Environmental Assessment Report

Volume 1

Part 5: Ivano-Frankivsk City (water supply, wastewater)

FINAL

November 2005
NOTE TO FILE:

The following Environmental Assessment Report is one of several that was prepared in support of the Urban Infrastructure Project for Ukraine which was under preparation in 2005-2006. This is a category B project for rehabilitation of various utilities, including water supply, waste water treatment, and solid waste. The EAs cover investments under Component B for Rehabilitation Investments under the project. Any technical variations in the final plans for these sites will be addressed in the review of the EMPs scheduled to take place in conjunction with the launch workshop. All subsequently identified works under Component B must comply with the preparation of similar EAs in accordance with the Environmental Framework Policy dated November, 2005, before the disbursement of any funds for the specific site. Investments under C. for Energy Efficiency under the Project must comply with the preparation of an abbreviated EA/EMP specified under a separate Environmental Framework Policy prepared specifically for Component C.
Urban Infrastructure Project (UI Project) and Nistru River/Black Sea Protection Project (NR/BSP Project) (GEF sub-project) have been merged into a single Urban Infrastructure Project (GEF sub-projects are treated under the UI Project) as their broad environmental goals include improvement of hygiene and health of the population, provision of low-cost and sustainable water supply and sanitation delivery services, and improvement of environmental conditions in Ukraine, with a special focus on the Nistru River and Black Sea basin as a priority region.

Within the framework of this integrated project, the EA Consultant is responsible for preparation of:

- Environmental Framework Policy (EFP);
- Environmental Assessment (EA).

Environmental Framework Policy

The Environmental Framework Policy document reflects key provisions of environmental policies adopted by Ukraine and the World Bank, the results of their comparative review, and demonstrates their compatibility on all major issues.

The existing methodological frameworks for environmental assessment, developed in Ukraine and adopted by the World Bank, have been reviewed as part of the EFP preparation. This review reveals a very close similarity of these frameworks, with only few minor inconsistencies, which have not been encountered in the preparation of environmental assessments for selected investment projects.

Environmental Assessment

The Environmental Assessment documents, presented in this submission, have been prepared according to the World Bank environmental policies (OP4.01) and procedures, which are compatible with the Law of Ukraine “On Environmental Review” and the EIA-related State Construction Standard DBN A.2.2-1-2003 “The Environmental Impact Assessment Content and Composition for Construction Projects” (Kyiv, 2004).

There have been numerous changes in the list of proposed projects, which should be subject to environmental assessment. The most recent list of projects, provided to the EA Consultant and dated 12 October 2005, appears to be different from the initial list, included in the Terms of Reference.

At the same time, the Environmental Assessment studies were carried out for a number of other projects/locations, included in the expert’s findings/e-mails dated 13 May, 11 June, 17 August and 26 August, 2005 (Ivano-Frankivsk, and towns in Kharkiv Oblast: Kupyansk, Izium, Chuguev).

According to above mentioned, the present report consists of two volumes:

- Volume 1 - preliminary sub-projects identified for inclusion under UI project (according to the list dated 12 October, 2005).
- Volume 2 - addition sub-projects reviewed according to expert’s findings.

The general content of Final EA Report is given below.
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INTRODUCTION

The proposed Urban Infrastructure Project is designed to finance priority investments pertaining to the rehabilitation and upgrade of two key service sectors, i.e. water supply and sanitation. The issue of ensuring the sustainability of water supply and wastewater collection/treatment services is of vital socio-economic and environmental significance for the large city of Ivano-Frankivsk.

This document summarises the results of preliminary Environmental Assessment (EA) of each proposed project component, which is intended to form part of the priority investment portfolio for the World Bank funding. The objective of this environmental assessment is to ensure that the proposed investments are environmentally sustainable by identifying, predicting and assessing the future environmental impacts associated with them and, by doing so, to contribute to overall decision-making process with respect to the proposed projects.

The Terms of Reference for the preparation of Environmental Assessments for the proposed Urban Infrastructure Project components classify them into the Category A. Consequently, the EA report addresses potential environmental impacts of these projects, both positive and negative; examines alternative options; and identifies the possibilities for mitigating the potentially significant impacts of these projects. Special focus is placed upon the preventative measures. The EA examines potential impacts on the natural environment and its components (air, water and soil), human health and safety aspects, social impacts (involuntary resettlement, impact on indigenous populations and cultural heritage); and assesses the likely environmental impacts in the transboundary context.

For all proposed project components, the two-stage consultation process has taken place with various local stakeholders, including local community groups and non-governmental organizations (NGOs), in order to ensure that their views and opinions are taken into account. Continuous feedback mechanisms have been established and used by the EA Consultant during the term of this assignment in order to obtain additional information on social/public concern on various EA issues. Summary information on the consultation process is provided in Annex C.

This non-technical document reflects the results of Environmental Assessments of projects, proposed for the World Bank funding.
General Information

Ivano-Frankivsk is a large industrial, scientific and cultural centre of the south-western Ukraine, the administrative centre of Ivano-Frankivsk Oblast. The City is located in the Carpathian foothills, occupying the valleys of the Bystritsia Nadvirmianska and Bystritsia Solotvinska Rivers, carrying their flow to the Dniestro River. Within the City, surface elevations range between 244 m to 255 m above sea level, reaching 270-290 m and more in the surrounding hilly areas.

Regional soil pattern comprises sod-podzolic, swampy and meadow soils. Specific to this area vegetation patterns are oak and beech woods, concentrated in the Dniestro River valley and Carpathian foothills, and mixed coniferous/broad-leaved forests in the Carpathian mountains.

The city was founded in the mid-17th century as a fortress, which subsequently evolved as a centre of commerce, crafts and arts in Halychina. The city was an important centre of trade routes, connecting Hungary, Bulgaria, Romania with Lviv and, further north, Lithuania. Initially, the city area was surrounded by the stone wall, and its remains can be seen today. Despite numerous war conflicts, many churches and city hall were constructed in that period. The city can be proud of its architectural monuments, dating back to the 17-18th centuries.

The first mention of the city name Stanyslaviv refers to 1662 when the city received a Magdeburg right. In 1962 the city celebrated its 300-anniversary. It was renamed after a famous writer and public figure Ivan Franko who would come here more than once, made good friends, wrote and recited his works. Since January through May 1919, the city was the capital of the West Ukrainian People’s Republic. Such prominent public figures as M. Hrushevskyi, V. Vynnychenko, S. Petliura, Y. Konovalets used to come here at that time.

After the World War II, the city has developed as an industrial centre with numerous industries, cultural and educational institutions, healthcare organisations, and banking facilities. The city has a great development potential as a centre of tourism and various recreational activities. Its numerous tourist attractions comprise architectural monuments, churches, museums, theatre, City Hall, Medical Academy House, Roman-Catholic Cathedral, Basilian Monastery, and many other buildings of outstanding architectural and historical significance.

Ivano-Frankivsk has the population of about 235,000 people, occupying the area of 92.8 km². The city's industries comprise machine-building and metal fabrication plants, wood processing plants, textile industry, food processing, building material production. The city a vibrant small business community, comprising over 7,000 entrepreneurial entities, with over 200 new entities registered every month.
Ivano-Frankivsk has a well-developed transport network, being linked by air, railway and motorway routes with all Oblast centres of Ukraine and many cities in Russia, Moldova, Belarus, Poland, Slovakia and Czech Republic. Industries are located along the city's perimeter, with social, cultural and administrative institutions being concentrated in the central part.

There is an extensive network of service and trade businesses, comprising over 900 retail stores and 455 public catering enterprises.

The city has 44 educational institutions and 30,000 students, being taught in Ukrainian, Polish and Russian languages.

Significant focus has been upon the development of healthcare services in the city, which currently has 14 medical institutions.

The city needs the long-term financial assistance in order to improve its water supply and sanitation systems to the level that meets current technical and environmental standards. In the light of extremely high funding amounts required for rehabilitation of these sectors, loans from international financing organisations are seen as a very important and attractive source of finance.

Further sections of this report reflect the results of Environmental Assessments for proposed investment project components grouped under the following broad categories:

1. Water supply:
2. Wastewater collection and treatment
1. REHABILITATION OF WATER SUPPLY SYSTEM

1.1. Existing Situation

1.1.1. Present Water Supply Arrangements

The city's water supply system provides potable water to the populations and industries of Ivano-Frankivsk itself, and to a number of smaller settlements located in the surrounding area (Pidluzhzhia, Pidpechery, Mykityntsi, Krikhitsi, Uhryniv and Tysmenytsia. Over 95% of the total volume of water supplied is consumed in Ivano-Frankivsk.

As of late 2004, the city's population is 234,800, showing an apparent stabilization trend as compared to the previous years. The average household size is 3 persons. The total number of service population is 179,948 people. The total number of registered customers is 63,803, including 31,482 customers with water meters.

Other important customer category comprises district heating units operating under the State Municipal Company “Ivano-Frankivsk Heating Company”, which only use centrally supplied water during the heating season. Budget and commercial entities consume up to 10% of abstracted water, or about 12% of water supplied to the distribution system. It can be concluded that households represent the major customer category, receiving water for their domestic needs via an extensive network of smaller connections distributed over the city area.

Existing water supply/distribution process (Figure 1.1) involves the following stages:

- Water is conveyed from the Chernyivsky Water Treatment Plant (WTP) to the Level III Water Pumping Station (WPS) via 1200 mm gravity-operated transmission main, flowing further to the Khruplin WPS via 500 mm main, and reaching the Cascade WPS and Naberezhna Street via 800 mm main;
- At the Level III WPS, water is pumped by two D 3200-75 pumps to the central part of the city;
- 500 mm gravity main conveys water along the Naberezhna Street;
- The Cascade WPS operates three Wilo 80 pumps to supply water in its respective pressure zone;
- Equalising/storage reservoirs are used to supply water to the distribution system serving the Pasichna residential area;
- 18 booster pump stations are operated to supply water to the high-rise buildings.

The system operates continuously, maintaining the required pressure during the day hours (from 5.30 to 24.00), and shifting to lower pressure levels in night hours (from 24.00 to 5.30).

Currently, 200 km (39%) of water pipes are operated beyond their operational life limits (being in operation for over 30-50 years), with further 123 km (24%) of water mains and distributions pipes being in extremely poor (emergency) condition. In 2004, the number of accidents recorded and fixed in the supply network was 496, which can be translated into the accident frequency rate of 97 per 100 km per year. This rate is lower than the country average by 2.2-fold, but exceeds the European average rate by 4-fold.
Table 1 - Key Chart

<table>
<thead>
<tr>
<th>Material</th>
<th>Steel</th>
<th>Reinforced Concrete</th>
<th>Asbestos-Cement</th>
<th>PVC</th>
<th>Total</th>
</tr>
</thead>
</table>

**Figure 1.1 - The Layout**

**Water Supply System in San Francisco**

**Diagram**
The Strategic Action Plan, developed and adopted by the Ivano-Frankivsk Water Utility "VodoEcoTechProm", identifies the following areas for priority action, which require immediate attention:

- Technical upgrade of water supply system through introduction of energy-efficient technologies and equipment;
- Reducing water losses and improving the efficiency of water metering system;
- Replacement of worn pipes and network optimisation by decommissioning certain sections in the distribution system.

It is considered that the proposed projects, described in this EA report, will contribute significantly to the implementation of these priority measures.

### 1.1.2. Regional Climate and Hydrogeology

Ivano-Frankivsk is located in the Climatic Zone 2, with moderately continental climate, relatively long and mild winter, and warm summer. Mean annual air temperature is +7.3°C. January is the coldest month, with average air temperature at -4.9°C, and absolute minimum temperature at -34°C. July is the warmest month: average air temperature is +18.5°C, with an absolute maximum temperature being at +38°C.

The area lies in the spontaneous precipitation zone, with relatively high moisture levels in air and soil. Total annual precipitation is 550-600 mm, with 80% falling in warm season. Winter weather is unstable, with frequent thaws and snowmelts. On the average, the snow cover lasts for about 100 days per year, and its thickness ranges between 30 to 40 cm. The lowest frost penetration depth is 57-83 cm. The soil defrosting normally completes by mid-March.

Wind pattern is dominated by the south-eastern and north-western winds. Mean annual wind velocity is 2.9 m/s, reaching 4 m/s in spring.

The area lies within the Pre-Carpathian Depression, characterized by largely homogenous structure of rocks. Key feature of these rocks is elevated salinity level. The area geology comprises Quaternary alluvium deposits (silty clay, gravel and pebble), covered by top soil layer. The thickness of Quaternary deposits, underlain by Miocene clay stratum, is 8-10 m.

Groundwater is present in the river valley area at the depths of 1.5 to 7 m from the land surface. The aquifer comprises gravel and pebble deposits. The seasonal variation of groundwater table is at ±1-1.5 m. Available groundwater quality data indicate that the water present in this aquifer is not aggressive to the W4 concrete.

The area is classified into the Category II in terms of complexity of geo-engineering conditions.

As can be seen from the Table 1.2, the quality of surface and ground waters in the locations of water intakes is generally acceptable, with the values of monitored parameters being below their prescribed MAC (maximum admissible concentration) limits. The only exception are higher turbidity levels in water samples taken from the Bystritsia-Nadvirianska and Bystritsia-Solotynska, which are attributed to the natural factors shaping water quality in the mountain streams. Existing groundwater abstraction site in Mochary is used only for technical water supply, therefore the recorded MAC exceedances for some water quality parameters are not considered as crucial.
Table 1.2 – Surface and Ground Water Quality Data

<table>
<thead>
<tr>
<th>Monitored Parameter</th>
<th>Bystritsia-Nadvirnianska</th>
<th>Bystritsia-Solotvinska</th>
<th>Groundwater Wells</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2005</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>7.3–8.4</td>
<td>7.3–8.4</td>
<td>5.93</td>
<td>6.5–8.5</td>
</tr>
<tr>
<td>Odour 20°C/60°C, points</td>
<td>0/0</td>
<td>0/0</td>
<td></td>
<td>&lt;2</td>
</tr>
<tr>
<td>Turbidity, mg/l</td>
<td>0.56–6.8 (65°)</td>
<td>0.56–4.6 (297°)</td>
<td>0.86</td>
<td>&lt;0.5</td>
</tr>
<tr>
<td>Colour, points</td>
<td>5.04</td>
<td>5.04</td>
<td></td>
<td>&lt;20</td>
</tr>
<tr>
<td>Hardness total, mg-equiv./l</td>
<td>1.6–2.6</td>
<td>1.5–2.45</td>
<td>5.5</td>
<td>At least 1.5; below 7.0</td>
</tr>
<tr>
<td>Dry residue, mg/l</td>
<td>160 (560°)</td>
<td>156 (868°)</td>
<td></td>
<td>&lt;1000</td>
</tr>
<tr>
<td>Ammonium nitrogen (NH₄⁺), mg/l</td>
<td>&lt;0.05</td>
<td>&lt;0.05</td>
<td>2.59</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Nitrites, mg/l</td>
<td>&lt;0.003</td>
<td>&lt;0.003</td>
<td>0.03</td>
<td>0.08</td>
</tr>
<tr>
<td>Nitrates, mg/l</td>
<td>3.98</td>
<td>4.71</td>
<td>1.85</td>
<td>18.3</td>
</tr>
<tr>
<td>Oxidability, mg O₂/l</td>
<td>1.7</td>
<td>1.6</td>
<td>1.8</td>
<td>1.23</td>
</tr>
<tr>
<td>Alkalinity, mg-equiv./l</td>
<td>1.4</td>
<td>1.4</td>
<td>1.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Chlorides, mg/l</td>
<td>11.5–17</td>
<td>10–15</td>
<td>22.3</td>
<td>&lt;350</td>
</tr>
<tr>
<td>Sulphates, mg/l</td>
<td>11–24</td>
<td>11–24</td>
<td>130</td>
<td>&lt;500</td>
</tr>
<tr>
<td>Iron, mg/l</td>
<td>0.11</td>
<td>0.11</td>
<td>12.12</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Copper, mg/l</td>
<td>0.028</td>
<td>0.028</td>
<td></td>
<td>&lt;1.0</td>
</tr>
<tr>
<td>Chromium, mg/l</td>
<td>&lt;0.02</td>
<td>&lt;0.02</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Fluoride, mg/l</td>
<td>&lt;0.04</td>
<td>&lt;0.04</td>
<td></td>
<td>At least 0.7; below 1.5</td>
</tr>
<tr>
<td>Zinc, mg/l</td>
<td>0.02</td>
<td>0.02</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Manganese, mg/l</td>
<td>0.014</td>
<td>0.014</td>
<td></td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>BOD₅, mg O₂/l</td>
<td>0.35</td>
<td>0.4</td>
<td></td>
<td>-</td>
</tr>
</tbody>
</table>

* during high-flow period
1.2. Proposed Investment Projects

The following water supply improvements are proposed to be financed as part of the Urban Infrastructure Project in Ivano-Frankivsk:

- Purchase of electrolytic unit for drinking water disinfection;
- Rehabilitation of groundwater abstraction plant, operated in low-flow periods;
- Introduction of improved water supply and distribution system;
- Rehabilitation of Level III Water Pumping Station;
- Construction of small-size hydropower plant at the water intake site to meet the site energy demand;
- Construction of 800 mm transmission line from the Chernyivsky Water Treatment Plant to the Kryplin Water Pumping Station;
- Construction of Water Pumping Station with clean water tank on the Tselevich Street;
- Completion of 800 mm water main section between the Ivasyuk Street and Nadrichna Street;
- Purchase of Pipe Cementation Equipment;
- Purchase of Flow Meters and Leak Detection Equipment.

