Ramboll Barents AS

UNEP-GEF Project

Russian Federation – Support to the National Programme of Action for Protection of the Arctic Marine Environment

PRE-INVESTMENT STUDIES

Modernization of Waste Water System in the Kachgort and Bondarny Settlements in Naryan-Mar of the Nenets Autonomous Okrug

FINAL REPORT

Project is financed by:

UNEP GEF

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ABBREVIATIONS

BOD - Biological oxygen demand
EBRD - European Bank of Reconstruction and Development
EIA - Environmental impact assessment study
EPS - Environmental Protection System
FER - Fuel and energy resources
FTP - Federal target programme
GEF - Global Environment Facility
HSE - Health, Safety and Environment
IACS - Instrumentation and automated control systems
IFC - International financial corporation
IFO - International financial organisation
IP - Investment project
IRR - Internal rate of return
ME - Municipal entity
MPD - Maximum Permitted Discharge
MUE - Municipal unitary enterprise
NECO - Northern Ecological Financial Corporation
NDEP - Northern Dimension Environmental Programme
NIB - Nordic Investment Bank
NPV - Net present value
OAO - Open Joint Stock Company
OOO - Limited liability company
PINS - Pre-investment studies
SAS - Surface active substances
SAP - Strategic Action Programme
SSAS - Synthetic surface active substances
TD - Town district
TEP - Technical and engineering personnel
UNEP - United Nations Environmental Programme
WPS - Water pumping station
WSF - Water and sewage facilities
WWPS - Waste water pumping station
WWTF - Waste Water Treatment Facilities

CONTENT

SUMMARY

Project title	Modernization of waste water system in Kachgort and Bondarny settlements in Naryan-Mar
Project owner	Naryan-Mar Municipal Unitary Enterprise Joint Boiler and Heating Systems
Branch	Municipal services, water supply and sewage
Brief description of IP and its benefits	The existing waste water treatment facilities in the Kachgort and Bondarny settlements in Naryan-Mar are in poor condition due to poor construction and outdated methods of wastewater treatment. Treated wastewater that does not meet the environmental requirements is discharged into water bodies that drain directly into the Pechora River. The existing WWTF in Kachgort and Bondarny are assessed as posing a hazardous risk to the local and regional environment, including the Arctic marine environment. In addition it is assessed as posing a hazardous risk to the health of workers and local residents. The IP provides for construction of new wastewater treatment facilities in both Kachgort and Bondarny are based on prefabricated block modular small treatment plants. The IP provides a solution for current and future capacity for waste water treatment with a level of treatment that meets the environmental requirements. Project implementation is assessed as contributing to reducing negative environmental impacts on the Arctic environment; improving the health of workers and local residents; and a positive development of wastewater treatment in the Nenets Autonomous Okrug.
Project implementation period	**2 years**
Total investments	**1 954 500 euro**

Total project costs, RUB

	Component	Cost	
		roubles	euro
1.	**Capital costs, Kachgort WWTF**		
	Engineering surveys	3 000 000	68 200
	Procurements and assembly	40 000 000	909 100
	Connection to the network	5 000 000	113 600
	Total, Kachgort WWTF	**48 000 000**	**1 090 900**
2.	**Capital costs, Bondarny WWTF**		
	Engineering surveys	3 000 000	68 200
	Procurements and assembly	30 000 000	681 800
	Connection to the network	5 000 000	113 600
	Total, Bondarny WWTF	**38 000 000**	**863 900**
	Total cost, IP	**86 000 000**	**1 954 500**

Financing plan, RUB

Investment Costs, Kachgort	2011	2012	TOTAL	Share, %
International funding, loan	19 200	0	19 200	40%
Grant	9 600	0	9 600	20%
Local funding	19 200	0	19 200	40%
Total Planned Investment	**48 000**	**0**	**48 000**	**100%**

* Change in particular years of project implementation will require adjustment of financial indicators of the project.

Investment Cost, Bondarny	2011	2012	TOTAL	Share, %
International funding, loan	15 200	0	15 200	40%
Grant	7 600	0	7 600	20%
Local funding	15 200	0	15 200	40%
Total Planned Investment	**38 000**	**0**	**38 000**	**100%**

* Change in particular years of project implementation will require adjustment of financial indicators of the project.

Financial analysis

Internal rate of return, IRR	Kachgort - the internal rate of return (IRR) is 11%. Bondarny – the internal rate of return (IRR) is 7%.
Net present value, NPV	Kachgort – based on the analysis, NPV with the discount rate of 5% is 33 million roubles. Bondarny – NPV with the discount rate of 5% is 9 million roubles.
Sensitivity of IP	Kachgort – the investments are not sensitive to changes in operational costs. The investments are more sensitive to changes in sales income and fixed assets expenses. In case the sales income and fixed assets expenses are increased by 12%, NPV will decrease to 10%. Bondarny - the investments are not sensitive to changes in operational costs. The investments are more sensitive to changes in sales income and fixed assets expenses. In case the sales income and fixed assets expenses are increased by 12%, NPV will decrease to 6%.
Commercial risk	• Sources for co-financing from the budget different levels (municipal, Okrug, regional) are not approved. • Difficulties in financial negotiations with Naryan-Mar Administration and the Project Owner.

1. INTRODUCTION

1.1 Description and Assignment

The present report summarises the work related to preparation of regional pre-investment studies (PINS) for modernisation of the waste water system in Kachgort and Bondarny settlements of Naryan-Mar. The work has been undertaken within the frames of the project "Russian Federation – Support to the National Programme of Action for Protection of the Arctic Marine Environment (NPA Arctic Project)". The overall aim of the project is to protect the global marine environment in which the Arctic plays a fundamental role. More specifically, the program shall contribute to developing and establishing a sustainable framework to reduce environmental degradation of the Russian Arctic from land-based activities on a systematic basis. NPA Arctic has been established through cooperation between the Ministry of Economic Development of the Russian Federation and United Nations Environmental Program (UNEP) and is financed by the Global Environment Facility (GEF).

The NPA Arctic Project is coordinated by the Executive Directorate of the National Pollution Abatement Facility, NPA Arctic Project, and consists of four main components:

1. Preparation and adoption of a Strategic Action Program (SAP)
2. Completion of a set of Pre-Investment Studies (PINS)
3. Development and implementation of the Environmental Protection System (EPS) consistent with the SAP
4. Implementation of three demonstration projects:
   i. preservation of indigenous people's traditional lifestyle
   ii. oil contamination remediation using marine alga
   iii. environmental remediation of decommissioned military bases

Ramboll Barents was given the assignment to develop pre-investment studies for 5-8 selected Investment Projects (IP) in the Central Arctic Region of Russia which includes the Arkhangelsk Region, Nenets Autonomous Okrug and the Republic of Komi. Initially, in the project selection phase, reference was given to the Hot Spot List of the Barents Region. However, the main criteria for selection of IP have been to comply with the overall and specific objective of the Project aim. Furthermore, the IPs have been proposed and supported by the regional authorities.

The following 5 IP in the Central Arctic Region of Russia have been selected and described in separate reports:

<u>Komi Republic</u>

1. Modernization of the Landfill for Municipal Solid Waste Disposal in Vorkuta.
2. Modernization of sewage water treatment system in Vorkuta.

<u>Arkhangelsk region:</u>

3. Land remediation from oil products in water protection zone of Northern Dvina River of White Sea basin near settlement Krasnoe of Primorsky district of Arkhangelsk Region.
4. Construction of new sewage treatment facilities in Lesnaya Rechka residential district of Arkhangelsk.

<u>Nenets Autonomous Okrug:</u>

5. Modernization of Waste Water Treatment Facilities in Settlements Kachgort and Bondarny in Naryan-Mar.

The project of Modernization of Waste Water System in the Settlements Kachgort and Bondarny in Naryan-Mar is one of the priority projects for the Nenets Okrug (Annex 1). The project was recommended by the Administration of the Nenets Okrug for pre-investment study development. Department of Natural resources and Environment of the Nenets Okrug provided full support in preparation of the pre-investment studies report and intends to contribute to the further promotion of the project. Regional and local authorities are extremely interested in the implementation of the IP, as existing WWTP represent an environmental threat to the local and regional environment, including the marine Arctic environment.

