the field of wastewater generation,
the purchasing and installation of the warning system in the case of the uncontrolled spills discharged to the sewer system of NCHZ, a.s. The impact of this system would be the improving the water quality of the Nitra river and the reduction of possible risk of accidents or acute pollution of the river.
If the project would not implement there are expected several negative impacts on aquatic environment of the Nitra River such as uncontrolled collection of hazardous organic substances to industrial sewer system and finally its discharge to the receiving water.

3.3 Status of Project Preparation

Recently the designed system is under the test operation, the project is in the final phase.

3.4 Technology Proposed

The fundamental equipment of the system is the fluid chromatography (Hewlett-Packard) operating in automation regime. The information from the installation is transferred by cable to the process computer set up at the environmental department with non-stop operation. The alarm situation is alerted by light and sound warning system.

3.5 Ownership of Project Site

The site of the system installation is in the region of company, it is the ownership of NCHZ, a.s.

3.6 Specific project Items

N/A

4. Project Effects and Interactions

4.1 Public's Expression of Interest

The results of the project will be presented on the workshop to be held in 06/10/98 in Bratislava. The invited participants are from the Ministry of Environment, central state bodies, general managers from the particular significant Slovak's industrial companies.

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

The region is highly polluted area (Horná Nitra) by all types of industrial emissions.

4.4 Primary Effects of Project

The implementation of project may positively improve the environmental problems on local and regional level. In case of hazardous substances discharge to the Nitra River, the problem also has the transboundary effect.

5. Economic Project Justification

5.1. Economic Project Benefits

It was not estimated because the project is the prevention against the pollution.

Employment/income effects	
during construction period	
during operation period	the system is operated in automated regime
Other economic benefits	
N/A	

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated?	☐ **yes** ☒ **no**
total investment costs of project	12.000.000,-Sk
planned annual depreciation	500.000,-Sk
planned annual operation costs	250.000,-Sk
planned annual revenues	N/A .-Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	5.000.000,-Sk
Allocation of capital cost	
Land	N/A .-Sk
Construction and machinery	N/A .-Sk
Planning and supervision	N/A .-Sk
Total cost	N/A .-Sk
On an annual basis	N/A .-Sk
Year of cost estimate	N/A .-Sk
Nature of cost estimate (preliminary, adequate, etc.)	
N/A	

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)	
150.000,- Sk	
Repair and replacement cost	100.000,-Sk/year
Total operational cost	150.000,-Sk/year
Year of cost estimate	250.000,-Sk/year
Nature of cost estimate (preliminary, adequate, sources of information)	
Preliminary	

6.3 Estimate of Revenues

Expected annual revenues (in real terms)	
-	
Year of estimate:	-
Nature of estimate (preliminary, adequate, etc.)	
-	

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme			
Sources of funding	**Secured**	**Requested**	**Non- secured**
	Currency [mil. Sk]		
1. Equity of project owner			
2. National Environmental Fund			1
3. **Water Management Fund**			1
4. Public loan - central budget			
5. Public loan - regional budget			
6. Public grant - central budget			
7. Public grant - regional budget			
8. International loan			
9. International grant			3
10. Commercial bank loan			
11.Others sources			
Total funds/requirements			5

Project No. 1b-I

Removal of Chlorinated Hydrocarbons in the Production of Propylenoxid

Date of first setting up:	5/27/1998	Date of latest upgrade:	6/01/1998

Project Title:	Removal of chlorinated hydrocarbons in the production of propylenoxid

Responsible/Legal Body	
Authority/Company	Novácke chemické závody, a.s.
Name	Ing. Ján Kostka Managing director
Address	Novácke chemické závody, a.s. ul. M.R.Štefánika 1 972 71 Nováky Slovak Republic
Telephone	00421/ (0)862/ 468 1111
Fax	00421/(0)862/ 461 138
e-mail	nchzobch@novitech.sk http://www.nchz.sk
Project Target	The main goal of the project is to reduce the discharge of chlorinated hydrocarbons generated in the production of propylenoxid. The starting of the project is planned in 1999, the finishing in 2000.
Investment Costs	30.000.000,- Sk
Status of Project	☐ ongoing ☐ planned ☒ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

Management of wastewater in NCHZ Nováky, a.s.

2 Investor Details

2.1 Authority/Company

Name	Novácke chemické závody, a.s. (NCHZ, a.s.)		
Address	Novácke chemické závody, a.s. ul. M.R.Štefánika 1 972 71 Nováky Slovak Republic		
Telephone	00421/ (0)862/ 468 1111		
Fax	00421/(0)862/ 461 138	e-mail	nchzobch@novitech.sk http://www.nchz.sk

2.2 Contact Persons

The department of technical and research services Dr. Beòo, NCHZ, a.s.
Plant II - Ing.A.Kopèan

2.3 Advisor/Consultant

N/A

2.4 Legal/Financial Status

joint stock company

Authority/Company Profile

Throughout company's 57 year long presence the company has formed as a producers of production items designed for further processing in various industrial branches. The company's production premises are divided into 5 plants where manufacture of electrolysis products, basic organic chemicals, vinyl chloride, polyvinyl chloride and products of its further processing, as well as calcium carbide and technical gases takes place. The development activities leading to the extension and strengthening of the product portfolio included both the preparation and establishment of working places for PVC processing and the modernization of individual technologies. The execution of technical arrangements has led to the reduction of hazardous substances in wastewater, quantities of which, discharged from the company decreased by 15,1 %.

Profit, sales revenues etc. of the company in 1997 are the following (according to Annual Report 1997 of the Company):

revenues	3.763.968.000,-Sk
sales	3.420.317.000,-Sk
exports	2.292.881.000,-Sk
gross profit	14.273.000,-Sk
number of employees	2561

2.6 Planning/Implementing Extent/Capacity of the Investor

Administration, consulting and control services

2.7 Institutions/Enterprises beside the Investor

Since this time they have not been chosen. It is expected that the service of consulting firm NOVING will be utilized.

3. PROJECT DESCRIPTION

3.1 Project Outline

The main goal of the project is to reduce the discharge of chlorinated hydrocarbons to the Nitra river. The reduction of the emission is estimated from 300 - 500 t/year. The technology and the problem of reduction the pollution in question is very complex and at this stage of the project description it is not worth to be specified.
The measure will have positive impact on the environment
The perspective user will be NCHZ, a.s.
The territory of realization will be at the site of NCHZ, a.s.

3.2 Primary Needs for the Project

see item 3.1
If the project would not implement there are expected negative impact on aquatic environment of the Nitra River.

3.3 Status of Project Preparation

Recently the basic technical solution of the project is developed.

3.4 Technology Proposed

The solid/liquid separation by sedimentation of lime from process water and stripping of chlorinated hydrocarbons by hot air is considered. The extracted hydrocarbons will incinerate in the existing company's incinerator. The operation of existing liquidation plant will stop and the gases containing chlorinated hydrocarbons will be frozen.

3.5 Ownership of Project Site

The site of the installation is in the territory of company, it is the ownership of NCHZ, a.s.

3.6 Specific project Items

N/A

4. Project Effects and Interactions

4.1 Public's Expression of Interest

N/A

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

The region is highly polluted area (Horná Nitra) by all types of industrial emissions.
It is expected the reduction of chlorinated hydrocarbons discharge from 300 to 500 t/year less in compare to the present state.

4.4 Primary Effects of Project

The implementation of project may positively improve the environmental problems on local and regional level. In case of hydrocarbons discharge to the Nitra river, the problem also has the transboundary effect.

5. Economic Project Justification

5.1. Economic Project Benefits

N/A

Employment/income effects	
during construction period	N/A
during operation period	N/A
Other economic benefits	

N/A

5.2. Economic Internal Rate of Return (EIRR)	
Has an EIRR been calculated?	☐ **yes** ☒ **no**
total investment costs of project	N/A .-Sk
planned annual depreciation	N/A .-Sk
planned annual operation costs	N/A .-Sk
planned annual revenues	N/A .-Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	N/A .-Sk
Allocation of capital cost	
Land	N/A .-Sk
Construction and machinery	N/A .-Sk
Planning and supervision	N/A .-Sk
Total cost	N/A .-Sk
On an annual basis	N/A .-Sk
Year of cost estimate	N/A .-Sk
Nature of cost estimate (preliminary, adequate, etc.)	
N/A	

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)	
N/A	
Repair and replacement cost	N/A
Total operational cost	N/A
Year of cost estimate	N/A
Nature of cost estimate (preliminary, adequate, sources of information)	
N/A	

6.3 Estimate of Revenues

Expected annual revenues (in real terms)	
N/A	
Year of estimate:	N/A
Nature of estimate (preliminary, adequate, etc.)	
N/A	

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme			
Sources of funding	**Secured**	**Requested**	**Non- secured**
	Currency [. Sk]		
1. Equity of project owner			3
2. National Environmental Fund			2
3. **Water Management Fund**			5
4. Public loan – central budget			
5. Public loan – regional budget			
6. Public grant – central budget			5
7. Public grant – regional budget			
8. International loan			5
9. International grant			5
10. Commercial bank loan			5
11.Others sources			
Total funds/requirements			30

Project No. 2-I

Reconstruction of Wastewater Treatment Plant in Bukocel, a.s.

Date of first setting up:	4/28/1998	Date of latest upgrade:	

Project Title:	Reconstruction of wastewater treatment plant in Bukocel, a.s.

Responsible/Legal Body	
Authority/Company	Bukocel, a.s.
Name	JuDr. Marián Porvažník, chairman of the Board, general manager Ing.Ján Oèovský, member of the Board
Address	Bukocel, a.s. 093 02 Hencovce Slovakia
Telephone	00421/ (0)931/ 233 38, 224 81, 211 65
Fax	00421/(0)931/ 22 957
e-mail	-
Project Target	The aim of the project is the reconstruction of wastewater treatment plant with the treatment of primary sludges. The project implements the new system of suspended solids separation in wastewater and the thickening, conditioning of primary sludge for combustion.
Investment Costs	200.000.000,- Sk
Status of Project	☐ ongoing ☐ planned ☒ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

Reconstruction of wastewater treatment plant in Bukocel, a.s.

2 Investor Details

2.1 Authority/Company

Name	Bukocel, a.s.		
Address	Bukocel, a.s. 093 02 Hencovce Slovakia		
Telephone	00421/ (0)931/ 233 38, 224 81, 211 65		
Fax	00421/(0)931/ 22 957	e-mail	-

2.2 Contact Persons

Ing. Marek Saxa,
Ing. Peter Krauspe

2.3 Advisor/Consultant

Chemoprojekt, a.s. Praha (project from the year 1990)
KPS Brno (project from the year 1992)

2.4 Legal/Financial Status

share holding company

Authority/Company Profile

The Bukocel production can be subdivided into three divisions:
chemicals (kraft pulp, chemical pulp and by products),
wood (timber, plywood boards, veneers),
furniture (chairs, tables, etc.).
The company owned power station, as well:
revenues: 3725 mil.-Sk
annual turnover: 3785,5 mil.-Sk
number of workers: 926

2.6 Planning/Implementing Extent/Capacity of the Investor

administration, consulting and control services during the period of construction.

2.7 Institutions/Enterprises beside the Investor

The present project is old and does not represent the state of art in the field of solid/liquid separation. Therefore it is assumed that it will be re-designed.

3. PROJECT DESCRIPTION

3.1 Project Outline

The project is solving the problems as follows:
pumping station for lifting the wastewater to sedimentation,
radial primary settling tank,
transport the wastewater to biological treatment plant,
thickening of sludge,
dewatering of sludge by filter presses,
conditioning of sludge prior its combustion,
pumping of surface water.
The Bukocel is the prospective user and investor of the project. The location of the expansion and upgrading of existing structures is on the own land of the Bukocel, a.s. Reconstruction of plant is ongoing. Since this time 23 mil.-Sk has been used. Due to the lack of finances the construction of the plant was stopped in 1993.

3.2 Primary Needs for the Project

The main goal of the project is to reduce the pollution discharged to the Ondava river from the present 305,5 t BOD_5/year to 203,1 t BOD_5/year.
This reduction will positively improve the fish management and to improve the hygienic and economy of irrigation system under the effluent discharge point.
The main part of the re-construction is mechanical treatment plant from the 1956. If the reconstruction would not implement it might be possible to expect that the collapse of biological part could exist.

3.3 Status of Project Preparation

The implementation project was completed in 1991. Chemoprojekt Praha was designer of the project. At present it is necessary to provide the tender to select the delivery firms and technology suppliers.

3.4 Technology Proposed

The treatment line of the reconstruction consist of:

- radial sedimentation tank with the 5 000 m^3, made from concrete,
- 2 thickeners of primary sludge with the volume of tanks 200 m,
- dewatering of primary sludge with the capacity of 1500 t DS/year.

3.5 Ownership of Project Site

The site of plant will be situated in the region of company, it is the ownership of Bukocel, a.s.

3.6 Specific project Items

The project intends to replace the old installations with the new ones.

4. Project Effects and Interactions

4.1 Public's Expression of Interest

The public attitude to this project is positive.

4.2 Environmental Impact Assessment (EIA)

☒ yes ☐ no *if yes, please determine the status of elaboration :*
☐ planned ☐ in progress ☐ finished/completed ☒ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

The pollution is discharged to the Ondava river with IV. class of water quality.

4.4 Primary Effects of Project

The pollution discharged from Bukocel to the Ondava River has an impact on the water quality not only on the local but also on international/transboundary level -reduction of the pollution of mass flux will improve the water quality in the Ondava River.

5. Economic Project Justification

5.1. Economic Project Benefits

Reconstruction of existing treatment plant will save about 100 mil.- Sk in compare of constructing a new plant.

Employment/income effects	
during construction period	25 employees – 9500,- Sk/month
during operation period	2 employees – 9700,- Sk/month

Other economic benefits

The savings can be express in the reduction of the payment for the compensation for the discharged wastewater to surface water. They are estimated about – 1.728.000,-Sk/year

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated?	☐ **yes** ☒ **no**
total investment costs of project	200.000.000,-Sk
planned annual depreciation	13.320.000,-Sk
planned annual operation costs	1.500.000,-Sk
planned annual revenues	0,-Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	200.000.000,-Sk
Allocation of capital cost	
Land	0,-Sk
Construction and machinery	298.500.000,-Sk
Planning and supervision	1.500.000,-Sk
Total cost	N/A .-Sk
On an annual basis	N/A .-Sk
Year of cost estimate	N/A .-Sk
Nature of cost estimate (preliminary, adequate, etc.)	
Preliminary	

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)	
it is not considered	
Repair and replacement cost	500.000,-Sk
Total operational cost	1.000.000,-Sk
Year of cost estimate	1.500.000,-Sk
Nature of cost estimate (preliminary, adequate, sources of information)	
preliminary calculation according to the operational experience	

6.3 Estimate of Revenues

Expected annual revenues (in real terms)	
N/A	
Year of estimate:	**N/A**
Nature of estimate (preliminary, adequate, etc.)	
it is not calculated	

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme

Sources of funding	Secured	Requested	Non- secured
	Currency [mil. Sk]		
1. Equity of project owner			
2. National Environmental Fund			
3. **Water Management Fund**			
4. Public loan – central budget			
5. Public loan – regional budget			
6. Public grant – central budget			
7. Public grant – regional budget			
8. International loan			
9. International grant			
10. Commercial bank loan			
11.Others sources			
Total funds/requirements		200	

Project No. 3a-I

Reconstruction of Wastewater Treatment Plant

Date of first setting up:	4/20/1998	Date of latest upgrade:	

Project Title:	Reconstruction of wastewater treatment plant

Responsible/Legal Body	
Authority/Company	Považské chemické závody, a.s.
Name	Považské chemické závody, a.s. (PCHZ, a.s.)
Address	Považské chemické závody, a.s. M.R.Štefánika 71 010 39 Žilina
Telephone	00421/ (0)89/ 436 62
Fax	00421/(0)89/ 468 98
e-mail	-
Project Target	The aim of the project is the reduction of nitrogen pollution discharged to the Váh river using nitrification-denitrification process at the existing wastewater treatment plant. The user of the project will be PCHZ, a.s. Žilina
Investment Costs	21.930.000,- Sk
Status of Project	☐ ongoing ☒ planned ☐ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

Reconstruction of the wastewater treatment plant

2 Investor Details

2.1 Authority/Company

Name	Považské chemické závody, a.s.		
Address	Považské chemické závody, a.s. M.R.Štefánika 71 010 39 Žilina		
Telephone	00421/ (0)89/ 436 62		
Fax	00421/(0)89/ 468 98	e-mail	-

2.2 Contact Persons

Ing. Ján Pilník, 089/675 217
Ing.Soňa Štefunková 089/675 250

2.3 Advisor/Consultant

Hydrotech, a.s. Bratislava
PROX T.E.C. Poprad
Ekoprogres, v.d. Trenèín

2.4 Legal/Financial Status

joint stock company

Authority/Company Profile

The company is chemical factory. It produces the organic and inorganic products, synthetic fertilizers, plastic materials and polymers. The production is specially aimed at caprolactam monomers and polymers, polyamide and polymethyl methacrylate. Window frames and pallets are also produced.
The annual turnover was about 2000 mil.- Sk
The average number of the employees was 1346 in 1997.

2.6 Planning/Implementing Extent/Capacity of the Investor

Administration, consulting and control services during construction

2.7 Institutions/Enterprises beside the Investor

The firm HYDROTECH, a.s. Bratislava will implement the project. The user of the project is PCHZ, a.s. Žilina.

3. PROJECT DESCRIPTION

3.1 Project Outline

The project includes the following measures:

- reconstruction and rearrange of two activated sludge tanks,
- the expansion of the existing structures to increase the accumulation of wastewaters,
- a new measures of activated sludge treatment.
- a reconstruction of blower station and aeration system,
- expansion and improving of monitoring of treatment plant automation system.

The implementation of project does not require a new land. It will be provided on the existing structures and site of company.

3.2 Primary Needs for the Project

The project should reduce the effluent loading by total nitrogen and suspended solids. This improvement is necessary due to the changes in receptor the Váh river. At present the new dam has already completed and the effluent is discharging to the bio-corridor of water dam.
After the completing the water dam Žilina the effluent will discharge to the bio-corridor The present higher pollution of effluent by total nitrogen will have to be reduce due to the possible impact on the bio-corridor. This fact will have a positive effect on the aquatic system in the water dam.

3.3 Status of Project Preparation

The tender of the project was closed and the consulting firm has already been chosen. The design project and the implementation of the project depend on the secured sources of financing.

3.4 Technology Proposed

Upgrading of the existing biological treatment step with nitrification-denitrification process, changes of activated sludge treatment and increasing of plant volume loading. The innovation of blowers with energy savings is included in this project, as well.

3.5 Ownership of Project Site

The site of plant is the ownership of PCHZ, a.s. Žilina.

3.6 Specific project Items

The problem of nitrogen effluent pollution had been created during the construction of water dam Žilina. Due to the fact the effluent will be discharged to the reduced flow rate than before during the period when the hydropower plant will not run, , the new strict effluent standards are in the preparation. In term of N-NH_4^+ it will be probably 3 - 4 times less. The present effluent standards are fulfilling however new standards will require the upgrading of the existing treatment plant.