1.2.1. Purchase of Electrolytic Unit for Drinking Water Disinfection

Currently, the disinfection process at the Water Treatment Plant features the use of sodium hypochloride supplied from the chlorination unit (Figure 1.2) in concentration 1.5.

![Figure 1.2 – Chlorination Unit at the Chernyivsky Water Treatment Plant](image)

The intention is to purchase the MBE-50 electrolytic unit for water disinfection, which features better disinfection efficiency relative to the liquid chlorine or sodium hypochlorite. Moreover, the potential for generation of dangerous chlorinated organic compounds is minimized due to greater stability of its disinfection.
The MBE electrolytic unit for water disinfection uses the bipolar membrane technology. Key technical characteristics of proposed MBE-50 disinfection unit are provided in Table 1.3.

### Table 1.3 – Key Technical Characteristics of MBE-50 Disinfection Unit

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production of activated chlorine, kg per day</td>
<td>100</td>
</tr>
<tr>
<td>Number of electrolytic units (including standby)</td>
<td></td>
</tr>
<tr>
<td>Daily consumption of sodium chloride, kg</td>
<td>185</td>
</tr>
<tr>
<td>Specific energy consumption, kWh/kg of activated chlorine</td>
<td>1.8</td>
</tr>
<tr>
<td>Area, m²</td>
<td>990</td>
</tr>
</tbody>
</table>

#### 1.2.2. Rehabilitation of Groundwater Abstraction Wells: Flow Periods

**Rehabilitation of Existing Wells**

Existing groundwater abstraction plants located at two intervals from Ivano-Frankivsk and Site No. 1). The abstraction wells provide water with the daily productivity of 30,800 m³/day.

The Chernyivsky Abstraction Site, between the Bystritsia and Nadvyniansk, which cannot be operated anymore, and Site No. 1, the site has 10 non-operational wells. Site No. 1 is located in the eastern part of the Bystritsia-Nadvyniansk, which cannot be operated any longer (Figure 1.3).

The proposed project involves total pumping for 3 days in order to determine the performance of the submerged well pumps (ECV type), air valves and stop valves.

Figure 1.3 – Current State of Abstraction Wells
The estimated output of 30 abstraction wells is 678.5 m³/hour, and the daily productivity of water abstraction plant is 16,284 m³/day.

Water Transmission Lines
The proposed water transmission lines are designed to connect the abstraction wells with the water treatment plant site. They would deliver water to the reception chamber, from where it would flow to the clean water tanks. The stop valves will be installed in the chamber.

According to the design, the proposed transmission lines would be made in steel pipes with diameters 219×6 mm, 152×4.5 mm, 89×4 mm. The pipe emplacement depth is ranging from 1.6 to 2.0 m. The lengths of proposed transmission lines are as follows:

- From Well Site I: 1,524 m;
- From Well Site II: 2,244 m;
- From Well Site III: 3,310 m.

Water Pumping Station
In low-flow period, the Bystitsia-Nadvirnianska and Bystritsia-Solotvinska Rivers are not capable of providing sufficient flows to meet the design capacity of existing water treatment plant (122,000 m³/day).

It is intended to establish the storage capacity for rainfall flows at the Chernyivsky Water Intake Site by constructing a 1.3 million m³ storage reservoir. The proposed project involves the design and construction of on-site water pumping station to pump water from the storage reservoir to the water treatment plant site during low-flow periods.

Key technical characteristics of the proposed pumping station are provided below:

- Capacity: 96,000 m³/day;
- Pumping head: 21.0 m;
- Pump type: AD 2000-21-2;
- Pump number: 2 in operation, 1 standby;
- Pump engine type: 4 A355-6U3.

Clean Water Tanks
There are two clean water tanks at the existing WTP site (10,000 m³ and 2,000 m³ (Figure 14). They are equipped with feeding, diverting, releasing, overflowing and flashing pipeline connections. It is planned to continue the use of existing tanks for accumulation and storage of water abstracted from groundwater wells, though the possibility of constructing a new storage tank for clean water is also being considered.

The proposed project does not involve the WTP site area extension. The mandatory sanitary protection zone (SPZ) comprises protective zones around water abstraction sites and protective strips running along the either side of water transmission lines. The protective zones around water abstraction sites consist of two protective bands: band 1 with strict protection regime, and band 2 with general protection regime. The width of the SPZ band 1 is 30 m, and its boundary runs along the water abstraction site fence.
The width of the SPZ was 60 m from the WTP fence. Any construction, fire-making or other polluting activities are prohibited in this area. The width of protective strips running along the edges of water transmission mains is 10 m.

Figure 1.4 – Existing Clean Water Tanks at the WTP Site

1.2.3. Introduction of Improved Water Supply and Distribution System

The proposed improved water supply and distribution arrangement has been developed on the basis of existing water supply system layout (Figure 1.1) and with involvement of leading experts and engineers from Frankivsk-Vodovod and Frankivsk Water Utility “VodoEcoTechProm”. In general, the proposed arrangement, in addition to existing pressure zones in the central part of the city, would be divided into two new zones. The central part of the city would be supplied from the central water supply system, pressurized distribution mains, and local booster stations. The lower part of the city would be supplied from the existing lower part of the water supply system, pressurized distribution systems, major water mains, and smaller-diameter lines. System network would have a circular form and small diameter changes.

The proposed lower part of the system will be modified as follows:

- Water supply from existing wells of WPS site
the Naberezhna Street via 600 mm main, and to the Mykitinetska Street via 500 mm main;

- Water supply to the Upper Zone via existing (600 mm) and new (1,000 mm) mains, the latter to replace the existing worn pipeline (400 mm) section of 350 m, connecting the Level III WPS and the Petlyura Street;

- Replacement of distribution lines:
  - 200 mm, 1,000 m long pipeline on the Sorokhtey Street with new 400 mm line;
  - 200 mm, 620 m long pipeline running parallel to the Horbachevsky Street with new 315 mm line;
  - 150 mm, 310 m long pipeline on the Fedkovich Street with 200 mm line;
  - 200 mm, 500 m long pipeline on the Vasyl Stus Street with 315 mm pipeline;
  - 50 mm, 400 m long pipeline in the Vovchynets residential area with 200 mm pipeline;

- Construction of additional distribution lines:
  - 315 mm, 500 m long pipeline section in the City Park;
  - 315 mm, 700 m long section from the Cascade WPS to the Ivasyuk Street;
  - 200 mm, 200 m long section along the Vochynetsky Street;

- Construction of water main connections:
  - Connection between the 1,200 mm gravity main with 1,000 mm rising main near the Level III WPS site (including construction of gate chamber with two 1,000 mm gate valves);
  - Connection between 400 mm and 250 mm lines on the Chornovil Street;
  - Connection between 300 mm and 200 mm lines on the Belvedere-Dovga Street;

- Disconnection of water lines operated in the Upper and Lower pressure zones:
  - 300 mm line from 800 mm line on the Konovalets Street;
  - 400 mm and 250 mm sections from 600 mm main at the junction of the Nezalezhnosti Street and Ivan Franko Street;

- Construction of inter-zone flow regulation chambers in the following locations:
  - Dovga Street (200 mm);
  - Novhorodska Street (300 mm);
  - Halytska Street (400 and 200 mm);
  - Nezalezhnosti Street (500 mm);
  - Khotkevich Street (500 mm);
  - Parkova Street (300 mm);
  - Depovska Street (500 mm).

The successful implementation and operation of new water supply/distribution arrangement requires continued pipe repair and replacement effort and improvements in metering/accounting for water supplied and consumed.

In order to improve the operational performance of water supply/distribution system, it is required to provide strict control of water deliveries to each pressure zone. This is better achieved when the boundaries of pressure zones are consistent with the boundaries of service areas. The Central Area should include the Upper and Lower pressure zones, with the flow control station located on 2, Botanichna Street. The boundaries of the Pasichna service area should be consistent with the boundary of the Level IV WPS pressure zone; and
A similar approach should be introduced in the Cascade and Eastern service areas with their WPS’s (Cascade WPS and Khry L’s). Outflow from all these WPS’s are controlled by ultrasound flow meters. The additional investment and maintenance does not require any additional investment and maintenance.

All water pumping stations shall be implemented as part of a comprehensive operation of water pumping stations. Depending on flow pressures in the system, with pressure readings reported by cell phones, automatic pressure control should be implemented as part of a comprehensive operation of water pumping stations.

Figure 1.5 - Proposed Enhancement
1.2.4. Rehabilitation of Level III Water Pumping Station

The Level III WPS site is located on the Botanichna Street, in the immediate vicinity of the Ivano-Frankivsk Water Utility “VodeEcoTechProm” building. The station provides about 70% of the total water supply to the city. There are two 7,000 m³ storage tanks at the WPS site, one of which has been recently repaired.

The WPS has 6 pumping units (Figure 1.6), 4 of them being on the standby and 2 in operation. Existing pump types include: 2 pumps D2500-62, 3 pumps D3200-75, and one pump D1250-65.

Figure 1.6 – Existing Pumping Equipment at the Level III WPS Site

It is proposed to replace the existing equipment with units up to 320 kW at 1,450 revs./min), or similar pumps in case the capacity of the design is adjusted accordingly.

1.2.5. Construction of Small Size Intake Pumps;

The water intake design will ensure sufficient capacity of the water intake and sufficient flow. The design of the construction site has been determined by the Company’s experts.
The Bystritsia-Solotvinska Water Intake site is located 18 km from Ivano-Frankivsk and 2 km from the nearest human settlement (Skobychivka village). On-site energy consumption levels vary from 500 kW/month in summer to 3,000 kW/month in winter, with the current energy tariff of 0.3528 UAH per kW.

The Bystritsia-Nadvirnianska Water Intake site is located at the distance of 2 km from the Chernivivsky Water Treatment Plant site, which is a sole source of energy for water intake operations. Energy consumption levels range from 60,000 to 100,000 kW/month depending on turbidity levels in raw water at the same tariff of 0.3528 UAH per kW.

The estimated payback period for this project is 5 years.

1.2.6. Construction of 800 mm Transmission Line from the Chernivivsky Water Treatment Plant to the Khryplin Water Pumping Station

The proposed transmission line project has been included in the environmental impact assessment of interested affected parties.

The proposed transmission line will connect Ivano-Frankivsk and Tysmenitsa Villages.
According to the ToR for the design development, it is intended to construct the second line of water transmission main from the Chernyivsky WTP site to the Khryplin WPS site, with the total length of 6.22 km.

According to the design, the proposed transmission main is to be laid in steel pipes (d 830x10 mm), at the depth of 1.6 m from the land surface. Where the line runs under the railway and motorway, the pipes would be placed at the depth of 2.5 m.

The proposed design includes provision for all required appurtenances (valves, gates, air bleeders etc.).

For railway and motorway crossings, the trenchless (pipe-ramming) technique will be used with 1220x10 mm pipe casings.

1.2.7. Construction of Water Pumping Station with Clean Water Tank on the Tselevich Street

The proposed water pumping station is designed to provide water to the northern part of the city. Key design characteristics of the proposed WPS are provided below:

- Pumping capacity (Phase I): 30,000 m³/day;
- Full pumping capacity (longer-term): 50,000 m³/day;
- Head requirement: 120 m.

Water to the proposed WPS will be supplied from the existing Level III WPS, located on the Botanichna Street. The proposed WPS site layout (Figure 1.8) comprises the following components:

- Pumping station;
- Storage tank (10,000 m³);
- Filter traps;
- Water-hammer alleviation chamber;
- Entrance control room.

The proposed project includes the provisions for access and on-site roads, footways, and on-site tree planting. The proposed widths of access roads are 4.5 m and 12 m, with turning sites. Open ditches (15x25 cm) will be constructed in concrete for surface runoff collection at the site, to run along the access roads.

It is proposed to install the ID 1250-125 pumps at the WPS site, with the following installation sequence:

- Phase I: 2 operational, 3 standby;
- Longer term: 3 operational, 2 standby.

The GNOM-10 pumping unit is proposed for drainage flow pumping, and the C-569M pump is proposed for overflow pumping. Additional provision for overflow handling is the emergency valve to release water directly to the sewer main.

The area of the proposed WTP site (Figure 1.9) is about 2 ha. There is a provision for clean water tank (10,000 m³), to be used for flow adjustment, fire-water and reserve water storage in the following proportions (for Phase I): $1,500 + 3,731 + 5,250 = 10,481$ m³. The design provisions for the clean water tank include filter traps and filling systems for firefighting vehicles.
Figure 1.8: The Proposed WDF Site Layout (Tselevych Street)
It is intended to replace the existing water main section, laid in tunnel, with a new water main, to be laid on the opposite side of the Trolleybus Street and connected to the existing 800 mm main. The proposed water main will be equipped with all required appurtenances (fire hydrants, branch valves, gate valves for fire hydrants, and line valves).

According to the Construction Standard SNiP 2.04.01-84, the boundary of the sanitary protection zone and strict protection band follows the contour of the WTP site fence on the following distances from key WTP facilities:

- Clean water tank: 20 m;
- WPS building: 15-20 m;
- The width of sanitary protection band 2 surrounding the strict sanitary protection zone is 100 m;
- The width of sanitary protection strip running on either side of water mains: 50 m.

1.2.8. Completion of 800 mm Water Main Section between the Ivasyuk Street and Nadrichna Street

This project is consistent with the City’s Master Plan Urban Development Plan, which involves the infrastructure development and housing area expansion in the Nadrichna residential area. This implies the increase in water demand by about 50% against the existing demand. The City’s Master Plan specifies a suite of measures relating to the development of water supply and sewer systems. As a result, after the completion of the project, there will be 800 mm water main sections to supply the new area. Due to the completion of the completion of 800 mm water main section to supply the new area is in the form of an underground WPS on the Tselevych Street, the proposed water main section is 1,100 m.
1.2.9. Purchase of Pipe Cementation Equipment

Existing pipe cementation equipment is old and in poor condition, requiring frequent repair, which is very problematic due to the lack of spare parts that are no longer manufactured in Ukraine and NIS countries. The state of rubber and metal parts is particularly challenging. Existing equipment is used for pipe diameters larger than 300 mm.