The key objective in this report is to define the technical and economical parameters for modernization of the waste water system in the settlements of Kachgort and Bondarny in Naryan-Mar.

Modernization of the waste water treatment facilities (WWTF) in the Kachgort and Bondarny settlements is two separate projects. As requested by the Naryan-Mar Municipal Administration, these two projects were joined into one for PINS development. When uniting these projects, some other factors were taken into account as well. Both WWTF are a part of the unified waste water system in Naryan-Mar that includes three WWTF: Town WWTF, Kachgort WWTF and Bondarny WWTF. The current situation on both WWTF is very complicated and requires urgent actions. The Kachgort and Bondarny WWTF are operated by the Naryan-Mar Municipal Unitary Enterprise Joint Boiler and Heating Systems.

1.2 Report Structure

In compliance with the requirements of the Terms of Reference, the PINS should include the following information: information about the owner of the project; description of the investment project; environmental and social assessment of the project; status of the investment project and its implementation activities; project financial viability assessment; legal or any other restrictions for Russian and foreign investors; assessment of potential risks and justification of selection and other additional information relevant to the investment project.

Chapter 1 – Introduction. **Chapter 2** describes the town of Naryan-Mar, including its geographical position, demographical situation, ecological condition and social and economical situation. **Chapter 3** contains information about the owner of the project – the Municipal Unitary Enterprise (MUE) Joint Boiler and Heating Systems, a brief description and the current financial status. **Chapter 4** contains information about the current status of the investment project, description of alternative options for modernization of the waste water system and description of proposed technical solutions for implementation of the IP. Project cost estimates are presented in **Chapter 5**. **Chapter 6** includes an assessment of the environmental and social impacts of the investment project. **Chapter 7** describes project financial viability. **Chapter 8** covers project implementation status and arrangements. **Chapter 9** deals with risk assessments and selection justification. **Chapter 10** – Conclusions.

In addition to the above mentioned information presented in the relevant Chapters, the Report contains additional information which gives a more complete picture of current aspects and opportunities for implementation of the investment project.

2. DESCRIPTION OF NARYAN-MAR, KACHGORT AND BONDARNY SETTLEMENTS

2.1 Geographical Position and Demographics

The Nenets Autonomous Okrug (NAO) is located in the North-East of the European part of the Russian Federation (Fig. 1) and is a part of the Arkhangelsk region (both territorial and administrative).

Fig. 1. NAO Location on the map of Russia

NAO includes the islands of Kolguev, Vaigach, Gulyaevskie Koshki, Pesyakov, Dolgy and others, smaller ones (Fig. 2). The area of the Okrug is 176 810 square km.

Fig. 2. Map of the Nenets Autonomous Okrug

In the south-west it borders the Mezen County of the Arkhangelsk region, in the south and south-east – the Komi Republic, and in the north-east – the Yamalo-Nenets Okrug.

In the north and north-west the Okrug is washed by the seas of the Arctic Ocean. Almost the whole area of the Okrug, apart from the far south-west, is located above the Polar Circle. The largest inland distance from the north to the south is approx. 320 km, from the west to the east – 950 km.

The Okrug takes an exclusive place among the northern regions of the European part of Russia in hydrocarbon reserves. Its subsurface resources amount to 52.7% of the total hydrocarbon resources of the Timan and Pechora oil and gas province. 76 onshore hydrocarbon fields have been discovered in NAO, including 65 oil fields, 2 gas and oil fields, 1 oil and gas field, 4 oil, gas and condensate fields and 4 gas and condensate fields. The total oil reserves are estimated at 1 225 million tons, gas reserves – at 470 billion m^3. The forecasted resources amount to 2.4 billion tons of oil and 1.1 trillion m^3 of gas. The large oil fields are: the Kharyaga field, the field named after R. Trebsa, the South-Khylchuouskoe and Toraveiskoe fields, the field named after A. Titov and others; the large gas fields are: the Layavozhskoe, Koumzhinskoe, Vaneivisskoe, Vasilkovskoe and Korovinskoe fields.

As of 1 January 2009 the permanent population of the Nenets Autonomous Okrug amounted to 42 023 people. In the period from January to August 2009 the natural increase in the population was (+) 163 persons, the increase in population due to migration - (+) 77 persons. The Okrug population is represented by people of over 50 different nationalities: the Nenets – 16,7%, the Komi – 11%, Russians – 62,4%, the Ukrainians – 4,2%. The number of population of other nationalities is small.

Within the frames of Federal Law No. 131-FZ dated 06.10.2003 "On General Principles of Municipal Government in the Russian Federation" two administrative units were established in the Nenets Autonomous Okrug, i.e. the town municipality Naryan-Mar and the municipal district Zapolyarny. The municipal district includes one town and 18 rural settlements.

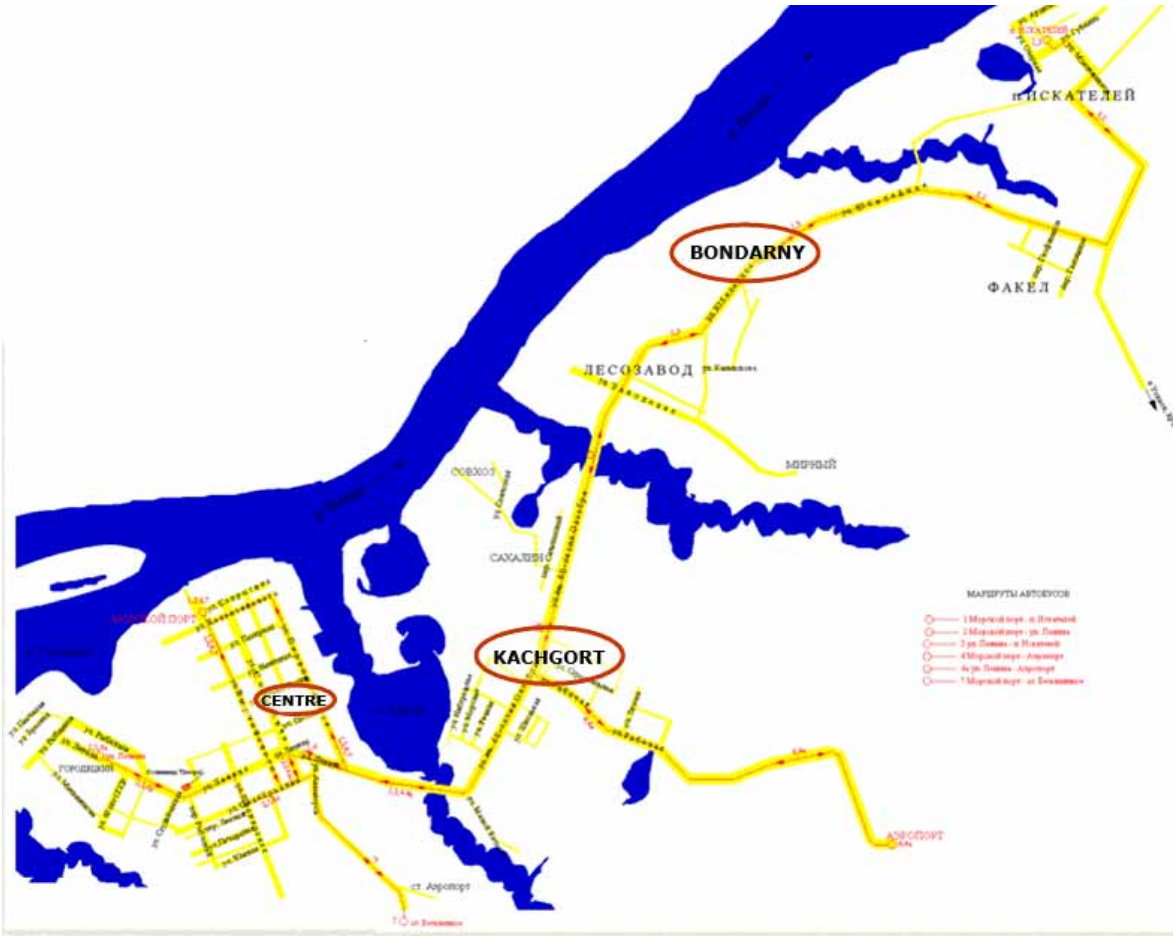


Fig. 3. Map of Naryan-Mar with location of Kachgort and Bondarny Settlements

The town of Naryan-Mar is the administrative centre of the Nenets Autonomous Okrug (**Ошибка! Источник ссылки не найден.**). It is located above the Polar Circle, in the mouth of the Pechora River, 125 km away from the Pechora Sea coast. The town consists of settlements stretching along the Big Pechora River bank, and separated from each other by natural water barriers – the Lake Kachgort, the Lesozavodskaya Kuriya Bay and the Zakhrebetny Bay. The distance from the Central (main) district of the town to the Iskateley settlement is 9.0 km. The maps of the settlements of Kachgort and Bondarny are given in Annexes 2 and 3 correspondingly. The town has an area of 49 km^2. According to the statistics as of 01.01.2009, the number of population in Naryan-Mar is 19 456 people, that is 46.3% of the NAO total population.