4. Project Effects and Interactions

4.1 Public's Expression of Interest

N/A

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

The Váh river is the receptor, but the present situation is more complex than before because of water dam constructing. Due to the fact that it is planned to utilize the hydropower only for producing the electricity during the peak hours, the rest time (about 2/3 of day) a small flow rate will be discharged to the bio-corridor serving as a receptor for PCHZ effluent. This issue changes the present receptor to very sensitive receptor esspecially with respect to nutrients and micro-pollutants.

4.4 Primary Effects of Project

Local/regional effect : the reduction of pollution transport to the Váh river
Transboundary effect - reduction of pollution flowing to the Danube river.

5. Economic Project Justification

5.1. Economic Project Benefits

N/A	
Employment/income effects	
during construction period	N/A
during operation period	it is expected to reduce the number of employees
Other economic benefits	
Reduction of energy demand - less 2074 MWh/year – 3.900.000,- Sk Reduction of phosphate acid dosage - less 40 % - 710.000,- Sk Reduction of operation costs - less 100.000,- Sk Reduction of costs for salaries - less 530.000,-Sk	

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated?	☐ **yes** ☒ **no**
total investment costs of project	21.930.000,-Sk
planned annual depreciation	1.056.000,-Sk
planned annual operation costs	5.240.000,-Sk
planned annual revenues	.-Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	21.930.000,-Sk
Allocation of capital cost	
Land	0,-Sk
Construction and machinery	20.930.000,-Sk
Planning and supervision	600.000,-Sk
Total cost	21.930.000,-Sk
On an annual basis	21.930.000,-Sk
Year of cost estimate	about 7.310.000,- Sk
Nature of cost estimate (preliminary, adequate, etc.)	
Preliminary	

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)	
The present operational costs – 21.927.000,- Sk in 1997. In the future they change significantly.	
Repair and replacement cost	the present costs – 3.090.000,-Sk the will reduce about 100.000,- Sk less in the future
Total operational cost	reduction about 5.240.000,-Sk less
Year of cost estimate	1997
Nature of cost estimate (preliminary, adequate, sources of information)	
preliminary calculation valid for the 1997 year	

6.3 Estimate of Revenues

Expected annual revenues (in real terms)	
The increasing of annual revenues is not considered.	
Year of estimate:	
Nature of estimate (preliminary, adequate, etc.)	
N/A	

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme

Sources of funding	**Secured**	**Requested**	**Non- secured**
	Currency [10^3. Sk]		
1. Equity of project owner		21.930	21.930
2. National Environmental Fund			
3. **Water Management Fund**			
4. Public loan - central budget			
5. Public loan - regional budget			
6. Public grant - central budget			
7. Public grant - regional budget			
8. International loan			
9. International grant			
10. Commercial bank loan		21.930	21.930
11.Others sources			
Total funds/requirements		21.930	21.930

Project No. 3b-I

Reconstruction of Ammonium Storehouse Varín

Date of first setting up:	4/20/1998	Date of latest upgrade:	

Project Title:	Reconstruction of ammonium storehouse Varín

Responsible/Legal Body	
Authority/Company	Považské chemické závody, a.s.
Name	Považské chemické závody, a.s. (PCHZ, a.s.)
Address	Považské chemické závody, a.s. M.R.Štefánika 71 010 39 Žilina
Telephone	00421/ (0)89/ 436 62
Fax	00421/(0)89/ 468 98
e-mail	-
Project Target	The aim of the project is the groundwater protection as well as the protection of surface water - the Váh river. The user of the project will be PCHZ, a.s. Žilina
Investment Costs	63.742.000,- Sk
Status of Project	☐ ongoing ☒ planned ☐ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

Reconstruction of ammonium storehouse Varín

2 Investor Details

2.1 Authority/Company

Name	Považské chemické závody, a.s.		
Address	Považské chemické závody, a.s. M.R.Štefánika 71 010 39 Žilina		
Telephone	00421/ (0)89/ 436 62		
Fax	00421/(0)89/ 468 98	e-mail	-

2.2 Contact Persons

Ing. Ján Pilník, 089/675 217
Ing.Soňa Štefunková 089/675 250

2.3 Advisor/Consultant

Consulting firm: PIO Chempik, a.s. Bratislava

2.4 Legal/Financial Status

joint stock company

Authority/Company Profile

The company is chemical factory. It produces the organic and inorganic products, synthetic fertilizers, plastic materials and polymers. The production is specially aimed at caprolactam monomers and polymers, polyamide and polymethyl methacrylate. Window frames and pallets are also produced.
The annual turnover was about 2000 mil.- Sk
The average number of the employees was 1346 in 1997.

2.6 Planning/Implementing Extent/Capacity of the Investor

Administration, consulting and control services during construction

2.7 Institutions/Enterprises beside the Investor

The consulting firm: PIO Chempik, a.s. Bratislava
The civil firm: Stavomat Žilina,
The technology supply: MIDOP Ša¾a,
The user of the project is PCHZ, a.s. Žilina.

3. PROJECT DESCRIPTION

3.1 Project Outline

The project includes the following measures:

- accumulation and water pollution control basins under 15 existing holding tanks for ammonium,
- accumulation and water pollution control basin for barreling station of fluid ammonium,
- accumulation basin for ammonium water,
- watering system to reduce the impact if the spill of ammonium exists,
- holding tank for ammonium water after the watering,
- holding tank for accident water,
- railway weigh-bridge with groundwater pollution control,
- administrative building with protection in case of accident.

The implementation of project does not require a new land. It will be provided on the existing structures and site of company.

3.2 Primary Needs for the Project

The project should reduce the groundwater pollution as well as the Váh river by ammonium. The reduction of possible impact if the accident may exist is also included in the project.
The possible contamination of groundwater may have an impact on the water quality of water source serving for the public water supply of Žilina city.

3.3 Status of Project Preparation

The design project and all the necessary confirmations to start the implementation of the project have already completed. The project does not implement due to the lack of finances.

3.4 Technology Proposed

The following measures are anticipated to provide under the project:

- holding of fluid ammonium in holding tanks equipped with water pollution control basins and watering system,
- handling with ammonium in the space where its the possible spill is protected against the contamination of groundwater,
- collecting and treatment ammonium water generated by watering of ammonium spills.

3.5 Ownership of Project Site

The site of plant is the ownership of PCHZ, a.s. Žilina.

3.6 Specific project Items

The present state of treatment and holding the ammonium does not fulfil the requirements for water pollution protection and safety labor measures.
The aim of the project is to reach the conditions accepting the requirements in question.

4. Project Effects and Interactions

4.1 Public's Expression of Interest

N/A

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

The storehouse of ammonium is situated nearby the Žilina city (8 km) in the region called Varínska terrace. This region has good condition for generation of groundwater due to the hydrogeological composition and therefore is utilized for public water supply of Žilina city.
Unfortunately there is a risk of possible groundwater contamination by ammonium.

4.4 Primary Effects of Project

Local effect: the reduction of groundwater pollution and contamination of water source for Žilina city,
Regional level: the reduction of possible contamination of the Váh river by ammonium in case of accident in the storehouse.

5. Economic Project Justification

5.1. Economic Project Benefits

N/A

Employment/income effects	
during construction period	N/A
during operation period	it is expected do not change the number of employees after the implementation of the project
Other economic benefits	
The economic savings are not calculated	

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated?	☐ **yes** ☒ **no**
total investment costs of project	68.681.000,-Sk
planned annual depreciation	2.236.000,-Sk
planned annual operation costs	.-Sk
planned annual revenues	.-Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	63.742.000,-Sk
Allocation of capital cost	
Land	0,-Sk
Construction and machinery	53.063.000,-Sk
Planning and supervision	2.200.000,-Sk
Total cost	68.681.000,-Sk
On an annual basis	68.681.000,-Sk
Year of cost estimate	about 22.900.000,- Sk
Nature of cost estimate (preliminary, adequate, etc.)	
Detail calculation prepared in the design project in 1997	

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)	
The present operational costs and the future ones will not change significantly.	
Repair and replacement cost	they are not calculated separately
Total operational cost	N/A
Year of cost estimate	N/A
Nature of cost estimate (preliminary, adequate, sources of information)	
N/A	

6.3 Estimate of Revenues

Expected annual revenues (in real terms)	
The increasing of annual revenues is not considered.	
Year of estimate:	
Nature of estimate (preliminary, adequate, etc.)	
N/A	

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme			
Sources of funding	**Secured**	**Requested**	**Non- secured**
	Currency [10^3. Sk]		
1. Equity of project owner	2200 *	66.481	66.481
2. National Environmental Fund			
3. **Water Management Fund**			
4. Public loan – central budget			
5. Public loan – regional budget			
6. Public grant – central budget			
7. Public grant – regional budget			
8. International loan			
9. International grant			
10. Commercial bank loan		66.481	66.481
11.Others sources			
Total funds/requirements	2200 *	66.481	66.481

Note : *- the consulting and design services have been already paid.

Project No. 3c-I

Reconstruction of Caprolactam Holding Tanks

Date of first setting up:	4/20/1998	Date of latest upgrade:	

Project Title:	Reconstruction of caprolactam holding tanks

Responsible/Legal Body	
Authority/Company	Považské chemické závody, a.s.
Name	Považské chemické závody, a.s. (PCHZ, a.s.)
Address	Považské chemické závody, a.s. M.R.Štefánika 71 010 39 Žilina
Telephone	00421/ (0)89/ 436 62
Fax	00421/(0)89/ 468 98
e-mail	-
Project Target	The aim of the project is the protection of groundwater as well as the surface water represented by the Váh river. The user of the project will be PCHZ, a.s. Žilina
Investment Costs	57.464.000,- Sk
Status of Project	☒ ongoing ☐ planned ☐ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

Reconstruction of caprolactam holding tanks

2 Investor Details

2.1 Authority/Company

Name	Považské chemické závody, a.s.		
Address	Považské chemické závody, a.s. M.R.Štefánika 71, 010 39 Žilina		
Telephone	00421/ (0)89/ 436 62		
Fax	00421/(0)89/ 468 98	e-mail	-

2.2 Contact Persons

Ing. Ján Pilník, 089/675 217
Ing.Soňa Štefunková 089/675 250

2.3 Advisor/Consultant

PIO Chempik, a.s. Bratislava

2.4 Legal/Financial Status

joint stock company

Authority/Company Profile

The company is chemical factory. It produces the organic and inorganic products, synthetic fertilizers, plastic materials and polymers. The production is specially aimed at caprolactan monomers and polymers, polyamide and polymethyl methacrylate. Window frames and pallets are also produced.

The annual turnover was about 2000 mil.- Sk

The average number of the employees was 1346 in 1997.

2.6 Planning/Implementing Extent/Capacity of the Investor

Administration, consulting and control services during construction

2.7 Institutions/Enterprises beside the Investor

The consulting and design firm: PIO Chempik, a.s. Bratislava
Civil firm : STAVOMAT Žilina,
Technology supply: MIDOP Šaľa, Friatec Austria, a.i.
The user of the project: PCHZ, a.s. Žilina

3. PROJECT DESCRIPTION

3.1 Project Outline

The project includes the following measures and structures:

- new holding tanks with the protection of groundwater contamination and air pollution,
- the reconstruction of barreling station for fluid substrates with the necessary protection of groundwater equipped with pumps,
- construction of new accumulation basin serving for groundwater pollution at the site where since this time the protection has not been implemented.

The implementation of project does not require a new land. It will be provided on the existing structures and site of company.

3.2 Primary Needs for the Project

The project should reduce the groundwater pollution and subsequently the Váh river contaminated by organic and inorganic substances in the sites where the handling of chemicals is taken place.

The project should ensure the reduction of possible risk of accident, as well.

If the project would not implement there is a possible risk of contamination of groundwater as well as the Váh River by organic and inorganic substances such as cyclohexanon, trichlorethylen, caprolactam, sulphur ammonium, hydroxylamin, ammonium and etc. The significant negative impact may have the spill of larger amount of these substances also on the Váh River.

3.3 Status of Project Preparation

The design project and all the necessary confirmations have already been completed. The implementation of the project started in 1997 but only one structure was completed. Due to the lack of finance sources the construction has been stopped.

3.4 Technology Proposed

The following measures of the project are including:

- holding organic and inorganic fluid substrate in tanks equipped with the required protection of groundwater pollution,
- handling with chemicals only in the sites protected against contamination of groundwater.

3.5 Ownership of Project Site

The site of plant is the ownership of PCHZ, a.s. Žilina.

3.6 Specific project Items

The present state of treatment and holding the hazardous chemicals does not fulfil the requirements for water pollution control and safety labor measures.
The project should coincide with the present state with the legislative requirement.

4. Project Effects and Interactions

4.1 Public's Expression of Interest

N/A

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

There is a risk of groundwater contamination by hazardous chemicals. In addition the present situation is more complex than before because of constructing the Žilina water dam. Due to the fact that it is planned to utilize the hydropower only for producing the electricity during the peak hours, the rest time (about 2/3 of day) a small flow rate will be discharged to the bio-corridor. This issue changes the present receptor to very sensitive one especially with respect to chemicals and micro-pollutants.

4.4 Primary Effects of Project

Local/regional effect : the reduction of pollution transport to the groundwater and the Váh river
Transboundary effect – reduction of pollution flowing to the Danube River.

5. Economic Project Justification

5.1. Economic Project Benefits

N/A

Employment/income effects	
during construction period	N/A
during operation period	it is expected the same number of employees
Other economic benefits	
N/A	

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated ?	☐ **yes** ☒ **no**
total investment costs of project	62.150.000,-Sk
planned annual depreciation	2.937.000,-Sk
planned annual operation costs	.-Sk
planned annual revenues	.-Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	57.464.000,-Sk
Allocation of capital cost	
Land	0,-Sk
Construction and machinery	52.415.000,-Sk
Planning and supervision	2.300.000,-Sk
Total cost	62.150.000,-Sk
On an annual basis	62.150.000,-Sk
Year of cost estimate	about 21.000.000,- Sk
Nature of cost estimate (preliminary, adequate, etc.)	
detail calculation in the project in 1996	

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)	
The expected operational costs will not significantly change after implementation the project.	
Repair and replacement cost	N/A
Total operational cost	N/A
Year of cost estimate	N/A
Nature of cost estimate (preliminary, adequate, sources of information)	
N/A	

6.3 Estimate of Revenues

Expected annual revenues (in real terms)	
The increasing of annual revenues is not considered.	
Year of estimate:	N/A
Nature of estimate (preliminary, adequate, etc.)	
N/A	

6.4 Financial Internal Rate of Return (FIRR)			
Has a FIRR been calculated?	☐ **yes** ☒ **no**		
6.5 Anticipated/Proposed Funding Scheme			
Sources of funding	**Secured**	**Requested**	**Non- secured**
	Currency [10^3. Sk]		
1. Equity of project owner	7.000*	55.000	55.000
2. National Environmental Fund			
3. **Water Management Fund**			
4. Public loan - central budget			
5. Public loan - regional budget			
6. Public grant - central budget			
7. Public grant - regional budget			
8. International loan			
9. International grant			
10. Commercial bank loan		55.000	55.000
11.Others sources			
Total funds/requirements	7.000*	55.000	55.000

Note: * the consulting and design services have been already paid and constructed 1 structure.

Project No. 3d-I

Reconstruction of Methylmethacrylate Holding Tanks

Date of first setting up:	4/20/1998	Date of latest upgrade:	

Project Title:	Reconstruction of methylmethacrylate holding tanks

Responsible/Legal Body	
Authority/Company	Považské chemické závody, a.s.
Name	Považské chemické závody, a.s. (PCHZ, a.s.)
Address	Považské chemické závody, a.s. M.R.Štefánika 71 010 39 Žilina
Telephone	00421/ (0)89/ 436 62
Fax	00421/(0)89/ 468 98
e-mail	-
Project Target	The aim of the project is the protection of groundwater as well as the surface water represented by the Váh river. The user of the project will be PCHZ, a.s. Žilina
Investment Costs	26.273.000,- Sk
Status of Project	☐ ongoing ☒ planned ☐ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

Reconstruction of methymethacrylate holding tanks

2 Investor Details

2.1 Authority/Company

Name	Považské chemické závody, a.s.		
Address	Považské chemické závody, a.s. M.R.Štefánika 71 010 39 Žilina		
Telephone	00421/ (0)89/ 436 62		
Fax	00421/(0)89/ 468 98	e-mail	-

2.2 Contact Persons

Ing. Ján Pilník, 089/675 217
Ing.Soňa Štefunková 089/675 250

2.3 Advisor/Consultant

PIO Chempik, a.s. Bratislava

2.4 Legal/Financial Status

joint stock company

Authority/Company Profile

The company is chemical factory. It produces the organic and inorganic products, synthetic fertilizers, plastic materials and polymers. The production is specially aimed at caprolactan monomers and polymers, polyamide and polymethyl methacrylate. Window frames and pallets are also produced.

The annual turnover was about 2000 mil,- Sk

The average number of the employees was 1346 in 1997.

2.6 Planning/Implementing Extent/Capacity of the Investor

Administration, consulting and control services during construction

2.7 Institutions/Enterprises beside the Investor

The consulting and design firm: PIO Chempik, a.s. Bratislava
Civil firm : STAVOMAT Žilina,
Technology supply: MIDOP Šaľa, Friatec Austria, a.i.
The user of the project: PCHZ, a.s. Žilina

3. PROJECT DESCRIPTION

3.1 Project Outline

The project includes the following measures and structures:

- new holding tanks with the protection of groundwater contamination and air pollution.

The implementation of project does not require a new land. It will be provided on the existing structures and owned site of company.

3.2 Primary Needs for the Project

The project should reduce the groundwater pollution and subsequently the Váh river contaminated by organic and inorganic substances in the sites where the handling of chemicals is taken place

The project should ensure the reduction of possible risk of accident, as well.

If the project would not implement there is a possible risk of contamination of groundwater as well as the Váh River by organic and inorganic substances such as methanol, acetoncyanhydrin, methymethacrylate, toluen and etc. The significant negative impact may have the spill of larger amount of these substances also on the Váh River.

3.3 Status of Project Preparation

The design project and all the necessary confirmations have already been completed. The implementation of the project did not start due to the lack of finance sources.

3.4 Technology Proposed

The following measures of the project are including:

- holding organic fluid substrates in tanks equipped with the required protection of groundwater pollution,
- handling with chemicals only in the sites protected against contamination of groundwater.

3.5 Ownership of Project Site

The site of plant is the ownership of PCHZ, a.s. Žilina.

3.6 Specific project Items

The present state of treatment and holding the hazardous chemicals does not fulfil the requirements for water pollution control and safety labor measures.

The project should coincide with the present state with the legislative requirements.

4. Project Effects and Interactions

4.1 Public's Expression of Interest

N/A

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

There is a risk of groundwater contamination by hazardous chemicals. In addition the present situation is more complex than before because of constructing the Žilina water dam. Due to the fact that it is planned to utilize the hydropower only for producing the electricity during the peak hours, the rest time (about 2/3 of day) a small flow rate will be discharged to the bio-corridor. This issue changes the present receptor to very sensitive one especially with respect to chemicals and micro-pollutants.

