I. **Basic Information**

1.1 **Desiree Number:** PL01.08.15

1.2 **Project Title:** construction of new water pipes and sewerage systems for the localities of: proszówka, wieza, wolbromów, krzewie wielkie.

1.3 **Sector** infrastructure/environment

1.4 **Location** Poland. Lower Silesia Voivodship, Euroregion NYSA. The distance to the Polish-German border is approximately 30 km. The project will comprise 4 villages of Gmina of Gryfów Slaski: Proszówka, Wieza, Wolbromów, Krzewie Wielkie

II. **Objectives**

2.1 **Wider/strategic objectives**

The general objective of this project is to reduce pollution of the border Odra river to the level accordant to requirements of standards of EU.

2.2 **Direct objectives**

The direct objective of the project is reduction of pollution discharged to the Kwisa river. The Kwisa river id the tributary of the border Odra river. Reduction is to be achieved by development of regional infrastructure in the range of waters protection as well as improvement of health conditions of inhabitants by construction of water pipes on area comprised by the investment.

2.3 **Priority “Accession Partnership” (AP) and “National Programme for the Adoption of the Acquis” (NPAA).**

The above-mentioned objectives have been defined on the basis of the assumptions identified in the Accession Partnership and the National Programme for the Adoption of Acquis (NPAA) - a document by the Polish central government, which incorporates strategic guidelines in respect of the government's actions to adapt to the requirements of the EU.

The medium-term guidelines regarding protection of the environment assume that environmental protection requirements have to be an integral part of the policies of various individual sectors through the development of structure, capability of monitoring and inspecting of the implementation of water, sewage and refuse related technologies.

The objectives of the project suit activities foreseen as main technical assistance instruments and commonwealth in the range of supporting of investment projects which enable the Polish infrastructure to adapt to the Community’s standards, particularly in respect of environment protection (…)” – Poland: Accession Partnership – Clause 5.1.II.

2.4 **Participation on the Preliminary National Development Plan.**

The project’s objective is accordant to priority directions of activities implemented under the Preliminary National Development Plan, which was produced by the Department of Regional Development, Ministry of Economy. Conformity with Priority 6 “Reinforcement of development potential of regions and counteraction reduction of importance of some terrains – priority direction 1: “Extension and modernisation of infrastructure for improvement of competitiveness of regions”.

This project is implemented in accordance with the Common Programme Document: LOWER SILESIA – SACHSEN PHARE CBC-II INTERREG II A POLAND-GERMANY; objective C – environment, instrument C1 – “reduction of hazard for natural environment in order to reinforcement of ecological development of border regions.

2.5 **Impact on Cross-Border Co-operation:**

As result of Project’s implementation the following effects influencing on local society and with visible trans-border impact:

- improvement of cleanness of rivers at drainage area of the Odra river: Oldza, Kwisa , Bóbr,
- improving healthiness of inhabitants if border belt of Poland and Germany on both sides of the Odra river by eliminating water pollution.
- improving the image of the borderland and making the region more attractive for tourists by development of local infrastructure for tourism and economic units,
- improving the habitat of flora and fauna in the regional rivers and increasing the number of fish in the ecosystem.
III. Description
3.1. Background and Justification

Area of the Gmina of Gryfów Slaski has not complex water pipe sewerage and systems. Buildings in Wieza, in quantity of 15 pieces, which are located near Gryfów Slaski are supplied with water from the municipal water pipe, other localities (Krzewie Wielkie, Wolbromów and remaining part of Wieza) take water from own sources. These sources are in most cases household shaft wells. Sanitary wastewater are treated on area of individual realties in septic tanks without outflow or in greater part (80 %) discharged to flow tanks and then to plough lands, forests or melioration ditches. Existing cesspools are untight and wastewater penetrates into underground water. Thus these localities need to execute equipment protecting soil and surface and underground waters against further degradation as well as extension of water pipes in order to improve healthiness of inhabitants.

Now wastewater in quantity of 1200 m$^3$/d is transported to the plant by means of cesspool emptiers and supplied through the existing sewerage system of Gryfów Slaski (approximately 70 % of its area). Wastewater from some buildings in villages, mainly buildings of public utilities, is also transported to the wastewater treatment plant. However, it makes only negligible part of produced at this area wastewater. Final throughput of the built-up wastewater treatment plant is of 3300 m$^3$/d. Now the wastewater treatment plant uses only one technological line. In order to use the second line quantity of supplied wastewater must be increased. Thus the necessity of considerable extension of the sanitary sewerage system on Gmina's area has arisen.