The distance to Arkhangelsk by water is 1097 km, by air – 650 km. The nearest railway station is Usinsk located at the distance of 376 km by a winter road.

Naryan-Mar is an industrial base of geological exploration in the Timan and Pechora oil and gas province, and an accommodation place for rotational workers involved in development of the tundra and offshore (the Barents Sea) fields. The geologists' settlements within the town of Naryan-Mar and in the suburbs can provide accommodation with all required facilities and infrastructure.

2.2 Description of Natural Environment

The climate is subarctic, moderately continental. The town is located in the permafrost area and has Polar Night in December and January. The winter is quite mild for the Far North due to impact from the Barents Sea, however, spring and autumn are long and cold and the summer is chilly. The average day temperature reaches positive values as late as in May, and comes back to negative values as early as in the beginning of October. The absolute minimum air temperature registered is -48°C (December 1978), the absolute maximum air temperature registered is +34°C (June 1990). Light frosts are possible in any of the summer months, and thaw - in winter months.

The climate peculiarities and variety are conditioned by the Okrug location on the Arctic coast, considerable, over 20^0, longitudinal extent from west to east and plain relief.

The Okrug climate is formed mainly by impact of Arctic and Atlantic air mass. Farther from the coast and farther from the west to the east, the more continental the climate is. The weather is unstable due to frequent change of air mass, movement of meteorological fronts and cyclones. In the western part winter lasts up to 180 days, in the eastern part – up to 230 days. In all parts of the Okrug the average annual temperature is negative, from -1^0C in the south-west to -9^0C in the north-east.

The annual precipitation is up to 280 mm in the north, up to 420 mm in the south, and up to 700 mm on the western slopes of Timan and Pai-Khoi. The minimal precipitation is in February, maximum – in August – September. At least 30% of precipitation is snow. Excessive humidity, conditioned by a low thermal level in combination with plain relief and hardly permeable and permafrost soil, contributes to a large number of bogs. There are frequent fogs, from 64 to 100 days per year on the coast and from 37 to 72 days per year in the areas far away from the coast. In summer and spring the northern wind prevails, while in winter and spring the southern wind is more frequent. The average wind speed is approx. 4-8 m/sec, while the maximum wind speed on the coast in winter time can exceed 40 m/sec.

2.2.2 Local Pollution

There are 27 enterprises and organizations in Naryan-Mar giving a certain impact on the environment. The largest of them are as follows:
OAO Myasoprodukty (meat products);
MUE Municipal Improvement Center;
MUE Naryan-Mar Electric Power Station;
Butter Diary Vita;
OAO Naryan-Mar Sea Commercial Port;
OAO Naryan-Mar United Air Squadron;
MUE Joint Boiler and Heating Systems;
a number of motor transport companies;
a number of geological and geophysical enterprises;
and others.

Atmospheric Air
The enterprises pollute the atmosphere with carbon black, carbon oxide and heavy metals (lead). The volumes of such emissions reach 1500-2000 tons/year. During the recent years there has been an increase of emissions from motor transport (6%).

Solid waste
Quite a large volume of solid domestic waste, scrap metal and debris is generated in Naryan-Mar (7000 – 8000 tons/year) incuding the toxic waste. The prevailing is domestic waste, including solid waste (domestic rubbish: food waste, card board, paper,

plastic, glass, scrap metal, carpenter's waste, tree branches, debris, etc.) and liquid waste (mainly, contents of the cesspools and catch pits). Recently due to implementation of the programmes of demolition of hazardous, ramshackle dwelling houses and unauthorized facilities the share of wooden waste in the total solid domestic waste volume has increased.

Since an equipped waste compound is not available, this waste is taken out to the landfills in the suburbs. The Naryan-Mar town landfill currently in operation is located 3.6 km away from the residential houses, to the south-east from the Central district, in the area of the sand pit. Now the thickness of the waste level reaches 1-2 meters. Liquid domestic waste is accumulated in the waste lower level. There are not any rain water discharge, treatment and filtration system and water resistant barrier, the waste disposal regulations are not observed. There is a real hazard for the town water intake facilities to get polluted. Frequent cases of landfill ignition lead to pollution of atmospheric air. There are no observation boreholes in the landfill area, which gives no possibility to monitor impact from the landfill to the quality of ground water. The existing landfill does not meet sanitary and hygienic requirements and itself represent a potential source of environmental pollution.

In the past the Naryan-Mar local government authorities took some actions to improve the solid domestic waste disposal process. For example, in 2003 on the initiative of the Naryan-Mar municipal administration the State Enterprise Research and Design Bureau Ecoinzh (St. Petersburg) developed a design for construction of a solid domestic waste compound with a total capacity of 200 thousand tons, operation period of 20 years and annual capacity of 10 000 tons. However, due to lack of financing, the project was not implemented.

Now a special land plot is assigned for all-town compound of solid and liquid domestic waste and its access road. The land plot includes also the area of the existing solid and liquid domestic waste landfill. In 2009 the Naryan-Mar Municipal Administration allocated financing for construction of a new solid domestic waste compound, including funds for next years, from the municipal budget.

Water facilities

Naryan-Mar enterprises discharge poorly treated water, containing biogens, surface-active substances, synthetic surface-active substances weighted and other substances into the Pechora River, directly or through a town system. The maximum discharge (over 900 000 m^3/year) is from MUE NaryanMarGorkomservice. The Pechora Fish Factory discharges over 30 000 m3/year.

The considerable contribution to pollution of water in the Gorodetsky Shar Channel and the Pechora River is made by the Naryan-Mar Sea Commercial Port, as well as private river shipping companies and owners of small-size river boats, with parking places within the town area along the Gorodetsky Shar channel.

The port receives both sea and river vessels providing annual ("northern") supply of goods for life of population and operation of enterprises of the Okrug. The duration of the sea navigation is 135-150 days per year. The port has 6 tug boats, auxiliary vessels, pilot's boat and 2 out-of date vessels for collection and disposal of solid and liquid waste, including oil-containing waste and waste from coming vessels. Approx. 100 m^3 of oil-containing water and approx. 400 m^3 of waste water are collected per year. This water is transported to the town landfill.

The port uses approx. 100 000 m^3 of water for own needs: the water is coming from the town water supply pipeline. 84 000 m3 of this volume is used for industrial needs, and 16 000 tons – as drinking water and for vessels bunkering. There are no storage tanks in

the port, which is the waste water is discharged into the Pechora River without any treatment.

According to the NAO Department of Natural Resources Management and Ecology, high concentration of polluting substances have been registered in the water of the Gorodetsky Shar Channel in the last years, considerably exceeding the natural background. Concentration of biogenic elements, like ammonia nitrogen, nitrate nitrogen, phosphorus, has reached the values of 0,6 mg/l, 0,4 mg/l, 0,35 mg/ respectively. Concentration of easy-oxidable organic substances (BOD_5) is 4,1-6,0 mg/l, phenol – 0,05-0,01 mg/l, and oil products – 0,06-0,1 mg/l. The channel water pollution level for the period from 1980 to 2000 is evaluated as highly polluted (using complex indices) , for the period from 2000 to 2004 – as transitional from quite polluted to highly polluted (Nikanorov and others, 2007).