4.4 Primary Effects of Project

Local/regional effect: the reduction of pollution transport to the groundwater and the Váh River

Transboundary effect – reduction of pollution flowing to the Danube River.

5. Economic Project Justification

5.1. Economic Project Benefits

N/A

Employment/income effects	
during construction period	N/A
during operation period	it is expected the same number of employees
Other economic benefits	

N/A

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated?	☐ **yes** ☒ **no**
total investment costs of project	28.809.000,-Sk
planned annual depreciation	1.256.000,-Sk
planned annual operation costs	.-Sk
planned annual revenues	.-Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	26.273.000,-Sk
Allocation of capital cost	
Land	0,-Sk
Construction and machinery	23.974.000,-Sk
Planning and supervision	1.300.000,-Sk
Total cost	28.809.000,-Sk
On an annual basis	28.809.000,-Sk
Year of cost estimate	about 9.600.000,-Sk
Nature of cost estimate (preliminary, adequate, etc.)	

detail calculation in the project in 1996

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)

The expected operational costs will not significantly change after implementation the project.

Repair and replacement cost	N/A
Total operational cost	N/A
Year of cost estimate	N/A

Nature of cost estimate (preliminary, adequate, sources of information)

N/A

6.3 Estimate of Revenues

Expected annual revenues (in real terms)

The increasing of annual revenues is not considered.

Year of estimate:	N/A

Nature of estimate (preliminary, adequate, etc.)

N/A

6.4 Financial Internal Rate of Return (FIRR)			
Has a FIRR been calculated?	☐ **yes** ☒ **no**		
6.5 Anticipated/Proposed Funding Scheme			
Sources of funding	**Secured**	**Requested**	**Non-secured**
	Currency [10^3. Sk]		
1. Equity of project owner	1.300*	27.509	27.509
2. National Environmental Fund			
3. **Water Management Fund**			
4. Public loan - central budget			
5. Public loan - regional budget			
6. Public grant - central budget			
7. Public grant - regional budget			
8. International loan			
9. International grant			
10. Commercial bank loan		27.509	27.509
11.Others sources			
Total funds/requirements	1.300*	27.509	27.509

Note: * the consulting and design services have been already paid.

Project No. 6a-I

Project 2000

Date of first setting up:	4/15/1998	Date of latest upgrade:	

Project Title:	Project 2000

Responsible/Legal Body	
Authority/Company	Chemko, a.s. Strážske
Name	Ing.Dušan Hordoš general manager
Address	Chemko, a.s. Strážske Priemyselná 720 072 22 Strážske
Telephone	00421/ (0)946/ 91451,91613
Fax	00421/(0)946/ 91 632
e-mail	-
Project Target	The aim of the project is the reduction of mass and energy consumption in the production process of cyclohexanon and the reduction of ecology loading.
Investment Costs	70.000.000,- USD
Status of Project	☐ ongoing ☐ planned ☒ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

Reconstruction of the cyclohexanon production

2 Investor Details

2.1 Authority/Company

Name	Chemko, a.s. Strážske		
Address	Chemko, a.s. Strážske Priemyselná 720 072 22 Strážske		
Telephone	00421/ (0)946/ 91451,91613		
Fax	00421/(0)946/ 91 632	e-mail	-

2.2 Contact Persons

Ing.Milan Lichvár,CSc.
Ing.Boris Kudelás

2.3 Advisor/Consultant

Chemko, a.s. Strážske, Slovakia

2.4 Legal/Financial Status

joint stock company

Authority/Company Profile

Chemko Company was established by Czechoslovak Government in 1952. National Enterprise was the original and legal form. The first role of the Company was the production of the explosives for the army. The part of intermediate was used for the civil sector. Another development of the Company continued in the following periods:

1.formalin chemistry complex (1957 to 1963),
2.nitrogen chemistry complex (1964 to1969)
3.benzene chemistry complex (1976 to 1983)
4.light stabilizers for plastics plant (1987 to 1991)
5.joint-venture of Chemko and Norwegian company DYNO NOBEL having the name DYNO-CHEMKO, a.s. for the production and distribution of loose and slurry industrial explosives (1993),
6.calcium ammonium nitrate plant (1996)

The main Company's object of activity is to produce basic products of formaldehyde chemistry and cyclohexanone as well as the business activity in the field of chemistry. Until March 31,1996 Chemko existed as a state company, and since April 1, 1996 it has existed as the joint stock Company.
Profit and loss account of the company in 1996 is the following (according to Annual Report 1996 of the Company) :

earnings (loss) from operations + 126.437.000,-Sk
profit (loss) before income taxes - 178.796.000,-Sk
profit (loss) on ordinary activities + 43.284.000,-Sk
extraordinary profit (loss) + 55.449.000,-Sk
profit (loss) for the period + 12.165.000,-Sk

2.6 Planning/Implementing Extent/Capacity of the Investor

Administration, consulting and control services, designer of technology and unit for building maintenance and construction

2.7 Institutions/Enterprises beside the Investor

The firms will be chosen with the supposed contractor TOY ENGINEERING Tokyo. It has already obtained the list of firms from SR and Czech Republic.

3. PROJECT DESCRIPTION

3.1 Project Outline

The replacement of oxidation process of cyclohexanon production :
the significant improvement of safety factor,
the reduction of waste generation as follows :
the process wastewaters less 60 % (18 m^3/h)
the emission less 80 % (37 000 m^3/h)
fluid wastes less 95 % (5,8 t/h)
All these measures will have positive impact on the environment
The perspective user will be Chemko, a.s. Strážske and its partners
The territory of realization will be the site of Chemko, a.s. Strážske

3.2 Primary Needs for the Project

see item 3.1

3.3 Status of Project Preparation

It was work out Opportunity Study, recently the ongoing negotiations are provided between the contractor, financial institutions and the owner of license.

3.4 Technology Proposed

The production of cyclohexanon with non oxidation method

3.5 Ownership of Project Site

The site of plant will be situated in the region of company, it is the ownership of Chemko, a.s.

3.6 Specific project Items

The project will implement the top technology. This one is operated only on one plant in the world.

4. Project Effects and Interactions

4.1 Public's Expression of Interest

At this level of elaboration of project the public has not been involved in its preparation.

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

The site of company and surrounded region are the pollution loaded areas.

4.4 Primary Effects of Project

The implementation of project may positively improve the environmental problems on local and regional level.

5. Economic Project Justification

5.1. Economic Project Benefits

The reduction of costs per 1 ton of product up to 100 USD.

Employment/income effects	
during construction period	400
during operation period	the same
Other economic benefits	
N/A	

5.2. Economic Internal Rate of Return (EIRR)	
Has an EIRR been calculated?	☐ **yes** ☒ **no**
total investment costs of project	2,5 billion Sk
planned annual depreciation	160 million Sk
planned annual operation costs	2,4 billion Sk
planned annual revenues	2,8 billion Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	2,5 billion Sk
Allocation of capital cost	
Land	1,9 billion Sk
Construction and machinery	0,2 billion Sk
Planning and supervision	2,5 billion Sk
Total cost	1 billion Sk
On an annual basis	1998
Year of cost estimate	
Nature of cost estimate (preliminary, adequate, etc.)	
Preliminary	

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)	
since this time has not been specified	
Repair and replacement cost	N/A .-Sk
Total operational cost	N/A .-Sk
Year of cost estimate	N/A .-Sk
Nature of cost estimate (preliminary, adequate, sources of information)	
N/A	

6.3 Estimate of Revenues

Expected annual revenues (in real terms)	
2,8 billion Sk after the year of 2002	
Year of estimate :	estimation on 1998
Nature of estimate (preliminary, adequate, etc.)	
preliminary	

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme			
Sources of funding	**Secured**	**Requested**	**Non- secured**
	Currency [. Sk]		
1. Equity of project owner	20 %	0	0
2. National Environmental Fund			50 %
3. **Water Management Fund**			
4. Public loan – central budget			
5. Public loan – regional budget			
6. Public grant – central budget			
7. Public grant – regional budget			
8. International loan	0	0	30 %
9. International grant			
10. Commercial bank loan			
11.Others sources			
Total funds / requirements	500 million		2,0 billion

Project No. 6b-I

Barreling the Chemicals for Production

Date of first setting up:	4/15/1998	Date of latest upgrade:	

Project Title:	Barreling the chemicals for production

Responsible/Legal Body	
Authority/Company	Chemko, a.s. Strážske
Name	Ing.Dušan Hordoš general manager
Address	Chemko, a.s. Strážske Priemyselná 720 072 22 Strážske
Telephone	00421/ (0)946/ 91451,91613
Fax	00421/(0)946/ 91 632
e-mail	-
Project Target	The aim of the project is to protect the manipulating places serving for the barreling of chemicals (phenol, NAOH) ahead of the leakage to the groundwater.
Investment Costs	16 mil. Sk
Status of Project	☒ ongoing ☐ planned ☐ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

The construction of new barrel place for the production of Fenokol - phenol and NaOH

2 Investor Details

2.1 Authority/Company

Name	Chemko, a.s. Strážske		
Address	Chemko, a.s. Strážske Priemyselná 720 072 22 Strážske		
Telephone	00421/ (0)946/ 91451,91613		
Fax	00421/(0)946/ 91 632	e-mail	-

2.2 Contact Persons

Ing.Mikuláš Žedényi

2.3 Advisor/Consultant

Chemko, a.s. Strážske, Slovakia

2.4 Legal/Financial Status

joint stock company

Authority/Company Profile

Chemko Company was established by Czechoslovak Government in 1952. National Enterprise was the original and legal form. The first role of the Company was the production of the explosives for the army. The part of intermediate was used for the civil sector. Another development of the Company continued in the following periods:

1.formalin chemistry complex (1957 to 1963),
2.nitrogen chemistry complex (1964 to1969)
3.benzene chemistry complex (1976 to 1983)
4.light stabilizers for plastics plant (1987 to 1991)
5.joint-venture of Chemko and Norwegian company DYNO NOBEL having the name DYNO-CHEMKO, a.s. for the production and distribution of loose and slurry industrial explosives (1993),
6.calcium ammonium nitrate plant (1996)

The main Company's object of activity is to produce basic products of formaldehyde chemistry and cyclohexanone as well as the business activity in the field of chemistry. Until March 31,1996 Chemko existed as a state company, and since April 1, 1996 it has existed as the joint stock Company.
Profit and loss account of the company in 1996 is the following (according to Annual Report 1996 of the Company):

earnings (loss) from operations + 126.437.000,-Sk
profit (loss) before income taxes - 178.796.000,-Sk
profit (loss) on ordinary activities + 43.284.000,-Sk
extraordinary profit (loss) + 55.449.000,-Sk
profit (loss) for the period + 12.165.000,-Sk

2.6 Planning/Implementing Extent/Capacity of the Investor

Administration, consulting and control services, designer of technology and unit for building maintenance and construction

2.7 Institutions/Enterprises beside the Investor

Consulting and design firm: Chempro, a.s. Michalovce

3. PROJECT DESCRIPTION

3.1 Project Outline

The construction of new basin under the site where the manipulation with chemicals is occurred (pumps and holding tanks) to collect and reuse leakage and to protect groundwater

3.2 Primary Needs for the Project

Territory of Chemko, a.s. Strážske is situated where the direction of groundwater flow is towards to receiving water - Laborec. This river flows to waterworks Šírava used for recreational purposes. The project should reduce the possible impact of pollution of groundwaters by chemicals.

3.3 Status of Project Preparation

The design project was finished at this time.

3.4 Technology Proposed

The civil modifications without changes in technology.

3.5 Ownership of Project Site

The site of the basin is situated in the region of company, it is the ownership of Chemko, a.s.

3.6 Specific project Items

N/A

4. Project Effects and Interactions

4.1 Public's Expression of Interest

N/A

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

see item 3.2

4.4 Primary Effects of Project

The implementation of project may positively improve the environmental problems on local level.

5. Economic Project Justification

5.1. Economic Project Benefits

The economic benefit is not expected.

Employment/income effects	
during construction period	
during operation period	

Other economic benefits

N/A

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated?	☐ **yes** ☒ **no**
total investment costs of project	16 million Sk
planned annual depreciation	0,4 million Sk
planned annual operation costs	
planned annual revenues	

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	16 million Sk
Allocation of capital cost	
Land	
Construction and machinery	15,75 million Sk
Planning and supervision	0,25 million Sk
Total cost	16 million Sk
On an annual basis	8 million Sk
Year of cost estimate	1997
Nature of cost estimate (preliminary, adequate, etc.)	
Adequate	

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)	
Repair and replacement cost	400.000,-Sk
Total operational cost	400.000,-Sk
Year of cost estimate	N/A .-Sk
Nature of cost estimate (preliminary, adequate, sources of information)	
Preliminary	

6.3 Estimate of Revenues

Expected annual revenues (in real terms)	
Year of estimate:	
Nature of estimate (preliminary, adequate, etc.)	

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme

Sources of funding	Secured	Requested	Non- secured
	Currency [.mil Sk]		
1. Equity of project owner	8		
2. National Environmental Fund		8	
3. **Water Management Fund**			
4. Public loan – central budget			
5. Public loan – regional budget			
6. Public grant – central budget			
7. Public grant – regional budget			
8. International loan			
9. International grant			
10. Commercial bank loan			
11.Others sources			
Total funds/requirements	8	8	

Project No. 6c-I

Reconstruction of Activated Sludge Tanks of Wastewater Treatment Plant

Date of first setting up:	4/15/1998	Date of latest upgrade:	

Project Title:	Reconstruction of activated sludge tanks of wastewater treatment plant

Responsible/Legal Body	
Authority/Company	Chemko, a.s. Strážske
Name	Ing.Dušan Hordoš general manager
Address	Chemko, a.s. Strážske Priemyselná 720 072 22 Strážske
Telephone	00421/ (0)946/ 91451,91613
Fax	00421/(0)946/ 91 632
e-mail	-
Project Target	The aim of the project is the improvement the efficiency of chemical wastewater treatment and the reduction of energy consumption of aeration system.
Investment Costs	15.050.000,- Sk
Status of Project	☐ ongoing ☒ planned ☐ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

The reconstruction and modernization of chemical wastewater treatment plant Chemko, a.s. Strážske

2 Investor Details

2.1 Authority/Company

Name	Chemko, a.s. Strážske		
Address	Chemko, a.s. Strážske Priemyselná 720 072 22 Strážske		
Telephone	00421/ (0)946/ 49 12 11		
Fax	00421/(0)946/ 49 11 54	e-mail	-

2.2 Contact Persons

Ing.Mencák

2.3 Advisor/Consultant

Chemko, a.s. Strážske, Slovakia
HAFI, a.s. Bratislava
Hydrotech, a.s. Bratislava

2.4 Legal/Financial Status

joint stock company

Authority/Company Profile

Chemko Company was established by Czechoslovak Government in 1952. National Enterprise was the original and legal form. The first role of the Company was the production of the explosives for the army. The part of intermediate was used for the civil sector. Another development of the Company continued in the following periods:

1.formalin chemistry complex (1957 to 1963),
2.nitrogen chemistry complex (1964to1969)
3.benzene chemistry complex (1976 to 1983)
4.light stabilizers for plastics plant (1987 to 1991)
5.joint-venture of Chemko and Norwegian company DYNO NOBEL having the name DYNO-CHEMKO, a.s. for the production and distribution of loose and slurry industrial explosives (1993),
6.calcium ammonium nitrate plant (1996)

The main Company's object of activity is to produce basic products of formaldehyde chemistry and cyclohexanone as well as the business activity in the field of chemistry. Until March 31,1996 Chemko existed as a state company, and since April 1, 1996 it has existed as the joint stock Company.
Profit and loss account of the company in 1996 is the following (according to Annual Report 1996 of the Company) :

earnings (loss) from operations + 126.437.000,-Sk
profit (loss) before income taxes - 178.796.000,-Sk
profit (loss) on ordinary activities + 43.284.000,-Sk
extraordinary profit (loss) + 55.449.000,-Sk
profit (loss) for the period + 12.165.000,-Sk

2.6 Planning/Implementing Extent/Capacity of the Investor

Administration, consulting and control services, designer of technology and unit for building maintenance and construction

2.7 Institutions/Enterprises beside the Investor

Consulting and design firm: Hydrotech, a.s. Bratislava
Technology supply: HAFI, a.s. Bratislava

3. PROJECT DESCRIPTION

3.1 Project Outline

The installation of fine bubble aeration system. The aeration system is supply by blowers and it is control by oxygen probes and power frequency.

3.2 Primary Needs for the Project

The target of the project is the combination of utilization of existing installation and structures and improvement of operation reliability of activated sludge system. The improvement of effluent standards is expected, too.
The existing aeration system is old that means the decreasing of its efficiency.

3.3 Status of Project Preparation

The design project is under preparation.

3.4 Technology Proposed

The fine bubble aeration with diffusers.

3.5 Ownership of Project Site

The site of the basin is situated in the region of company, it is the ownership of Chemko, a.s.

3.6 Specific project Items

N/A

4. Project Effects and Interactions

4.1 Public's Expression of Interest

N/A

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

N/A

4.4 Primary Effects of Project

The implementation of project may positively improve the environmental problems on local and regional level.

5. Economic Project Justification

5.1. Economic Project Benefits

The economic benefit is expressed in the savings of energy - 1600 MWh/year.