3.2. Related Activity

The project is functionally interrelated to the project implemented in drainage area of the Odra river under the programme of Ministry of Environmental Protection and the Office of Prime Minister: “Odra 2006” in which is assumed intensification of activities related to utilisation of studies and implementation of programmes prepared by International Commission of Protection of Odra Waters against Pollution. The Commission works on “Programme of fast Activityon Protection of the Odra river against Pollution”. The programme comprises 138 users which implement and plan investment activities up to 2002. Alongside the water course Kwisa – Bóbr – Odra rivers, below the Gmina of Gryfów Slaski most of towns (Zagan, Luban, Boleslawiec, Nowogór Bobrzanski, Krosno Odrzanskie) has begun improvements in water-wastewater management.

In Gmina of Gryfów Slaski in framework of improvement of water-wastewater conditions lately has been implemented between others: part of sanitary sewerage system in the Town of Gryfów Slaski, the water pipe in the village of Rzasiny with length of 13.4 km with 140 connections and in 1997 was put into operation the modern mechanical biological chemical wastewater treatment plant for the Gmina with the final throughput of 3300 m$^3$/d. This wastewater treatment plant complies with required by law grades of treatment. Currently under construction od the water pipe between localities of Proszówka and Młynsko with length approximately 13 km (120 connections) with the modern Water Treatment Station with capacity of 10 m$^3$/h

3.3. Results

The achieved result will be improvement of drinkable water quality in localities of Wieza, Wolbromów and Krzewie Wielkie and increase of wastewater discharged to the wastewater treatment plant in Gryfów Slaski. Discharged wastewater is to be treated in compliance with EU and Polish regulations. As the result of project's implementation it is foreseen to comply with requirements of the Guideline regarding drinkable water 98/63/EC and Guideline regarding municipal wastewater 91/27/EWG.

3.4 Products/Results

The planned investment assumes construction of the sewerage system basing on gravitational and forced (pumping stations) flow of household wastewater from the localities of Proszówka, Wieza, and Krzewie Wielkie to the modernised wastewater treatment plant in Gryfów Slaski and construction of water pipes in the localities of: Wieza, Wolbromów, Krzewie Wielkie.

WOLBROMOW – water pipe
Intake of water from the well, pumped by means of water pipe DN125 to the reserve-equalising tank with capacity of Vut = 50 m$^3$. There are foreseen the pumping stations I and II with suction deep-well pumps (3 pieces + 1 reserve). The water pipe comprises:
- distribution water pipe made of DN 125 and 110 pipes, with length of 2570 m,
- surrounding water pipe made of DN 90 and 63 mm, with length of 850 m,
- 45 water pipe connections made of PE pipes, with total length of 1170 m.

**KRZEWIE WIELKIE**

- **water pipe**
  Water is to be supplied from the municipal water intake for the Town of Gryfów Slaski and through the pipeline ∅ 160 with length of 1600 m. The water pipe comprises:
  - distribution water pipe made of DN 160 and 110 pipes, with length of 5000 m,
  - surrounding water pipe made of DN 110, 90 and 63 mm, with length of 3300 m,
  - 90 water pipe connections made of PE pipes, with total length of 1870 m.

- **sewerage system**
  - network of gravitational sewer mains ∅ 160 - 315 PVC, with length of 10,000 m,
  - pumping pipelines ∅ 90-110 PVC, with length of 855 m,
  - zone pumping stations – 3 pieces; household pumping stations – 2 pieces; the monitoring system for pumping stations,
  - sewerage connections 88 pieces.

**PROSZÓWKA**

- **water pipe**
  Water is to be supplied from the municipal water intake for the Town of Gryfów Slaski and through the pipeline ∅ 160 with length of 650 m. The water pipe comprises:
  - distribution water pipe made of DN 160 and 110 pipes, with length of 4250 m,
  - surrounding water pipe made of DN 90 and 63 mm, with length of 1760 m,
  - 82 water pipe connections made of PE pipes, with total length of 1716 m,
  - 1 hydrophore station.

- **sewerage system**
  - network of gravitational sewer mains ∅ 160 - 315 PVC, with length of 5,900 m,
  - pumping pipelines ∅ 110 PVC, with length of 460 m,
  - zone pumping stations – 2 pieces; household pumping stations – 4 pieces; the monitoring system for pumping stations,
  - sewerage connections 51 pieces.