The existing local pollution sources caused by human activities produce a negative impact on the Pechora River, which flows into the Pechora Sea and further into the Barents Sea. Based on available data on pollution level of the town water facilities the Naryan-Mar Municipal Administration regards WWTF as a facility presenting the highest risk both for local population and for regional, and also Arctic marine environment. Mitigation of the negative impact will result in improvement of the environmental situation in the Pechora Sea basin, and will have a positive effect on improving the Arctic marine environment.

2.3 Economic status and future perspectives

2.3.1 Economic status

The natural resources sector is a leading sector in the development of the Nenets Autonomous Okrug. Production of the oil sector forms 90% of the overall volume of industrial products of the Okrug. Oil production has become a leading sector defining the social and economic status of the region. Due to the fact that the maturity of explored oil reserves in the Okrug is 8% and gas – less than 1% the Nenents Autonomous Okrug is considered one of the promising regions of Russia in terms of development of the national oil production. Along with oil and gas the fuel and energy sector of the Okrug includes black coal; emersions of manganese, copper, nickel, molybdenum, gold, and diamonds were found. However they are not explored. Emersions of lead and zinc and copper ore were identified on the Vaygach Island.

According to the information from Naryan-mar Administration the analysis of social and economic situation is being performed for the whole okrug because in general all industrial development is focused around the oil and gas sector. The Administration is not conducting deep statistic account due to complexity of its performance. So, for example, many companies are registered in Naryan-Mar but are in fact acting outside of it. Presented below, for information purposes, is the general information about economic activity in NAO which gives partially the understanding of Naryan-Mar's development, taking into consideration that its population amounts to half of the population of the Okrug.

Over 1 028 enterprises and organizations conduct their activity on the territory of the Nenents Autonomous Okrug. Fuel industry takes over 90% in the structure of industrial production of NAO. The largest oil producing companies as of 01.01.2007 are OOO Lukoil-Komi (43% of oil production), OOO Company Polyarnoe Siyanie (9% of oil production), OAO Northern Oil (OAO NK Rosneft) (32% of oil production), OAO Total E&P Russie (7% of oil production).

Afro-industrial sector of the Nenents Autonomous Okrug is a constituent of the regional economy and a source of life support for the indigenous population. Due to natural climactic conditions the agriculture of the Okrug is focused mainly on the branches traditional for the Okrug – deer breeding and fisheries. The structure of AIS of the Okrug is represented by agricultural, fishing, processing enterprises, communities and family households.

The portion of trade, vehicle, household and personal items repairs forms over 30% of the total number of enterprises. The share of enterprises dealing with industrial activity and construction is not large. The rest are transportation enterprises, communication, agriculture, various types of paid services, publishing and printing activities, production of non-metallic mineral products etc.

In 2009 the volume of construction activities dropped significantly. In January-September 2009 the volume of construction amounted to 4 972.9 million rubles which is 52,8% lower than the level of the corresponding period of the previous year. Residential construction also dropped considerably. In January-September 2009 208 flats with a total area of 11.6 thousand square meters of residential premises were commissioned on the territory of the Okrug by companies of all ownership types as well as at the expense of the population, this is 45.5% to the level of January-September 2008.

2.3.1 Employment and income level

The average staffing of enterprises including the small-scale business (not taking into account employees holding a second job) as of January-August 2009 amounted to 28 551 persons and decreased as compared to the corresponding period of the previous year by 6.4%. The average staffing of enterprises against types of economic activity is presented in Table 1.

Table 1: Average staffing of enterprises against types of economic activity

Type of economic activity	January – August 2009, persons	In % to January-August 2008
Total	**28 551**	**93,6**
including:		
Agriculture, hunting and forestry	1 330	97,9
Fisheries, fish farming	361	95,5
Mining	6 429	81,7
Manufacturing activities	325	93,9
Production and distribution of power, gas and water	1 332	143,4
Construction	2 779	79,3
Wholesale and retail trade; car, motorcycle, household and personal items repairs	828	107,1
Hotels and restaurants	767	76,1
Transportation and communication	3 368	102,0
Financial activities	234	93,2
Real estate operations, rent and services	2 234	90,0
State governance and provision of military safety; welfare services	2 061	100,9
Education	3 411	104,5
Public health services and social services	1 888	101,3
Other housing and utilities, social and personal services	1 204	107,8

* The data is given against the types of economic activity formed on the basis of information provided by companies against each type of their activity, on full range of companies

The most employees are registered in the following spheres:

- mining - 25,5% (6 429 persons),
- transport and communications - 11,8% (3 368 persons),

- construction - 9,7% (2 779 persons),
- state-financed sphere - 30,0% (8 564 persons).

Average wage per one employee in the companies of the Okrug including small-scale business in January-September 2009 amounted to 43 389.2 rubles and grew in comparison with the corresponding period of 2008 by 8.2%. The average wage in the Okrug amounted to approximately 160% to the level of average wage in the Arkhangelsk region (17 529 rubles). The wage in the Okrug decreased by 6.2% during the same period.

In January-September income of the Okrug population decreased by 4.4% and amounted in average to 48 146.3 rubles per capita.

2.3.3 Federal and Regional Development Prospects of the Arkhangelsk region

In 2008 the Nenets Autonomous Okrug was included in the Arkhangelsk region. NAO should develop in close connection with the goals and directions of social and economic development of the Arkhangelsk region.

The Strategy of Social and Economic Development for the Arkhangelsk Region until 2030 (hereinafter referred to as the Strategy) was approved by the Executive Order of the Arkhangelsk region administration dated of 16.12.2008 № 278-ra/48. The Strategy was developed with account of the Concept of the Long-term Social and Economic Development of the Russian Federation until 2020. At the same time the strategy and tactic of developments in the Arkhangelsk Region are developed with account of local factors and specific social and economic environment.

The strategic aim of the Arkhangelsk region Government corresponds to the aims of the Russian Federation Government. The main aim of the regional Government - to achieve a high level of citizens' well-being and living standards – is divided into three aims of the second level:

1. Establishment of effective, dynamically growing and well-balanced economy of the region
2. Establishment in the region of favourable living conditions, environment for professional and creative fulfillment of the regional population
3. Provision of effectiveness of the executive authorities of the region

Sectoral priorities of the development of the Arkhangelsk region which are given in Table 2 were defined in the course of strategic analysis

Table 2: Sectoral priorities in economic development of the Arkhangelsk Region

1 priority	2 priority	3 priority	4 priority
• ship-building • machine-building • forestry enterprises • transport • tourism	• fuel and power production (oil refinery plant) • mining operations, apart from fuel and power resources • fisheries	• trade • food industry • electric power engineering, gas and water o scientific and educational branch	• chemistry and oil chemistry • communications and telecom • construction materials industry • construction • jewelry industry • agriculture • metallurgy • fuel and power

			resources production

The sectoral priorities of the Arkhangelsk Region correspond with the major directions of development of North-West Federal Okrug regions stipulated by the Concept of RF Development until 2020. Among the identified prospective directions are development of transportation services, military industrial establishment and ship-building, machine-building, extraction of oil and gas resources on the shelf, forestry as well as catch and processing of marine biological resources.

With a purpose of focusing the efforts and resources on solving the priority tasks aimed at achieving the objectives the key directions of Government activities under implementation of the Development Strategy were defined: within the sphere of economy, social sphere and efficiency of state government (Table 3).