Figure 1.10 – Existing Pipe Cementation System

This equipment is used for cementing the inner pipe surfaces in order to increase their operational life and reduce pipe breakage.

The plan is to purchase a new cementation unit with improved technical and economic characteristics, to use it for pipe diameters starting from 300 mm. The supplier will be identified on the basis of tender procedure.

1.2.10. Purchase of Flow Meters and Leak Detection Equipment

The following flow meters and leak detection equipment are suggested for the water supply systems:

- Portable ultrasonic flow meter
- Correlator Correlator
- Acoustic leak detector

It is proposed to purchase all equipment for system performance.
- Digital correlator for precise identification of leak locations (1 unit);
- Underground pipe locating equipment (installation locators, signal generators and related accessories) (3 units);
- Pepmalog system for leak detection in water supply system (acoustic control of pipe integrity) (1 unit);
- Metal detector (3 units);
- KhMIS geophone (high-precision leak locating system) (1 unit);
- Gas detectors (5 units);
- Stationary flow meter to control actual supply of drinking water to the distribution system (1 unit);
- Portable flow meter Panometrix (1 unit).

The suppliers will be identified on the basis of tender procedure. Potential alternatives include Water Point, MP DICIT and ITR–BBC.
1.3. Analysis of Potential Environmental Impacts

In line with the World Bank EA policy and procedure, the proposed project and all its components are classified into the environmental category B.

1.3.1. Physical Impacts

The potential physical impacts of the proposed project on the environment are likely to be limited to the reconstruction phase, or during the continued operation of dilapidated pipework.

In practice, the planned project will involve the construction and excavation works relating to the rehabilitation, upgrade and capital repair of water supply system components. These works are not likely to affect the existing ecological equilibrium in the project area, or result in any pollution or deterioration of the environment.

The proposed project is fully compliant with existing environmental legislation in terms of its provisions designed to mitigate the potential effects on the air quality, water resources, soil, vegetation cover during the implementation of proposed rehabilitation, upgrade and capital repair works.

As can be seen from Section 1.1.1 “Existing Situation”, 200 km (39%) of existing water mains are now operated beyond their design life (over 30-50 years), and additional 123 km (24%) of water mains and distribution pipes are in critical, accident-prone condition. There were 496 accidents recorded and repaired in the city’s water supply system, which is translated into the average pipe break frequency of 97 per 100 km per year. Therefore the implementation of proposed urgent actions on the rehabilitation of water supply network would help minimize the potential for emergency situations, thereby reducing the leaks and losses of water, which affect the groundwater levels and infrastructure integrity in the area, resulting in the deterioration of environmental situation.

**Ambient Air**

In the process of rehabilitation, upgrade and capital repair of water supply network, dust generation and excessive emissions will be controlled and minimized by adopting proper mitigation measures. Adequate provisions are included in the project design with regard to the control and minimization of noise and vibration. The proposed investment project includes adequate provisions that ensure its full compliance with existing standards and regulations, particularly with regard to the emissions of polluting substances into the ambient air.

**Water Resources**

Impacts on water resources during operation are likely to be associated with pipe break events, when water from the mains reaches the groundwater table, resulting in its elevation.

This impact is only possible in the event of major accident, and will be mitigated as part of the emergency policy adopted by the utility operator. This policy is considered to be adequate for preventing the pollution of surface waters and groundwater sources during construction and operation.
**Land Resource**
The protection and conservation of land resources involves a suite of institutional, economic and legal measures, designed to prevent and control the adverse processes affecting the state of land resource and land use regime in the project area.

No additional land requirement is associated with the implementation of proposed project. All proposed activities will be limited to the existing, officially allocated site.

The proposed project includes provision for the restoration of landcover upon the completion of pipe replacement. Land restoration includes two phases, i.e. technical and biological. Technical restoration is a responsibility of a construction contractor, while biological restoration is to be undertaken by a land permit holder. The maximum permitted distance to the temporary storage site for stripped top soil cover is 500 m.

**Flora and Fauna**
Given that the proposed project does not entail any additional land allocation, and will be implemented in the built-up area, there will be no additional loss of habitat, and no damage to vegetation cover in the surrounding area will be incurred.

**Vegetation Cover**
The State Construction Standard DBN 360-92** sets a 1 m limit upon the proximity of earthwork operations to a plantation; and requires a temporary protective fence if loading/unloading equipment is operated at a distance of less than 0.5 m from a tree stem or crown. All vegetation affected during excavation will be replaced.

**Landscape and Visual**
The proposed project will not cause the alteration of existing landscape.

**1.3.2. Impacts on Social Environment and Existing Utilities**
The rehabilitation of water supply system would generate direct benefits to the local population by improving the quality of water supply service.

The implementation of proposed project would not have a major impact on the social situation in the City. The proposed project design meets all current sanitary standards and poses no threat to human health and living conditions.

The environmental assessment of the proposed project indicates that it would not have any adverse effect on local industries, agricultural activities, housing areas, surface and subsurface communications, recreational areas, landscape features and cultural assets.

No human resettlement is required under the project.

**1.4. Review of Alternative Options**
As was discussed in the previous sections of the report, there is an urgent need in improving the technical condition of existing water supply system in order to ensure the provision of improved water supply service to the customers. The implementation of proposed project is seen as the most feasible way of improving the reliability of water service and preventing further deterioration of environmental situation and human health in the region. The proposed project, involving:
- Purchase of electrolytic unit for drinking water disinfection;
- Rehabilitation of groundwater abstraction plant, operated in low-flow periods;
- Introduction of improved water supply and distribution system;
- Rehabilitation of Level III Water Pumping Station;
- Construction of small-size hydropower plant at the water intake site to meet the site energy demand;
- Construction of 800 mm transmission line from the Chernyivsky Water Treatment Plant to the Khryplin Water Pumping Station;
- Construction of Water Pumping Station with clean water tank on the Tselevich Street;
- Completion of 800 mm water main section between the Ivasyuk Street and Nadrichna Street;
- Purchase of Pipe Cementation Equipment;
- Purchase of Flow Meters and Leak Detection Equipment

enables to maintain the acceptable level of operational reliability of water network in existing complicated operational conditions, ensure the constancy of water supply service and stability of flow regime in the system, and significantly reduce the unaccounted-for water losses in the distribution system, resulting in significant energy/resource savings.

In the light of the above, no consideration has been given to the "no project" scenario.
1.5. Environmental Management Plan

1.5.1. Brief Description of Key Environmental Issues

The following environmental effects are likely to arise in the process of rehabilitation, upgrade and repair of existing water supply system:

- Dust and exhaust gas emissions, generated during construction phase. To reduce dust generation and vehicle emissions, adequate dust suppression measures and routine control and maintenance for all construction equipment would be implemented. Proposed dust suppression measures include the use of covered trucks, periodical watering of road surfaces and prompt removal of excess material from the construction site.
- Noise generated by construction traffic and mobile plant. Mitigation provisions include the proper scheduling and specific restrictions for noisy operations. Routine control and maintenance of all mobile plant will be required to ensure acceptable noise levels.
- Disposal of construction/demolition waste. All dismantled equipment and piping will be removed from the construction site and will be disposed of at an officially approved location.
- Avoidance of surface and ground water pollution by construction runoffs. Proper measures for protection of groundwater will be required, including the adequate runoff and drainage control, to be provided prior to the commencement of construction activity.

The proposed project will not require additional land acquisition or result in involuntary resettlement, since the work will be carried out at the existing sites, managed by the local water company.

1.5.2. Mitigation Plan

The ultimate objective of the proposed rehabilitation, upgrade and capital repair project for the city’s water supply system is to improve the operational reliability and constancy of water supply service in Ivano-Frankivsk. It is imperative that the proposed project causes no further deterioration in the state of environment. Key proposed mitigation measures are described in Table A.1 (Annex A).

In line with existing environmental regulations, the proposed design includes the following water-related measures:

- Measures designed to prevent the alteration of hydrological and hydrogeological regime at the site during the excavation activity;
- Measures designed to prevent pollution of water bodies;
- Provision of surface drainage system prior to the commencement of excavation activity.

The proposed project includes provision for the restoration of landcover upon the completion of excavation works. Land restoration includes two phases, i.e. technical and biological. Technical restoration involves the placement and levelling of stripped top soil, and establishment of required curb slabs etc., while biological restoration relates to tree and grass planting activities. The detailed specification of restoration works is to be prepared as part of full feasibility study.
1.5.3. Monitoring Plan

Key objective of proposed investments is to develop a sustainable and environmentally sound system for the provision of good quality drinking water to the service population in Ivano-Frankivsk. The quality of water supplied needs to be monitored in order to detect and address possible exceedances in chemical, bacteriological and radiological parameters, for which maximum admissible concentration values are set.

In Ukraine, drinking water quality regulation is based upon the following guideline documents:

1. State Standard DSTU 2874-82: "Drinking Water. Hygienic Requirements and Water Quality Control": this State Standard specifies the list of 28 water quality parameters that have to be monitored.
2. State Sanitary Norms and Rules SanPiN 383-96 "Drinking Water. Hygienic Quality Requirements to the Centrally Supplied Drinking Water": this document specifies a comprehensive list of 55 parameters, which have to be introduced into the mandatory monitoring programme in a phased manner from 2005 onwards.
3. State Regulation DR-97 "Permissible Levels of Caesium-137 and Strontium-90 Radionuclides in Food Products and Drinking Water".
4. Radiation Safety Norms NRBU-97: this regulatory documents sets out the admissible levels of human exposure to radiation, and provides methodological guidance on the regulation of radioactive contaminant levels in drinking water.

Intermediate performance indicators can be used to measure the progress towards the specified project objective. These can be based on actual water quality determinations made in the process of implementing improvements in existing water supply system. Other useful performance indicators relate to proactive leakage control in the whole water supply system. Water leaks may significantly affect the hydrological regime in the project area, resulting in the elevation of groundwater levels, groundwater contamination, landslipping and subsidence.

These processes need to be carefully monitored, with a special focus on those areas where they are considered to have been triggered by leaks from water distribution mains. It is essential to continue a periodic monitoring programme for groundwater levels in the project area after the completion of construction activity, as part of post-project monitoring.

Another group of intermediate performance indicators for monitoring and evaluation may include impact indicators that relate to the control of construction/reconstruction activity effects on the environment, including potential pollution releases, noise and vibration, waste generation and management.

The details of monitoring plan, including the parameters to be monitored, are provided in Annex B.1.
2. REHABILITATION OF WASTEWATER COLLECTION & TREATMENT SYSTEM

2.1. Existing Situation

2.1.1. Present Wastewater Collection and Treatment Arrangement

Existing wastewater collection and treatment system, inherited from the USSR era, is characterized by high degree of wear and excessive energy consumption. Moreover, there has been no or little systemic analysis involved in planning the development of the city’s water supply and sewerage system, which has been only driven by previous and current housing construction activities, with no attention paid to the technical and technological standards.

The technical state of sewer network is largely inadequate. The total length of sanitary sewers is 252 km, and that of storm water sewers is 180 km, with the average rate of wear being at 33%. The technical state of existing sewage pumping capacity is similarly poor due to the high level of wear in the pumping units and their inability to maintain the required flows and pressures in the system.

There is a need in improving the wastewater treatment efficiency and quality in order to mitigate the adverse impacts on water bodies. The layout of existing wastewater treatment plant is presented in Figure 2.1. It features the traditional biological treatment process with mechanical pre-treatment, and receives combined flow of sanitary sewage, industrial effluent and storm water. The sludge produced at the wastewater treatment process is accumulated at the sludge fields. The inlet chamber at the WwTP (Figure 2.2) receives sewage flows from the whole city via two sewer lines. The WwTP’s pump house has the Flygt pumping units, which are in operation, with old, domestically manufactured pumps being on the standby. The Main Sewage Pumping Station comprises two sections: mechanical rake section and engine room.

Raw sewage is treated in screen facilities, grit chambers and primary clarifiers (Figure 2.3). There are 8 radial-type primary clarifiers (d 24 m) at the treatment lines I and II, with the total volume of 12,000 m³. Two pumping stations are in operation to transfer raw sludge to the sludge lagoons. The sludge pumps are inefficient, in poor condition and need to be replaced.

Sewage water from primary clarifiers flows by gravity to the distribution chamber, where it is distributed among existing aeration tanks. In the aeration tanks (Figure 2.4), it is mixed with solids that contain micro-organisms that use oxygen to consume the remaining organic matter in the wastewater as their food supply. There are three types of aeration tanks at the WwTP: jet aeration tank (Line I); aerating/clarifying basin and jet aeration tank with distributed wastewater outflow (Line II).

Circulating activated sludge is supplied from the sludge distribution chamber (airlift chamber) to the first section of aeration tank for regeneration, and is further mixed with wastewater flowing from the distribution chamber. At the end of the fourth section, the sludge flows into the bottom canal of aeration tank, from where is supplied into the secondary clarifiers.

Secondary clarifiers (Figure 2.5) are of radial type. Four 24 m diameter clarifiers are included into Line I, and thirty 30 m diameter units operate at Line II, with the total capacity of 18,290 m³. Clarified wastewater flows from the secondary clarifiers to the chlorine
contact tanks at Lines I and II. The Line I contact tank features a horizontal, two-section structure. Sodium hypochlorite is supplied to the distribution section in the contact tank, which also receives wastewater flow treated at the Line I. The Line II has a four-section chlorine contact tank. After disinfection, treated wastewater is discharged into the Bystritsia River.

Sludge lagoons are used for sludge settlement, dewatering and, partially, disinfection. One sludge lagoon site has 8 units, occupying the area of 7,200 m² (15 m × 60 m), with horizontal drainage system and one-way reject water outflow. Another sludge lagoon site has 4 units, occupying the area of 9310 m², with horizontal and vertical drainage system. Maximum filling depth is 1 m.

The WwTP site also comprises the air blower system, supplying compressed air to the aeration tanks, grit chambers and chlorine contact tanks. Water supply for the air blower system is provided through the closed-loop system. Water for cooling purpose is supplied at the pressure of 2-3.5 kg-c/sec.

The WwTP site has the anaerobic sludge digesters (methane tanks), which have never been in operation since their construction. It is planned to commission and operate the digesters for thickened surplus sludge treatment (see Section 2.2.3).
Figure 1: General Layout of Wastewater Treatment Plant Site in Ivano-Frankivsk

- Distribution section: 1. chambers Lines II and I; 6, 10 - grit chambers (Lines II and I); 3, 4 - distribution section
- Pump units at the primary clarifier sites (Lines II and I): 7a, 8a - primary clarifiers (Lines II and I)
- Distribution section of aeration tanks at Lines II and I: 13a, 14a, 25 - aeration tanks; 17 - pump unit at the Line I secondary clarifier site: 15-16 - distribution section of secondary clarifiers at Lines II and I: 15a, 16a - secondary clarifiers (Lines II and I);
- Chlorine contact tanks at Lines II and I: 26 ab - chlorine contact tanks at Lines II and I: 18 - airlift chamber;
- Technical water tank: 27 ab - storage tank for sodium hypochlorite: 55 - surplus activated sludge tank; 38 a6a - sludge thickeners; 43, 44 - sludge lagoons; 33 - sludge dewatering site.
Figure 2.2  Inlet Chamber of WwTP Sit.

Figure 2.3  Primary Clarifiers.
Figure 7  Storage Tanks

Figure 25  Secondary Clarifier
2.2. Proposed Investment Projects

The objective of this proposed project is the rehabilitation of existing sewer network and wastewater treatment capacity in Ivano-Frankivsk, to be achieved through the upgrade and reconstruction of key facilities, replacement of equipment, repair of wastewater collection system, in order to prevent technical accidents and ensure the environmental safety in the project area.