**WIEZA**

- **water pipe**
  Water is to be supplied from the municipal water intake for the Town of Gryfów Slaski and through the pipeline ∅ 160 with length of 650 m. The water pipe comprises:
  - distribution water pipe made of DN 160 and 110 pipes, with length of 4250 m,
  - surrounding water pipe made of DN 90 and 63 mm, with length of 1760 m,
  - 82 water pipe connections made of PE pipes, with total length of 1716 m,
  - 1 hydrophore station.

- **sewerage system**
  - network of gravitational sewer mains ∅ 160 - 315 PVC, with length of 5,750 m,
  - pumping pipelines ∅ 110 PVC, with length of 1370 m,
  - zone pumping stations – 5 pieces; household pumping stations – 5 pieces; the monitoring system for pumping stations,
  - sewerage connections 62 pieces.
  - przylacza kanalizacyjne sztuk 62

### 3.5 Expenditures

It is planned under the project to execute construction-assembly works – one tender procedure and one contract for the amount of EURO million 2.78.

### IV. Institutional Framework

Self-Government Authorities of the Gmina of Gryfów Slaski are the Beneficiary and the agenda responsible for implementation of the project.

The following entities are involved in implementation of the project:
- Voivodship Fund of Environmental Protection in Wroclaw,

A tender process will be followed to appoint “the Engineer”.

The Gmina of Gryfów Slaski will become the owner of the assets once the project is finished. Responsible for operation of the built-up networks will be Zakład Wodociągów I Kanalizacji in Gryfów Slaski (quotas of Municipality of Gryfów Slaski).

The following entities are responsible for the implementation of the project:

- **a) Contract awarding**
  - Gmina of Gryfów Slaski – The Beneficiary and the direct investor,
  - the Cross Border Co-operation Programme Implementing Authority
- **b) Project implementation supervision**
  - the Beneficiary and direct investor (the Gmina of Gryfów Slaski)
  - the Cross Border Co-operation Programme Implementing Authority
  - the European Commission
- **c) Project final acceptance**
  - the Beneficiary, direct investor (the Gmina of Gryfów Slaski)
  - the European Commission
- the Cross Border Co-operation Programme Implementing Authority
  d) Project implementation monitoring
  - the Beneficiary, direct investor (the Gmina of Gryfów Słaski)
  - the Cross Border Co-operation Programme Implementing Authority
  - the European Commission
  e) Reporting
     - the Beneficiary, direct investor (the Gmina of Gryfów Słaski)
  f) Co-ordination
     - the Cross Border Co-operation Programme Implementing Authority

V. Budget (amounts in MEURO)

<table>
<thead>
<tr>
<th>Item</th>
<th>Investment</th>
<th>Institution Building</th>
<th>Total PHARE CBC 2001</th>
<th>National funding</th>
<th>IFI</th>
<th>TOTAL</th>
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</thead>
<tbody>
<tr>
<td>Construction of new sewage system</td>
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<td>2.0</td>
<td>0.78</td>
<td>0.0</td>
<td>2.78</td>
</tr>
</tbody>
</table>

Co-funding from national sources will be available.

VI. Organisation of Implementation:

6.1 Implementing Agency
   The Implementing Authority for Phare Cross Border Co-operation Programme
   Krucza 36 Street; 00-522 Warsaw
   e-mail: Phare@wwwpwp.it.pl

6.2. Twining-N/A
6.3. Non-standard aspects
The project shall be realised in accordance with the principles of Phare - the Decentralised Implementation Manual (DIS) will be followed.

6.4 Contracts
One tender procedure will be advertised in respect of construction-assembly works. It is anticipated that a single EURO 2.78m contract will be signed with a contractor of construction-assembly works.

VII. Implementation Schedule
    7.1 Tender commencement January 2002.
    The Terms of Reference (tender documentation) will be produced by end of December 2001.
    7.2 Work commencement - March 2002.

VIII. Equal Opportunities
The relevant professional skills and experience in performing similar projects shall be the criterion for the evaluation and selection of staff who will be responsible for the implementation and follow-up of the project rather than their gender or age. Due to the specific nature of construction-assembly works (hard physical work), most of the staff is male, however both males and females shall have the same opportunities to become work progress supervising personnel members.