Table 3: Main areas of activity of the Arkhangelsk region Government

Main areas of activity of the Arkhangelsk region Government
Economy
1. Establishment of conditions for development of priority economy sectors 2. Development and implementation of a strategy on the development of priority economy sectors 3. Competitive growth and modernization of the existing enterprises 4. Raise of investments and increase of investment of the Arkhangelsk region 5. Development of small-sized business and private enterprises 6. Establishment and guarantee of activity of development institutions 7. Security of access to the facilities and resources of the Federal Centre 8. Support and development of the agricultural sector of the Arkhangelsk region
Social Sphere
1. Along with the implementation of the earlier planned initiatives in culture, sports, education and social insurance of the population, the Administration will focus their strengths on the three most problematic sectors in which the Arkhangelsk region falls behind to other regions in Russia 2. Improvement and implementation of the demographical policy aimed at prevention of the population departure from the region
State Administration
1. Introduction of the management system according to the aims and results 2. Optimisation of business processes and institutional structure in accordance with a long-term strategy, aims and modern principals of effective organisations establishment 3. Advanced training of the regional administration personnel

The Strategy which identifies the long-term objectives and priorities of activities of the regional Government will be revised on an annual basis with account of changes in the changes within the economic and social sphere.

The Strategy for Arkhangelsk region was developed before the Nenets Autonomous Okrug was included in the structure of the region and part of authority was transferred to the Government of the Arkhangelsk region. Despite this fact the priority sectors stipulated by the Strategy correspond with the major industrial sectors of NAO which should contribute to the development of economic potential of the okrug.

2.3.4 Prospects of development of NAO and Naryan-Mar

In accordance with Article 26.6 of Federal Law No.184-FZ of 6 October 1999 "On basic principles of organization of legislative (representative) and executive bodies of state power of subjects of the Russian Federation" the authorities of state power bodies of the subject of the Russian Federation in the spheres of responsibility of the subjects of the

Russian Federation are to be carried out by these bodies individually at the expense of the budget of that subject of the Russian Federation. Some authorities of the bodies of state power of the subject of the Russian Federation which includes in its structure autonomous okrugs are to be conducted by the bodies of state power of the subject on its entire territory including the territory of autonomous okrug unless otherwise stipulated by the federal law.

Implementation of the above mentioned authorities by the bodies of state power of Arkhangelsk region has been implemented on the territory of NAO since January 1, 2009. Development of NAO, including the development of mineral resources sector which is the basis for economic development of the okrug should be considered one of the constituents of the Strategy of the Arkhangelsk region.

The Strategy if social and economic development of the Nenets Autonomous Okrug for the period until 2030 was developed by the Administration of the okrug in 2009 and at present is being reviewed by the Ministry of Economic Development of the RF.

2.3.5 Prospects of development of Naryan-Mar

According to the information from the Administration of Naryan-Mar there are no approved Programme and Plans of social and economic development of the city. The city administration is now working on the development of the Programme of social and economic development of Naryan-Mar but its completion is delayed by some difficulties. One of the reasons is that the city is dependent of the okrug. As mentioned above, oil and gas companies registered in Naryan-Mar conduct their activity outside the city; therefore a large portion of taxes does not reach the city budget but goes to the okrug and regional budgets. The dates of completion of this Programme are so far not defined.

However, the available information from NAO and Naryan-Mar Administrations and their activity in the last few years show some tendencies of development of the municipal sector of the city. Administration of Naryan-Mar gives consideration to improvement of the quality of life of the population. The major problems of the city economy are:

- Large number of city population live in buildings lacking amenities, the deterioration of which ranges from 70 to 100%.
- At the moment the city line for getting new housing is over 2.2 thousand families.
- The safety of residence is not provided to the population of Naryan-Mar.
- Low level of engineering infrastructure.
- Fragmentation of the city territory.
- Lack of territories suitable for construction.

Naryan-Mar has considerable problems in the sphere of housing and utilities due to the depreciation and obsolescence of main assets. At present the systems of water supply are decentralized. The water supply system of the Central District is generally ring-fed; the water supply to Kachgort is dead-ended.

The level of sewage in Naryan-Mar is very low. The gravity and pressure system with a complex of treatment facilities is constructed only in the central part of the city. The rest of housings are equipped with septic tanks and cesspits with transportation of accumulated sewage to the city landfill or discharge to the local terrain. Non-authorized equipment of housings with sanitary ware connected to the heating systems leads to overload of accumulation tanks. This results in flooding of the territory and pollution through the wells and single drills of underground waters which are used for water supply.

One of the main directions in development of the social sphere of the city is construction of social objects: schools, day-care centres, hospitals, sports facilities.

On the initiative of Administrations of Naryan-Mar and NAO the Administration of the Arkhangelsk region developed a long-term target programme of the Arkhangelsk region "Co-financing of construction of social and engineering infrastructure facilities on the territory of the Nenets Autonomous Okrug for the period of 2009-2011" (approved by the Decree of the Administration of the Arkhangelsk region No 219-pa/34 of 30 September 2008).

The list of programme activities in Naryan-Mar includes: construction of a secondary school, children's day care centre, engineering infrastructure facilities – reconstruction of WWTF in Settlements Kachgort and Bondarny. Implementation of the activities is envisaged for the period from 2009 till 2011. Individual activities will extend to 2012, 2013 and further years due to their considerable cost and limited regional budget. It should be noted that in 2009 the funds for reconstruction of WWTF in Settlements Kachgort and Bondarny were not allocated in 2009 within this Programme, the reason being the difficult financial situation.

The increase of the level of social and engineering infrastructure provision to Naryan-Mar population is one of the key purposes for the city administration in terms of municipal development. Taking into consideration that new buildings are being constructed in the city on a regular basis, a large number of population live in flats lacking amenities, the social facilities are being constructed there is a need to take immediate measures for improvement of the housing and utilities infrastructure of the city which at this moment can not provide for the needs of the city.

3. PROJECT OWNER – ASSESSMENT OF THE FINANCIAL POSITION

The main interested parties in this project are the Naryan-Mar Municipal Administration and MUE Joint Boiler and Heating Systems of Naryan-Mar. The project owner is MUE Joint Boiler and Heating Systems.

The contact details of the interested parties are given in Table 4 below.

Table 4: Contact Details

Project owner:	Naryan-Mar Municipal Unitary Enterprise Joint Boiler and Heating Systems	
Head:	E.Egiazaryan, Director	
Address:	166001, Naryan-Mar, Rabochaya str. 18a	
Contact person:	Alexander Alexandrovich Khabarov, Deputy Director for Water and Sewage Systems	
Telephone/fax:	+7 81853 43643	+7 81853 45311
E-mail:	teplo@atnet.ru	
Applicant:	**Naryan-Mar Municipal Administration**	
Address:	166000, Naryan-Mar, Lenina str. 12	
Telephone/fax:	+7 81853 42069	+7 81853 49971
E-mail:	goradm@atnet.ru	
Contact person:	Valentina Viktorovna Sautina, Deputy Head of the Administration for Infrastructure Development	
Telephone/fax:	+7 81853 49967; +7 911 550 6464	+7 81853 49971
E-mail:	goradm@atnet.ru	

3.1 Brief Description of MUE Joint Boiler and Heating Systems

At present property of the municipal entity City District of Naryan-Mar designed to provide citizens with heat, water, and water drainage services is under economic management of the Naryan-Mar Municipal Unitary Enterprise Joint Boiler and Heating Systems (MUE Joint Boiler and Heating Systems). The enterprise is the main municipal company that maintains municipal infrastructure systems of heat and water supply, water drainage and treatment of waste water in the municipal entity City District of Naryan-Mar.

As per 01.01.2007 the part of the MUE Joint Boiler and Heating Systems in the total amount of services rendered in the municipality was:

- under heat supply – 75 %,
- under water supply – 99.7 %,
- under water drainage - 100 %.

The activities of the enterprise are divided into two units – main and auxiliary. The main activities include production and supply of heat energy, extraction and supply of ground water as drinking water, receipt and treatment of waste water, as well as operations related to installation and maintenance of outdoor and indoor piping and equipment. The auxiliary unit comprises the structural units providing efficient implementation of the main activities. They are: repair and mechanical workshops, a vehicles garage, a power workshop, a gasification unit, an accidents and operations control centre, a construction department, an energy saving unit, an instrumentation and automatic equipment laboratory and a gas service.

The Enterprise of Joint Boiler and Heating Systems was established on 1 May 1984 by merging of boiler houses. During the period 1986 - 2008 the enterprise has received 15 boiler houses from different companies. In order to reduce the cost of the heat energy, 6 unprofitable boiler houses were closed and the consumers were transferred to existing boiler houses.