Employment/income effects	
during construction period	
during operation period	

Other economic benefits

the savings of energy - 1600 MWh/year
the decreasing the operation and maintenance costs

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated?	☒ **yes** ☐ **no**
total investment costs of project	15.050.000,-Sk
planned annual depreciation	1.850.000,-Sk
planned annual operation costs	
planned annual revenues	1.900.000,-Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	15.000.000,-Sk
Allocation of capital cost	
Land	0,-Sk
Construction and machinery	15.050.000,-Sk
Planning and supervision	0,-Sk
Total cost	15.050.000,-Sk
On an annual basis	1997
Year of cost estimate	7.500.000,- Sk
Nature of cost estimate (preliminary, adequate, etc.)	
Adequate	

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)	
Repair and replacement cost	350.000,-Sk
Total operational cost	350.000,-Sk
Year of cost estimate	- ,-Sk
Nature of cost estimate (preliminary, adequate, sources of information)	
Preliminary	

6.3 Estimate of Revenues

Expected annual revenues (in real terms)	
1.900.000,- Sk in energy savings and in reduction of O&M costs.	
Year of estimate:	
Nature of estimate (preliminary, adequate, etc.)	
preliminary	

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☒ **yes** ☐ **no**

6.5 Anticipated/Proposed Funding Scheme

Sources of funding	Secured	Requested	Non- secured
	Currency [.mil Sk]		
1. Equity of project owner			7,5
2. National Environmental Fund			7,5
3. **Water Management Fund**			
4. Public loan – central budget			
5. Public loan – regional budget			
6. Public grant – central budget			
7. Public grant – regional budget			
8. International loan			
9. International grant			
10. Commercial bank loan			
11.Others sources			
Total funds/requirements			15

Project No. 6d-I

Reconstruction of Sewer System

Date of first setting up:	4/15/1998	Date of latest upgrade:	

Project Title:	Reconstruction of sewer system

Responsible/Legal Body	
Authority/Company	Chemko, a.s. Strážske
Name	Ing.Dušan Hordoš general manager
Address	Chemko, a.s. Strážske Priemyselná 720 072 22 Strážske
Telephone	00421/ (0)946/ 91451,91613
Fax	00421/(0)946/ 91 632
e-mail	-
Project Target	The aim of the project is the separation of sewage from the combine sewer system and its collection and draining to the existing wastewater treatment plant
Investment Costs	100.000.000,- Sk
Status of Project	☒ ongoing ☐ planned ☐ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

Reconstruction of sewer system

2 Investor Details

2.1 Authority/Company

Name	Chemko, a.s. Strážske		
Address	Chemko, a.s. Strážske Priemyselná 720 072 22 Strážske		
Telephone	00421/ (0)946/ 49 12 11		
Fax	00421/(0)946/ 49 11 54	e-mail	-

2.2 Contact Persons

Ing.Pavol Mencák, Ing.Miroslav Murín

2.3 Advisor/Consultant

Chemko, a.s. Strážske, Slovakia

2.4 Legal/Financial Status

joint stock company

Authority/Company Profile

Chemko Company was established by Czechoslovak Government in 1952. National Enterprise was the original and legal form. The first role of the Company was the production of the explosives for the army. The part of intermediate was used for the civil sector. Another development of the Company continued in the following periods:

1.formalin chemistry complex (1957 to 1963),
2.nitrogen chemistry complex (1964to1969)
3.benzene chemistry complex (1976 to 1983)
4.light stabilizers for plastics plant (1987 to 1991)
5.joint-venture of Chemko and Norwegian company DYNO NOBEL having the name DYNO-CHEMKO, a.s. for the production and distribution of loose and slurry industrial explosives (1993),
6.calcium ammonium nitrate plant (1996)

The main Company's object of activity is to produce basic products of formaldehyde chemistry and cyclohexanone as well as the business activity in the field of chemistry. Until March 31,1996 Chemko existed as a state company, and since April 1, 1996 it has existed as the joint stock Company.
Profit and loss account of the company in 1996 is the following (according to Annual Report 1996 of the Company) :

earnings (loss) from operations + 126.437.000,-Sk
profit (loss) before income taxes - 178.796.000,-Sk
profit (loss) on ordinary activities + 43.284.000,-Sk
extraordinary profit (loss) + 55.449.000,-Sk
profit (loss) for the period + 12.165.000,-Sk

2.6 Planning/Implementing Extent/Capacity of the Investor

Administration, consulting and control services, designer of technology and unit for building maintenance and construction

2.7 Institutions/Enterprises beside the Investor

Consulting and design firm: Chempik Michalovce

3. PROJECT DESCRIPTION

3.1 Project Outline

The construction new sewer system for collecting sewage flowing from the old part of company territory and pumping station to pump these wastewater to the existing wastewater treatment plant.

3.2 Primary Needs for the Project

The target of the project is to reduce the pollution of Laborec river. It is expected that the sewage collection and transport to the existing plant will reduce the pollution of discharged wastewater in term of BOD_5 to about 18,85 kg/h. The Laborec river is flowing to the recreational significant area and waterworks Šírava.

3.3 Status of Project Preparation

The design project is in the phase of implementation.

3.4 Technology Proposed

The separate sewer system for sewage including the necessary construction arrangements.

3.5 Ownership of Project Site

The site of construction is situated in the region of company, it is the ownership of Chemko, a.s.

3.6 Specific project Items

N/A

4. Project Effects and Interactions

4.1 Public's Expression of Interest

N/A

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

see item 3.2

4.4 Primary Effects of Project

The implementation of project may positively improve the environmental problems on local and regional level.

5. Economic Project Justification

5.1. Economic Project Benefits

The economic benefit is expressed in the reduction of the payment for the compensation for the wastewater discharge to the Laborec river.

Employment/income effects	
during construction period	N/A
during operation period	N/A

Other economic benefits

N/A

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated?	☐ **yes** ☒ **no**
total investment costs of project	100.000.000,-Sk
planned annual depreciation	2.500.000,-Sk
planned annual operation costs	.-Sk
planned annual revenues	.-Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	100.000.000,-Sk
Allocation of capital cost	
Land	0,-Sk
Construction and machinery	100.000.000,-Sk
Planning and supervision	0,-Sk
Total cost	100.000.000,-Sk
On an annual basis	40.000.000,- Sk
Year of cost estimate	1997
Nature of cost estimate (preliminary, adequate, etc.)	
Preliminary	

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)	
Repair and replacement cost	250.000,-Sk
Total operational cost	- ,-Sk
Year of cost estimate	250.000,-Sk
Nature of cost estimate (preliminary, adequate, sources of information)	
Preliminary	

6.3 Estimate of Revenues

Expected annual revenues (in real terms)	
Year of estimate:	
Nature of estimate (preliminary, adequate, etc.)	
Preliminary	

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme

Sources of funding	Secured	Requested	Non- secured
	Currency [.mil Sk]		
1. Equity of project owner			50
2. National Environmental Fund			50
3. **Water Management Fund**			
4. Public loan – central budget			
5. Public loan – regional budget			
6. Public grant – central budget			
7. Public grant – regional budget			
8. International loan			
9. International grant			
10. Commercial bank loan			
11.Others sources			
Total funds/requirements			100

Project No. 7-I

The Reduction of Discharged Wastewater Pollution to the Danube River

Date of first setting up:	4/15/1998	Date of latest upgrade:	

Project Title:	The reduction of discharged wastewater pollution to the Danube River

Responsible/Legal Body	
Authority/Company	AssiDomän Packaging Štúrovo, a.s.
Name	Ing.Marián Slovák general director
Address	Továrenská ul.è.1 943 03 Štúrovo
Telephone	00421/ (0)810/ 56 1111
Fax	00421/(0)810/ 34 80
e-mail	-
Project Target	The project target is to upgrade and reconstruct the existing mechanical-biological wastewater treatment plant and to improve the total efficiency of the total amount of the produced wastewater. The aim is also to reduce the process wastewater discharged to combine and separate sewer systems. Finally the project will solve the reconstruction of combine sewer and convey the wastewater to the existing treatment plant
Investment Costs	1.stage - year 2002. 125 mil. .- Sk 2.stage - year 2005 192,7 mil. .- Sk 3Total investment costs 317,7 mil. .- Sk
Status of Project	☐ ongoing ☒ planned ☐ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

The reduction of discharged wastewater pollution to the Danube River

2 Investor Details

2.1 Authority/Company

Name	AssiDomän Packaging Štúrovo, a.s.		
Address	Továrenská ul.è.1 943 03 Štúrovo		
Telephone	00421/ (0)810/ 56 1111		
Fax	00421/(0)810/ 34 80	e-mail	-

2.2 Contact Persons

Ing.Eduard Haderka - director of the environmental and quality department (56 3121)
Ing. Adriana Juhászová - water manager (56 3214)

2.3 Advisor/Consultant

Design and consulting firm BIDOR, Ltd. Bratislava

2.4 Legal/Financial Status

Share holding company. The firm AssiDomän Sweden owns the majority of shares.

Authority/Company Profile

The company has the dominant position not only in Slovakia but also in European market in producing paper, cardboard and packings. It produces hydro insulation, anti-vibration and roof insulation materials.
The yearly turnover is 3368,5 mil,-Sk
The number of workers is 2000 in non-stop working hours.

2.6 Planning/Implementing Extent/Capacity of the Investor

Administration, legislative services during the construction.

2.7 Institutions/Enterprises beside the Investor

They have not been chosen, yet.

3. PROJECT DESCRIPTION

3.1 Project Outline

The project outline is the following:

- upgrading and reconstruction of the existing mechanical-biological wastewater treatment plant and the improving the treatment efficiency of the total amount of the produced wastewater in two stages :

I. stage - year 2002 - 125 mil. Sk
II. stage - year 2005 - 192,7 mil. Sk

- the reduction of the process wastewater discharged to combine and separate sewer systems (sewage and storm waters)
- the reconstruction of combine sewer and to convey the wastewater to the existing treatment plant

3.2 Primary Needs for the Project

The main targets the project are:
reduction of wastewater pollution under the level required for the effluent quality according to Slovak effluent standards (BOD_5= 50 mg/l, COD = 250 mg/l, SS = 50 mg/l, DS = 800 mg/l, NPES = 3 mg/l),
reduction of transboundary pollution.
It is estimated if the project would be implemented the following reduction of discharged pollution in compare to the existing state in 1997:
BOD_5 less 1650 t/y, COD less 1350 t/y, SS less 1000 t/y, DS less 50 t.
If the project would not implemented the pollution of Danube river does not reduce which finally may have impact on water quality in system waterworks Gabčíkovo-Nagymaros.

3.3 Status of Project Preparation

The project is in the phase of conceptual study.

3.4 Technology Proposed

Technology proposed in the project is as follows:
medium loaded activated sludge system with fine bubble aeration system.

- expansion and reconstruction of mechanical – biological step of treatment :
- the capacity of activated sludge tanks increased to 15.000 m^3,
- the clarifiers to 4200 m^3,
- the connecting wastewater from combine sewer system to the existing wastewater treatment plant,
- the construction of stormwater tank,
- expansion of sludge treatment line,
- dewatering of sludges with centrifuges.

3.5 Ownership of Project Site

The erection of the structures will be carry out at the site own by AssiDomän Štúrovo, a.s.

3.6 Specific project Items

Modernization and reconstruction of existing wastewater treatment facilities and structures will be provided at the level of present knowledge.

4. Project Effects and Interactions

4.1 Public's Expression of Interest

The implementation of the project will ensure the improvement of aquatic environment in the area of company but it will have a positive impact on transboundary pollution transported to Hungary.

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

The company is situated on the left bank of the Danube river. The effluent discharge is in the 1722 river km. At this place The Danube River creates the natural border between Hungary and Slovakia. The sensitivity upgrading of the Danube River is expected if the waterworks Gabèíkovo – Nagymaros will be completed.

4.4 Primary Effects of Project

The reduction of wastewater pollution min. to the level required by Slovak legislation and improvement the situation with the transport pollution to Hungary.

5. Economic Project Justification

5.1. Economic Project Benefits

The reduction of compensation for the discharged wastewater to surface water - less 8.256.000,-Sk. Other savings are expected in the reduction of wastewater in particular company departments.

Employment/income effects	
during construction period	60 workers/year
during operation period	N/A
Other economic benefits	
The expansion will be controlled by the modernization of technology lines in company.	

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated?	☐ **yes** ☒ **no**
total investment costs of project	317.700.000,-Sk
planned annual depreciation	16.600.000,-Sk
planned annual operation costs	27.000.000,-Sk
planned annual revenues	N/A-Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	317.700.000,-Sk
Allocation of capital cost	
Land	0,-Sk
Construction and machinery	302.000.000,-Sk
Planning and supervision	15.000.000,-Sk
Total cost	317.700.000,-Sk
On an annual basis	N/A -Sk
Year of cost estimate	-
Nature of cost estimate (preliminary, adequate, etc.)	
-	

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)	
Repair and replacement cost	N/A -Sk
Total operational cost	N/A -Sk
Year of cost estimate	27.000.000,-Sk
Nature of cost estimate (preliminary, adequate, sources of information)	
Preliminary	

6.3 Estimate of Revenues

Expected annual revenues (in real terms)	
	N/A -Sk
Year of estimate :	-
Nature of estimate (preliminary, adequate, etc.)	
Preliminary	

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme

Sources of funding	Secured	Requested	Non- secured
	Currency		
1. Equity of project owner			
2. National Environmental Fund			
3. **Water Management Fund**			
4. Public loan - central budget			
5. Public loan - regional budget			
6. Public grant - central budget			
7. Public grant - regional budget			
8. International loan			
9. International grant			
10. Commercial bank loan			
11.Others sources			
Total funds/requirements			

Project No. 8-I

Construction of Wastewater Treatment Plant with Reconstruction and Expansion of Sewer Network

Date of first setting up:	4/13/1998	Date of latest upgrade:	

Project Title:	Construction of wastewater treatment plant with reconstruction and expansion of sewer network

Responsible/Legal Body	
Authority/Company	Buèina, a.s. Zvolen (The Buèina Wood Works)
Name	Ing.Peter Macko general director
Address	Buèina, a.s. Zvolen Luèenecká cesta 1335/21 960 96 Zvolen
Telephone	00421/ (0)855/ 301 100
Fax	00421/(0)855/ 301 121
e-mail	-
Project Target	The aim of the project is the reduction of mass loading of pollution discharged to the Hron river, Slatina and Zolná creek and simultaneously to decrease the contamination of groundwater, surface waters and soil.
Investment Costs	94.000.000,- Sk
Status of Project	☐ ongoing ☐ planned ☒ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

Construction of wastewater treatment plant with reconstruction and expansion of sewer network

2 Investor Details

2.1 Authority/Company

Name	Ing.Hamáry Štefan, engineering director		
Address	Buèina, a.s. Zvolen Luèenecká cesta 1335/21 960 96 Zvolen		
Telephone	00421/ (0)855/ 301 270		
Fax	00421/(0)855/ 301 123	e-mail	-

2.2 Contact Persons

Ing. Pavel Prošek, the head of the environmental department

2.3 Advisor/Consultant

Hydroconsult, š.p. Bratislava, EKO-HYDRO Trenèín

2.4 Legal/Financial Status

private share holding company

Authority/Company Profile

The Buèina Wood Works has a very large saw mill and it processes timber raw materials into various semi-finished and finished products: wooden pools and beechwood rail sleepers, particle (soft) board, laminated particle board, plywood, parquets, and other finished products like prefabricated halls and family houses. There is also the engineering and civil division, energy and heat management and transport.
Economic aspects:
revenues: 1.549.113.000,-Sk
production costs: 1.536.336.000,-Sk
profit: 12.777.000,-Sk
annual turnover: 1.561.985.000,-Sk
number of workers: 1820

2.6 Planning/Implementing Extent/Capacity of the Investor

administration, consulting and control services during the period of construction, small civil and engineering professions

2.7 Institutions/Enterprises beside the Investor

EKO-HYDRO Trenèín - study of segregation of sewage into the site of the Buèina Wood Works.

3. PROJECT DESCRIPTION

3.1 Project Outline

The project will be covered as follows:

- reconstruction the old sewer network (segregation the sewage) with the discharge to the biological treatment plant,
- expansion and completing the storm and sewage sewer network in the northern part of company with the connection to the biological treatment plant,
- expansion of biological treatment step serving for the treatment of sewage and wastewater after the pre-treatment at the electroflotation unit.

The prospective user of these ones will be the Buèina Wood Works. The location of the expansion and upgrading of existing structures is on the own land of the Buèina Wood Works.

3.2 Primary Needs for the Project

The main goal of the project is the following:
to construct non-defective sewer network (the groundwater are drained to the creek Zolná and Slatina passing the site of company),
to abolish the existing non control discharges to surface waters,
to reduce the pollution loading of the watercourses Slatina, Zolná and Hron in term of flow rates and quality.
If the project would not implement Buèina is not able to reach the required effluent standards

3.3 Status of Project Preparation

At present the study of the segregation of sewage with the conjunction to prepare biological wastewater treatment plant and the design project of sewer network for the northern part of company was carried out. There is under selection process the choice of consulting firms able to prepare the design project for southern part of company and for biological wastewater treatment plant.

3.4 Technology Proposed

Since this time the particular technology has not been specified, yet.

3.5 Ownership of Project Site

The site of plant will be situated in the region of company, it is the ownership of Buèina.

3.6 Specific project Items

Project, except wastewater treatment, solves predominantly the elimination of groundwater contamination because there is water level very high and it is drained to Zolná and Slatina creeks.

4. Project Effects and Interactions

4.1 Public's Expression of Interest

N/A

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

The site of company is situated between the creeks of Slatina and Zolná. Zolná flows along the whole territory of Buèina and Slatina only its southern part.

4.4 Primary Effects of Project

There are expected the following positive effects:
local level and regional - improving the water quality in the river Zolná, Slatina and finally Hron,
international/transboundary level -reduction of the pollution of mass flux, improving the water quality in the Hron River.

5. Economic Project Justification

5.1. Economic Project Benefits

Since this time the economic project benefits have not been estimated.

Employment/income effects	
during construction period	N/A
during operation period	N/A

Other economic benefits

N/A

5.2. Economic Internal Rate of Return (EIRR)	
Has an EIRR been calculated?	☐ **yes** ☒ **no**
total investment costs of project	N/A .-Sk
planned annual depreciation	N/A .-Sk
planned annual operation costs	N/A .-Sk
planned annual revenues	N/A .-Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	94.000.000,-Sk
Allocation of capital cost	
Land	ownership of Buèina.-Sk
Construction and machinery	N/A .-Sk
Planning and supervision	N/A .-Sk
Total cost	N/A .-Sk
On an annual basis	N/A .-Sk
Year of cost estimate	N/A .-Sk
Nature of cost estimate (preliminary, adequate, etc.)	
N/A	

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)	
N/A	
Repair and replacement cost	N/A .-Sk
Total operational cost	N/A .-Sk
Year of cost estimate	N/A .-Sk
Nature of cost estimate (preliminary, adequate, sources of information)	
N/A	

6.3 Estimate of Revenues

Expected annual revenues (in real terms)	
N/A	
Year of estimate :	**N/A**
Nature of estimate (preliminary, adequate, etc.)	
N/A	

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme			
Sources of funding	**Secured**	**Requested**	**Non- secured**
	Currency [mil. Sk]		
1. Equity of project owner			
2. National Environmental Fund			
3. **Water Management Fund**			
4. Public loan – central budget			
5. Public loan – regional budget			
6. Public grant – central budget			
7. Public grant – regional budget			
8. International loan			
9. International grant			
10. Commercial bank loan			
11.Others sources			
Total funds/requirements			

Note:
The system of funding has not been available, yet. The equity of project owner will not ensure the necessary financial sources therefore the other sources such as National Environmental Fund, International loans etc. are considered.

Project No. 9-I

Wastewater Treatment Plant Reconstruction

Date of first setting up:	4/15/1998	Date of latest upgrade:	

Project Title:	Wastewater treatment plant reconstruction

Responsible/Legal Body	
Authority/Company	Biotika, a.s.
Name	Ing.Dušan Somora engineering manager Ing. Monika Bošanská director of environmental department
Address	Biotika, a.s. 976 13 Slovenská ¼upèa
Telephone	00421/ (0)88/ 721 2800
Fax	00421/(0)88/ 721 2804
e-mail	-
Project Target	The aim of the project is the reconstruction of existing tanks, the expansion of their capacity and upgrading the efficiency of plant. The elimination of odor problems at the treatment plant is also considered.
Investment Costs	50.000.000,- Sk
Status of Project	☐ ongoing ☐ planned ☒ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

Wastewater treatment plant reconstruction

2 Investor Details

2.1 Authority/Company

Name	Biotika, a.s.		
Address	Biotika, a.s. 976 13 Slovenská ¼upèa		
Telephone	00421/ (0)88/ 721 2800		
Fax	00421/(0)88/ 721 2804	e-mail	-

2.2 Contact Persons

Ing.Dušan Somora
engineering manager
Ing. Monika Bošanská
director of environmental department

2.3 Advisor/Consultant

Biotika, a.s. Slovenská ¼upèa

2.4 Legal/Financial Status

joint stock company

Authority/Company Profile

The company produces antibiotics (e.g. penicillin), amino acids by fermentation, premix and the final products for the preparation of drugs.
average budget: from 50 to 100 mil. Sk,
profit (loss): - 160 mil. Sk
average yearly turnover; 1.330.000.000,- Sk
average number of employees in 1997: 1420

2.6 Planning/Implementing Extent/Capacity of the Investor

Administration, consulting and control services during the construction

2.7 Institutions/Enterprises beside the Investor

The firms will be chosen by the investor after the completing the ongoing study.