IX. Environment
A comprehensive study titled: “Analysis of Environmental Impact of Construction of Water Pipe and Sewerage System for the localities of: Krzewie Wielkie, Proszówka, Rzasiny, Wieza, Wolbromów”
Execution of the sewerage system will contribute in liquidation of existing numerous sources of pollution and prevents discharging of wastewater to waters and soil. Construction of water pipes will cause liquidation of household water intakes and in the same time reduces number of potential pollution of deep waters.
In conclusions of this study it can be read that planned networks of sewerage systems and water pipes will contribute in improvement of condition of water-ground environment for described terrain
and improvement of life conditions of inhabitants. During construction the investment will be the
source of local and limited in time arduousness. This arduousness will cease after completion of
the construction. Proper from the point of view of technique and technology course of these works
and meeting of the assumed in the building design execution regime in considerable way will limit in
considerable way adverse impact of the planned investment on natural environment.

X. Rates of Return
A summary of an economic and financial analysis which proves that financing of the project is justi-
fiable, with FIRR and EIRR calculations, is shown in appendix 4.
Financial Internal Rate of Return (FIRR) is of 4.16 %.
Economic Internal Rate of Return (EIRR) is of 10.10 %.
The financial analysis has shown that the project is feasible.

XI. Investment Criteria
11.1. Catalyst Activities:
Financial assistance from Phare would allow us to finalise the planned environmental project by the
end of 2004. Should we use only our own funding to carry out the project, it could be completed
around 2010.

11.2. Co-financing:
The project will be co-financed through the local authority’s own budget. Their share shall be 28 %.

11.3. Additionality:
Each of the co-financing institutions provides their financial allocation to this project with the alloca-
tion not being dependent on the amounts allocated by the other institutions. The Phare financial
assistance does not leave out other sources of funding, it is just a component that can accelerate
the accomplishment of the target results.

11.4. Project Preparation and Size:
The project is completely prepared for implementation. A technical design for this task is prepared.
A building permit is issued. Any legal issues in respect of the project are resolved. The Gmina has
financed design studies. The Gmina will also cover from own funds cost of some construction-
assembly works implemented under this project and cost of engineering handling of the Contract.
The project meets requirements of Phare co-financing above 2 MEURO.

11.5. Duration:
The project will be sustainable, in line with the EU policy and standards. Completed sewerage sys-
tem will be connected to the modernised wastewater treatment plant. Operation of the system is
foreseen for at least 40 years. The project shall have a positive impact on the environment. Any
maintenance costs of the project shall be met through its operating income.

11.6. Conformity with State Assistance Provisions:
Any action to be taken under the project shall respect any regulations regarding competitiveness as
effective in the European Union. A contractor shall be appointed following a tender procedure open
to the European Union member states and Phare countries without applying any preferences

This project is in line with the priorities of the Preliminary National Development Plan, with its objec-
tive being consistent with one of the strategic goals of the National Development Plan (National En-
vironment Protection Strategy for the years 2000 - 2006) aimed to achieve the Community’s stan-
dards regarding the quality of water in river drainage areas, which will result in better living and
health conditions of the residents. The implementation of the project is in line with the programme
implementation schedule, which assumes the commencement of environment protection infra-
structure projects at a pre-accession phase.

XII. Conditions and Sequence.
Given this implementation schedule, the project should not meet any difficulties in the course of
realisation. It foresees: to begin tender procedure in January 2002,
beginning of project implementation in March 2002,
completion of project implementation in June 2004.
Planned works may be executed in the same time in all localities of Gmina, ensuring simultaneous taking-over of water pipes and sewerage systems and connection of the new sewerage system to the modernised wastewater treatment plant.
### Appendix 1: LogFrame