The main activities of the enterprise are production of heat energy for heating and hot water supply, extraction of ground water for service and drinking water supply to consumers in Naryan-Mar, as well as receipt, treatment and discharge of waste water.

The enterprise renders 11 types of services to the companies in Naryan-Mar:

1. Supply of heating power in hot water for residential and public buildings - 191566 Gcal /year.
2. Supply of hot water with centralized hot water supply - 350 240 m^3 /year.
3. Supply of hot water, used from the heating system - 88 239 m^3 /year.
4. Supply of drinking water – 1 408 000 m^3/year.
5. Receipt of waste water – 1 233 000 m^3/year.
6. Maintenance and repair of indoor systems.
7. Construction of gas supply facilities - 43 facilities /year.
8. Maintenance of boiler houses owned by other companies in Naryan-Mar - 7 boiler houses.
9. Maintenance of residential housing - Agreement No. 4/P-08 with the Customer's Service.
10. Maintenance of residential housing as a Managing company.
11. Repair of outdoor heat and water supply and sewage networks.

Number of employees - 410 people, including:

- Technical and engineering personnel - 72 employees
- Workers - 338 employees.

At present MUE Joint Boiler and Heating Systems deals with providing citizens, enterprises and organisations of Naryan-Mar with heating power, renders services of hot and cold water supply, treatment of waste water, maintenance of domestic utilities, remedial works of housing facilities, gas-installation works.

MU Joint Boiler and Heating Systems services 23 boiler houses, including 13 boiler houses with total output of 77.4Gcal/h in the enterprise's record books and 10 boiler houses which belong to different organisations around the city. Extension of heating systems registered in the record books in 2-pipe enumeration is 31.9km; extension of cold water supply systems is 37.0km; extension of sewage systems is 24.4km. The main source of central water supply is water inlet facility Ozerny; 23 wells and 25 fresh water pits are in operation. There are three water treatment facilities: central in the city, in settlements Kachgort and Bondarny. 25 production areas located in different part of the city are available at the enterprise. The vehicle park of the enterprise amounts 39 motor vehicles and 8 pieces of tractor equipment.

Despite of the extension of maintenance areas and scope of activities of the enterprise, material and technical resources of the enterprise haven't been developing. Therefore to date a question of enhancement of the material and technical resources of the enterprise has been risen.

In many cases timely and quality mitigation of different type accidents is not possible due to the low level of equipment of manufacturing facilities with machinery required. This has an adverse effect on the level of technical operation of housing facilities, vital infrastructure and social sphere facilities which leads to the situation of social strain and reasonable complains.

The enterprise is not able to solve this problem by itself and at its own expense.

There is a need to attract additional resources including budget funds of the municipal entity City District of Naryan-Mar in order to enhance the material and technical resources of the enterprise to improve the system of rendered to population municipal services and to improve the efficiency, stability and reliability of the enterprise's operation.

3.2 Water and Sewage Systems in Naryan-Mar

Water Supply System

The existing water supply system in Naryan-Mar is based on ground water. According to the water supply data from the MUE Joint Boiler and Heating Systems for 2008, the water consumption in the town was 1 648 400 m^3/year. 1 479 200 m^3/year were supplied from the water intake facility Ozerny, 108 800 m^3/year – from single wells and 60 400 m^3/year – from wells at the boiler houses. Out of the 1 648 400 m^3/year of the total water intake, 849 400 m^3/year were supplied to the residential housing, 238 900 m^3/year – to the organizations included in the State Register, 396 900 m^3/year to other organizations, 100 600 m^3/year – consumption for own needs and 62 600 m^3/year – loss in the networks.

The water supply source in Naryan-Mar is artesian wells of the Ozerny water intake facility and single wells.

The Ozerny water intake facility was put in operation in 1986. The construction contractor was Naryan-Mar Construction and Installation Department of Glavarkhangelskstroy. The wells were drilled by the Arkhangelsk Construction and Installation Department Burvodstroy. In total 13 wells were drilled with a total flow rate of 326.1 m^3/hour (7826.4 m^3/day), the wells depth is from 30 to 32 m, a flow rate is from 10 to 30 m^3/hour. The submerged pumps of ECV-8 and ECV-6 type are installed in the wells. In addition 22 wells were drilled in the period from 1990 till 2003. The wells were drilled by the Timan Exploration and Survey Expedition of Arkhangelskgeologia, OAO Naryan-Marstroy, Construction and Installation Department Arkhburvodstroy.

The water intake facility was transferred to MUE Joint Boiler and Heating Systems for operation by the municipal administration in 2003. At that time the water intake facility had 35 wells, 18 of which were in operation with a total flow rate of 5568 m^3/day. The enterprise received license for intake of ground water at the Ozerny water intake facility for service and drinking water supply No. NRM 00607 VE valid till 2030. The water intake stipulated by the license is 5450 m^3/day. During the last 5 years 10 satellite wells with a flow rate in the range 25 - 46 m^3/hour were drilled. The drilling operations were implemented by OOO Technologia, Arkhangelsk, and OOO Severgeoldobycha, Naryan-

Mar. For the first time polyethylene filters were used for drilling. The thickness of the gravel layer around the filter was increased. The water reserves at the Ozerny water intake facility were confirmed in 1978 and amounted to 5800 m^3/day. 25 years after confirmation of the reserves re-estimations will be made.

As of 01.01.2009 the number of drilled wells at the Ozerny water intake facility is 45 wells, 13 of which are in operation with a total flow rate of 7240 m3/day. Other wells are not suitable for operation due to damage of the filter screen and mudding of the pre-filter area with iron oxides. All dysfunctional wells are put out of operation; the well heads are capped with a metal plate along the edge of the filter column with additional fixation by welding. Pumps of the ECV-8 and ECV-6 type depending on the well flow rate are installed in wells in operation. There are currently 7 wells in operation with a flow rate of 3820 m^3/day and 6 wells with a total flow rate of 3420 m^3/day are reserved. The total water consumption rate is 3800-4100 m^3/day.

The water is supplied from the water intake facilities by two water pipelines with a diameter of 300 mm to the accumulation tanks with a capacity of 5000 m^3. The first water intake facility is diked, and the diking is also an access road for service vehicles and machinery to the water intake facilities. During the spring flood season, when the water level reaches 5.5 m the diking is flooded and washed away in some areas. Only after the flood declines, the water intake facilities located at the distance of 4.5 km from the water intake control station can be reached by special vehicles. The second water intake facility is built in 2008 of polyethylene pipes with a diameter of 315 mm. The water is supplied from the accumulation tanks with the help of the 2nd elevation pumping station VNS-1 by three water pipelines with a diameter of 300, 250 and 22 mm to the town. The pressure rate at the collector is 5 atmospheres.

There are two sanitary controlled-access areas (1st zone area) on the territory of the water intake facility: water intake facilities and accumulation tanks. These areas are fenced with a barbed wire. The area of the water intake facilities is guarded by the special guard company Svyatogor. The area of accumulation tanks, VNS-1, and the control station are equipped with a video monitoring system, transmitting signals to the operators' display in the control station. There is an emergency alarm button in the control station connected to the guard company Svyatogor's receiver.

There are 4 accumulation tanks in the area of the main pumping station (VNS-1) with the following capacity: 2x1000m^3 and 2x2400m^3. In the accumulation tanks the water supplied to the town is aerated and partially settled. The water is delivered to the networks from accumulation tanks without chlorination. The tanks are washed without chlorination on a daily basis.

Sewage System

Presently the level of the central sewage system distribution in the town is medium. The gravity and pressurized system with the waste water treatment facilities covers the Gorodetsky district and parts of the Kachgort and Bondarny settlements. The remaining town areas are equipped with septic tanks and cesspits and the accumulated sewage water is delivered to the waste water treatment facilities and the town waste landfill by vehicles (approximately 20-25% of the total sewage water). Taking into account that the sewage water volume in the town is not accounted for, estimate of the sewage water distribution would be inexact and has not been made.