3. PROJECT DESCRIPTION

3.1 Project Outline

3.2 Primary Needs for the Project

To improve the effluent quality to reach the stricter effluent standards in the future and the reduction of odor problems in the wastewater treatment plant.

3.3 Status of Project Preparation

The preliminary phase of the project. This year only the input data are prepared for the pre-feasibility study.

3.4 Technology Proposed

It is not defined yet.

3.5 Ownership of Project Site

The site of plant reconstruction is in ownership of the company Biotika, a.s.

3.6 Specific project Items

N/A

4. Project Effects and Interactions

4.1 Public's Expression of Interest

At this level of elaboration of project the public has not been involved in its preparation, however there is strong presumption of positive public attitude as well as the environmental authorities.

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

The discharge of effluent is to the Istebník creek that it is the tributary of the Hron river. This area is classified as sensitive area because of well-developed tourist industry.

4.4 Primary Effects of Project

The implementation of project may positively improve the environmental problems on local and regional level.

5. Economic Project Justification

5.1. Economic Project Benefits

At this phase of the project preparation it is not possible to estimate the expected economic benefits.

Employment/income effects	
during construction period	N/A
during operation period	N/A
Other economic benefits	
N/A	

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated?	☐ **yes** ☒ **no**
total investment costs of project	N/A
planned annual depreciation	N/A
planned annual operation costs	N/A
planned annual revenues	N/A

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	50 mil.-Sk
Allocation of capital cost	
Land	N/A
Construction and machinery	N/A
Planning and supervision	N/A
Total cost	N/A
On an annual basis	N/A
Year of cost estimate	
Nature of cost estimate (preliminary, adequate, etc.)	
preliminary	

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)	
since this time has not been specified	
Repair and replacement cost	N/A .-Sk
Total operational cost	N/A .-Sk
Year of cost estimate	N/A .-Sk
Nature of cost estimate (preliminary, adequate, sources of information)	
N/A	

6.3 Estimate of Revenues

Expected annual revenues (in real terms)	
N/A	
Year of estimate:	N/A
Nature of estimate (preliminary, adequate, etc.)	
preliminary	

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme

Sources of funding	Secured	Requested	Non- secured
	Currency [mil. Sk]		
1. Equity of project owner		0	20 %
2. National Environmental Fund			30 %
3. **Water Management Fund**			
4. Public loan - central budget			
5. Public loan - regional budget			
6. Public grant - central budget			
7. Public grant - regional budget			
8. International loan	0	0	50 %
9. International grant			
10. Commercial bank loan			
11.Others sources			
Total funds/requirements			50 mil.

Project No. 10-I

Centralization of the Collection and Treatment of Wastewater Polluted by Chrome

Date of first setting up:	4/21/1998	Date of latest upgrade:	

Project Title:	Centralization of the collection and treatment of wastewater polluted by chrome

Responsible/Legal Body	
Authority/Company	Koželužne Bošany,a.s.
Name	Koželužne Bošany,a.s.
Address	956 18 Bošany
Telephone	00421/ (0)815/427305-308
Fax	00421/(0)815/ 427 425
e-mail	-
Project Target	The aim of this project is to ensure the collection and treatment of wastewater contaminated by Cr^{3+} with the subsequent recuperation and recycling in the Koželužne Bošany, a.s.
Investment Costs	80.702.000,- Sk
Status of Project	☒ ongoing ☐ planned ☐ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

Centralization of the collection and treatment of wastewater polluted by chrome

2 Investor Details

2.1 Authority/Company

Name	Koželužne Bošany,a.s.		
Address	956 18 Bošany		
Telephone	00421/ (0)815/427305-308		
Fax	00421/(0)815/ 427 425	e-mail	-

2.2 Contact Persons

Ing. Mišeje E. - Koželužne Bošany, a.s.
Ing.Kopný, Ing.Matiašovský - VIPO, a.s. Partizánske

2.3 Advisor/Consultant

VIPO, a.s. Partizánske
CHEMPIK, a.s. Bratislava

2.4 Legal/Financial Status

share holding company

Authority/Company Profile

Tannery produces leather and shoemaker's board. There is a complete treatment of leathers, production of clothes and fancy goods, production of shoe materials, refining of tannery's wastes, production of heating energy and electric current, civil, export and business activities.

2.6 Planning/Implementing Extent/Capacity of the Investor

administration, consulting and control services during the period of construction.

2.7 Institutions/Enterprises beside the Investor

Technology supplier and consulting firm: VIPO, a.s. Partizánske
Civil firm: Vodohospodárske stavby, a.s. Nitra, Koželužne Bošany, a.s.
The user of the project: Koželužne Bošany, a.s.

3. PROJECT DESCRIPTION

3.1 Project Outline

The aim of the project is collecting wastewater polluted by Cr^{3+}, their precipitation with $Cr(OH)_3$ in acids and then mixing with chromium mud producing in Koželužne Bošany, a.s. This technology had been designed by the firm ITALPROGETTI and then implemented by CHEMPIK, a.s. Bratislava in Slovak conditions.

The additional target of the project is to upgrade the technology line with the possible utilization of existing structures, installations and expansion with new ones and adjust the technology of precipitation process to get CrOH3 and utilize it. (study of VIPO, a.s. Partizánske).

Recuperation enables the extraction of chromium. The dual effect, ecological improvement and the economic benefit, is considered.

The treatment line is situated in the territory of tannery.

3.2 Primary Needs for the Project

It is expected 95 % efficiency of the precipitation of Cr^{3+} from wastewater. In addition there is essential to limit the concentration of Cr^{3+} below the value of standards for sludge disposal to enable the utilization sludge in agriculture.

If the project does not realize the level of contamination of sludge from tannery overcome the standards for sludge disposal in agriculture (at present overcome 10 - 25 times more).

3.3 Status of Project Preparation

At present the feasibility study is under preparation. It starts at the beginning of this year. Optimization of tannery processes is focused on the reduction of water consumption and contamination of wastewater and finally the sludges. VIPO, a.s. Partizánske is solving the project within the frame of Strategic Action Plan of the Ministry of Economy of SR.

3.4 Technology Proposed

To collect wastewater polluted by Cr^{3+} and treat with the change of pH to precipitate and separate Cr in the form of $Cr(OH)_3$. This product will be recycle and utilize in the plant processes.

3.5 Ownership of Project Site

The site is owned by Koželužne, a.s. Bošany

3.6 Specific project Items

N/A

4. Project Effects and Interactions

4.1 Public's Expression of Interest

The project positively approved legal institutions.

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

The territory of Koželužne Bošany,a.s.

4.4 Primary Effects of Project

Implementation of project will enable to solve the problem of sludge utilization as a one component for the compost. At present the disposal of this sludge is in the territory of tannery - it is regional problem, The utilization and recycling of a part of wastewater is problem serving on the national level..

5. Economic Project Justification

5.1. Economic Project Benefits

Economic project benefits will be evaluated after the completing the ongoing study. It is assumed 20% savings of investment costs in compare to the previous estimation of costs.

Employment/income effects	
during construction period	N/A
during operation period	3 -5 workers

Other economic benefits

It is supposed the reduction of operational costs, reduction of material use and Cr^{3+}, reduction of water consumption, and finally the reduction of energy requirements.

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated ?	☐ **yes** ☒ **no**
total investment costs of project	N/A .-Sk
planned annual depreciation	N/A .-Sk
planned annual operation costs	N/A .-Sk
planned annual revenues	N/A .-Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	65.000.000,-Sk
Allocation of capital cost	
Land	N/A .-Sk
Construction and machinery	N/A .-Sk
Planning and supervision	3.200.000,-Sk
Total cost	65.000.000,-Sk
On an annual basis	N/A .-Sk
Year of cost estimate	N/A .-Sk
Nature of cost estimate (preliminary, adequate, etc.)	
N/A	

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)	
N/A	
Repair and replacement cost	N/A .-Sk
Total operational cost	N/A .-Sk
Year of cost estimate	N/A .-Sk
Nature of cost estimate (preliminary, adequate, sources of information)	
N/A	

6.3 Estimate of Revenues

Expected annual revenues (in real terms)	
N/A	
Year of estimate:	**N/A**
Nature of estimate (preliminary, adequate, etc.)	
N/A	

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme

Sources of funding	Secured	Requested	Non- secured
	Currency [mil. Sk]		
1. Equity of project owner	23,7	8,8	8,8
2. National Environmental Fund	15,5	17,0	17,0
3. **Water Management Fund**			
4. Public loan – central budget			
5. Public loan – regional budget			
6. Public grant – central budget			
7. Public grant – regional budget			
8. International loan			
9. International grant			
10. Commercial bank loan			
11.Others sources			
Total funds/requirements	39,2	25,8	25,8

Project No. 11-I

Biological Wastewater Treatment

Date of first setting up:	4/24/1998	Date of latest upgrade:	5/2/1998

Project Title:	Biological wastewater treatment

Responsible/Legal Body	
Authority/Company	HARMANECKÉ PAPIERNE , a.s. HARMANEC
Name	Ing.MIROSLAV VAJS, general manager
Address	Harmanecké papierne, a.s. Harmanec 97603
Telephone	00421/88/722210
Fax	00421/88/798256
e-mail	hapa@pollux.sk
Project Target	Project solves the problem of biological wastewater treatment step and the treatment of sewage with alternative treatment of municipal wastewater discharged from the settlement of Harmanec (10 000 P.E.) and state enterprise VKÚ Harmanec (250 P.E.). The main goal of the project is to reduce the pollution in terms of BOD_5 less 105 t/year, COD less 300 t/year and SS 30 t/year and to reach the effluent standards set by Slovak and also EU Decree.
Investment Costs	80.000.000,- Sk
Status of Project	☐ ongoing ☐ planned ☒ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

Wastewater treatment in Harmanecke Papierne, a.s. Harmanec

2 Investor Details

2.1 Authority/Company

Name	Harmanecké papierne, a.s. Harmanec		
Address	Harmanecké papierne ,a.s. Harmanec 97 603		
Telephone	00421/(0)88/722210		
Fax	00421/(0)88/798256	e-mail	hapa@pollux.sk

2.2 Contact Persons

Ing.Jiøí Mìdílek , engineering manager
Phone: 00421/88/722340, Fax:0421/88/798101
Ing. Stanislav Kaliský, director of project
Phone: 00421/88/722282, Fax:0421/88/798101

2.3 Advisor/Consultant

Harmanecké papierne, a.s. Harmanec

2.4 Legal/Financial Status

share holding company

Authority/Company Profile

The treatment of used paper and the production of paper products for domestic and foreign market. The major production of the company are the toilet papers and handkerchiefs produce on the secondary raw material (used paper).

Economy results in 1996

Total revenues	1.169.181 Sk
Total costs	1.067.685 Sk
Earnings from operations	101.496 Sk
Profit before income taxes	-72.636 Sk
Profit on ordinary activities	13.722 Sk
Extraordinary profit	13.021 Sk
Profit for the period	26.793 Sk

Average number of employees in 1996 and 1997 was 750.

2.6 Planning/Implementing Extent/Capacity of the Investor

administration, consulting and control services during the period of construction, small civil and engineering professions

2.7 Institutions/Enterprises beside the Investor

The firms will be chosen during the preparation of the project.

3. PROJECT DESCRIPTION

3.1 Project Outline

Project solves the construction of wastewater treatment plant for process wastewater from the production of toilet papers. This wastewater together with the sewage is pre-treated on the existing mechanical treatment plant (settling tank Dorr). At present the sewage treats on the old overloaded biological wastewater treatment plant (type BB-90 KPS Brno/1970) and the limiting amount is treating in septic tanks. It is supposed that the construction of new treatment plant will reduce the total present pollution discharged to recipient Bystrica up to 5- 10 %. The site of construction is in the territory of company. Alternatively the capacity of new wastewater treatment plant can be designed also for the wastewater produced by the settlement Harmanec and VKÚ Harmanec, state enterprise. It is expected that at the new treatment plant only the Dorr settling tank will be utilized.

The present average quality of raw wastewater is as follow:

SS = 720-1038 mg/l, BOD_5 = 224-409 mg/l, COD = 1273-1992 mg/l

Effluent quality after primary settling tank is following :

SS = 23-31 mg/l, BOD_5 = 61-109 mg/l, COD = 189-340 mg/l

Effluent quality after existing biological treatment step :

SS = 29 mg/l, BOD_5 = 31 mg/l, COD = 121 mg/l

Effluent quality (max. values) required after upgrading of treatment plant (the whole production of wastewater will be treated) :

SS = 25 mg/l, BOD_5 = 30 mg/l, COD = 150 mg/l

3.2 Primary Needs for the Project

The environmental benefits of the project can be summarized as follows :

- reduction of discharged pollution to the Bystrica river in terms of BOD_5, COD, SS less 50-95 %,
- the significant reduction of the risk of overcome the effluent standards and the pollution accidents,
- improvement of aesthetics problems with the foam and odor,
- reduction of pollution impact on fish management,
- resolve of the recreational utilization of the river course Bystrica,

increasing the rate of recycling of used water in the production of toilet paper with the subsequent reduction of the process water consumption abstracted from the water course - less 30 -50 %.

If the project would not implement the following adverse problems can be occurred

- impact of discharged wastewater on the Bystrica river,
- non-sustainable consumption of water abstract from the Bystrica river,
- risk of accidents and overcome the effluent standards.

3.3 Status of Project Preparation

At present the project is under preparation. In 1998 it is planned to prepare the investment concept. The implementation of the project is planned in 1999.

3.4 Technology Proposed

Since this time the particular technology has not been specified, yet.

3.5 Ownership of Project Site

The site of plant will be situated in the region of company, it is the ownership of Harmanec, a.s.

3.6 Specific project Items

The alternative of the project is the mutual treatment the wastewater discharged from the settlement of Harmanec and process wastewater from Harmanec, a.s. However the relationships between the municipality and company, from the point of view of mutual treatment plant, are not clear, yet.

4. Project Effects and Interactions

4.1 Public's Expression of Interest

The environmental authority set the following effluent standards for the mutual treatment plant: BOD_5 = 50 mg/l, COD = 25 mg/l, SS = 60 mg/l and after the year 2005 BOD_5 = 40 mg/l, COD = 200 mg/l, SS = 40 mg/l.

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

The site of company is situated in the mountainous area in the narrow valley where the sensitive the Bystrica river is flowing. The major polluter of this river is the company - Harmanecké papierne, a.s.

4.4 Primary Effects of Project

There are expected the following positive effects :
local level - settlement Harmanec and U¾anka:
reduction of discharged pollution , improvement of oxygen regime of the river and reduction of adverse effect on the river aesthetic as well as problems with the odor,
regional level - city of Banská Bystrica, Zvolen and the Hron river basin :
improvement the total hydrobiological state of the Bystrica river flowing via Banská Bystrica, improvement of its aquatic environment, the fish management and recreational possibilities. The Bystrica river is the tributary of the River Hron, thus the reduction of pollution in the river will assist in the water quality improvement in the Hron.
International/transboundary level is not so significant, but it cannot be neglected

5. Economic Project Justification

5.1. Economic Project Benefits

Since this time the economic project benefits have not been estimated.

Employment/income effects	
during construction period	10 - 20 workers
during operation period	it is expected that the operators will be from the existing number of employees in the company

Other economic benefits

It is expected the savings in raw water consumption for production process less 20-50 % , or 0,4 - 1,2 mil. Sk/year.
If the mutual treatment plant will construct the income from municipality for discharged wastewater is estimated about 0,3 mil. Sk/year.
reduction of discharged pollution (less than 50 - 85 %) to surface water will decrease the payment for the compensation for wastewater discharge about 0,7-1,3 mil. Sk/year.

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated ?	☐ **yes** ☒ **no**
total investment costs of project	80 mil.-Sk
planned annual depreciation	N/A .-Sk
planned annual operation costs	10 mil.-Sk
planned annual revenues	N/A .-Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	80.000.000,-Sk
Allocation of capital cost	
Land	ownership of Harmanec, a.s.-Sk
Construction and machinery	N/A .-Sk
Planning and supervision	N/A .-Sk
Total cost	N/A .-Sk
On an annual basis	N/A .-Sk
Year of cost estimate	N/A .-Sk

Nature of cost estimate (preliminary, adequate, etc.)

N/A

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)	
N/A	
Repair and replacement cost	N/A .-Sk
Total operational cost	N/A .-Sk
Year of cost estimate	N/A .-Sk
Nature of cost estimate (preliminary, adequate, sources of information)	
N/A	

6.3 Estimate of Revenues

Expected annual revenues (in real terms)	
The preliminary estimation is 2,3 mil. Sk/year (year 2000)	
Year of estimate:	**N/A**
Nature of estimate (preliminary, adequate, etc.)	
N/A	

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme

Sources of funding	Secured	Requested	Non- secured
	Currency [mil. Sk]		
1. Equity of project owner			
2. National Environmental Fund			
3. **Water Management Fund**			
4. Public loan - central budget			
5. Public loan - regional budget			
6. Public grant - central budget			
7. Public grant - regional budget			
8. International loan			
9. International grant			
10. Commercial bank loan			
11.Others sources			
Total funds/requirements			80

Note :
Recently the project is in preparation therefore since this time the applications, to request the particular funds, have not been submitted.

Project No. 12-I

Sludge Disposal Upgrading in Wastewater Treatment Plant

Date of first setting up:	4/27/1998	Date of latest upgrade:	

Project Title:	Sludge disposal upgrading in Wastewater Treatment Plant

Responsible/Legal Body	
Authority/Company	VSŽ OCEĽ, s.r.o. Košice
Name	Ing.Alexander Dudinský engineering manager VSŽ OCE¼, s.r.o.
Address	VSŽ OCE¼, spol. s r.o. 044 54 Košice
Telephone	00421/ (0)95/ 673 4147
Fax	00421/(0)95/ 673 7780
e-mail	-
Project Target	The aim of the project is to improve the way of sludge disposal to reach the requirement of Slovak legislative with the respect of groundwater pollution control
Investment Costs	115.264.000,- Sk
Status of Project	☐ ongoing ☐ planned ☒ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

Sludge disposal upgrading in Wastewater Treatment Plant

2 Investor Details

2.1 Authority/Company

Name	VSŽ Holding, a.s. Košice		
Address	VSŽ Holding, a.s. 044 54 Košice		
Telephone	00421/ (0)95/ 673 7682 00421/ (0)95/ 673 6849		
Fax	00421/(0)95/ 673 6900	e-mail	-

2.2 Contact Persons

Ing.František Špièka
VSŽ Konzult, s.r.o. Košice

2.3 Advisor/Consultant

VSŽ Inžiniering, s.r.o. Košice
Ekotechnik, s.r.o. Košice

2.4 Legal/Financial Status

joint stock company

Authority/Company Profile

Production of coke, steel and cast, rolled and wrought iron

2.6 Planning/Implementing Extent/Capacity of the Investor

Complete administration, consulting and control services and construction capacity in VSŽ Inžiniering, s.r.o. Košice

2.7 Institutions/Enterprises beside the Investor

VSŽ Inžiniering, s.r.o. Košice
Ekotechnik, s.r.o. Košice

3. PROJECT DESCRIPTION

3.1 Project Outline

The upgrading of sludge disposal in the wastewater treatment plant consists of the following activities :

- to construct sealing wall with the length 2613 m with the depth 10 m,
- to eliminate leakage of polluted water to the vicinity of sludge landfill.