<table>
<thead>
<tr>
<th>Description</th>
<th>Indicators of Achievement</th>
<th>Total budget of the project</th>
<th>Total EUR</th>
<th>Phare EUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wider objective</td>
<td></td>
<td>2.78</td>
<td>2.78 mln EURO</td>
<td>2.00 mln EURO</td>
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<tr>
<td>Immediate Objectives</td>
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<tr>
<td>reduction of pollution of the border Odra river to the level accordant to EU standards</td>
<td>complying with requirements of the Guideline 91/271/EWG regarding municipal wastewater and drinkable water 98/63/WE</td>
<td>How: results of specialistic tests of indicators of water pollutions of the Odra river (State Inspection of Environmental Protection, Monitoring of Surface Flowing Waters) When: within three (3) years after completion of works. Who: Marshall Office</td>
<td></td>
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</tr>
<tr>
<td>construction of new sewerage systems and water pipes for the localities of: proszówka, wieza, wolbromów, krzewie wielkie.</td>
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<tr>
<td>reduction of pollution discharged to the Kwisa river which is the tributary of the Odra river by arrangement of water-wastewater economy, improvement of health of residents on area comprised by the investment, reduction of penetration of pollution to underground water and improvement of microclimate by closure of household cesspools</td>
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<tr>
<td>Results/Outputs</td>
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<tr>
<td>uniform system of wastewater collecting in the localities of: Proszówka, Wieza, Krzewie Wielkie. new water pipe system in the localities of: Krzewie Wielkie, Wolbromów, Wieza. proper charge of wastewater in the wastewater treatment plant in Gryfów Śląski</td>
<td>100% of wastewater from the area comprised by the investment is treated to values required in standards, viz.: - BOD₅ – 15 mgO₂/l, - Ammonia Nitrogen – 6 mgN/l, - General Phosphorus – 1.5 mg P/l</td>
<td>How: testing of wastewater at outflow from the wastewater treatment plant, testing of quality of drinkable water. When: after completion of works. Who: Department of Environmental Protection in Gryfów Śląski</td>
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### Activities

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Koszty</th>
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</table>
The project plans to execute the following:

Water pipe network: distribution network made of DN160, 125, 110 pipes with total length of 13,420 m, surrounding network made of DN110, 90, 63 pipes with total length of 5,910 m, water pipe connections, approximately 220 pcs.

Sewerage system: gravitational made of DN160-315 pipes with total length of 21,650 m, pressure made of DN90-110 pipes with total length of 2,690 m, zone pumping stations - 8, household pumping stations - 11, monitoring system of pumping stations, sewerage connections, approximately 200 pcs.

One contract for execution of construction-assembly works co-financed from Phare funds.

Data opracowania (Date of Drafting)
listopad 2000 November 2000

okres planowania (Planning Period)

(Budget Allocation - Cost Estimate) M€

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<td>- Contract (kontrakt) 1</td>
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<td>Harmonogram wydatkowania (Disbursement schedule)</td>
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<tr>
<td>- CONTRACT (KONTRAKT) 1</td>
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UE: 2.00 mln EURO
Own funds: 0.78 mln EURO
Total: 2.78 mln EURO
Legenda: D = przygotowanie pod-projektów (design of sub-projects) / C = przetargi i kontraktowanie (tendering and contracting) / I = realizacja kontraktów i płatności (contract implementation and payment)
Annex 5

Calculations of financial indexes for the enterprise
"CONSTRUCTION OF NEW WATER PIPES AND SEWERAGE SYSTEMS FOR THE LOCALITIES OF:
PROSZÓWKA, WIEZA, WOLBROMÓW, KRZEWIE WIELKIE."

Introduction
This study is the summary of the financial analysis of the enterprise, which aims to prove economic feasibility and stability of the project at assumed strategy of fates. In order to estimate financial feasibility the analysis of the enterprise using discount methods was made. In framework of this analysis were calculated basic indications of effectiveness: NPV and IRR. These indications were calculated in two versions:
⇒ financial, i.e. taking into consideration pure financial flows (FNPV, FIRR), and
⇒ economic, i.e. taking into consideration external advantages generated thanks implementation of the project and its impact on social-economic environment (ENPV, ERR).

Calculations were made for needs of the application for financing the Project from Phare Cross Border Phare Programme.

Analyses were made basing on the prepared technical documentation and simulation of costs born during operation of operation of the project.

1 Project Title
"CONSTRUCTION OF NEW WATER PIPES AND SEWERAGE SYSTEMS FOR THE LOCALITIES OF:
PROSZÓWKA, WIEZA, WOLBROMÓW, KRZEWIE WIELKIE ".

2 Project Description
In the sector of wastewater economy the project concerns extension of the sewerage system in Krzewie Wielkie, Proszówka and Wieza with total length near 22 km. The system will enable receipt of wastewater from 1102 residents and transfer of wastewater to the wastewater treatment plant in Gryfów Slaski.
In the sector of drinkable water under the described enterprise will be built the water pipe in Krzewie Wielkie, Wolbromów (together with the water intake) and in Wieza, with total length of 17.7 km for almost 845 residents.