The sewage system is combined. It has 7 pumping stations. The largest stations (Main Sewage Pumping Station and Sewage Pumping Station No. 1) deliver the sewage water to the waste water treatment facilities (Town WWTF).

Short description of the system:

Equivalent number of citizens connected to the sewage system: 19 500 people;
Total length of the sewage network: 26.7 km;

The Municipal Administration of Naryan-Mar owns the following waste water treatment facilities (municipal ownership): Town WWTF, located in the left part of the town in Gorodetsky district; Kachgort WWTF, located on the site of the former fish factory in the Kachgort settlement and Bondarny WWTF, located not far from the meat factory of OAO Myasoprodykty currently in operation in the Bondarny settlement.

The average daily volume of sewage water:
- Town WWTF – 3600 m^3/day.
- Bondarny WWTF – 195 000 m^3/day.
- Kachgort WWTF – 140 000 m^3/day.

Types of sewage water:
- domestic sewage water – 99 %
- industrial sewage water (meat factory) – 1 %

The design of reconstruction of the Bondarny WWTF in Naryan-Mar has been developed and is available now. The design was developed by OOO IzhGeoProekt and stipulates mechanical and biological treatment of sewage water. It should be noted that the quality of discharged water provided in the design is quite high.
But the specialists of the water and sewage systems in Naryan-Mar have contradictory opinions concerning provision of the secured discharged water quality level. That is why the design should be submitted for an expert review to take a final decision on implementation of reconstruction based on this design.

3.3 Key Financial Data

Neither the enterprise management, nor the Naryan-Mar administration provided any data on the financial status of MUE Joint Boiler and Heating Systems with the exception of the scopes of the services rendered by the enterprise in 2008 (Table 5) and tariffs for water supply and water drainage for the last 5 years (Table 6).

In 2008 the enterprise rendered services at an amount of 312 895 421RUB (Table 5).

Table 5: Services rendered by the enterprise in 2008, RUB.

Service Description	Amount
Total income for 2008	312 895 421
including:	
heat power	138 543 384
hot water supply	26 590 484
Service water	5 904 043
cold water supply	18 649 970
water drainage	42 039 673
maintenance of housing facilities	17 635 703
domestic services for other organisations	4 535 906
remedial works of housing facilities	12 595 637
other operating income	46 400 621

Table 6: Tariffs for water consumption and water drainage allocated by the Administration of the municipal entity City District of Naryan-Mar

Services	Cost, RUB/m3									
	2004[1]		2005[2]		2006		2007		2008	2009
	Municipal enterprises and budget organisations	Miscellaneous consumers	Housing facilities	Miscellaneous consumers	Housing facilities	Miscellaneous consumers	Housing facilities	Miscellaneous consumers		
Cold water supply	15.11	17.17	12.61	17.13	15.56	17.63	15.64	17.32	19.22	15.64
Hot water supply	65.58	74.52	56.35	63.28	57.29	63.59	68.73	68.73	76.16	68.73
Drainage and treatment of waste water (central treatment facilities)	24.09	27.37	25.96	35.13	28.44	35.84	29.72	36.73	33.31	29.72
Drainage and treatment of waste water (st. Bondarny)	76.83	87.3								

[1] until 2005 tariffs for drainage and treatment of waste water were calculated separately for waste water treatment facilities
[2] Tariffs were set beginning from 1.05.2005

The information given in Tables 5 and 6 doesn't give an opportunity to analyse the current financial condition of the enterprise.

4. DESCRIPTION OF THE INVESTMENT PROJECT

4.1 Project Information

The matter of the pre-investment studies is to investigate the existing situation in waste water treatment in the Kachgort and Bondarny settlements of Naryan-Mar and to give recommendations based on investigation results on reasonability to use the selected technologies for modernizing the waste water treatment facilities.

Within the frames of the project the main problem that is now acute for the Town Administration and MUE Joint Boiler and Heating Systems is considered, i.e. unsatisfactory waste water treatment at the waste water treatment facilities (WWTF) in the Kachgort and Bondarny settlements. The waste water treatment in the Kachgort settlement has a very low efficiency, in the Bondarny settlement the efficiency of waste water treatment should be improved by some properties. Expansion of both WWTF should be planned, including considerable increase of capacity for potential connection of new facilities (residential houses and industrial facilities) to the sewage system.

Implementation of this project will provide high-quality waste water treatment in compliance with regulatory parameters and contribute to improving the environmental situation in the Kachgort and Bondarny settlements and in Naryan-Mar on the whole as well as to improving the quality of life.

4.1.1 Regulatory Documents for Water Supply and Waste Water Management

This section includes the list of regulatory documents that regulate water supply and water discharge (waste water) activities in the Russian Federation:

- Federal Law No. 89-FZ dated 24.06.1998 "On industrial and consumer waste".
- Federal Law No. 52-FZ dated 30.03.1999 "On sanitary and epidemiological wellbeing of the population".
- Federal Law No. 210-FZ dated 30.12.2004 "On the regulation basis of the rates of companies providing communal services".
- RF Government Decree No. 310 dated 31.12.1995 "On the charges for discharge of waste water and contaminating substances into the sewage systems of residential areas".
- SanPiN 42-128-4690-88 "Sanitary rules for maintenance of residential territories".
- SanPiN 2.1.5.980-00 "Waste water handling in residential areas. Sanitary protection of water facilities. Hygienic requirements for the protection of surface waters".
- Regulations for technical operation of water supply and sewage water systems and facilities MDK 3-02.2001.

4.1.2 Brief Description of Waste Water Treatment in the Kachgort settlement in Naryan-Mar

WWTF of Kachgort with the design capacity of 167 m^3/day were constructed in 1971 by the Pechora Fish Factory for their own production needs against the design developed by VRPO Sevryba in 1967 (see Annex 4). WWTF were design with mechanic treatment.

The waste water treatment facilities in the Kachgort settlement were initially constructed based on the design developed by the Design and Cost Estimate Office of the All-Soviet Union Fish Industry Association Sevryba in 1967. The facilities consisted of three settling tanks; waste water was treated by natural sedimentation of contaminated substances. The accumulated sediments were taken away to the sludge well. The treated water after chlorination was discharged into a nameless lake. Due to increase in waste water volumes and new requirements for the waste water treatment quality, in 1985-1986 the WWTF were reconstructed to use the biological treatment and increase capacity to 400 m^3 per day (see Annex 6). The process flow sheet included a flotator-clarifier and two stages of aerotanks that should have given a possibility to treat waste water meeting the requirements in force.

In 2004 the treatment facilities were transferred by the city administration for operation to MUE Joint Boiler and Heating Systems.

Presently the flotator and the aerotanks are not in operation and the Kachgort WWTF only provides waste water settling. The option of biological treatment was discarded due to the fact that during the design an experimental technological method of treatment was applied which did not prove reasonable for the operation.

The quality of discharged water does not meet the requirements currently in force and exceed some factor by tens of times. Therefore basically non-treated sewage is discharged into the water body, which is absolutely unacceptable.

WWTF Kachgort to not have the sludge beds and the sludge is not pumped out- this proves that the sewage water is not treated at the WWTF and it simply flows through the facility to be dumped in the River Pechora.

The waste water volume received by WWTF is not measured. The daily waste water intake can be estimated based on the number of operation hours of pumps in the pumping station delivering waste water to WWTF. According to MUE Joint Boiler and Heating Systems, the waste water flow is approximately 400 m^3 per day.

4.1.3 Brief Description of Waste Water Treatment in the Bondarny settlement in Naryan-Mar

The Bondarny biological WWTF with the capacity of 200m3\day were constructed in 1996 against the design developed in 1985 by the Design Institute Lengipprommyasomolprom for treatment of waste water from the meat factory (Annex 5). Due to a small quantity of waste water and in order to reduce the price of meat products the treatment facilities were transferred to municipal ownership.

In 2003 the treatment facilities were transferred by the city administration for operation to MUE Joint Boiler and Heating Systems.

Presently the Bondarny WWTF are used for treatment of waste water from the meat factory (AO Myasoprodukty), as well as for treatment of domestic waste water from residential houses in the Bondarny, Lesozavod and Novy settlements and social and cultural facilities. This waste water is delivered by vehicles, because these settlements are not connected to the central sewage system.