The annual production of sludge is 10.137 m^3 with the dry solids 70 %. Capacity of sludge lagoon is for 21 years. The implementation of the project does not require the new land but the sanation of existing sludge lagoon will have to take into account.

3.2 Primary Needs for the Project

to eliminate the leakage of polluted water from sludge lagoon to groundwater,
to utilize the existing lagoon according to Slovak legislative,
to effective utilization of existing lagoon without the requirements of expansion of existing one for the period of the next 21 years,
to improve present groundwater quality.
If the planned measures does not implement it is possible to expect the gradual contamination of groundwater

3.3 Status of Project Preparation

The feasibility study has been carried out and the analysis of monitoring report. After the positive proof by legal institutions the project will be designed. The project will be implemented in the years 2000 -2001.

3.4 Technology Proposed

The existing lagoon will be sealed by sealing wall with the length 2613 m. The monitoring of sludge lagoon has already operated.

3.5 Ownership of Project Site

The site of lagoon is the ownership of VSŽ Holding, a.s.

3.6 Specific project Items

The project will implement the latest technology of sealing lagoon. This approach should ensure the improvement of aquatic environmental problems.

4. Project Effects and Interactions

4.1 Public's Expression of Interest

The project has already been discussed and approved by the representatives from the settlements in the vicinity of lagoons.

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

The project should improve the present environmental loading of the region to reduce the leak of contaminants to groundwater.

4.4 Primary Effects of Project

The implementation of project may positively improve the environmental problems on local level.

5. Economic Project Justification

5.1. Economic Project Benefits

Employment/income effects	
during construction period	N/A
during operation period	N/A
Other economic benefits	
Elimination of environmental problems	

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated?	☐ **yes** ☒ **no**
total investment costs of project	115.264.000,-Sk
planned annual depreciation	.-Sk
planned annual operation costs	.-Sk
planned annual revenues	.-Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	115.264.000,-Sk
Allocation of capital cost	
Land	.-Sk
Construction and machinery	99.583.000,-Sk
Planning and supervision	2.293.000,-Sk
Total cost	115.264.000,-Sk
On an annual basis	.-Sk
Year of cost estimate	
Nature of cost estimate (preliminary, adequate, etc.)	
preliminary	

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)	
since this time has not been specified	
Repair and replacement cost	N/A .-Sk
Total operational cost	N/A .-Sk
Year of cost estimate	N/A .-Sk
Nature of cost estimate (preliminary, adequate, sources of information)	
N/A	

6.3 Estimate of Revenues

Expected annual revenues (in real terms)	
N/A	
Year of estimate:	N/A
Nature of estimate (preliminary, adequate, etc.)	

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme

Sources of funding	Secured	Requested	Non- secured
	Currency [. Sk]		
1. Equity of project owner			
2. National Environmental Fund			
3. **Water Management Fund**			
4. Public loan - central budget			
5. Public loan - regional budget			
6. Public grant - central budget			
7. Public grant - regional budget			
8. International loan			
9. International grant			
10. Commercial bank loan			
11.Others sources			
Total funds/requirements			

Waste Disposal

Project No. 1-L

Reduction of Contamination of Groundwater and Revitalization of Landfill in Krompachy

Date of first setting up:	4/15/1998	Date of latest upgrade:	

Project Title:	Reduction of contamination of groundwater and revitalization of landfill in Krompachy

Responsible/Legal Body	
Authority/Company	Kovohuty Krompachy. a.s.
Name	Ing.Ján Šimko,CSc. engineering director
Address	Kovohuty Krompachy,a.s. 053 42 Krompachy
Telephone	00421/ (0)965/ 472 898
Fax	00421/(0)965/ 472 692
e-mail	tech@kovohuty.sk
Project Target	The aim of this project is to eliminate the groundwater contamination by landfill in Krompachy and to revitalization the existing industrial and municipal landfill.
Investment Costs	-
Status of Project	☐ ongoing ☐ planned ☐ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

Reduction of contamination of groundwater and revitalization of landfill in Krompachy

2 Investor Details

2.1 Authority/Company

Name	Kovohuty Krompachy. a.s.		
Address	Kovohuty Krompachy,a.s. 053 42 Krompachy		
Telephone	00421/ (0)965/ 472 898		
Fax	00421/(0)965/ 472 692	e-mail	tech@kovohuty.sk

2.2 Contact Persons

Ing. Ján Šimko,CSc.
engineering director
Ing.Štefan Chovanec

2.3 Advisor/Consultant

-

2.4 Legal/Financial Status

share holding company

Authority/Company Profile

Kovohuty Krompachy, share holding company processes copper ore, manganese ore and copper scrap material from metallurgical plants into powder and electrolytic copper and electrolytic manganese.
Economic aspects:
annual turnover: 2.282.491.000,-Sk
number of workers: 990

2.6 Planning/Implementing Extent/Capacity of the Investor

administration, consulting and control services during the period of construction.

2.7 Institutions/Enterprises beside the Investor

The concept of the project was discussed to the following firms :
Mega, a.s. Stráž pod Ralskem, Czech Republic
Váhostav Žilina
Envirochem Canada
DUHA Prešov
Geologia,Ltd. Spišská Nová Ves.

3. PROJECT DESCRIPTION

3.1 Project Outline

The landfill is originated from industrial and municipal solid wastes. At present the monitoring of the landfill is carried out and it is operated in a special regime. The present results indicate the contamination of groundwater by heavy metals. The consultancy with the perspective supplier of particular technology has not lead to the actual solution in spite of the fact that the investor devotes the substantial attention to this environmental problem with respect the protection of the Hornád river.

3.2 Primary Needs for the Project

The project is not finished yet. The main goal of the project is to protect the contamination of groundwater by heavy metals coming from the landfill and to ensure the revitalization of the landfill.

3.3 Status of Project Preparation

the preliminary stage

3.4 Technology Proposed

Since this time the particular technology has not been specified, yet.

3.5 Ownership of Project Site

The site of landfill of industrial wastes is an ownership of Kovohuty,a.s.

3.6 Specific project Items

-

4. Project Effects and Interactions

4.1 Public's Expression of Interest

The project will be consult with the institutions and it will submit to the public evaluation.

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

The site of landfill is close to the Hornád river.

4.4 Primary Effects of Project

-

5. Economic Project Justification

5.1. Economic Project Benefits

-

Employment/income effects	
during construction period	N/A
during operation period	N/A

Other economic benefits

N/A

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated?	☐ **yes** ☐ **no**
total investment costs of project	N/A .-Sk
planned annual depreciation	N/A .-Sk
planned annual operation costs	N/A .-Sk
planned annual revenues	N/A .-Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	N/A .-Sk
Allocation of capital cost	
Land	N/A .-Sk
Construction and machinery	N/A .-Sk
Planning and supervision	N/A .-Sk
Total cost	N/A .-Sk
On an annual basis	N/A .-Sk
Year of cost estimate	N/A .-Sk

Nature of cost estimate (preliminary, adequate, etc.)

N/A

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)	
N/A	
Repair and replacement cost	N/A .-Sk
Total operational cost	N/A .-Sk
Year of cost estimate	N/A .-Sk
Nature of cost estimate (preliminary, adequate, sources of information)	
N/A	

6.3 Estimate of Revenues

Expected annual revenues (in real terms)	
N/A	
Year of estimate :	**N/A**
Nature of estimate (preliminary, adequate, etc.)	
N/A	

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☐ **no**

6.5 Anticipated/Proposed Funding Scheme

Sources of funding	Secured	Requested	Non- secured
	Currency [mil. Sk]		
1. Equity of project owner			
2. National Environmental Fund			
3. **Water Management Fund**			
4. Public loan - central budget			
5. Public loan - regional budget			
6. Public grant - central budget			
7. Public grant - regional budget			
8. International loan			
9. International grant			
10. Commercial bank loan			
11.Others sources			
Total funds/requirements			

Project No. 2-L

Final Landfill Chalmová - VI. Construction

Date of first setting up:	4/21/1998	Date of latest upgrade:	

Project Title:	Final landfill Chalmová - VI. construction

Responsible/Legal Body	
Authority/Company	Slovenské elektrárne (SE), a.s. Bratislava
Name	Elektrárne Nováky, o.z. Zemianske Kosto¾any
Address	Slovenské elektrárne, a.s. Bratislava Elektrárne Nováky (ENO), o.z. 972 43 Zemianske Kosto¾any
Telephone	00421/ (0)862/ 462 053 - director
Fax	00421/(0)862/ 462 006
e-mail	-
Project Target	The aim of the project is to ensure the sufficient capacity of landfill site for residual ash produced by thermal power plant - ENO and to control the groundwater and soil contamination by leachate water. The user of the project : SE, a.s. ENO, o.z. Zemianske Kosto¾any
Investment Costs	335.160.000,- Sk
Status of Project	☐ ongoing ☒ planned ☐ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

Final landfill Chalmová - VI. construction

2 Investor Details

2.1 Authority/Company

Name	Slovenské Elektrárne, a.s.		
Address	Hranièná 12 836 17 Bratislava		
Telephone	00421/ (0)7/ 521 7525		
Fax	00421/(0)7/ 569 3552	e-mail	-

2.2 Contact Persons

Ing. Jozef Svitok - deputy manager ENO, o.z. Zemianske Kosto¾any
Ing. Július Šúò - director of the project
Ing.Jozef Breznický - design and consulting engineer Hydroconsult, š.p. Bratislava

2.3 Advisor/Consultant

Hydroconsult, š.p. Bratislava,
Vodohospodárska výstavba, š.p. Bratislava

2.4 Legal/Financial Status

share holding company

Authority/Company Profile

SE, a.s. ENO, o.z. Zemianske Kosto¾any - production and delivering the power and steam.

2.6 Planning/Implementing Extent/Capacity of the Investor

administration, consulting and control services during the period of construction

2.7 Institutions/Enterprises beside the Investor

Design and consulting firms: Hydroconsult, š.p. Bratislava, SEUS, a.s. Bratislava
Civil firms: Priemstav stavebná , Ltd. Nováky, SEUS, a.s.
User of the project: SE, a.s. ENO, o.z. Zemianske Kosto¾any

3. PROJECT DESCRIPTION

3.1 Project Outline

The main components of the projects are as follows :

- landfill dam made from residual ash,
- pipeline for slurry,
- thickening and the transport of slurry with ratio 1: 2,
- the sealing of landfill site against groundwater and soil contamination,
- the monitoring of landfill site.

The prospective user of the project will be SE, a.s. ENO, o.z. Zemianske Kosto¾any. The location of the project implementation is the region of Chalmová settlement and Dvorníky nad Nitricou, district Prievidza.
The utilization of the land : residual ash disposal from ENO, o.z.

3.2 Primary Needs for the Project

The main goal of the project is the disposal of the residual ash produced by ENO, o.z. and to protect the landfill site against groundwater and soil contamination. The reduction of leachate release will be guaranteed by the transport of the thick slurry with ratio 1:2 (ash : water) to balance the amount of transport water and evaporation and water binding with disposed ash.
The implementation of thick slurry transport and its disposal in landfill will protect the impact of contamination on groundwater and finally on the Nitra river water quality.

3.3 Status of Project Preparation

At present the project is under realization . The project documentation was completed and the measures (civil structures) have already started to protect the site against the contamination by leachate.

3.4 Technology Proposed

The project solve the treatment of slurry - its thickening. The slurry flows from the power plant ENO, o.z. with the ratio 1:20 (ash : water) and then it is thickening to the ratio 1: 2 with utilization of pumping station in the site of power plant. The thickener will be constructed at the landfill site.

3.5 Ownership of Project Site

The site of landfill is the ownership of power plant ENO, o.z.

3.6 Specific project Items

N/A

4. Project Effects and Interactions

4.1 Public's Expression of Interest

The project had been approved by legal institutions including the close situated settlements and local environmental authorities as well as with the state enterprise Vodohospodárska výstavba, š.p.

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

The site of landfill is situated in the fissure-karst territory. Therefore the significant portion of leachate has contaminated the groundwater. The project solves this problem to protect the supported soil layers against the leakages.

4.4 Primary Effects of Project

The primary effect is to eliminate the leakage of leachate to groundwater from the landfill and to protect the landfill site and finally the Nitra river against the contamination.

5. Economic Project Justification

5.1. Economic Project Benefits

Since this time the economic project benefits have not been estimated.

Employment/income effects	
during construction period	N/A
during operation period	N/A

Other economic benefits

N/A

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated?	☐ **yes** ☒ **no**
total investment costs of project	335.160.000,-Sk
planned annual depreciation	8.379.000,-Sk
planned annual operation costs	N/A .-Sk
planned annual revenues	N/A .-Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	335.160.000,-Sk
Allocation of capital cost	
Land	58.649.825,-Sk
Construction and machinery	- ,-Sk
Planning and supervision	6.344.000,-Sk
Total cost	335.160.000,-Sk
On an annual basis	- ,-Sk
Year of cost estimate	130.000.000,-Sk
Nature of cost estimate (preliminary, adequate, etc.)	
Adequate	

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)	
N/A	
Repair and replacement cost	N/A .-Sk
Total operational cost	N/A .-Sk
Year of cost estimate	N/A .-Sk
Nature of cost estimate (preliminary, adequate, sources of information)	
N/A	

6.3 Estimate of Revenues

Expected annual revenues (in real terms)	
N/A	
Year of estimate :	**N/A**
Nature of estimate (preliminary, adequate, etc.)	
N/A	

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme

Sources of funding	Secured	Requested	Non- secured
	Currency [mil. Sk]		
1. Equity of project owner			
2. National Environmental Fund			
3. **Water Management Fund**			
4. Public loan – central budget			
5. Public loan – regional budget			
6. Public grant – central budget			
7. Public grant – regional budget			
8. International loan			
9. International grant			
10. Commercial bank loan			
11.Others sources			
Total funds/requirements			

Project No. 3-L

Reconstruction of Wet Waste Tip

Date of first setting up:	4/27/1998	Date of latest upgrade:	

Project Title:	Reconstruction of wet waste tip

Responsible/Legal Body	
Authority/Company	VSŽ OCEĽ, s.r.o. Košice
Name	Ing.Alexander Dudinský engineering manager VSŽ OCE¼, s.r.o.
Address	VSŽ OCE¼, spol. s r.o. 044 54 Košice
Telephone	00421/ (0)95/ 673 4147
Fax	00421/(0)95/ 673 7780
e-mail	-
Project Target	The reconstruction of slag-ash mixture lagoon to reach the requirements of Slovak legislation with the aim of groundwater protection
Investment Costs	21.255.000,- Sk
Status of Project	☐ ongoing ☐ planned ☒ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

Reconstruction of wet waste tip

2 Investor Details

2.1 Authority/Company

Name	VSŽ Holding, a.s. Košice		
Address	VSŽ Holding, a.s. 044 54 Košice		
Telephone	00421/ (0)95/ 673 7682 00421/ (0)95/ 673 6849		
Fax	00421/(0)95/ 673 6900	e-mail	-

2.2 Contact Persons

Ing.František Špièka
VSŽ Konzult, s.r.o. Košice

2.3 Advisor/Consultant

VSŽ Inžiniering, s.r.o. Košice
Ústav pre výskum rúd, Košice

2.4 Legal/Financial Status

joint stock company

Authority/Company Profile

Production of coke, steel and cast, rolled and wrought iron

2.6 Planning/Implementing Extent/Capacity of the Investor

Complete administration, consulting and control services and construction capacity in VSŽ Inžiniering, s.r.o. Košice

2.7 Institutions/Enterprises beside the Investor

VSŽ Inžiniering, s.r.o. Košice
Ústav pre výskum rúd, Košice

3. PROJECT DESCRIPTION

3.1 Project Outline

Reconstruction of slag-ash mixture lagoon with the aim to protect of groundwater
The following measures are assumed :
the sealing of existing lagoon to reduce the leachate from lagoon to groundwater by sealing wall with the length 1650 m,
construction of temporarily waste dump for slag and ash with the sealing system for take out for re-use or following treatment
The average production of slag and ash is 60.000 t/year,. It is assumed to re-use about 30.000 t/year. The temporary waste dump will have the capacity 200.000 t. Its sealing system will have the permeability coefficient 10^{-9} m/s . A part of lagoon will have the sealing wall with the length 1650. The waste lagoon monitoring will also be the objective of this project.

3.2 Primary Needs for the Project

to eliminate the leak of contaminants from lagoon to groundwater,
to operate the lagoon with respect the requirement of Slovak legislation,
to limit the expansion of lagoon and in this way to protect the arable land,
to improve the quality of groundwater in the vicinity of lagoon
If the planned measures does not implement it is possible to expect the gradual contamination of groundwater

3.3 Status of Project Preparation

The preliminary design study is finished and recently the ongoing negotiations are provided between the investor and other legal institutions. After the proof of the submitted project the final design project will be worked out. The project will be implemented in the years 1999 -2000.

3.4 Technology Proposed

The existing lagoon will be sealed by sealing wall with the length 1650 m. The sealing of new temporary waste dump will be made from plastic geomembranes from HDPE with the thickness 2 mm and the basis layers.

3.5 Ownership of Project Site

The site of lagoon is the ownership of VSŽ Holding, a.s.

3.6 Specific project Items

The project will implement the latest technology of sealing lagoons. This approach should ensure the improvement of aquatic environmental problems.

4. Project Effects and Interactions

4.1 Public's Expression of Interest

At this level of preparation of project has not been approved by public, however the final version will be submitted to the representatives of settlements in the vicinity of the lagoon.

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration:*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

The project should improve the present environmental loading of the region to reduce the leak of contaminants to groundwater.

4.4 Primary Effects of Project

The implementation of project may positively improve the environmental problems on local level.