3 Location
Region Lower Silesia Voivodship
Localities: Krzewie Wielkie, Proszówka, Wieza and Wolbromów

4 Objective
The objective of the project is liquidation of untight cesspools without outflow from which wastewater in uncontrolled way penetrates to soil and contaminates drinkable water in household wells and contamination of nearby located lands. Moreover, construction of sewerage system for these localities will ensure proper charge for the extended wastewater treatment plant in Gryfów Slaski. Construction of water pipes will ensure supply of water complying requirements of EU, i.e. Guideline 98/63 regarding drinkable water for residents, both for consumption and production goals. Additionally it will improve life standard and reduce risk of diseases related to consumption of not proper water.

5 Methodology of the analysis
At the analysis of the enterprise were used typical methods from among discount methods, which are utilised as standard ones at analysis of investment projects. Discount methods are included into dynamic methods, i.e. take into consideration change of money’s value in time. In the present study were used methods of Net Present Value (NPV) and Internal Rate of Return (IRR). In order to calculate above mentioned
indexes were defined net money flows. Analysis of net money flows was based on simulation method, consisting in estimation of costs and advantages resulting from implementation of the enterprise.

6 Results

6.1 Assumptions

- Economic analysis of the enterprise was made for 2-years period of construction and 25-years period of operation,
- the assumed rate of exchange is of 3.9271 PLN/EUR¹,
- the analysis is made for fixed prices,
- it was assumed 2% increase of charges in real formulation,
- for calculations of NPV were used three following rates of discount: 5%, 10% and 15%,
- the unit water consumption was assumed at level of 140 – 150 l/d per resident,
- Phare fund grant: 2 MEUR,

6.2 Indexes of financial effectiveness

1. FNPV – Financial net present value was calculated as the value obtained by discounting, separately for every year, of the difference between money incomes (revenues) and expenses (expenditures) through the whole period of object's existence, at the specified level of the discount rate. The period of operation was assumed as 25 years and the discount rate of 5%, 10%, 15%.

<table>
<thead>
<tr>
<th>Discount Rate</th>
<th>FNPV</th>
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<tr>
<td>5%</td>
<td>-225 625</td>
</tr>
<tr>
<td>10%</td>
<td>-930 314</td>
</tr>
<tr>
<td>15%</td>
<td>-1 104 736</td>
</tr>
</tbody>
</table>

2. FIRR – Financial internal rate of return was calculated as the real income rate obtained from the investment during its whole economic life. Thus, the internal rate of return is such discount rate for which the net present value (NPV) is equal to 0. FIRR takes into consideration only "pure" financial flows, without external advantages resulting from realisation of the project.

For above assumptions:
Dla przyjęty zalogen opisanych powyżej
IRR 4,16%

6.3 Indexes of economic effectiveness

1. ENPV – Economic net present value was calculated as the value obtained by discounting, separately for every year, of the difference between incomes (financial and economic revenues) and expenses (expenditures and economic costs) through the whole analysed period, at the specified level of the discount rate. The period of operation was assumed as 25 years and the discount rate of 5%, 10%, 15%.

<table>
<thead>
<tr>
<th>Discount Rate</th>
<th>ENPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>5%</td>
<td>1 554 030</td>
</tr>
<tr>
<td>10%</td>
<td>17 737</td>
</tr>
<tr>
<td>15%</td>
<td>-542 470</td>
</tr>
</tbody>
</table>

1. EIRR – economic rate of return was calculated using the same algorithm as FIRR, taking onto consideration external advantages arising from implementation of the project.

For above assumptions
EIRR 10,10%

7 Conclusions

¹ Table No 223/A/NBP/2000 of 2000-11-16
Calculated indexes of economic effectiveness of the enterprise shows feasibility and justness of implementation of the project from financial point of view. Value of the index of financial present value (FNPV) is smaller than zero at discount rate of 5 %, while value of financial internal rate of return FIRR is of 4.16 % and value of ERR id of 10.5 %. Because the project is financed from Phare funds and WFOSiGW (Voivodeship Fund of Environmental Protection and Water Economy) and from own funds so capital cost will be near forecasted inflation level in 2004 – 3 %. Thus the FIRR at level of 4.16 % indicates for feasibility of the enterprise. Summarising, it is recommended to implement the project because of undeniable ecological and social-economic advantages and the fact that at assumed low capital costs the enterprise has ensured stabile period of implementation and operation and also rate of return at acceptable by the investor level.

8 Financial analysis.
Investment costs of the project, operational costs and potential revenues were calculated basing on the investor’s pricing and design assumptions.