The following components are proposed to be included in the project:

- Laying the 500 mm sewer collector on the Nova Street to decommission the existing Sewage Pumping Station at the Boiler Repair Plant No. 63;
- Construction of new grit chambers;
- Rehabilitation of pumping capacity at the WwTP’s primary and secondary clarifier sites;
- On-site sludge management facility for natural gas generation (design development);
- Purchase of equipment for internal inspection of sewer collectors;
- Purchase of laboratory equipment to enable the analysis of drinking water and effluent quality;
- Rehabilitation of Sewage Pumping Capacity;
- Construction of Cogeneration Plant to Provide Energy for the Yamnitsia Wastewater Treatment Plant in Ivano-Frankivsk Oblast.

2.2.1. Laying the 500 mm Sewer Collector on the Nova Street to Decommission the Existing Sewage Pumping Station at the Boiler Repair Plant No. 63

Currently, the sewage flow from this area is delivered to the WwTP by a sewage pumping station via two rising sewers (d 150 mm, total length 900 m). Rising sewers have been in operation since the 1960s. High frequency of sewer breaks, low operational efficiency of pumping equipment, and excessive energy consumption are key factors justifying the decision on the decommissioning of existing SPS (Figure 2.6). The practicability of this solution has been greatly enhanced by the construction of new, 1,000 mm sewer main along the Bystritsia-Nadvirnianska River channel, which makes possible the decommissioning of existing SPS, to be replaced with the gravity-operated sewer collector. Additional justification relates to the fact that the existing rising sewer line crosses eight railway lines, which makes the repair and maintenance extremely difficult.

The SPS is overloaded in wet periods, which results in frequent pump failures and overflows. The proposed option is to lay the 500 mm sewer collector along the Nova Street, with the total length of 600 m, to be connected to the existing 1000 mm sewer main (Figure 2.7). New sewer collector will receive sewage flows from a number of apartmental buildings, kindergarten, Boiler Repair Plant No. 63, and other customers.

The construction of new sewer collector would help improve the sustainability of sewage collection service in the area by reducing the potential for accidents, repair cost requirement would be thereby significantly reduced. The proposed project component would also improve energy and resource efficiency, and contribute to the improvement of environmental situation in the area.
2.2.2. New Grit Chambers

The Line II grit chambers have been designed and constructed under contract and are not operational due to the sturry pipework.
In the absence of grit chambers, the sand is removed in the primary clarifiers, and this arrangement adversely affects the performance of pumping equipment and related piping work.

Existing grit chambers are conventional (Figure 2.8), and wastewater flows from the inlet section to the distribution of primary clarifiers via a by-pass.

Figure 2.8 - Current State of Existing Grit Chambers

The proposed project involves the construction of new grit chambers with the following design characteristics:

**Key Design Parameters (Horizontal Grit Chamber with Direct Flow):**
- Number of sections
- Number of sections
- Section cell through
- Number of sand cells
- Target sand removal
- Sand slurry flow rate
- Number of sand
- Sand load per
- Frequency of

**Key Design Parameters (Horizontal Grit Chamber with Slurry Discharge Chamber):**
- Number of sections
- Section through
- Water velocity
- Water velocity
- Target sand particle size: 0.2-0.15 mm
- Number of sand drying sites: 2
- Sand load per drying site: up to 3 m³/m² per year
- Frequency of dried sand removal: once per year

2.2.3. Rehabilitation of Pumping Capacity at the WwTP’s Primary and Secondary Clarifier Sites

Pump Units (Primary Clarifiers)
The primary clarifier system has sludge pumps (NP-28) for removing sludge slurry from the primary clarifier basins (Figure 2.9). These pumps have been in operation since 1970 and are in poor condition. The pumps require frequent repair, which is a very difficult task in the absence of required spare parts, and their lack of reliability contributes to the poor performance of the whole biological treatment line.

Figure 2.9 – Existing Sludge Pumps (Primary Clarifier Site)
The analysis and selection of suitable pump equipment options involved careful consideration of properties and composition of sludge generated at the primary clarifiers. This material contains sand, silt, and debris, with particle sizes reaching 16 mm.

Based on this analysis, it was decided that the following characteristics of the sludge pumping capacity would be sufficient: Digisol pumps with capacity 150 m³/h, energy use 10.5 kW, efficiency 70%; CT 3531/705 pumps with capacity 150 m³/h, energy use 10.5 kW.

Pump Units (Secondary Clarifiers)
The Secondary Clarifier Sludge Pumps are in poor condition. The pumps require frequent repair in the absence of required spare parts, and their lack of reliability contributes to the poor performance of the whole biological treatment line.

Based on the detailed
2.2.4. On-Site Sludge Management Facility for Natural Gas Generation (Design Development)

This project is designed to improve the current sludge management arrangement at the WWTP site, and generate biological gas for the site needs.

The existing wastewater treatment process is described in Section 2.1.1. It is proposed to modernize this process by introducing the anaerobic sludge digestion stage to eliminate pathogens and generate natural gas, to be used for on-site electricity generation. The proposed design includes the provision for flaring system to handle the (possible) excess gas. The proposed sludge digestion facility design comprises the following components and equipment items:

- Upgraded sludge thickener;
- Upgraded pump house for thickened sludge transfer;
- Surplus activated sludge tank;
- Mechanical thickening unit;
- Anaerobic sludge digesters (methane tanks - Figure 2.10);
- Engine room;
- Storage tank for digested sludge;
- Sludge dewatering/disinfection unit;
- Sludge storage site;
- Desulphurisation unit;
- Gas-holder;
- Gas flare;
- Boiler house and power generation plant.

Sludge generated at the WWTP site at the primary (primary sludge) and secondary (excess sludge) clarifiers will be pumped to the anaerobic sludge digesters after thickening. The estimated dewatering efficiency of thickening process is $W = 96.0\%$.

Surplus activated sludge will be stored in the surplus sludge tank, to be further pumped to the mechanical dewatering unit, which will be located in the specially equipped section of existing chlorination station.

Two anaerobic digesters will be installed to treated and stabilize the sludge generated at the WWTP site, with related heating and mixing systems. Methane and carbon dioxide will be generated as a result of the decomposition of organic matter. Methane will be used for digester heating and electricity generation. The digested sludge will be transferred to the storage tank, which will need to be installed to fit the cyclic operation regime of sludge dewatering facility. The tank will have a mixing system.

Sludge dewatering unit is a final stage of the on-site sludge management process. It is planned to utilize the existing building of mechanical dewatering station for organizing the operation of sludge dewatering equipment. The sludge will be treated and stabilized with lime slurry.

Generated gas will be treated at the desulphurisation unit and collected in a new membrane-type gas holder. Gas flare will be an integral element of this arrangement, to handle excess gas in the event of overloading. Treated gas will be used for heating and electricity generation.
2.2.5. Purchase of Equipment for Internal Inspection of Sewer and Water Supply Pipes

Under existing arrangement, the Ivano-Frankivsk Water Utility contracts the provision of internal pipework inspection services to other organisations (Lviv Water Utility and Kharkiv Water Utility) due to the lack of in-house inspection capability.

It is planned to purchase the CCTV inspection camera capable of moving inside a pipeline, both full and empty, and transfer images to the PC monitor. The purchase of this equipment would help build the in-house capability for conducting the internal pipe inspections.

2.2.6. Purchase of Analytical Equipment for Drinking Water and Sludge Analysis

Analytical equipment, currently used by the Ivano-Frankivsk Water Utility laboratory, is outdated and inefficient. The Utility's laboratory was affected by August 2008 floods, and a large volume of sanitary sewage, surface water, sludge, and other effluents was exposed.

It is proposed to improve the analytical capability of the laboratory by the purchase and installation of the following equipment:

- Dehumidifiers
- Laboratory desks with sinks
- Weighing desks
- Analytical scales
- Technical scales
- Microscope;
- Distiller (redistiller);
- pH-meter (portable);
- automatic titration system;
- Organic carbon meter;
- Atomic absorption spectrophotometer.
- Chromatograph/mass spectrometer.

2.2.7. Rehabilitation of Sewage Pumping Capacity

It is planned to replace existing pumping equipment and rehabilitate associated structures at four Sewage Pumping Stations (Figure 2.11). Four (4) Sewage Pumping Stations have already been rehabilitated, specifically:

- The Karmelyuk SPS
- The Naberezhna SPS
- The Dudaev SPS
- The Krykhivtsi SPS

The Karmelyuk SPS (Figure 2.11) opened in 1966 with the following types of pumping equipment: two 144 10.5 pump units and one 144 10.5 pump with engine capacity 7.5 kW and rising heights ranging from 6 m to 8 m.

Figure 2.11 - The Karmelyuk SPS Pumping Capacity

The Naberezhna SPS opened in 1966. It has the SM 10-12.5 pumps (engine capacity 7.5 kW with rising heights ranging from 6 m to 8 m).
and the NG 150-125-298b pumps (engine capacity 10 kW, rising height 10 m, pump capacity 160 m$^3$/hour).

The Dudaev SPS has been in operation since 1978, with two pumping units of SD-100/40 type (engine capacity 4.5 kW, rising height 40 m, pump capacity 100 m$^3$/hour).

The Krykhivtsi SPS has two pump units of CN 100-65-200a type, with pump capacity 35 m$^3$/hour, engine capacity 4.5 kW, and rising height 10 m. The SPS was commissioned in 1993.

It is planned to upgrade these SPS by installing new powerful pumping equipment. The FLYGT pumps would be preferable, but final decision would be made on the basis of tender procedure. Other proposed improvements involve the replacement of electrical equipment to fit the energy requirements of new pumping equipment, and replacement/rehabilitation of suction and rising pipework.

2.2.8. Construction of Cogeneration Plant to Provide Energy for the Yamnitsia Wastewater Treatment Plant in Ivano-Frankivsk Oblast

The proposed project involves the construction of a cogeneration plant at the Yamnitsia WwTP site, to operate on natural gas in the beginning, with the subsequent shift to biological gas, generated at the Yamnitsia WwTP, to be used for heating and electricity generation. The design capacity of cogeneration plant is 1 MW.

Currently, the Quanto plant by TEDOM company is considered as one of potential options. This plant is designed to produce both heat and electricity, and its key advantages are integrated approach, minimum space requirement, and wide range of auxiliary equipment supplied with the main plant, let alone the highest efficiency levels demonstrated by the Quanto plant.

Key plant's element is gas-fired combustion engine that drives an electrical generator. Heat generated from the engine is captured in two ways: Circulating coolant runs through cavities in each engine body. As the digester gas combusts, excess heat raises the coolant temperature. Hot coolant is channelled to a heat exchanger where the heat is transferred to the plant heating system. Exhaust gas which leaves the engine runs through a heat exchanger where it is cooled. The heat recovered in this process is also transferred to the plant heating system. The exhaust gas is vented into the atmosphere through mufflers located at the top of the cogeneration facility. Special acoustic insulation system and exhaust silencer would reduce the level of noise generated by the plant. Standard Quanto plant uses natural gas, but shift to biological gas (landfill or digester gas) is possible.
2.3. Analysis of Potential Environmental Impacts

In line with the World Bank EA policy and procedure, the proposed project and all its components are classified into the environmental category B.

2.3.1. Physical Impacts

The potential physical impacts of the proposed project on the environment are likely to be limited to the reconstruction phase, or during the continued operation of dilapidated sewer pipelines.

In practice, the planned project will involve the construction and excavation works relating to the rehabilitation, upgrade and capital repair of water supply system components. These works are not likely to affect the existing ecological equilibrium in the project area, or result in any pollution or deterioration of the environment.

The proposed project is fully compliant with existing environmental legislation in terms of its provisions designed to mitigate the potential effects on the air quality, water resources, soil, vegetation cover during the implementation of proposed rehabilitation, upgrade and capital repair works.

As can be seen from Section 2.1.1 “Existing Situation”, the total length of sewer network is 252 km, and additional 180 km are rainstorm sewers, with the average rate of wear at 33%. Technical state of existing sewage pumping capacity is poor and inadequate for handling current sewage flows. The improvement of wastewater treatment efficiency is required to prevent/minimize surface water pollution. Therefore the implementation of proposed urgent actions on the rehabilitation of water supply network would help minimize the potential for accidents, thereby reducing the leaks and losses of untreated sanitary sewage, which result in the deterioration of environmental situation.

Under existing arrangement, treated wastewater is discharged from the WwTP site to the Bystritsia River (near Yamnytsia village) at the rate of 100,000 m³/day at the WwTP design capacity of 145,000 m³/day. The Utility’s laboratory carries out the continuous monitoring of treated effluent and ambient water quality in six monitoring locations (control stations (CS)), on the basis of approved schedule:

Control Station 1.1: inflow to the WwTP;
Control Stations 3.2, 6.1 and 6.2: WwTP discharge outfalls;
Control Station 7.1: Bystritsia River, 500 m upstream of WwTP discharge;
Control Station 7.2: Bystritsia River, 500 m downstream of WwTP discharge.

The 2004 and 2005 chemical testing results for treated effluent and ambient water samples are presented in Tables 2.1 and 2.2. As can be seen from these Tables, the quality of treated effluent is largely compliant with existing standards (MAC limits set for discharges into surface water bodies used for fisheries), the exceptions being phosphates, ammonium nitrogen, nitrites, and total iron. It should be noted that in 2004 the elevated levels of phosphates (exceeding the prescribed MAC limits by a margin of 1.2) were characteristic only for one monitoring location (Control Station 7.2). No exceedances of MAC levels were recorded at the Control Station 7.2 in 2005.
## Table 2.1 - Treated Effluent and Ambient Water Quality Data for 2004

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<th>MAC limit, mg/l</th>
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<th>MAC 3.1 exceedance</th>
<th>CS 3.2 exceedance</th>
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The construction phase itself is the likely source of environmental impacts, which will be associated with excavations and earth material movements; temporary storage of top soil and building materials; groundwater flow diversions from excavated trenches; noise generated by construction traffic and mobile plant. These impacts will be mitigated by adopting proper mitigation measures, developed in full compliance with existing environmental regulations and designed to minimize the effects of construction on the ambient air, water resources, soil and vegetation cover in the process of planned rehabilitation and capital repair works.

**Ambient Air**

In the process of rehabilitation, upgrade and capital repair of sewer network (i.e., the laying of new 500 mm sewer collector on the Nova Street and decommissioning of existing SPS at the Boiler Repair Plant site; construction of new grit chambers; and construction of sludge digesting facility), dust and exhaust gas emissions are likely to be generated by construction traffic and mobile plant. Other potential impacts include noise generated by mobile plant and traffic.

The rehabilitation and upgrade of sludge pumps at the primary and secondary clarifier units at the WwTP site will mainly comprise the indoor operations, which are not likely to generate any harmful emissions to the ambient air.

**Water Resources**

The following effects on water resources may be likely in the process of operation of sewer network and wastewater treatment facilities:

- Releases of untreated sanitary sewage due to accidents and sewer pipe breaks. These can result in soil contamination in the location of accidental release and migration of untreated sanitary sewage to the subsurface aquifers.
- Accidental spills and overflows of untreated sanitary sewage in the event of pump failure at the main SPS. These are generally classified as extreme events of very low probability.

**Land Resource**

No additional land requirement is associated with the implementation of proposed project. All proposed activities will be limited to the existing, officially allocated site.

The proposed project includes provision for the restoration of landcover upon the completion of construction activity (see Section 1.3.1).

**Flora and Fauna, Protected Areas**

Given that the proposed project does not entail any additional land allocation, and will be implemented in the built-up area, there will be no additional loss of habitat, and no damage to vegetation cover in the surrounding area will be incurred. There are no protected areas at and near the project site.

**Vegetation Cover**

The State Construction Standard DBN 360-92* sets a 1 m limit upon the proximity of earthwork operations to a plantation; and requires a temporary protective fence if loading/unloading equipment is operated at a distance of less than 0.5 m from a tree stem or crown. All vegetation affected during excavation will be replaced.
**Landscape and Visual**
The proposed project will not cause the alteration of existing landscape.