5. Economic Project Justification

5.1. Economic Project Benefits

Employment/income effects	
during construction period	N/A
during operation period	N/A
Other economic benefits	
Elimination of environmental problems	

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated?	☐ **yes** ☒ **no**
total investment costs of project	212.505.000 .-Sk
planned annual depreciation	.-Sk
planned annual operation costs	.-Sk
planned annual revenues	.-Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	212.555.000,-Sk
Allocation of capital cost	
Land	.-Sk
Construction and machinery	161.124.000,-Sk
Planning and supervision	4.261.000,-Sk
Total cost	212.555.000,-Sk
On an annual basis	
Year of cost estimate	
Nature of cost estimate (preliminary, adequate, etc.)	
preliminary	

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)	
since this time has not been specified	
Repair and replacement cost	N/A .-Sk
Total operational cost	N/A .-Sk
Year of cost estimate	N/A .-Sk
Nature of cost estimate (preliminary, adequate, sources of information)	
N/A	

6.3 Estimate of Revenues

Expected annual revenues (in real terms)	
N/A	
Year of estimate:	N/A
Nature of estimate (preliminary, adequate, etc.)	

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme

Sources of funding	Secured	Requested	Non- secured
	Currency [. Sk]		
1. Equity of project owner			
2. National Environmental Fund			
3. **Water Management Fund**			
4. Public loan - central budget			
5. Public loan - regional budget			
6. Public grant - central budget			
7. Public grant - regional budget			
8. International loan			
9. International grant			
10. Commercial bank loan			
11.Others sources			
Total funds/requirements			

Project No. 4-L

Reconstruction of Dry Waste Tip and Waste Liquidation

Date of first setting up:	4/27/1998	Date of latest upgrade:	

Project Title:	Reconstruction of dry waste tip and waste liquidation

Responsible/Legal Body	
Authority/Company	VSŽ OCEĽ, s.r.o. Košice
Name	Ing.Alexander Dudinský engineering manager VSŽ OCE¼, s.r.o.
Address	VSŽ OCE¼, spol. s r.o. 044 54 Košice
Telephone	00421/ (0)95/ 673 4147
Fax	00421/(0)95/ 673 7780
e-mail	-
Project Target	The environmentally friendly disposal of wastes and by-products from metallurgical blast furnace such as steel slags with the aim to eliminate the groundwater pollution.
Investment Costs	503.062.000,- Sk
Status of Project	☐ ongoing ☐ planned ☒ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

Reconstruction of dry waste tip and waste liquidation

2 Investor Details

2.1 Authority/Company

Name	VSŽ Holding, a.s. Košice		
Address	VSŽ Holding, a.s. 044 54 Košice		
Telephone	00421/ (0)95/ 673 7682 00421/ (0)95/ 673 6849		
Fax	00421/(0)95/ 673 6900	e-mail	-

2.2 Contact Persons

Ing.František Špièka
VSŽ Konzult, s.r.o. Košice

2.3 Advisor/Consultant

VSŽ Inžiniering, s.r.o. Košice

2.4 Legal/Financial Status

joint stock company

Authority/Company Profile

Production of coke, steel and cast, rolled and wrought iron

2.6 Planning/Implementing Extent/Capacity of the Investor

Complete administration, consulting and control services and construction capacity in VSŽ Inžiniering, s.r.o. Košice

2.7 Institutions/Enterprises beside the Investor

VSŽ Inžiniering, s.r.o. Košice

3. PROJECT DESCRIPTION

3.1 Project Outline

The territory of dry waste tip is about 150 ha with the height 28-30 m. The project will divide this territory into two sites.

The first one will serve for disposal and storage of industrial wastes generated in VSŽ Holding, a.s. Košice with the annual production of 150.000 t/year.

The second one will serve for disposal of by-products generated in metallurgical blast furnace; especially slags with the production of 975.000 t/year.

Both of these landfills have the capacity for 20 years of expected by-products production.

The protection of groundwater contamination is ensured to construction of hydrosealing from the north site and the sealing wall from southwest site.

3.2 Primary Needs for the Project

to eliminate the secondary dustiness in the vicinity of landfill,

to utilize the existing territory according to Slovak legislative,

to effective utilization of existing dump territory without the requirements of expansion of existing one for the period of the next 20 years,

to protect the groundwater contamination.

If the planned measures does not implement it is possible to expect the gradual contamination of groundwater

3.3 Status of Project Preparation

The feasibility study has been carried out. After the positive proof by legal institutions the project will be designed. The project will be implemented in the years 1998 -2000.

3.4 Technology Proposed

The existing dump will be sealed by sealing geomembranes. The membrane will be covered by soil. The run-off will be collected and transported to neutralization station. The second phase of this project will be the construction of the hydrosealing and sealing walls.

3.5 Ownership of Project Site

The site of lagoon is the ownership of VSŽ Holding, a.s.

3.6 Specific project Items

The project will implement the latest technology of sealing dumps. This approach should ensure the improvement of aquatic environmental problems.

4. Project Effects and Interactions

4.1 Public's Expression of Interest

At this level of preparation of project has not been approved by public, however the final version will be submitted to the representatives of settlements in the vicinity of the landfill.

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

The project should improve the present environmental loading of the region to reduce the leak of contaminants to groundwater.

4.4 Primary Effects of Project

The implementation of project may positively improve the environmental problems on local level.

5. Economic Project Justification

5.1. Economic Project Benefits

Employment/income effects	
during construction period	N/A
during operation period	N/A
Other economic benefits	
Elimination of environmental problems	

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated?	☐ **yes** ☒ **no**
total investment costs of project	507.134.000,-Sk
planned annual depreciation	.-Sk
planned annual operation costs	.-Sk
planned annual revenues	.-Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	503.062.000,-Sk
Allocation of capital cost	
Land	.-Sk
Construction and machinery	298.639.000,-Sk
Planning and supervision	.-Sk
Total cost	507.134.000,-Sk
On an annual basis	.-Sk
Year of cost estimate	
Nature of cost estimate (preliminary, adequate, etc.)	
Preliminary	

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)	
since this time has not been specified	
Repair and replacement cost	N/A .-Sk
Total operational cost	N/A .-Sk
Year of cost estimate	N/A .-Sk
Nature of cost estimate (preliminary, adequate, sources of information)	
N/A	

6.3 Estimate of Revenues

Expected annual revenues (in real terms)	
N/A	
Year of estimate:	N/A
Nature of estimate (preliminary, adequate, etc.)	

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme

Sources of funding	Secured	Requested	Non- secured
	Currency [. Sk]		
1. Equity of project owner			
2. National Environmental Fund			
3. **Water Management Fund**			
4. Public loan - central budget			
5. Public loan - regional budget			
6. Public grant - central budget			
7. Public grant - regional budget			
8. International loan			
9. International grant			
10. Commercial bank loan			
11.Others sources			
Total funds/requirements			

Project No. 5-L

Reconstruction of Industrial Landfill

Date of first setting up:	4/28/1998	Date of latest upgrade:	

Project Title:	Reconstruction of industrial landfill

Responsible/Legal Body	
Authority/Company	Bukocel, a.s.
Name	JuDr. Marián Porvažník, chairman of the Board, general manager Ing.Ján Oèovský, member of the Board
Address	Bukocel, a.s. 093 02 Hencovce Slovakia
Telephone	00421/ (0)931/ 233 38, 224 81, 211 65
Fax	00421/(0)931/ 22 957
e-mail	-
Project Target	The aim of the project is the reconstruction of industrial landfill situated close to the watercourse of Ondava river. At present the landfill is only separated from the river by soil dam. The existing dam is necessary to reconstruct.
Investment Costs	50.000.000,- Sk
Status of Project	☐ ongoing ☐ planned ☒ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

Reconstruction of industrial landfill

2 Investor Details

2.1 Authority/Company

Name	Bukocel,a.s.		
Address	Bukocel, a.s. Hencovská 2073 093 02 Hencovce Slovakia		
Telephone	00421/ (0)931/ 233 38, 224 81, 211 65		
Fax	00421/(0)931/ 22 957	e-mail	-

2.2 Contact Persons

Ing. Marek Saxa,
Ing. Peter Krauspe

2.3 Advisor/Consultant

CIPPOS Nové Zámky - study and consulting services,
Vodohospodárska výstavba, š.p. Bratislava - study

2.4 Legal/Financial Status

share holding company

Authority/Company Profile

The Bukocel production can be subdivided into three divisions:
chemicals (kraft pulp, chemical pulp and by products),
wood (timber, plywood boards, veneers),
furniture (chairs, tables, etc.).
The company owned power station, as well:
revenues: 3725 mil.-Sk
annual turnover: 3785,5 mil.-Sk
number of workers: 926

2.6 Planning/Implementing Extent/Capacity of the Investor

administration, consulting and control services during the period of construction.

2.7 Institutions/Enterprises beside the Investor

At present the studies only exist. The project is not elaborated. The perspective user is Bukocel, a.s.

3. PROJECT DESCRIPTION

3.1 Project Outline

During the period of Bukocel plant construction (1950 years) the Ondava river was regulated . The old part of the watercourse has served for the $CaCo_3$ sludge lagoon as well as for the slag and ash.

In 1972 the hydraulic transport had been stopped and lately the solid waste disposal has started (wood, soil, sludge from the production of cellulose, etc.). The height of the present landfill is about 8 m therefore during the wet period (higher flow rate in Ondava) there is a risk of dam damage and the acute pollution of the Ondava River.

The operation of landfill is only temporarily permitted by the environmental authority (up to 31.12.2000). It is necessary to carry out:
geological survey,
dewatering (drainage) of the landfill,
improve the state of the dam (solidified the dam).

3.2 Primary Needs for the Project

The project should enable to protect the dam and thus to prevent the water quality of the Ondava River against the possible impact of the landfill during its failure.

3.3 Status of Project Preparation

The study is prepared. There is an evaluation of the present state. It is necessary to provide the geological survey, to construct the dewatering of the landfill, to solidify the damp and to construct the new block and in the south part of landfill to accommodate the landfill rehabilitation.

3.4 Technology Proposed

It is assumed to construct the solidification of the damp with the length 400 m and height 8 m. The project will be handled after the geological survey of the landfill and inundation region of the Ondava River.

3.5 Ownership of Project Site

The site of landfill is situated in the region of company, it is the ownership of Bukocel, a.s.

3.6 Specific project Items

The protection of water quality against the impact of pollution coming from the landfill.

4. Project Effects and Interactions

4.1 Public's Expression of Interest

The public attitude to this project is positive.

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

The pollution is discharged to the Ondava river with IV. class of water quality.

4.4 Primary Effects of Project

The discharged pollution from the landfill to the Ondava river would have an impact on the water quality not only on the local but also on international/transboundary level.

5. Economic Project Justification

5.1. Economic Project Benefits

Reconstruction of a new landfill will cost about 100 mil. .- Sk, so the savings would be about 50 mil. Sk..

Employment/income effects	
during construction period	10 employees – 9500,- Sk/month
during operation period	1 employee – 9700,- Sk/month

Other economic benefits

The savings in the terms of expenses savings.

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated?	☐ **yes** ☒ **no**
total investment costs of project	50.000.000,-Sk
planned annual depreciation	1.000.000,-Sk
planned annual operation costs	700.000,-Sk
planned annual revenues	none .-Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	50.000.000,-Sk
Allocation of capital cost	
Land	0,-Sk
Construction and machinery	0,-Sk
Planning and supervision	2.500.000,-Sk
Total cost	50.000.000,-Sk
On an annual basis	N/A .-Sk
Year of cost estimate	N/A .-Sk
Nature of cost estimate (preliminary, adequate, etc.)	
Preliminary	

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)	
it is not considered	
Repair and replacement cost	0,-Sk
Total operational cost	700.000,-Sk
Year of cost estimate	700.000,-Sk
Nature of cost estimate (preliminary, adequate, sources of information)	
preliminary calculation according to the operational experience	

6.3 Estimate of Revenues

Expected annual revenues (in real terms)	
N/A	
Year of estimate:	**N/A**
Nature of estimate (preliminary, adequate, etc.)	
it is not calculated	

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme

Sources of funding	Secured	Requested	Non- secured
	Currency [mil. Sk]		
1. Equity of project owner			
2. National Environmental Fund			
3. **Water Management Fund**			
4. Public loan – central budget			
5. Public loan – regional budget			
6. Public grant – central budget			
7. Public grant – regional budget			
8. International loan			
9. International grant			
10. Commercial bank loan			
11.Others sources			
Total funds/requirements	0	50	

Project No. 6e-I

Disposal of Wastes from the PCB Production

Date of first setting up:	4/15/1998	Date of latest upgrade:	

Project Title:	Disposal of wastes from the PCB production

Responsible/Legal Body	
Authority/Company	Chemko, a.s. Strážske
Name	Ing.Dušan Hordoš general manager
Address	Chemko, a.s. Strážske Priemyselná 720 072 22 Strážske
Telephone	00421/ (0)946/ 91451,91613
Fax	00421/(0)946/ 91 632
e-mail	-
Project Target	The aim of the project is the disposal of wastes containing PCB which were accumulated during the PCB production in special storehouses
Investment Costs	250 – 400.000.000,- Sk
Status of Project	☐ ongoing ☐ planned ☒ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English: ☐ yes ☒ no

1 Project Title

Disposal of wastes from the PCB production

2 Investor Details

2.1 Authority/Company

Name	Chemko,a.s. Strážske		
Address	Chemko, a.s. Strážske Priemyselná 720 072 22 Strážske		
Telephone	00421/ (0)946/ 49 12 11		
Fax	00421/(0)946/ 49 11 54	e-mail	-

2.2 Contact Persons

Ing.Peter Laca

2.3 Advisor/Consultant

Ministry of Environment
Institute of preventive and clinic medicine
Chemko, a.s. Strážske, Slovakia

2.4 Legal/Financial Status

joint stock company

Authority/Company Profile

Chemko Company was established by Czechoslovak Government in 1952. National Enterprise was the original and legal form. The first role of the Company was the production of the explosives for the army. The part of intermediate was used for the civil sector. Another development of the Company continued in the following periods:

1.formalin chemistry complex (1957 to 1963),
2.nitrogen chemistry complex (1964 to 1969)
3.benzene chemistry complex (1976 to 1983)
4.light stabilizers for plastics plant (1987 to 1991)
5.joint-venture of Chemko and Norwegian company DYNO NOBEL having the name DYNO-CHEMKO, a.s. for the production and distribution of loose and slurry industrial explosives (1993),
6.calcium ammonium nitrate plant (1996)

The main Company's object of activity is to produce basic products of formaldehyde chemistry and cyclohexanone as well as the business activity in the field of chemistry. Until March 31,1996 Chemko existed as a state company, and since April 1, 1996 it has existed as the joint stock Company.
Profit and loss account of the company in 1996 is the following (according to Annual Report 1996 of the Company):

earnings (loss) from operations + 126.437.000,-Sk
profit (loss) before income taxes - 178.796.000,-Sk
profit (loss) on ordinary activities + 43.284.000,-Sk
extraordinary profit (loss) + 55.449.000,-Sk
profit (loss) for the period + 12.165.000,-Sk

2.6 Planning/Implementing Extent/Capacity of the Investor

At this stage of preparation of the project it is not possible to estimate.

2.7 Institutions/Enterprises beside the Investor

Consulting and design firms serving in this particular field - disposal PCB wastes

3. PROJECT DESCRIPTION

3.1 Project Outline

The development of general methodology of PCB wastes disposal and the wastes with the similar contamination for the whole territory of Slovakia.
The evaluation of existing systems of disposal and to establish the common approach of solving this problem.
At this stage of the project preparation it is not possible to define precisely the technology or the procedure of waste disposal. The expected users will be all the producers of these types of wastes.

3.2 Primary Needs for the Project

The main target of the project is reliable disposal of PCB wastes designed for the whole territory of SR. There is still the risk of possible attack of environment by PCBs.

3.3 Status of Project Preparation

The project is in the phase of emerging study. The study about the existence of PCBs, their impact on environment and possible disposal

3.4 Technology Proposed

It is supposed to apply the thermal or chemical processing of waste treatment for disposal. The treatment technology will design as a mobile plant to handle the waste at the site of landfill.

3.5 Ownership of Project Site

At present it is not defined.

3.6 Specific project Items

N/A

4. Project Effects and Interactions

4.1 Public's Expression of Interest

Since this the public has not been involved in this project. The project was consulted with Ministry of Environment.

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes, please determine the status of elaboration :*

☐ planned ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

The existence of PCB is very sensitive issue for the whole territory of Slovakia. Therefore the project is design for Slovakia (on national level).

4.4 Primary Effects of Project

The implementation of project will have an effect for the whole territory of Slovakia. The results of the project could be utilized for CEE countries.

5. Economic Project Justification

5.1. Economic Project Benefits

The economic benefits have not been estimated, yet.

Employment/income effects	
during construction period	N/A
during operation period	N/A

Other economic benefits

At this time the system of PCB waste disposal, the transport of this waste to other countries, is not the conceptual solution.

5.2. Economic Internal Rate of Return (EIRR)	
Has an EIRR been calculated?	☐ **yes** ☒ **no**
total investment costs of project	N/A .-Sk
planned annual depreciation	N/A .-Sk
planned annual operation costs	N/A .-Sk
planned annual revenues	N/A .-Sk

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	N/A .-Sk
Allocation of capital cost	
Land	N/A .-Sk
Construction and machinery	N/A .-Sk
Planning and supervision	N/A .-Sk
Total cost	N/A .-Sk
On an annual basis	N/A .-Sk
Year of cost estimate	-
Nature of cost estimate (preliminary, adequate, etc.)	
-	

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)	
Repair and replacement cost	N/A .-Sk
Total operational cost	N/A .-Sk
Year of cost estimate	N/A .-Sk
Nature of cost estimate (preliminary, adequate, sources of information)	
preliminary	

6.3 Estimate of Revenues

Expected annual revenues (in real terms)	
	N/A .-Sk
Year of estimate:	-
Nature of estimate (preliminary, adequate, etc.)	
preliminary	

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme			
Sources of funding	**Secured**	**Requested**	**Non- secured**
	Currency		
1. Equity of project owner			
2. National Environmental Fund			
3. **Water Management Fund**			
4. Public loan – central budget			
5. Public loan – regional budget			
6. Public grant – central budget			
7. Public grant – regional budget			
8. International loan			
9. International grant			
10. Commercial bank loan			
11.Others sources			
Total funds/requirements			

Non-structural Projects

Project No. 1-O

Floodplain Meadow Restoration in the Lower Morava River

Date of first setting up:	04/20/1998	Date of latest upgrade:	04/06/97

Project Title:	Floodplain Meadow Restoration in the Lower Morava River

Responsible/Legal Body

Authority/Company	DAPHNE-Center for Applied Ecology
Name	RNDr. Ján Šeffer, CSc.
Address	Hanulova 4/d 844 40 Bratislava Slovak Republic
Telephone	00421/7/654 121 62
Fax	00421/7/654 121 33
e-mail	daphne@changenet.sk

Project Target	• identification of area of degraded meadows • elaboration of restoration and management plan for whole non-forest floodplain area • to restore 200 ha arable soil in floodplain back to the species-rich meadow • to restore 1000 ha of degraded meadow • to establish system of monitoring plots for evaluation of restoration processes • monitoring

Investment Costs	1st Phase 66.200,- ECU 2nd Phase 310.000,- ECU
Status of Project	☒ ongoing ☐ *planned* ☐ emerging concept
Language of Project Document	☐ Slovak ☒ English ☐ German Summary in English : ☒ yes ☐ no

1 Project Title

Floodplain Meadow Restoration in the Lower Morava River

2 Investor Details

2.1 Authority/Company

Name	DAPHNE-Center for Applied Ecology		
Address	Hanulova 4/d 844 40 Bratislava Slovak Republic		
Telephone	00421/7/654 121 62		
Fax	00421/7/654 121 33	e-mail	daphne@changenet.sk

2.2 Contact Persons

RNDr. Ján Šeffer, CSc.