8.1 Investment expenditures
The total cost of the project will be of 2.87 MEUR. It is necessary to take into consideration that some expenditure, especially for design and financial studies was born yet. Other costs will be born in 2001, i.e. before beginning of construction. Because these costs will be adjusted after taking-over of sequence activities, in Table 1 expenditures for these activities are corrected by these values.

Table 1 – Schedule of investment expenditures.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Construction</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sewerage system in Krzewie Wielkie</td>
<td>0.81</td>
<td>0.00</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>Sewerage system in Proszówka</td>
<td>0.00</td>
<td>0.00</td>
<td>0.51</td>
<td></td>
</tr>
<tr>
<td>Sewerage system in Wieza</td>
<td>0.00</td>
<td>0.51</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>Water pipe in Krzewie Wielkie</td>
<td>0.43</td>
<td>0.00</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>Water pipe in Wieza</td>
<td>0.00</td>
<td>0.32</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>Water pipe in Wolbromów</td>
<td>0.00</td>
<td>0.28</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>Expenditures EURO</td>
<td>1.25</td>
<td>1.11</td>
<td>0.51</td>
<td></td>
</tr>
<tr>
<td>Budget EURO</td>
<td>2.87</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

At calculation of expenditures 5% reserve was assumed. Also only part of VAT was taken into consideration, i.e. calculated for MEUR 0.87.

8.2 Operational costs of sewerage systems and water pipes [EUR/year]
Operational costs results from design and operational assumptions taken by the investor.

Table 2 – Annual operational costs at the moment of putting into operation

<table>
<thead>
<tr>
<th>Categories of Costs</th>
<th>EURO/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Consumption of materials and energy</td>
<td>7 600</td>
</tr>
<tr>
<td>2. External services</td>
<td>290</td>
</tr>
<tr>
<td>3. Taxes and charges</td>
<td>0</td>
</tr>
<tr>
<td>4. Salaries</td>
<td>500</td>
</tr>
<tr>
<td>5. Benefits for workers</td>
<td>150</td>
</tr>
<tr>
<td><strong>Operational costs</strong></td>
<td><strong>8 540</strong></td>
</tr>
<tr>
<td>6. Depreciation</td>
<td>33 800</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>42 340</strong></td>
</tr>
</tbody>
</table>
Some items are described in details below.

Consumption of materials and energy

Table 3 – Final daily demand for energy

<table>
<thead>
<tr>
<th>Specification</th>
<th>Demand for energy [kWh/d]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sewerage system in Krzewie Wielkie</td>
<td>24.86</td>
</tr>
<tr>
<td>Sewerage system in Proszówka</td>
<td>19.88</td>
</tr>
<tr>
<td>Sewerage system in Wieza</td>
<td>37.30</td>
</tr>
<tr>
<td><strong>TOTAL Sewerage system</strong></td>
<td><strong>82.04</strong></td>
</tr>
<tr>
<td>Water pipe in Krzewie Wielkie</td>
<td>36.45</td>
</tr>
<tr>
<td>Water pipe in Wieza</td>
<td>36.45</td>
</tr>
<tr>
<td>Water pipe in Wolbromów</td>
<td>152.85</td>
</tr>
<tr>
<td><strong>TOTAL Water pipes</strong></td>
<td><strong>225.75</strong></td>
</tr>
</tbody>
</table>

Current energy cost: 0.17 PLN/kWh i.e. 0.04 EURO/kWh

8.2.1 Salaries and benefits for workers

It was assumed employment of one additional worker with gross month salary of 1 800 PLN. i.e. . 458 EURO

8.2.2 Depreciation

Depreciation was calculated separating the fixed assets into two groups with different depreciation rate: 2.5 % for Group 2 KST and 14 % for Group 4, Sub-group 44. Rates were assumed basing on Decree of Minister of Finances of 17th January 1997 regarding depreciation of fixed assets and immaterial and legal values - Dz. U. 97.6.35 as amended.

8.3 Revenues

In order to define revenues from transport of wastewater as the result of construction of the sewerage system and transport and production of water as the result of construction of water intake the following assumptions were taken, in accordance with assumptions used by the designer.

8.3.1 Definition of demand

Demand for water was defined as product of number of residents taking advantages of services and other sources of demand for water and the unit consumption.

**Unit consumption**

Number of residents serviced by the new sewerage system: **1102 residents.**
Number of residents serviced by the water pipe: **845 residents.**

Dynamics of changes in number of residents was prepared basing on studies of Chief Census Bureau: "Forecast of population in Poland for Voivodships – 1999 – 2030".