2.3.2. Impacts on Social Environment and Existing Utilities

The implementation of proposed project would not have a major impact on the social situation in the City. The proposed project design meets all current sanitary standards and poses no threat to human health and living conditions.

The rehabilitation of sewage management would generate direct benefits to the local population by improving the service quality, which will be fully compliant with existing standards. The sustainable provision of sanitation service will ensure the human health safety and improved living conditions.

The environmental assessment of the proposed project indicates that it would not have any adverse effect on local industries, agricultural activities, housing areas, surface and subsurface communications, recreational areas, landscape features and cultural assets.

No human resettlement is required under the project.

2.3.3. Waste Management

Sludge generation is inherent to the biological treatment process, and the organization of its disposal is largely the issue of space provision/availability. Wastewater treatment sludge is a non-hazardous material, classified into the Waste Hazard Category 4 (materials that pose no threat to the environment and human health). Sludge disinfection takes place at the sludge fields, being based on the natural freezing process in winter period, followed by the mandatory laboratory tests.

It is anticipated that the disinfected sludge will be used as an organic fertiliser at the permitted farm sites.
2.4. Review of Alternative Options

The implementation of proposed project is seen as the most feasible way of improving the reliability of sanitation service and preventing further deterioration of environmental situation and human health in the region. The proposed project, involving:

- Laying the 500 mm sewer collector on the Nova Street to decommission the existing Sewage Pumping Station at the Boiler Repair Plant No. 63;
- Construction of new grit chambers;
- Rehabilitation of pumping capacity at the WwTP's primary and secondary clarifier sites;
- On-site sludge management facility for natural gas generation (design development);
- Purchase of equipment for internal inspection of sewer collectors;
- Purchase of laboratory equipment to enable the analysis of drinking water and effluent quality;
- Rehabilitation of Sewage Pumping Capacity;
- Construction of Cogeneration Plant to Provide Energy for the Yamnitsia Wastewater Treatment Plant in Ivano-Frankivsk Oblast.

is seen as an effective response to current challenges, associated with the complicated operational conditions, which would ensure the system reliability, stable operation of sewer network and wastewater treatment plant, significant reduction in leaks and losses, improved control of treated effluent discharges into the Bystritsia River near Yamnytsia, and reduced consumption of energy, resources and materials.

In the light of the above, and considering the level of urgency, involved in the proposed rehabilitation of sewage management system in Ivano-Frankivsk, no other alternatives (including the 'no project' alternative) are considered to be appropriate.

2.5. Environmental Management Plan

2.5.1. Brief Review of Key Environmental Issues

The following environmental issues are likely to arise in the process of rehabilitation, upgrade and repair of existing wastewater collection/treatment system:

- Dust and exhaust gas emissions, generated during construction phase. To reduce dust generation and vehicle emissions, adequate dust suppression measures and routine control and maintenance for all construction equipment would be implemented. Proposed dust suppression measures include the use of covered trucks, periodical watering of road surfaces and prompt removal of excess material from the construction site.
- Noise generated by construction traffic and mobile plant. Mitigation provisions include the proper scheduling and specific restrictions for noisy operations. Routine control and maintenance of all mobile plant will be required to ensure acceptable noise levels.
- Disposal of construction/demolition waste. All dismantled equipment and piping will be removed from the construction site and will be disposed of at an officially approved location.
- Avoidance of surface and ground water pollution by construction runoffs. Proper measures for protection of groundwater will be required, including the adequate runoff and drainage control, to be provided prior to the commencement of construction activity.
The proposed project will not require additional land acquisition or result in involuntary resettlement, since the work will be carried out at the existing sites, managed by the local water company. All affected sites will be restored upon the completion of excavation/construction works.

2.5.2. Mitigation Plan

The ultimate objective of the proposed rehabilitation, upgrade and capital repair project for the city's wastewater collection/treatment system is to improve the operational reliability and constancy of water supply service in Ivano-Frankivsk. It is imperative that the proposed project causes no further deterioration in the state of environment.

In line with existing environmental regulations, the proposed design includes the following water-related measures:

- Measures designed to prevent the alteration of hydrological and hydrogeological regime at the site during the excavation activity;
- Measures designed to prevent pollution of water bodies;
- Provision of surface drainage system prior to the commencement of excavation activity.

These measures are designed to exclude the possibility of surface water and groundwater pollution during construction and operation.

Air protection programme includes a suite of measures designed to prevent the excessive dust and exhaust gas generation during construction, and ensure compliance with existing construction standards.

The details of key stages and actions included into the Mitigation Plan are provided in Table A.2 (Annex A).

2.5.3. Monitoring Plan

The key monitoring objective in the proposed project is to ensure the good ecological state of the Bystritsia River as a receiving water body by preventing the releases of untreated sewage, and prevent the contamination of soil and groundwater. It is also required to carry out the continuous monitoring of quality and sustainability of sanitation service provided to the city's population.

This objective will be achieved through a continuous sampling and testing programme, designed to ensure the prompt and timely identification of any potential exceedances in the levels of chemical and bacteriological contamination. It is particularly important to provide continuous monitoring of treated effluent quality in the locations of discharge outfalls, and ambient water quality in the Bystritsia River, which is part of the Dniestro River Basin. Another important performance indicator relates to the control of leaks and losses from the sewer network.

The proposed monitoring plan will support prompt and effective decision-making by responsible agencies with respect to the planning and taking steps towards full compliance with existing environmental and sanitary regulations, and inform the public about the actual state of environment.
3. INSTITUTIONAL ISSUES

The Environmental Management Plan will be implemented in order to ensure compliance with existing environmental and sanitary regulations in the process of rehabilitation and operation of proposed water supply, wastewater collection and solid waste management facilities in Ivano-Frankivsk. Relevant executive authorities will be responsible for overall control and supervision of construction and operation of all proposed facilities.

Should the need arise, the independent monitoring of the project will be organised and implemented.

It is anticipated to enhance the monitoring and control capability of Ivano-Frankivsk Water Utility by introducing the automatic quality control system in key locations within the water supply system.

4. PUBLIC CONSULTATION

In accordance with the World Bank requirement, the public consultation process was organized as part of the environmental assessment, in order to discuss the proposed urban infrastructure development projects with various stakeholder groups in Ivano-Frankivsk. This public consultation involved two stages.

The first public consultation was held on 14 October, 2005, in the premises of the Ivano-Frankivsk Water Utility “VodoEcoTechProm”. According to the list of attendees, 39 persons were present, including the following representatives of the Executive Committee of Ivano-Frankivsk City Council: Mr. Bohdan Bilyk, Head of Department of External Relations and Tourism; and Ms. Nadia Karabin, Head of Municipal Utility Management Sector within the City’s Socio-Economic Development Department.

Mr. Bilyk made an introductory presentation and emphasized the significance of the World Bank’s Urban Infrastructure Project for the City, noting that the proposed list of investment projects was identified on the basis of the Long-Term Development Strategy, developed and adopted by the Ivano-Frankivsk Water Utility “VodoEcoTechProm”. Mr. Bilyk also emphasized the significance of environmental issues faced by the city and noted that 10 of 18 on-going technical assistance projects funded by various international donors were designed to address some of these issues.

The following senior officials of Ivano-Frankivsk Water Utility attended the meeting: Mr. V. Ivanyshyn (Director), Mr. M. Tkachuk (Technical Director), Mr. M. Vabyschevich (Operations Director), Mr. V. Chornopysky (Deputy Head of Technical Department), and Mr. L. Maistryshyn (Head of Chemical/Biological Laboratory).

In the friendly atmosphere of the meeting, attendees raised and discussed various questions, which are detailed in the Minutes of Consultation Meeting, annexed to the present EA Report.

The detailed Minutes of Consultation Meetings and other materials are attached in Annex C.
CONCLUSIONS

This section presents key conclusions, drawn on the basis of the present Environmental Assessment Effort.

The development of the City of Ivano-Frankivsk water supply system commenced in the early 1900s. At that time, pipes were laid in various materials and diameters, based on the city development needs, population growth, industrial developments, and science/technology advances.

Currently, the water supply system in Ivano-Frankivsk consists of 511.4 km of water mains, including 200 km (39%) with active service life of over 30-50 years, and additional 123 km (24%) in extremely poor technical condition. In 2004, the number of accidents recorded and fixed in the supply network was 496, which can be translated into the accident frequency rate of 97 per 100 km per year. This rate is lower than the country average by 2.2-fold, but exceeds the European average rate by 4-fold.

The proposed rehabilitation project for the city's water supply system includes the following components: purchase of electrolytic unit for drinking water disinfection; rehabilitation of groundwater abstraction plant, operated in low-flow periods; introduction of improved water supply and distribution system; rehabilitation of Level III Water Pumping Station; construction of small-size hydropower plant at the water intake site to meet the site energy demand; construction of 800 mm transmission line from the Chernyivsky Water Treatment Plant to the Khryplin Water Pumping Station; construction of Water Pumping Station with clean water tank on the Tselevich Street; completion of 800 mm water main section between the Ivasyuk Street and Nadrichna Street.

The need for rehabilitation and upgrade of the city's wastewater collection/treatment system is justified by the following facts:

- Existing wastewater collection and treatment system, inherited from the USSR era, is characterized by high degree of wear and excessive energy consumption. Moreover, there has been no or little systemic analysis involved in planning the development of the city's water supply and sewerage system, which has been only driven by previous and current housing construction activities, with no attention paid to the technical and technological standards.

- The technical state of sewer network is largely inadequate. The total length of sanitary sewers is 252 km, and that of storm water sewers is 180 km, with the average rate of wear being at 33%. The technical state of existing sewage pumping capacity is similarly poor due to the high level of wear in the pumping units and their inability to maintain the required flows and pressures in the system.

There is an urgent need in improving the reliability and constancy of water services provided to the city's population, those services being the provision of drinking water as required by population and industry, and the collection, treatment and disposal of wastewater and associated wastes in a manner that is safe for the population, including downstream communities, and the environment.

The proposed projects include adequate provisions for the mitigation of their potential environmental impacts in line with existing legislation. The Environmental Management Plans outline provisions for the environmental performance monitoring and supervision.
There is strong public support for the implementation of proposed urban infrastructure development project, stemming from the understanding of benefits associated with the provision of good quality water supply and sanitation service in a manner that is safe for human health and environment.
ANNEX A: Mitigation Plan
<table>
<thead>
<tr>
<th>Phase</th>
<th>Issue</th>
<th>Mitigation Measure</th>
<th>Cost</th>
<th>Responsibility</th>
</tr>
</thead>
</table>
| Construction           | Increased construction traffic may have impact on road safety         | • Provision of appropriate warning signs around the construction site.  
• Reasonable daytime working hours.  
• Identification of acceptable alternative routes for construction traffic.                                                                                                      | Construction budget    | Contractor      |
|                        | Dust emissions generated by traffic and mobile plant during construction | • Implement dust avoidance measures.  
• Covering of earth/building material transporting vehicles.  
• Watering of access roads and excavation zones, implementation of good construction practice, site cleaning at the end of working hours.  
• Use of protective covers and screens to contain fugitive dust emissions wherever possible.                                                                                       | Construction budget    | Contractor      |
|                        | Construction noise and vibration                                      | • Restricting noisy construction activities to normal daily working hours.  
• Adopting a reasonable work schedule.  
• Use of acoustical enclosures or noise suppressors for noisy equipment where appropriate.                                                                                           | Construction budget    | Contractor      |
|                        | Interim stockpiling of the stripped soils and construction waste       | • All waste materials, generated during construction, including hazardous waste, will be delivered to the official sanitary landfill(s).                                                                                     | Construction budget    | Contractor      |
|                        | Significant effect unless properly managed                            | • Regular inspection and proper maintenance of vehicles and equipment.  
• Provision of adequate containment for fuel oils and lubricants, paints, cooling agents, solvents etc., in full compliance with the requirements set out in the Operational Rules for Centralised Water Supply and Sewerage Systems in Ukraine, approved by the State Municipal Utility Management Committee of Ukraine Order No. 30 of 05.07.95.  
• Prompt elimination and control of leaks and spills.  
• Identification of a minimum required number of delivery routes for fuel and lubricants, cooling agents, paints, solvents and asphalt material to minimize risk of accidental spills and releases.  
• Limiting vehicle maintenance operations to specially designated sites.                                                                                                                                 | Construction budget    | Contractor      |
|                        | Surface water and soil contamination from leaks or spills of process chemicals such as fuel oils/lubricants, paints, cooling agents etc. | • Ensure proper technical state of all equipment by conducting regular technical inspections.  
• Restricting construction activities to reasonable working hours.                                                                                                                                                     | Construction budget    | Contractor      |
|                        | Air emissions during equipment operation                               | • Comprehensive geoengineering survey prior to construction, survey results to be accounted for in the final design.  
• Strict compliance with safety requirements set out in the Operational Rules for Centralised Water Supply and Sewerage Systems in Ukraine, approved by the State Municipal Utility Management Committee of Ukraine Order No. 30 of 05.07.95.                                                                 | Construction budget    | Contractor      |
|                        | Soil disturbance/landslipping due to construction activity             | • Minimise the potential for damage.  
• Replant/restore affected vegetation cover.                                                                                                                                                                            | Construction budget    | Contractor      |
<p>|                        | Damage to trees and other vegetation during construction               | • Proper control/prompt elimination of leaks                                                                                                                                                                              | Operating cost         | Operator      |
| Operation              | Leaks in the distribution mains.                                       |                                                                                                                                                                                                                        |                        |                |</p>
<table>
<thead>
<tr>
<th>Phase</th>
<th>Issue</th>
<th>Mitigation Measure</th>
<th>Cost</th>
<th>Institutional Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>Potential impact of construction activity on the pedestrian safety in the location of construction site</td>
<td>• Provision of safety fence around the construction site.</td>
<td>Allowance made in the project budget</td>
<td>Contractor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Restricted access to the construction site on the basis of passes</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Dust emissions during construction</td>
<td>• Implement dust avoidance measures: Provision of proper package for loose materials during transportation.</td>
<td>Allowance made in the project budget</td>
<td>Contractor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Covering of earth/building material transporting vehicles.</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• Waterproofing of access roads and excavation zones, implementation of good construction practice, site cleaning at the end of working hours.</td>
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<tr>
<td></td>
<td></td>
<td>• Use of protective covers and screens to contain fugitive dust emissions wherever possible.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Noise and vibration</td>
<td>• Reducing noisy construction activities to normal daily working hours (from 8.00 a.m. to 5.00 p.m.).</td>
<td>Allowance made in the project budget</td>
<td>Contractor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Adopting a reasonable work schedule.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Use of acoustical enclosures or noise suppressors for noisy equipment where appropriate.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Short-term surface water and soil contamination from leaks or spills of process chemicals such as fuel oils/lubricants, paints, cooling agents etc.</td>
<td>• Regular inspection and proper maintenance of vehicles and equipment.</td>
<td>Allowance made in the project budget</td>
<td>Contractor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Provision of adequate containment for fuel oils and lubricants, paints, cooling agents, solvents etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Prompt elimination and control of leaks and spills.</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>• Identification of a minimum required number of delivery routes for fuel and lubricants, cooling agents, paints, solvents and asphalt material to minimize risk of accidental spills and releases.</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>• Limiting vehicle maintenance operations to specially designated sites.</td>
<td></td>
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<tr>
<td></td>
<td>Short-term groundwater and soil contamination from spills during the connection of new piping to the existing sewer network</td>
<td>• Strict compliance with construction standards and design specifications.</td>
<td>Allowance made in the project budget</td>
<td>Contractor</td>
</tr>
<tr>
<td></td>
<td>Air emissions during equipment operation</td>
<td>• Ensure proper technical state of all equipment.</td>
<td>Allowance made in the project budget</td>
<td>Contractor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Restricting construction activities to reasonable working hours.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Top soil stripping may affect soil properties</td>
<td>• Provide adequate temporary storage for top soil material and subsequent restoration of disturbed site</td>
<td>Allowance made in the project budget</td>
<td>Contractor</td>
</tr>
<tr>
<td></td>
<td>Interference with natural drainage</td>
<td>• Short-term impact. No special mitigation measures are required</td>
<td>Allowance made in the project budget</td>
<td>Contractor</td>
</tr>
<tr>
<td></td>
<td>Damage to trees and other vegetation during construction</td>
<td>• Minimise the potential for damage.</td>
<td>Allowance made in the project budget</td>
<td>Contractor</td>
</tr>
<tr>
<td>Phase</td>
<td>Issue</td>
<td>Mitigation Measure</td>
<td>Cost</td>
<td>Institutional Responsibility</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td></td>
<td>Construction waste and old piping can be a potentially significant</td>
<td>• All waste materials, generated during construction, including hazardous waste, should be delivered to the official sanitary landfill(s).</td>
<td>Allowance made in the project budget</td>
<td>Contractor</td>
</tr>
<tr>
<td></td>
<td>effect unless properly managed</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Operation | Odours and noise generated by sewage pumping station can cause     | • Air emissions from sewer mains should be minimised in accordance with the Operation Rules for Centralised Water Supply and Sewerage Systems (approved by the State Municipal Utility Management Committee of Ukraine Order No. 30 of 05.07.95).  
• Pumping stations should be appropriately located at a sufficient distance from residential areas, in adequately insulated buildings. | Allowance made in the operating cost estimate                          | Operator                       |
|        | considerable nuisance to local residents                            |                                                                                                                                                     |                                                                       |                                |
| Soil and groundwater contamination due to leaks from sewer system | • Adequate leak control.  
• Comprehensive quality assurance/control programme during construction, with subsequent technical inspection and maintenance programme |                                                                                                                                                     | Allowance made in the operating cost estimate                          | Operator. The control of soil contamination in the surrounding area is the responsibility of local Sanitary Epidemiological Service (bacteriological contamination) and analytical quality control unit of local Department of Environment and Natural Resources |
ANNEX B: Monitoring Plan
### Table B.1. Monitoring Plan: Rehabilitation of Water Supply System