2.3 Advisor/Consultant

PHARE for Danube Environmental Programme

2.4 Legal/Financial Status

NGO

Authority/Company Profile

Daphne - Center for Applied Ecology is independent institute with main focus on restoration ecological projects. Implementation phases are based on profound scientific research and involvement of stakeholders.

2.6 Planning/Implementing Extent/Capacity of the Investor

-

2.7 Institutions/Enterprises beside the Investor

-

3. PROJECT DESCRIPTION

3.1 Project Outline

Serious threats to the meadow ecosystem biodiversity have also been caused by the plowing of 500 ha of meadows during socialism from 1960-1989. The plowing was concentrated on the middle section of the Ramsar site, and the arable land was regularly fertilized and herbicides were used. Some fields are still active, but most fields have been abandoned for a few years and are under invasion from weed and alien species, especially *Aster novi-belgii* agg. Intensive use of chemicals has caused an increase of pollution in the Morava River.

Habitat restoration or reconstruction is generally concerned with producing characteristic and typical communities, thus differing from traditional land reclamation for agriculture, industry or housing. However, in our case the restoration of interesting communities is concerned with the traditional uses of land for agriculture. Alluvial meadows thus enable us to sustainable use floodplains with mutual benefit for farmers and nature conservation.

According to methods for floodplain meadow restoration, which were developed during project “Restoration and Management Species-Rich Meadows in Morava River Floodplain” the area of 200 ha arable soil will be transformed back to the species-rich meadow ecosystem. Additional 1000 ha of degraded meadows will be restored by special management measures.

The arable soil in active floodplains created big environmental problem for increasing of surface and underground water pollution, loses of original biodiversity and other functions of wetlands.

3.2 Primary Needs for the Project

Growing vegetation removes nutrients from the water, and if the vegetation is removed the net result is a reduction of nutrients. The regularly mowed meadows in the Morava River Floodplains are a unique ecosystem not only for their high biodiversity value, but also because they act like huge nutrient sinks. After rough estimations we have predicted that 290 tons of nitrogen and 30 tons of phosphorus are removed by hay annually, but the potential for this area is 480 tons and 50 tons respectively.

3.3 Status of Project Preparation .

On going Phase I.

3.4 Technology Proposed

N/A

3.5 Ownership of Project Site

N/A

3.6 Specific project Items

N/A

4. Project Effects and Interactions

4.1 Public's Expression of Interest

In August 1995 the Daphne Foundation performed an opinion research poll in 12 settlements in Morava River Floodplains. On the basis of answers of 205 respondents we determined the publics perception of possible ways of managing and future development of this region. One of the questions concerned the ploughing of meadows. The 59% of inhabitants do not agree with using these meadows as arable fields.

4.2 Environmental Impact Assessment (EIA)

☐ *yes* ☒ no *If yes, please define the level of progress :*

☐ planned ☐ in progress ☐ finished/completed/ ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

The Morava River Floodplains are located on the western edge of Slovakia and are situated along the former iron curtain which was closed up to 1990. It forms the border between the Slovak Republic and Austria (the lower section), and also between the Slovak and Czech Republics (the middle section). There are very various well-developed types of wetlands. The most common are meadows and pastures - 2 823 ha (more than 50% of area). This area contains species rich meadow ecosystems, which are a result of the former extensive flood regime of the territory. These areas provide necessary foraging and nesting habitat for numerous bird species, especially during the breeding season.

4.4 Primary Effects of Project

Joint vision of project is restoration of floodplain meadows, which are result of sustainable use of this ecosystem by local communities for hundreds of years. Species-rich floodplain meadows of Morava River are last biggest complex of them in Central Europe. The restoration of them is excellent example of win-win approach - it creates benefit for all sustainable interests in the area (water quality, farming, nature conservation, recreation, fishing, hunting, education and science).

5. Economic Project Justification

5.1. Economic Project Benefits

Saved investment cost *(compared to without project case)*

N/A

Employment/income effects	
during construction period	
during operation period	

Other economic benefits

N/A

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated ?	☐ **yes** ☒ **no**

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	.-Sk
Allocation of capital cost	
Land	.-Sk
Construction and machinery	.-Sk
Planning and supervision	.-Sk
Total cost	.-Sk
On an annual basis	.-Sk
Year of cost estimate	.-Sk
Nature of cost estimate (preliminary, adequate, etc.)	
N/A	

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)	
N/A	
Repair and replacement cost	.-Sk
Total operational cost	.-Sk
Year of cost estimate	.-Sk
Nature of cost estimate (preliminary, adequate, sources of information)	
N/A	

6.3 Estimate of Revenues

Expected annual revenues (in real terms)
N/A
Year of estimate
Nature of estimate (preliminary, adequate, etc.)
N/A

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme

Sources of funding	**Secured**	**Requested**	**Non- secured**
	Currency [ECU]		
1. Equity of project owner			
2. National Environmental Fund			
3. **Water Management Fund**			
4. Public loan - central budget			
5. Public loan - regional budget			
6. Public grant - central budget			
7. Public grant - regional budget			
8. International loan			
9. International grant	66.200,-	310.000	244.000
10. Commercial bank loan			
11.Others sources			
Total funds/requirements	66.200,-	310.000	244.000

Project No. 2-O

Analysis of Sediments Quality and Disposal of Extracted Sediments within the Slovak Part of the Danube River Basin

Date of first setting up:	25/05/1998	Date of latest upgrade:	

Project Title:	Analysis of sediments quality and disposal of extracted sediments within the Slovak part of the Danube River basin

Responsible/Legal Body

Authority/Company	Water Research Institute
Name	Ing.Juraj Brtko, CSc. director WRI
Address	Nábrežie L.Svobodu è. 5, 812 49 Bratislava, Slovak Republic
Telephone	00421/7 5 343 336
Fax	00421/7 5 318 479
e-mail	sciesecr@vuvh.sk
Project Target	• analysis of river and reservoir sediments quality of the Slovak part of the Danube River basin • role of sediments quality in development of surface water quality • proposal of extracted sediment disposal according to the enacted legal regulations • delivery of: a/ equipment for sediment sampling and analysis • equipment for measurement amount of deposited sediments
Investment Costs	20.000.000,- Sk
Status of Project	☐ ongoing ☒ *planned project* ☐ emerging concept
Language of Project Documents	☒ Slovak ☐ English ☐ German Summary in English : ☒ yes ☐ no

1 Project Title

Analysis of river and reservoirs sediments quality within monitoring network of the water quality of Slovak streams, reservoirs and disposal of extracted sediments from the Danube River basin tributaries and reservoirs.

2 Investor Details

2.1 Authority/Company

Name	Ministry of Environment SR, state institution		
Address	Štúrovo námestie è.1 Bratislava		
Telephone	00421/7 516 745		
Fax	00421/7 516 2367	e-mail	

2.2 Contact Persons

Ing.Hucko Pavel,CSc. , WRI

2.3 Advisor/Consultant

Slovak water management enterprise, state enterprise, Banská Štiavnica , SR

2.4 Legal/Financial Status

Central State Institution

Authority/Company Profile

Ministry of Environment SR

2.6 Planning/Implementing Extent/Capacity of the Investor

3.000.000, - Sk

2.7 Institutions/Enterprises beside the Investor

Slovak watermanagement enterprise, state enterprise, Banská Štiavnica , SR

3. PROJECT DESCRIPTION

3.1 Project Outline

Objective of this project is working out the analysis of river and reservoirs sediments quality in profiles of Danube tributaries in Slovakia.

The second important task of this project is a proposal of disposal of extracted sediments from the Danube tributaries and reservoirs in the Slovak territory of Danube River basin. This proposal has to be done according to the enacted legal regulations.

Sediments of surface streams and reservoirs play an important role in development of surface water quality. They give an image on the long-term load of surface streams and reservoirs, accumulating different types of pollution, discharged into surface streams, as heavy metals, inorganic and organic matters with different degree of toxicity. Thus, river and reservoirs sediments may have, after shorter or longer period, negative effect on water quality of the surface stream or reservoir.

The results of solution may provide a complex survey on the quality of river or reservoir sediments. On the basis of these results it would be possible to describe the motion of respective pollutants within the longitudinal profile of the respective Danube tributary and their potential effect on surface and groundwater quality.

3.2 Primary Needs for the Project

Objectives:
The solution of this project consists of the analysis of sediments quality in significant profiles of the monitoring networks of the surface water quality and water reservoirs in Slovakia.
Assessment of sediments quality from reservoirs is important with regard to the potential negative effect on water quality.
Resulting information on sediments quality in selected water reservoirs and other Danube tributaries will create the basis for proposal of their disposal.

3.3 Status of Project Preparation.

proposal of the planned project

3.4 Technology Proposed

Proposed technology of extracted river sediment disposal is a subject of this project

3.5 Ownership of Project Site

state property

3.6 Specific project Items

The territory of Slovakia belongs to the Danube River basin only without a small part of the Poprad River basin, therefore this project covers nearly whole Slovak Republic. All anthropogenic activities are finished in surface water - tributaries of the Danube. From this point of view problems of sediments play important role at the quality of surface and underground water.
From the quantitative point of view erosion and sediment deposition at rivers and reservoirs of respective tributary basins are reflecting in decreasing reservoirs volume with negative impact on flood protection and hydroenergetic potential.

4. Project Effects and Interactions

4.1 Public's Expression of Interest

was not examined

4.2 Environmental Impact Assessment (EIA)

☐ yes ☒ no *if yes please go to the next row.*

☒ planned/ ☐ in progress ☐ finished/completed ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor,

Locality : Slovak part of Danube River basin
Recipient: Main tributaries of the Danube River, water reservoir

4.4 Primary Effects of Project

Sediments of Danube tributaries and water reservoirs play an important role in development of surface water quality. They give an image on the long-term load of surface streams and reservoirs, accumulating different types of pollution, discharged into surface streams, as heavy metals, inorganic and organic matters with different degree of toxicity. Thus, tributary and reservoir sediments may have, after shorter or longer period, negative effect on water quality of the surface streams or reservoirs. Correct way of sediments disposal after their extraction from Danube tributaries or reservoirs is very important with regard to the positive effects on water quality of the Danube.

5. Economic Project Justification

Economic Project Benefits

Saved investment cost *(compared to without project case)*	
N/A	
Employment/income effect	
during construction period	N/A
during operation period	N/A
Other economic benefit	
N/A	

5.2. Economic Internal Rate of Return (EIRR)	
Has an EIRR been calculated?	☐ **yes** ☒ **no**

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	20.000.000,- Sk
Allocation of capital cost	
Land	.-Sk
Construction and machinery	.-Sk
Planning and supervision	600.000,-Sk
Total cost	20.000.000,- Sk
On an annual basis	10.000.000,- Sk
Year of cost estimate	10.000.000,- Sk
Nature of cost estimate (preliminary, adequate, etc.)	
Preliminary	

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)	
N/A	
Repair and replacement cost	200.000,- Sk
Total operational cost	8.000.000,- Sk
Year of cost estimate	2.000.000,- Sk
Nature of cost estimate (preliminary, adequate, sources of information)	
Preliminary	

6.3 Estimate of Revenues

Expected annual revenues (in real terms),
N/A
Year of estimate: N/A
Nature of estimate (preliminary, adequate, etc.)
N/A

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no**

6.5 Anticipated/Proposed Funding Scheme

Sources of funding	Secured	Requested	Non- secured
	Currency [thousands Sk]		
1. Equity of project owner		3000,-	3000,-
2. National Environmental Fund		2000,-	2000, -
3. **Water Management Fund**		1000,-	1000,-
4. Public loan – central budget		-	-
5. Public loan – regional budget		-	-
6. Public grant – central budget		-	-
7. Public grant – regional budget		-	-
8. International loan		-	-
9. International grant		14.000,-	14.000,-
10. Commercial bank loan		-	-
11.Others sources		-	-
Total funds/requirements		20.000,-	20.000,-

Project No. 3-O

Water Management Transformation Process - the Support of Municipal Authorities

Date of first setting up:	29/05/98	Date of latest upgrade:	

Project Title:	Water management transformation process - the support of municipal authorities

Responsible/Legal Body	
Authority/Company	The Association of Towns and Communities of Slovakia (ZMOS)
Name	Frantisek Jezik Deputy chairman of ZMOS
Address	Bezruèova 9, 811 09 Bratislava Slovak Republic
Telephone	00421/07/368025
Fax	00421/07/364256
e-mail	zmos @netlab.sk
Project Target	Based on analysis of the conditions of transformation and the actual state of institutional development of self-government bodies it is necessary to secure a support for the communities as partners of the state in process of transformation, and to reach quality in water management. The target subjects : - Association of Towns and Villages of Slovakia (ZMOS) - regional associations of communities - consumers and associations of consumers
Investment Costs	Investment and operational costs 6.156.000 Sk (180.000 USD)
Status of Project	☐ ongoing ☐ *planned* ☒ emerging concept
Language of Project Documents	☒ Slovak ☒ English ☐ German Summary in English : ☒ yes ☐ no

1 Project Title

Institutional strengthening of municipal authorities in the process of water management transformation.

2 Investor Details

2.1 Authority/Company

Name	Vodohospodárska agentúra, Združenie (Municipal Water Management Agency, further MWMA)		
Address	Bezruèova 9 811 09 Bratislava Slovak Republic		
Telephone	00421/07 368025		
Fax	00421/07 364256	e-mail	zmos @ netlab.sk

2.2 Contact Persons

Ing. Jaroslav NEMA

2.3 Advisor/Consultant

HYDROMEDIA Bratislava, Ltd.
The Association of Towns and Communities (ZMOS)

2.4 Legal/Financial Status

Association of legal bodies

Authority/Company Profile

The realization of project shall be assured by the non-governmental, non-profit organization founded for this purpose (further referred as „agency“).
Estimated annual budget .....60.000 USD
number of employees.....3-5
Field of activities :
- information collecting and evaluating
- advisory and consulting activities
- know-how transfer to municipal authorities

2.6 Planning/Implementing Extent/Capacity of the Investor

The project will be implemented by own capacities of investor, with organizational and political support of ZMOS

2.7 Institutions/Enterprises beside the Investor

HYDROMEDIA Bratislava, LTD

3. PROJECT DESCRIPTION

3.1 Project Outline

Institutional project description :

The MWMA was created to serve the specific targets group (No) in the process of water management transformation. The Community Administration Act imposes the duty on municipalities to secure the communal water supply and sewerage. The ownership, the operating and maintenance of existing water works will be transferred from state to communities.

Also the planning and implementation of new water supply and sewage projects will be provided by municipal authorities.

Main activities of MWMA :

1. Advisory and consulting service
   - advising on organization structure of municipal authorities (water management division)
   - management of water management transformation process
   - technical advising (technical state of the facilities and infrastructure of water works)
   - investment, economic and financial advising (feasibility studies, models of financing of planned water works, etc.)
   - legal advising (aspects of water-rights, water works property-rights,...)
   - municipal water management policy
2. Water management information agency service
   - acquiring, collecting and evaluation of information of water management nature
   - providing information to target group
   - media liaison
   - public relations
3. Know-how transfer
   - tasks of public and private sector
   - water management in a market environment
   - costs and prices analysis
   - tariff structures, prize regulation and deregulation, prize policy
   - consumer service

3.2 Primary Needs for the Project

The main aim of project is to support the institutional strengthening of communities, to be able to assume the responsibility and control of water management.

The actual economic situation of the communities does not allow the financing of MWMA from the sources of communities; in this time it is necessary to provide the expert service free of charge.

It may be justly assumed that in course of 1999-2001 the gradual self-financing of MWMA is possible (paid service delivery)

Founding from external (foreign) sources is requested for 1999-2001 (3 years)

The activities of MWMA are necessary to balance the partners - the state and the communities, in transformation process in long-term view.

The lack of activities provided by the project of MWMA may result in problems in water management, namely in water works operation, non-controlled increasing of water prize, water quality problems, etc.

3.3 Status of Project Preparation

Institutional project

Project is prepared, ready to implementation

3.4 Technology Proposed

3.5 Ownership of Project Site

3.6 Specific project Items

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4. Project Effects and Interactions

4.1 Public's Expression of Interest

The Association of Towns and Communities (ZMOS) is the representative of over 87 % of communities in Slovakia. Its long-term objective is development of a public administration model based on the principles of subsidiary, decentralization and strengthening of competencies of self- governing authorities. The project of MWMA is approved by ZMOS.

4.2 Environmental Impact Assessment (EIA)

institutional project

☐ yes ☒ no *If yes please, specify :*

☐ planned ☐ in progress ☐ finished/completed/ ☐ accepted ☐ rejected

4.3 Sensitivity of Locality/Receptor

4.4 Primary Effects of Project

The effects of project can be seen in all of above mentioned levels from the local level (E.G. the quality and the price of drinking water) to the international level (quality of treatment of municipal waste waters in great MWWT plants)

5. Economic Project Justification

Economic Project Benefit

Institutional project. Indirect economic benefits only.

Saved investment cost *(compared to without project case)*

Employment/income effects	
during construction period	1. year : 3 emp., 15.000 Sk
during operation period	2. and next : 5 emp., 15.000 Sk

Other economic benefits

5.2. Economic Internal Rate of Return (EIRR)

Has an EIRR been calculated ?	☐ **yes** ☒ **no** institutional project

6. Financial Viability

6.1 Estimated Investment Cost

Investment cost	750.000,-Sk
Allocation of capital cost	
Land	- .-Sk
Construction and machinery	750.000,-Sk
Planning and supervision	- .-Sk
Total cost	750.000,-Sk
On an annual basis	- .-Sk
Year of cost estimate	1998
Nature of cost estimate (preliminary, adequate, etc.)	
preliminary	

6.2. Estimated Operational Cost

Expected annual (operational) recurrent cost (in real terms)

1999	1.680.000,-Sk
2000	1.800.000,-Sk
2001	1.926.000,-Sk

Repair and replacement cost	- .-Sk
Total operational cost	5.406.000,-Sk
Year of cost estimate	1998

Nature of cost estimate (preliminary, adequate, sources of information)

preliminary

6.3 Estimate of Revenues

Expected annual revenues (in real terms)

N/A (please see 3.2 Primary Needs ...)

Year of estimate

Nature of estimate (preliminary, adequate, etc.)

6.4 Financial Internal Rate of Return (FIRR)

Has a FIRR been calculated?	☐ **yes** ☒ **no** institutional project

6.5 Anticipated/Proposed Funding Scheme

Sources of funding	Secured	Requested	Non- secured
	Currency **USD**		
1. Equity of project owner			
2. National Environmental Fund			
3. **Water Management Fund**			
4. Public loan - central budget			
5. Public loan - regional budget			
6. Public grant - central budget			
7. Public grant - regional budget			
8. International loan			
9. International grant		180.000	180.000
10. Commercial bank loan			
11.Others sources			
Total funds/requirements		180.000	180.000