Unit consumption for a resident: **150 l/d.**

**Unit consumption for breeding**

Milk cows - 70 l/d,
Swines - 30 l/d

Unit consumption regarding transport

Passenger cars - 200 l/d,
Tractors - 150 l/d.
Rates
Direct costs related to water-wastewater activity are covered by revenues from sale of water and charges for receipt of wastewater. Level of charges is set out at the level enabling current activity of the sewerage system and the wastewater treatment plant and increase so called restoration fund ensuring future stable operation of the system.

The unit price for 1 m$^3$ of water and wastewater was set out basing on cost analysis. Taken for the analysis price is the difference price resulting from not taking into consideration of charges for water and for treatment of wastewater in the wastewater treatment plant in Gryfów Śląski. This price enables covering of operational costs and depreciation of the sewerage system and the water pipes. In order to define final prices the price for residents should be properly increased by price of water and treatment of wastewater in the wastewater treatment plant in Gryfów Śląski. The final price depends on policy of Gminas in the range of granting subsidies of municipal activities in this sector.

The difference price for water in 2004, i.e. at the moment of putting into operation should achieve the level of 6 PLN/m$^3$, i.e. 1.53 EUR/m$^3$; the same rate for water as for wastewater.

9 Economic Analysis.
Analysis of economic effectiveness of the enterprise leading to calculation of EIRR was based on advantages and costs resulting from implementation of the project.

9.1 Social Advantages.
Extension of water pipes and sewerage systems on near terrains may bring many advantages for existing consumers, viz.:
⇒ increase of system’s power in order to service greater number of consumers may increase system’s reliability,
⇒ not spending money for cleaning of environment or for compensation of effects in case of giving up of project’s implementation (contaminated household water intakes),
⇒ improvement of health conditions on terrains comprised by the project; smaller number of doctors’ visits,
⇒ improvement of sanitary and environmental conditions and in consequence increase of number of tourists,
⇒ improvement of infrastructure and creation of possibilities for development of processing industry,
⇒ savings resulting from resignation of using of cesspool emptiers – high costs of transport,
⇒ increase of productivity of farms.

Some of these advantages were estimated but some of them were not taken into consideration because of missing precise data.

9.2 Social costs.
To the basic social costs in case of this investment may be included exclusion of some terrains from production during conducting construction works.

Annex 6
SUMMARY
ESTIMATION OF ENVIRONMENTAL IMPACT
The planned networks of water pipe and sewerage system in the following localities of Gmina of Gryfów Śląski: Krzewie Wielkie, Proszówek, Rzasiny, Wieza and Wolbromów in the District of Lwówek Śląski are the investment which in negligible way will impact on individual components of environment and the greatest adverse impact is noticeable in stage of construction-assembly works.
The total length of external water pipe network with household connections for localities of Krzewie Wielkie, Wieza and Wolbromów is of 22.4 km.
Proper from point of view of technique and technology course of these works and maintaining of the assumed in the construction design working regime will limit in great measure adverse impact of the planned investment.

During operation the system of intake and transfer of water and sanitary wastewater executed in accordance with assumptions and requirements regarding protections of natural environment should work reliably and in accordance with safety principles, without problems for environment.

The estimated investment is the enterprise friendly for environment because it not only arranges environment in sanitary-hygienic aspect but leads to direct protection and proper forming of environment for the area comprised by the present investment.

Efforts of Municipality of Bogatynia directed to as quick as possible implementation of the investment are justified and pro-ecological. All efforts directed to gathering funds for this investment in accordance with the presented appraisal should be considered as justified.

Conclusions

1. Execution of planned networks of sanitary sewerage system and water pipe system will contribute first of all in improvement of soil-water conditions of the described area and improvement of life conditions of residents.
2. During construction the investment will be a source of arduousness with local character and limited in time. This arduousness will cease after completion of works.
3. During operation the planned investment may be hazardous only in emergency situations, which in substance may not occur.
4. Earth and construction-assembly works at the whole route of sewerage pipelines must be executed basing on obligatory standards. It is necessary to take into consideration requirements of owners of the existing underground service lines and offices and institutions indicated within setting out adjustments for the project of the planned investment.
5. After placing of courses of water pipes and sewerage systems and reclamation of soil the contractor is obliged to restore the original landscape and repair of damages in environment made during implementation of the described investment.
6. In case of disclosure during implementation of works of traces, which may indicate existence of archaeological stands, works are to be executed after adjustment with Voivodship Conservator of Monuments.