<table>
<thead>
<tr>
<th>Project Phase</th>
<th>Monitoring Parameter</th>
<th>Monitoring Location</th>
<th>Monitoring Technique</th>
<th>Monitoring Frequency</th>
<th>Institutional Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction and Supervision</td>
<td>Percentage of population connected to upgraded water supply service</td>
<td>Human settlement</td>
<td>Monitoring report by a municipal utility’s laboratory</td>
<td>Monthly</td>
<td>Contractor, Sanitary Epidemiological Service</td>
</tr>
<tr>
<td>Operation</td>
<td>Leaks in the distribution system</td>
<td>Within a water distribution system</td>
<td>Visual inspection, public complaints</td>
<td>As part of regular maintenance</td>
<td>Operating Agency</td>
</tr>
<tr>
<td><strong>Intermediate Performance Indicators</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction and Supervision</td>
<td>Drinking water quality parameters, set out in the State Sanitary Standard DSaPiN 383-96 “Drinking Water. Hygienic Requirements to the Centrally Supplied Drinking Water”</td>
<td>Within a water supply system, in accordance with the Water Quality Control Plan</td>
<td>Instrumented measurements (physical, chemical, bacteriological, radiological parameters) in accordance with the DSaPiN 383-96</td>
<td>Daily or weekly during construction</td>
<td>Contractor, Sanitary Epidemiological Service, Environmental Inspectorate</td>
</tr>
<tr>
<td>Construction</td>
<td>Air emissions (dust; nitrogen dioxide, carbon oxide, carbon dioxide, iron oxide, manganese, nickel oxide, chromium (6+), fluorides, xylene, phenol, glycol, butyl acetate, ethyl acetate, ethylcellulose, acetone, cyclohexanone, solvent, white spirit)</td>
<td>Construction site and surroundings</td>
<td>Instrumented measurements in accordance with the Guideline Document RD 52.04.186-89 “Air Pollution Control Manual” and the Technique for Determination of Emission Loads from Mobile Sources (the RF Ministry of Transport, 1993)</td>
<td>Daily or weekly during construction</td>
<td>Contractor, Sanitary Epidemiological Service, Environmental Inspectorate</td>
</tr>
<tr>
<td>Construction</td>
<td>Soil contamination by oil products and paints</td>
<td>Construction site</td>
<td>Instrumented measurements in accordance with the Regulation on Land Monitoring (approved by the Cabinet of Ministers of Ukraine Resolution No. 661 of 20.06.1993)</td>
<td>Monthly during construction</td>
<td>Contractor, local environmental authorities, sanitary service, supervisor</td>
</tr>
<tr>
<td>Construction</td>
<td>Waste generation and management</td>
<td>Construction site and surroundings</td>
<td>Visual inspection, waste inventory, evidence from landfill operator</td>
<td>Continuous daily control</td>
<td>Construction contractor, supervisor</td>
</tr>
<tr>
<td>Construction / Supervision</td>
<td>Water leaks from the distribution system</td>
<td>Within a water distribution system</td>
<td>Water meters to meter production/distribution input and customer metering</td>
<td>Weekly</td>
<td>Contractor, supervisor, customers</td>
</tr>
</tbody>
</table>

Target Performance Indicators

- **Construction and Supervision**
- **Operation**
- **Intermediate Performance Indicators**
- **Construction**
- **Construction**
- **Construction**
- **Construction / Supervision**

---

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### Table B.2. Monitoring Plan: Rehabilitation of Municipal Sewage Collection and Treatment System

<table>
<thead>
<tr>
<th>Project Phase</th>
<th>Monitoring Parameter</th>
<th>Monitoring Location</th>
<th>Monitoring Technique</th>
<th>Monitoring Frequency</th>
<th>Institutional Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>Contaminant loadings in treated effluent (based on the list of regulated contaminants, specified for Ivano-Frankivsk Water Utility)</td>
<td>Discharge outfall</td>
<td>Instrumented measurements (physical, chemical, bacteriological, radiological parameters)</td>
<td>Daily</td>
<td>Contractor, local environmental and water management authorities, supervisor</td>
</tr>
<tr>
<td>Construction</td>
<td>Groundwater contamination by oil products and other regulated contaminants</td>
<td>Monitoring boreholes along the sewer main route</td>
<td>Instrumented measurements in accordance with the Unified Inter-Ministerial Regulation on the Organisation and Implementation of State Water Monitoring (approved by the Ministry of Environment and Natural Resources of Ukraine Order No. 485 of 24.12.2001)</td>
<td>Daily during construction</td>
<td>Contractor, local environmental and water management authorities, supervisor</td>
</tr>
<tr>
<td>Construction</td>
<td>Air emissions (dust, nitrogen dioxide, carbon oxide, carbon dioxide, iron oxide, manganese, nickel oxide, chromium (6+), fluorides, xylene, phenol, glycol, butyl acetate, ethyl acetate, ethyl-cellulose, acetone, cyclohexanone, solvent, white spirit)</td>
<td>Plant site and surroundings</td>
<td>Instrumented measurements in accordance with the Guideline Document RD 52.04.186-89 “Air Pollution Control Manual” and the Technique for Determination of Emission Loads from Mobile Sources (the RF Ministry of Transport, 1993)</td>
<td>Daily during construction</td>
<td>Contractor, local environmental authorities, sanitary service, supervisor</td>
</tr>
<tr>
<td>Construction</td>
<td>Waste generation and management</td>
<td>Plant site and surroundings</td>
<td>Visual inspection, waste inventory, evidence from landfill operator</td>
<td>Continuous daily control</td>
<td>Contractor, supervisor</td>
</tr>
<tr>
<td>Construction</td>
<td>Surplus activated sludge generation and management</td>
<td>Plant site and surroundings</td>
<td>Visual inspection, waste inventory, evidence from landfill operator</td>
<td>Continuous daily control</td>
<td>Contractor, supervisor</td>
</tr>
<tr>
<td>Construction</td>
<td>Process waste management</td>
<td>Plant site and surroundings</td>
<td>Visual inspection, waste inventory, evidence from landfill operator</td>
<td>Continuous daily control</td>
<td>Contractor, local environmental authorities, sanitary service, supervisor</td>
</tr>
<tr>
<td>Operation</td>
<td>Percentage of water losses in sewer mains</td>
<td>Sewer network</td>
<td>Instrumented measurements</td>
<td>Monthly</td>
<td>Contractor</td>
</tr>
<tr>
<td>Operation</td>
<td>Surplus activated sludge generation and management</td>
<td>Plant site and surroundings</td>
<td>Visual inspection, waste inventory, evidence from landfill operator</td>
<td>Continuous daily control</td>
<td>Contractor, supervisor</td>
</tr>
<tr>
<td>Project Phase</td>
<td>Monitoring Parameter</td>
<td>Monitoring Location</td>
<td>Monitoring Technique</td>
<td>Monitoring Frequency</td>
<td>Institutional Responsibility</td>
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</tr>
<tr>
<td>Operation</td>
<td>Groundwater contamination by oil products and other regulated contaminants</td>
<td>Monitoring boreholes along sewer main route</td>
<td>Instrumented measurements in accordance with the Unified Inter-Ministerial Regulation on the Organisation and Implementation of State Water Monitoring (approved by the Ministry of Environment and Natural Resources of Ukraine Order No. 485 of 24.12.2001).</td>
<td>Weekly during operation</td>
<td>Contractor, local environmental authorities, sanitary service</td>
</tr>
<tr>
<td>Operation</td>
<td>Soil contamination regulated contaminants along the sewer main route</td>
<td>Sampling locations along sewer main route</td>
<td>Instrumented measurements in accordance with the Regulation on Land Monitoring (approved by the Cabinet of Ministers of Ukraine Resolution No. 661 of 20.06.1993)</td>
<td>Monthly during operation</td>
<td>Contractor, local environmental authorities, sanitary service</td>
</tr>
<tr>
<td>Operation</td>
<td>Air emissions ((\text{H}_2\text{S}, \text{CH}_4))</td>
<td>Plant site and surroundings</td>
<td>Instrumented measurements in accordance with the Guideline Document RD 52.04.186-89 “Air Pollution Control Manual”</td>
<td>Daily during operation</td>
<td>Contractor, local environmental authorities, sanitary service</td>
</tr>
<tr>
<td>Operation</td>
<td>Waste generation and management</td>
<td>Plant site and surroundings</td>
<td>Visual inspection, waste inventory, evidence from landfill operator</td>
<td>Continuous daily control</td>
<td>Contractor, local environmental authorities, sanitary service</td>
</tr>
</tbody>
</table>
ANNEX C: Public Consultation Materials
FOREWORD

The Need for Public Consultation

According to the requirements of the World Bank and Ukrainian legislation, it is necessary to consult project-affected groups and local nongovernmental organizations (NGOs) about the project's environmental aspects and to take their views into account when performing Environmental Assessment (EA) of investment project on municipal infrastructure. Thus, generation of positive attitude on all stages of projects is the necessary requirement for the project performance.

Organisation of Public Consultations

According to Terms of References, the Consultant (IWMC) has organized the public consultation process in the following way:

1. Two public consultations for each project location were carried out:
   - **The first public consultation** - the purpose of this consultation was to present the planned project, review the EA outline and schedule, Terms of Reference, and to solicit from affected groups and local NGOs any environmental issues they consider to be a priority and they wish to see addressed in the EA report.
   - **The second public consultation** - the purpose of this consultation was to present the results of EA work, discuss positive and negative impacts of planned project, to review the draft EA document to ensure that the issues identified in the first public consultation have been properly addressed and resolved to the satisfaction of locally affected groups and NGOs.

   The main objectives of public consultations were as follows:
   - To make the EA project transparent and open for the public;
   - To discuss various issues and concerns with project-affected groups, to familiarize public with potential negative impacts and problems during realization of investment projects;
   - To have feedback from competent bodies and local project-affected groups during the EA process on potential positive and negative impacts.

2. To invite local stakeholders, the places and dates of two public consultations were announced in local/oblast newspapers, followed by the telephone and fax communications. Key participants are:
   - Loan Recipients (Municipal Utilities);
   - Key field institutions;
   - Key research organizations and organizations performing Environmental Impact Assessment (EIA);
   - Local state administrations;
   - State authorities (environmental authorities and sanitary epidemiological service);
   - NGOs;
   - TV, radio stations, newspapers.

3. Responsible persons (from IWMC and Loan Recipients) were appointed for each location.

4. The following information materials were prepared for each consultation:
5. Records of consultations were carefully documented, including the lists of attending persons, pictures/photos, and minutes of each consultation meeting.

6. All comments and opinions of participants were taken into account during the preparation of EA reports.

Public consultations in Ivano-Frankivsk were conducted according to the approved programme.
Public Consultations in Ivano-Frankivsk City

The First Public Consultation

1. A working meeting with potential loan recipients to discuss key issues relating to the organization of the first consultation (for investment projects in Ivano-Frankivsk) was conducted at the Meeting Hall of Ivano-Frankivsk Water Utility (2 Botanichna Street, Ivano-Frankivsk). The date and venue of the first consultation meeting were discussed, and the Plan of Preparatory Activities for the First Public Consultation was agreed. It was decided to hold the first public consultation on October 14, 2005, at the Meeting Hall of Ivano-Frankivsk Water Utility (2 Botanichna Street, Ivano-Frankivsk).

2. The meeting announcement was published in the city newspaper “Zakhidny Courier” on 13 October 2005, No. 41 (990) (Attachment 1).

3. The meeting agenda (Attachment 2), distribution material (Attachment 3) and press-release (Attachment 4) were prepared.

4. The minutes of the first consultation meeting were maintained (Attachment 5).

The Second Public Consultation

1. A working meeting with potential loan recipients to discuss key issues relating to the organization of the second consultation was held at the Meeting Hall of Ivano-Frankivsk Water Utility (2 Botanichna Street, Ivano-Frankivsk). The date and place of the second consultation meeting were discussed, and the 2nd Consultation Meeting Preparation Plan was agreed. It was decided to hold the second public consultation on 11 November, 2005, at the Meeting Hall of the Central Public House (1 Shevchenko Street, Ivano-Frankivsk).

2. The meeting announcement was published in the city newspaper “Zakhidny Courier” on 3 November 2005, No. 44 (998) (Attachment 7).

3. The second meeting agenda (Attachment 8), distribution material (Attachment 9) and press-release (Attachment 10) were prepared.

4. The minutes of the second consultation meeting were maintained (Attachment 11), and pictures (Attachment 12) were made.

5. Mass-media (Oblast TV Channel “Halychina”, Oblast newspaper “Halychina”, and City newspaper “Zakhidny Courier”) provided media coverage for the event and presented the views and opinions of the public in their news programmes and publications.

Conclusions

A set of very important and interesting issues/comments/opinions were identified/received as a feedback from interested and project-affected groups, in particular, potential loan recipients, NGOs and general public. All comments have been taken into account and properly addressed during the preparation of EA reports.
The feedback received from the public consultations has proved invaluable in assessing the following aspects of the proposed projects:

- Compliance of planned investment projects with the Ukrainian environmental legislation and regulations;
- Completeness of available information on the current environmental situation;
- Current environmental permitting status of each proposed project;
- Completeness of available information on the potential environmental impacts associated with the proposed investment project implementation;
- Adequacy of proposed mitigation measures in terms of ensuring the environmental safety and sustainability;
- Acceptability of potential environmental impacts and environmental feasibility of each proposed project;
- Need for additional environmental information or clarification of available environmental data.

The generally positive feedback received from various stakeholder groups demonstrates the relevance and urgency of proposed projects in Ivano-Frankivsk. Their implementation would contribute significantly to the improvement of existing water supply and wastewater collection/treatment infrastructure. The proposed projects would produce broader environmental and social benefits, resulting from improved municipal infrastructure and service quality, which would help develop the economic potential of Ivano-Frankivsk and Oblast.

The projects will not cause involuntary resettlement of population.

The potential physical impacts on local geology, climate, air quality, fauna, water bodies, soil, vegetation cover and existing utilities/infrastructure are likely to be acceptable, being largely limited to the construction phase.
The first public consultation – 14 October, 2005

Announcement in the Newspaper

Source: the city newspaper “Zakhidny Courier”, 13 October 2005, No. 41 (990)

Ivano-Frankivsk VodoEcoTechProm Water Utility
Information Analysis Department
2 Botanichna Street. Ivano-Frankivsk Ukraine
Tel./fax: 380 (342) 775256

On 14 October 2005, at 8.30, in the meeting hall of Ivano-Frankivsk VodoEcoTechProm Water Utility, the WB, IWMC and Ivano-Frankivsk VodoEcoTechProm will conduct the public consultation on investment projects on the rehabilitation of water supply and wastewater systems in Ivano-Frankivsk city for discussing the TOR on Environmental Assessment (schedule, structure of reports, etc.). Interested persons are welcome.
ВИСОКА ВІДЗНАКА

Щорічно в Україні проводиться величезна кількість конкурсів — для політиків, діячів культури, бізнесменів. Однак не часто в них перемогу добувають представники засобів масової інформації. Утім, сьогодні є привід відмовлятися від шампанського.

Наш угоджаний журнал «Всекраїнський конкурс "Молодіжне видання року"» Перемогу в номінації "Середній та великий бізнес" здобув (прізвищу) цим заслужено, директор газети "Все про бухгалтерський облік" Олександр Андрийович.

Радість перемоги зі своїм директором редакції "Все про бухгалтерський облік", а як кожний із більш ніж 90-ти інших перекладачів. Але газета все ж давно стала для них незамінною, можна сказати, рідною. А ті, хто робить першу крок в бухгалтерські справи, дізнаються про безсумнівні достойності видання навіть не з реклам, а від старших товарищів, які передають його не перший раз. Відповідь на найбільш використані питання, міцну і різноманітну, зроблену в газеті.

Ivan-Frankivskie Mirske Upravlinnia Iuutilistii
ogoloshu torzand na zamishennia vakanstvoi
posadi spetsialista 1 kategorii vididuli RACI
Ivan-Frankivskoe Mirovskoe upravlinnia juutilistii.

Do uchasti u konkursi zaproszhuyoma gradomini Ukrainy z juridichnoю osivotoю, zdatni do svoimi osobistymi ta dli

IVAN-ФРАНКІВСЬКЕ МІСЬКЕ УПРАВЛІННЯ ЮСТИЦІЇ

оголошує конкурс на заміщення вакантної
посади спеціаліста I категорії відділу РАСІ
Іван-Франківського міського управління юстиції.

До участі у конкурсі призивають громадян України з юридичною освітою, здатні до своєї особистої та дієвої

овоспечених іншою документацією зазначеної у відомостях, з відомостями, з документацією, що до

Якщо відзнакою факта, джерело, інші — фіксації
користуваються електронною — ви можете анонімно по
відомити про це телефоном довіри облнебергера.

Адміністрація ВАТ "Прикарпаттяоблнеберега".

Західний полтос

Тел. студії: 775272; e-mail: ihor@1043.com.ua

Відкритий безготівковий розрахунок

вул. Василянович, 30, тел. 4-01-41
WORLD BANK FOR RECONSTRUCTION AND DEVELOPMENT
URBAN INFRASTRUCTURE PROJECT

Public Consultation Meeting
(Meeting Hall, 2 Botanichna Street, Ivano-Frankivsk)

Meeting Agenda

8.30 a.m.
O. Artemova – EA Expert, Industrial Waste Management Centre
Introduction to the Environmental Assessment process, EA Terms of Reference, EA requirements of Ukrainian legislation and World Bank, EA report structure

8.50 a.m.
Representative of Ivano-Frankivsk City Administration
Significance of proposed projects for the City of Ivano-Frankivsk

9.10 a.m.
Representative of Ivano-Frankivsk VodoEcoTechProm Water Utility
Presentation of proposed projects in the field of water supply and wastewater collection/treatment in Ivano-Frankivsk

9.30 a.m.
Questions, comments and discussion
WORLD BANK FOR RECONSTRUCTION AND DEVELOPMENT
URBAN INFRASTRUCTURE PROJECT

Public Consultation

as part of the Environmental Assessment of potential investment projects, aiming to improve the sanitary and epidemiological situation in the region through the provision of good quality municipal services

INVESTMENT AREAS:
- Water Supply;
- Wastewater Collection and Treatment.

IVANOFRANKIVSK

Water Supply:
- Purchase of Electrolytic Unit for Drinking water Disinfection;
- Rehabilitation of Groundwater Abstraction Plant Operated in Low-Flow Periods;
- Introduction of Improved Water Supply and Distribution System;
- Rehabilitation of Level III Water Pumping Station;
- Construction of Small-Size Hydropower Plant at the Water Intake Site;
- Construction of 800 mm Transmission Line from the Chernyivsky Water Treatment Plant to the Khryplin Water Pumping Station;
- Construction of Water Pumping Station with Clean Water Tank on the Tselevich Street;
- Completion of 800 mm Water Main Section between the Ivasyuk Street and Nadrichna Street.

Wastewater Collection and Treatment:
- Laying the 500 mm Sewer Collector on the Nova Street to Decommission the Existing Sewage Pumping Station at the Boiler Repair Plant No. 63;
- Rehabilitation of Pumping Capacity at the WwTP's Primary and Secondary Clarifier Sites, Construction of New Grit Chambers;
- On-site Sludge Management Facility for Natural Gas Generation (Design Development);
- Purchase of Equipment for Internal Inspection of Sewer Collectors.

It is also planned to procure the laboratory equipment for analysis of drinking water and effluent quality.

PUBLIC CONSULTATION MEETINGS

14 October 2005: Discussion of the EA report structure and ToR, and formulation of priority environmental issues.

November 2005: Presentation and discussion of EA report.

EA Team Leader: Olexander Kuzin, Deputy Scientific Director, USRIEP
EA Contact Person: Olena Artemova
Tel./Fax: (057) 702 15 78
(057) 715 60 93
E-mail: akousine@mail.ru
Press Release

Today, on 14 October 2005, the public consultation meeting was held in the Meeting Hall of Ivano-Frankivsk VodoEcoTechProm Water Utility (2 Botanichna Street) to discuss the proposed investment projects relating to the rehabilitation of water supply and wastewater management systems in Ivano-Frankivsk.

According to the policies and procedures adopted by the International Bank for Reconstruction and Development, the environmental assessment is required for all proposed urban infrastructure development projects, to be prepared in accordance with the Ukrainian legislation and WB EA policies and procedures.

Promoting positive public attitudes at all stages of project preparation and implementation is a very important aspect. The public consultation process, comprising 2 consultation meetings (prior to and after the preparation of EA report), and continuous monitoring of project implementation will be organized and undertaken to ensure that all views and concerns are taken into account, and all interested parties are involved, including environmental NGOs and individuals. Special feedback mechanism will be established, and relevant details will be published in local press.

The public consultation process has been initiated by the Industrial Waste Management Centre Association (the Environmental Assessment consultant) and Ivano-Frankivsk VodoEcoTechProm Water Utility, which is one of the major potential borrowers under the Urban Infrastructure Project in Ukraine.
Minutes of Public Consultation Meeting No. 1
World Bank's Urban Infrastructure Project

City of Ivano-Frankivsk, 14 October 2005

Meeting Venue: Ivano-Frankivsk Water Utility “VodoEcoTechProm”

Meeting Organisers: Association “Industrial Waste Management Centre”, Ivano-Frankivsk
Water Utility “VodoEcoTechProm”, Ivano-Frankivsk City Administration

Presiding Committee:
O. Artemova, Expert, IWMC Association
M. Tkachuk, Technical Director, Ivano-Frankivsk Water Utility “VodoEcoTechProm”
B. Bilyk, Head, Department of External Relations and Tourism, Executive Committee of
Ivano-Frankivsk City Council

PR Coordinator in the EA Process: V. Fushtei, Head, Information Analysis Department,
Ivano-Frankivsk Water Utility “VodoEcoTechProm”

Secretary: O. Tymchishina, Engineer, Ivano-Frankivsk Water Utility “VodoEcoTechProm”

The meeting was attended by 39 persons (the participant registration sheets are attached).

1. O. Artemova, IWMC Expert, briefed the participants that Ivano-Frankivsk is one of 5
cities, included into the World Bank’s Urban Infrastructure Project (along with Kharkiv,
Donetsk, Odessa and Chernihiv), and the Bank requires to undertake the
environmental assessment of projects proposed for funding. She informed that the
draft EA report would be prepared within the next 2-3 weeks, and the second public
consultation meeting would be held to discuss the EA findings. The objective of the first
public consultation meeting was to ensure that all interests of concerned public were taken
into account and establish the foundation for the public control mechanism.

2. B. Bilyk, Head, Department of External Relations and Tourism, Executive Committee
of Ivano-Frankivsk City Council, informed the participants that the Long-Term
Development Strategy, developed/adopted by Ivano-Frankivsk Water Utility, was used
as a basis for the selection of projects proposed for the Bank’s funding. The next
planned step would be the issuance of municipal bonds with a total value of 5 million UAH
in cooperation with the USAID, with the proceeds to be used for the improvement of
city’s external lighting system and provision of financial support to the Municipal
Heating Company, whose financial position was rather problematic. The participation of
Ivano-Frankivsk Water Utility in the World Bank project would promote further
investments to the city’s municipal infrastructure. He emphasized that there has been
growing recognition of the importance of environmental issues in the world. Of 18 on-
going investment projects in Ivano-Frankivsk, 10 incorporated the environmental agenda,
or related to the improvement of living conditions and vital services in the city.

3. O. Artemova, IWMC Expert, emphasized that social aspects were to be considered in
the environmental assessment of proposed projects.
4. M. Tkachuk, Technical Director, Ivano-Frankivsk Water Utility “VodoEcoTechProm”, presented proposed investment projects and emphasized that their primary objective was to improve the reliability of service, company’s sustainability and environmental performance. More specifically:

- **Proposed Water Supply Rehabilitation Projects:**

  a) Purchase of electrolytic disinfection unit would improve the operational reliability and water treatment quality, though economic benefits would be marginal;  
  b) Rehabilitation of groundwater abstraction plant, operated in low-flow periods, would also contribute to the improved reliability and constancy of water supply, especially during low-flow periods. It would be required to utilize appropriate technical solutions incorporated into the existing design of 1956 and existing technical facilities in the area of water intake and WTP site;  
  c) Introduction of improved water supply and distribution system would ensure economic benefits, stable water supply service without interruptions, reduction in frequency of accidents and related water losses, energy savings (estimated at about 40%, or approximately 2000 kW/month, for the Level III WPS. Various design solutions are available for this project component, including the one developed by Rivne Institute;  
  d) Rehabilitation of Level III Water Pumping Station and replacement of pumping equipment would ensure economic benefits through energy savings and improve the operational reliability of pumping capacity and rising mains;  
  e) Construction of small-size hydropower plant at the water intake site to meet the site energy demand would help reduce operating costs. The project idea is technically achievable, though significant amount of research and design effort would be required since no project design has been developed. There is a plan to construct low-head hydropower plants at both water intake sites by 2010;  
  f) Construction of 800 mm transmission line from the Chernyivsky Water Treatment Plant to the Khryplin Water Pumping Station would improve the reliability of water supply and help meet the city’s growing demand for water in the nearest future, particularly in the intensively developing city areas (Khryplin Industrial Zone, Cascade residential area, and Tysmenytsia);  
  g) Construction of Water Pumping Station with clean water tank on the Tselevich Street would help improve the constancy and reliability of water supply in the Pasichna residential area, which has been expanding so quickly that a new water intake site might be necessary to provide water to this area;  
  h) Completion of 800 mm water main section between the Ivasyuk Street and Nadrichna Street is also designed to meet the growing development needs of the Cascade and Tysmenitsia areas.

- **Questions with regard to water supply:**

  - **Ya. Bats**, computer engineer, Ivano-Frankivsk Water Utility “VodoEcoTechProm”: Does the project involve any improvements in automatic control of water supply system operation?  
    **Answer:** Yes, it is anticipated to develop and introduce the automatic control/management system, the city would be divided into service zones, and continuous automatic control of flows, supply volumes and distribution regime would be provided.  
  - **I. Lesiv**, shop foreman: What are other advanced alternatives to the use of sodium hypochloride for water disinfection?
Our Utility has already introduced a similar unit, being a pioneer in this field. Ozonation used to be considered as the most favourable option but views have changed due to high energy costs involved. Another alternative is the ultrasound technique, used in Japan, but its application is limited. No comparative analysis of options has been undertaken.

N. Karabin, Head, Municipal Utility Management Unit, Ivano-Frankivsk City Administration: What are current water losses and are there any plans to reduce them?

Answer: The introduction of improved water supply and distribution system with automatic control unit would facilitate the 10% reduction in water losses, from current 50% to 40%, as soon as by 2006. It is planned to take over useful experience of water system operators in Khmelnytskyi with respect to the identification of "hidden breaks". Pressure regulation in the system also helps achieve a reduction in water losses at about 10%.

Ya. Bats: What are the international averages for water losses?

Answer: Elsewhere in the world, water losses at about 25-30% are considered normal (this estimate includes direct losses, pipework flushing flows, use of drinking water for street watering purposes etc.), and optimal rate of water losses is considered to be no less than 15%.

V. Chornopysky, Deputy Head, Technical Department, Ivano-Frankivsk Water Utility “VodoEcoTechProm”: What is your vision with respect to the improvements in the company’s information management systems, particularly service accounting, fee collection and billing systems?

Answer: Recently introduced regulation requires the installation of pulse-type water meters at each individual apartment as a condition of a service provision license. With these meters, the access to an individual apartment is not required when meter readings are to be recorded. This option also enables the individual customer disconnection.

Wastewater Management System Rehabilitation Projects:

a) Laying the 500 mm sewer collector on the Nova Street to decommission the existing Sewage Pumping Station at the Boiler Repair Plant No. 63: Existing SPS is extremely energy-inefficient, consuming about 8000 kW/month, which is higher than total energy consumption by all other SPS’s in the city. The reason is the continuing use of old and inefficient pumping equipment. The decommissioning of this SPS and construction of new sewer collector would ensure significant savings, and the payback period for this project is about 8 years;

b) Rehabilitation of pumping capacity at the WwTP’s primary and secondary clarifier sites; construction of new grit chambers: existing sludge pumps are old and inefficient, and need to be replaced with modern, energy-efficient equipment. In the absence of any operational grit chambers, new grit chambers are needed to improve the treatment process efficiency, especially at the primary clarifier stage;

c) On-site sludge management facility for natural gas generation (design development): This is a very costly project (about 50% of the total investment budget), but its implementation is required due to the fact that the amount of sludge accumulated at the WwTP site is very large, it has not been transported
offsite since 1978, and the proposed sludge management facility would provide the capacity for sludge disinfection to enable its subsequent application in agriculture, which is a source of revenue for the WwTP. The biological gas could be utilized for on-site heating, energy generation for company's needs, thereby ensuring savings and improved reliability of energy supply;
d) Purchase of equipment for internal inspection of sewer collectors would facilitate improved control of network condition, identification, planning and prioritisation of repair efforts, so the benefits are obvious.

- Questions with regard to wastewater collection/treatment:

  L. Maistryshin, Head of Chemical/Biological Laboratory: Is there a plan to purchase the laboratory equipment to improve the company's analytical capability?
  Answer: Yes, this component is also included into the list of priority investments, because it is obvious that existing laboratory equipment is old and inefficient, and needs to be replaced.

5. O. Artemova thanked all participants for useful discussion and reiterated that all proposed projects relate to the rehabilitation and upgrade of existing water facilities, designed to improve the operational and environmental performance of existing facilities. It is therefore expected that the environmental assessment of proposed projects is likely to be positive. She invited to attend the second public consultation meeting for the discussion of EA findings, and informed that this meeting would be held in early November in the premises of Ivano-Frankivsk City Council.

Signatures:

Chairman of Presiding Committee

Secretary

PR Coordinator in the EA Process
Registration of Participants
B. Bilyk, Head, Department of External Relations and Tourism, Executive Committee of Ivano-Frankivsk City Council
Question from the Public - V. Chornopysky. Deputy Head, Technical Department. Ivano-Frankivsk Water Utility "VodoEcoTechProm"
The second public consultation – 10 November, 2005

Announcement in the Newspaper

Source: the city newspaper “Zakhidny Courier”, 3 November 2005, No. 44 (993)

Ivano-Frankivsk VodoEcoTechProm Water Utility
Information Analysis Department
2 Botanichna Street. Ivano-Frankivsk Ukraine
Tel./fax: 380 (342) 775256

On 10 November 2005, at 16.00, in the conference hall of Central Public House, 1 Shevchenko Street, Ivano-Frankivsk, the WB, IWMC and Ivano-Frankivsk VodoEcoTechProm Water Utility will conduct public consultation on investment projects on rehabilitation of water supply and wastewater system in Ivano-Frankivsk city, to discuss the results of Environmental Assessment.

Representatives of City State Administration, deputies, trade unions, NGOs, political parties and mass media will take part in the consultation. Interested persons are welcome.
ГРОМАДСЬКІ СЛУЧАННЯ

10 листопада 2005 року о 16.00 в приміщені Народного дому наул. Шевченка, 1 відбудуться громадські слухання з обговорення інвестиційних проектів реконструкції систем водопостачання та водоохолодження м.Івано-Франківська та технічного забезпечення з екологічного оцінки даних проектів (гірф графік виконання, структура).
Запрошується всі зацікавлені особи та представники неза- довів організацій.

КП «Івано-Франківськводоекотехніон»

ОТРИМАТИ У ВЛАСНІСТЬ МАГАЗИН, КАФЕ ЧИ ОФІС — КОМЕРЦІЙНА
ІПОТЕКА ВІД РАЙФФАЙЗЕНБАНКУ РОБИТЬ ЦЕ ІЗ ЦІЛКОМ РЕАЛЬНИМ

Історією часом банки почали продовжувати українським підприємцям надавати кредити для комерційних цілей. Йдесть про кредити під за- твір комерційної нерухомості, в тому числі й для придбання цієї не- рухомості. У відповідно з економічним підходом з інвестиційних проектів, є можливість використовува- ти прийнятність магазинів та перпету- нів, офісні та виробничі цехи для отримання прибутку без обов'язко- них додаткових витрат на оренду.

Сполучаючи з банківським кредитом, підприємець поступово стає власником таких приміщень, спрацьовуючи, спрацьовуючи перспективу бізнесу та своєї долі. Якщо більша частина бізнесменів це 2-3 роки тому над- давала позови оренді таких площ, то вже багато вигоди від придбан- ня комерційної нерухомості очевидні — затрати, що вони почесе при виплаті кредиту, часто аналогічно до витрат на оренду приміщення. Але в першому випадку, підприємець стає влас- ником нерухомості, а в другому випадку гроші, сплачені за оренду при- міщення, для нього "втратили" на- об'єкт виступають особи, які вже орендують ці або подібні приміщен- ня та мають ним активно розвива- тися та здійснювати надлишкову фунда- мент для розвитку своїх підприємств. Бізнес розвивається і у компаній, що зв'язані в заняття, які вони готові вкладати у розвиток виробництва та у власні об'єкти нерухомості. У всьому світі кредитування на розвиток комерційної нерухомості є одним з найбільш цінними секторами фінан- сового ринку, що динамічно розвива- ється. Член європейської банкі- всього сім'ї Райффайзен банк український Райффайзенбанк є однією із фінан- сових установ, яка дуже динамічно нараховує свій портфель комерційної іпотеки. В умовах стрімкого розвитку іпотечного кредитування, банк пропонує кредити на купівлю, ремонт, реконструкцію, будівництво комерцій- них нерухомостей, а також інвести- ційний іпотечний кредит під заставу комерційної нерухомості.

Особливо інноваційним є інвести- ційний іпотечний кредит — його вар- то охарактеризувати детальніше. Цей вид кредиту покликаний допомоги купівлі нового обладнання, впровад- ження нових технологій, збільшення ассортименту товарів та послуг, тобто для більшого здійснення і підтримки влас- ного бізнесу, а так само резуль- тат від зміни власних доходів.

На сьогодні Райффайзенбанк Україна пропонує дуже широкий купівлю та кредити на розвиток комерцій- них відомих кредитних інструментів, як на- просив, клієнт може отримати кредит з найменшими витратами. Макси- мальний термін кредиту становить сім років, а відсоткові ставки є вище- ми зі схожих кредитних продуктів із інших банків. Усі кредитні продукти розглядаються індивідуально згідно з потребами клієнтів. До приоритетних напрямків співпраці з нашими позичальниками здійснюються завдання. Це включає такі рішення та спрощення аналіз діяль- ності суб'єкта господарювання, основні до уваги береться стан та ринкова вартість комерційної нерухомості.

ЗАПРОШУЄМО ДО СПІВПРАЦІ!

Телефон довідкового центру Райффайзенбанк Україна
WORLD BANK FOR RECONSTRUCTION AND DEVELOPMENT
URBAN INFRASTRUCTURE PROJECT

Public Consultation Meeting Agenda

(10.11.2005, 4.00 p.m., Meeting Hall of the Central Public House, 1 Shevchenko Street, Ivano-Frankivsk)

Presentation of the WB Urban Infrastructure in Ukraine Project and Discussion of Draft Environmental Assessment Report with Stakeholders and Public

1. Registration of participants and distribution of handout materials (water supply and sanitation project briefs)

2. O. Artemova, EA Expert, Industrial Waste Management Centre Association: Introductory speech, explanation of project status and meeting objective, discussion/adoption of agenda.

3. O. Sinyutka, Deputy City Mayor: Description of proposed investment projects and their significance for the City of Ivano-Frankivsk; attitude of local executive authorities towards the municipal utility sector and urgency of proposed improvements.

4. I. Palimon, Chief Engineer, Operations Department, Ivano-Frankivsk VodoEcoTechProm Water Utility: Presentation of proposed projects in the field of water supply and wastewater collection/treatment in Ivano-Frankivsk.

5. O. Artemova, EA Expert, Industrial Waste Management Centre Association: Presentation of draft EA report, its key findings and conclusions; discussion of potential environmental impacts, both positive and negative, associated with the proposed project activity.

6. Comments and questions from the public.

WORLD BANK FOR RECONSTRUCTION AND DEVELOPMENT
URBAN INFRASTRUCTURE PROJECT

Public Consultation

as part of the Environmental Assessment of potential investment projects, aiming to improve the sanitary and epidemiological situation in the region through the provision of good quality municipal services.

INVESTMENT AREAS:

- Water Supply;
- Wastewater Collection and Treatment.

IVANO-FRANKIVSK

Water Supply:
- Purchase of Electrolytic Unit for Drinking water Disinfection;
- Rehabilitation of Groundwater Abstraction Plant Operated in Low-Flow Periods;
- Introduction of Improved Water Supply and Distribution System;
- Rehabilitation of Level III Water Pumping Station;
- Construction of Small-Size Hydropower Plant at the Water Intake Site;
- Construction of 800 mm Transmission Line from the Cherniyivskiy Water Treatment Plant to the Khryplin Water Pumping Station;
- Construction of Water Pumping Station with Clean Water Tank on the Tselevich Street;
- Completion of 800 mm Water Main Section between the Ivasyuk Street and Nadrichna Street; Purchase of Pipe Cementation Equipment;
- Purchase of Flow Meters;
- Purchase of Leak Detection Equipment. Wastewater Collection and Treatment:
- Laying the 500 mm Sewer Collector on the Nova Street to Decommission the Existing Sewage Pumping Station at the Boiler Repair Plant No. 63;
- Rehabilitation of Pumping Capacity at the WwTP’s Primary and Secondary Clarifier Sites, Construction of New Grit Chambers;
- On-site Sludge Management Facility for Natural Gas Generation (Design Development);
- Construction of Cogeneration Plant to Provide Energy for the Yamnitsia Wastewater Treatment Plant in Ivano-Frankivsk Oblast;
- Rehabilitation of Sewage Pumping Capacity;
- Purchase of Equipment for Internal Inspection of Sewer Collectors.

It is also planned to procure the laboratory equipment for analysis of drinking water and effluent quality.

PUBLIC CONSULTATION MEETINGS

14 October 2005: Discussion of the EA report structure and ToR, and formulation of priority environmental issues.
10 November 2005: Presentation and discussion of EA report.

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Press Release

Today, on 11 November 2005, the public consultation meeting was held in the Meeting Hall of the Central Public House (1 Shevchenko Street) to discuss the proposed investment projects relating to the rehabilitation of water supply and wastewater management systems in Ivano-Frankivsk.

More specifically, the proposed project involves the provision of loan funding for the improvement of the city's infrastructure, sanitary and epidemiological situation, and municipal service quality. The list of proposed project components is presented below:

Ivano-Frankivsk

**Water Supply:**
- Purchase of Electrolytic Unit for Drinking Water Disinfection;
- Rehabilitation of Groundwater Abstraction Plant Operated in Low-Flow Periods;
- Introduction of Improved Water Supply and Distribution System;
- Rehabilitation of Level III Water Pumping Station;
- Construction of Small-Size Hydropower Plant at the Water Intake Site;
- Construction of 800 mm Transmission Line from the Chernyivsky Water Treatment Plant to the Khryplin Water Pumping Station;
- Construction of Water Pumping Station with Clean Water Tank on the Tselevich Street;
- Completion of 800 mm Water Main Section between the Ivasyuk Street and Nadrichna Street; Purchase of Pipe Cementation Equipment;
- Purchase of Flow Meters;
- Purchase of Leak Detection Equipment.

**Wastewater Collection and Treatment:**
- Laying the 500 mm Sewer Collector on the Nova Street to Decommission the Existing Sewage Pumping Station at the Boiler Repair Plant No. 63;
- Rehabilitation of Pumping Capacity at the WwTP's Primary and Secondary Clarifier Sites, Construction of New Grit Chambers;
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- Rehabilitation of Sewage Pumping Capacity;
- Purchase of Equipment for Internal Inspection of Sewer Collectors.

It is also planned to procure the laboratory equipment for analysis of drinking water and effluent quality.

According to the policies and procedures adopted by the International Bank for Reconstruction and Development, the environmental assessment is required for all proposed urban infrastructure development projects, to be prepared in accordance with the Ukrainian legislation and WB EA policies and procedures.

The Environmental Assessment process has now been undertaken for all proposed investment project components. The EA results demonstrate significant social benefits of these project components, associated with the improved reliability and quality of water supply and sanitation service in Ivano-Frankivsk. The implementation of proposed projects will result in the provision of proper quality services to the city population. These projects will not involve any human resettlement programmes, and their potential environmental impacts on air quality, water resources and landcover, flora and fauna, landscape,
vegetation cover and existing utilities are expected to be at or below the guideline levels, specified by the national legislation and regulations.

Since promoting positive public attitudes at all stages of project preparation and implementation is a very important aspect, the EA results have been presented to and discussed with a broad range of various stakeholder groups.

The public consultation process has been initiated by the Industrial Waste Management Centre Association (the Environmental Assessment consultant) and Ivano-Frankivsk VodoEcoTechProm Water Utility, which is one of the major potential borrowers under the Urban Infrastructure Project in Ukraine, and the Ivano-Frankivsk City Administration.
3. Palimon, Chief Engineer, Operations Department, Ivano-Frankivsk VodoEcoTechProm Water Utility: provided a brief overview of all proposed project components, specifically:

- **Water Supply:**
  - Purchase of Electrolytic Unit for Drinking water Disinfection;
  - Rehabilitation of Groundwater Abstraction Plant Operated in Low-Flow Periods;
  - Introduction of Improved Water Supply and Distribution System;
  - Rehabilitation of Level III Water Pumping Station;
  - Construction of Small-Size Hydropower Plant at the Water Intake Site;
  - Construction of 800 mm Transmission Line from the Chernyivsky Water Treatment Plant to the Khryplin Water Pumping Station;
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  - Purchase of Flow Meters;
  - Purchase of Leak Detection Equipment;

- **Wastewater Collection & Treatment:**
  - Laying the 500 mm Sewer Collector on the Nova Street to Decommission the Existing Sewage Pumping Station at the Boiler Repair Plant No. 63;
  - Rehabilitation of Pumping Capacity at the WwTP's Primary and Secondary Clarifier Sites, Construction of New Grit Chambers;
  - On-site Sludge Management Facility for Natural Gas Generation (Design Development);
  - Construction of Cogeneration Plant to Provide Energy for the Yamnitsia Wastewater Treatment Plant in Ivano-Frankivsk Oblast;
  - Rehabilitation of Sewage Pumping Capacity;
  - Purchase of Equipment for Internal Inspection of Sewer Collectors.

He also provided an overview of expected socio-economic benefits of proposed projects and emphasized their significance, not only for the Ivano-Frankivsk Water Utility, but for the region as a whole.

### Summary of questions and answers on the technical aspects of proposed projects:

1. **M. Melnikovich, Head, Energy Saving Department, City Council Executive Committee:** Does the practice of constructing/operating low-head hydropower plants at the water abstraction sites exist in Ukraine?

   **Answer:** There are no operational systems of this type in Ukraine, but a similar plant is being constructed in Borislav (Lviv Oblast), to be commissioned in 2006. Similar facilities has been successfully constructed and operated in other countries.

2. **V. Melnyk, Deputy Head, Oblast Municipal Utility Management Department:** What criteria have been used for prioritisation of proposed projects?

   **Answer:** The projects with the shortest payback periods were ranked highest.
4. **O. Artemova**, EA Expert, Industrial Waste Management Centre Association: informed that participants that the presented EA report was only a draft, therefore any comments and revisions would be welcome. The final EA report would be submitted to the World Bank by the end of November. Explained the differences between the initial EA process and the detailed EIA, which would have to be prepared in accordance with the Ukrainian legislation at the detailed design/feasibility study phase of the project.

She informed the participants that the EA study addressed the potential impacts of proposed project activity on air quality, water and land resources, flora and fauna, landscape and vegetation cover. The EA results indicate that these impacts are likely to be associated with the construction phase, and would be mitigated in accordance with existing regulations by adopting proper construction and operational practices.

She emphasized the need for enhancing the analytical capability of Ivano-Frankivsk Water Utility in order to ensure proper control of water quality and operational performance of wastewater treatment plant.

5. **O. Sinyutka**, Deputy City Mayor on Economic Issues: noted that the level of completed environmental assessment was considered to be adequate and expressed hope that the EA report would be finalized and submitted to the World Bank as soon as possible, so that the Urban Infrastructure Project could move on to the next phase. He thanked the participants for their interest and concern with respect to environmental issues, and expressed hope for a positive lending decision by the Bank.

**Signatures:**

Chairman of Presiding Committee

Secretary

PR Coordinator in the EA Process
Preparation for Consultation Meeting
I. Pallmon, Chief Engineer, Operations Department, Ivano-Frankivsk
VodoEcoTechProm Water Utility