The WWTF process flow sheet includes a grease catcher, a sewage regulator - pre-aeration tank, 3 stages of biological treatment, providing biological removal of nitrogen and phosphor (Annex 7). The sediments from waste water and the sludge generated

during the treatment process are pumped to the sludge beds adjacent to the treatment facilities where they are naturally dehydrated (freezing and melting and drying in natural conditions) and therefore transported to the town waste landfill.

The treatment facilities in Bondarny are constructed against outdated standards which at that time regulated the quality of waste water. The existing process flow sheets can not provide the required quality of water. The waste water factors, as advised by the enterprise workers, complies with the design levels, but do not comply with the regulatory standards and exceed some factors by several times – thus the waste water is discharged into the water body causing great harm to the nature.

The volume of received waste water has not been measured, it is estimated based on number of hours of operation of the pumping station delivering waste water to WWTF. The WWTF designed capacity is 200 m^3 per day, the actual output, according to the MUE Joint Boiler and Heating Systems, is 213 m^3 per day.

As mentioned earlier in Chapter 3 there is a design of WWTF Bondarny reconstruction which sets the high quality of water. The quality of water is doubted by the workers of water supply and sewage system of Naryan-Mar and the design needs to be reviewed to make a final decision on its implementation.

4.2 Technical Description

This section covers the various technical aspects of modernization of the waste water treatment systems in the Kachgort and Bondarny settlements of Naryan-Mar, based on which the technological solutions for implementation of the present investment project will be proposed.

The current condition of the water sewage system in Naryan-Mar requires the measures on improvement of efficiency of sanitary sewage system in Kachgort and Bondarny. The quality of waste water treatment at both WWTF does not comply with the regulator requirements and exceeds some of the factors by several times which has a negative impact on the water bodies located on the territory of the city and okrug as well as on the marine Arctic environment. Use of the existing technology of waste water treatment will only lead to further degradation of the ecological situation in Naryan-Mar and adjacent territories.

4.2.1 Possible Options of Modernization of the Kachgort and Bondarny WWTF

MUE Joint Boiler and Heating Systems of Naryan-Mar will require the following results of the project as listed in 7.

Table 7: Environmental and capacity requirements for implementation of the project

Parameter	Kachgort	Bondarny
Environmental requirements		
Suspended materials	5.90 mg/l	3.43 mg/l
BOD_5	4.0 mg/l	4.0 mg/l
Ammonium ion	2.00 mg/l	2.00 mg/l
Phosphate ion	3.5 mg/l	3.5 mg/l
Synthetic surfactants	0.5 mg/l	0.5 mg/l

Capacity requirement		
Capacity	1200 m^3 per day	700 m^3 per day

The project should increase the capacity of Kachgort WWTF from 400 to 1 200 m^3/day. The considerable increase of capacity is due to planned construction of a discharge facility of 500 m^3 per day and proposed connection of some of the residential houses in the Kachgort settlement, presently not connected to networks, to the sewage system.

For WWTF at Bondarny it is proposed to increase the WWTF capacity from 200 to 700 m^3 per day. The considerable increase of capacity is due to the necessity to receive waste water from the Lesozavod and Novy settlements and will allow the removal of septic tanks and cesspits.

For the pre-investment studies on modernization of the waste water treatment systems in Kachgort and Bondarny it is proposed to review the following alternative options for improving the current situation in waste water treatment:

1. Reconstruction of the WWTFs in Kachgort and Bondarny.
2. Construction of new WWTFs in Kachgort and Bondarny.
3. Application of prefabricated block-modular small-size plant to treat waste water at Kachgort and Bondarny.

4.2.2 Technical Assessment of the Options of the Kachgort and Bondarny WWTF Modernization

The Kachgort and Bondarny were constructed for treatment of production waste water from fish and meat factories (correspondingly) to provide for their production needs. In the beginning of 2000s the treatment facilities were transferred by the city administration for operation to MUE Joint Boiler and Heating Systems. Presently the equipment at both WWTF is in poor condition; waste water is not being treated at Kachgort WWTF and treatment at Bondarny WWTF has minimal effect.

Reconstruction of the Kachgort WWTF and the Bondarny WWTF

Reconstruction/upgrading the WWTF should provide technical improvements to meet the current environmental standards and regulations and should contribute in reducing the future negative impacts on the environment.

Reconstruction of the Kachgort WWTF and Bondarny WWTF are not assessed as viable solutions, as implementation of technologies sufficient to meet the environmental and capacity requirements are not practically possible at the existing WWTF sites. The reconstruction of the existing WWTF does not provide a sustainable and long-term solution for waste water treatment.

Construction of new WWTFs in the Kachgort and Bondarny settlements

Construction of a new WWTF offers the possibility of designing WWTF based on modern technologies, the amount of waste water, the content of waste water and environmental requirements of the treated waste water.

A new location for construction of the WWTF close to the existing facilities should be identified.

The construction of a new WWTF will have to be combined with proper environmental decommissioning of the existing WWTF.

Application of prefabricated block-modular small-size plant to treat wastewater

Prefabricated block-modular plants to treat waste water provide high efficiency of water treatment and at the same time they have a possibility for expansion (installation of parallel treatment lines), dense dimensions and high quality of manufacture obtained due to the centrally-controlled production.

Ready-to-operate block-modular water treatment plant is easy-to-work and designed to treat household wastewater and water of similar composition as well as works in automatic mode. Plants provide treatment of household waste water to the characteristics corresponding to the maximum permissible concentration of discharge into fishery water bodies.

The application of prefabricated block-modular water treatment plant at Kachgort and Bondarny will have to be combined with proper environmental decommissioning of the existing WWTF.

Preliminary assessment of the most appropriate technology

In order to choose the most appropriate technical solution at the given time and situation, a preliminary assessment and evaluation of the 3 suggested solutions has been made. Despite the fact that Kachgort and Bondarny WWTF have some differences in process arrangements, the condition of building structures and quality of waste water treatment in general same approaches and criteria for selection of the most appropriate process solution may be applied to both of them.

A screening of the 3 solutions regarding social, environmental, technical, financial and legal liability is presented in **Ошибка! Источник ссылки не найден.**. The screening includes a preliminary evaluation in 3 classes A, B and C. 'A' symbolises a condition with no or few difficulties, 'B' symbolises a condition with medium difficulties/challenges and 'C' symbolises a condition with many difficulties/challenges.

Table 8: Preliminary assessments and evaluation of the 3 alternative technical solutions. The evaluations are classified in classes A, B and C, where A has the highest denotation and C the lowest.

Social liability	Environmental liability	Technical liability	Financial liability	Legal liability	Assessment
Solution 1:Reconstruction of WWTF					
Project owner positive Local administration sceptical Environmental authorities expected to be sceptical Public expected to be positive	Increased risk that the reconstruction does not provide a solution that meets environmental requirements. The solution should be combined with upgrading actions	The general condition of WWTF is unsatisfactory. The reconstruction should be combined with upgrading measures to meet the requirements	High implementation costs Low - moderate operational costs	Upgrading the WWTF is not allowed in accordance with the area planning	
B	**C**	**C**	**B**	**C**	**B/C**
Solution 2: Construction of a new WWTF					
Project owner positive Local administration positive Environmental authorities expected to be positive Public expected to be positive	Modern technology to meet current and future environmental requirements	Requires some external experts	High implementation costs Low - moderate operational costs Existing WWTF closure costs	Site location to be decided	
A	**A**	**B**	**C**	**B**	**B**
Solution 3: Application of prefabricated block-modular small-size plant to treat wastewater					
Project owner positive Local administration positive Environmental authorities expected to be positive Public expected to be positive	Modern technology to meet current and future environmental requirements	Requires some external experts	Low implementation costs Low operational costs Existing WWTF closure costs	Site location to be decided	
A	**A**	**B**	**A**	**B**	**A/B**

Social liability
In general the 3 solutions are expected to provide positive attitudes from all stakeholders. Since solution 1 provides an environmental liability risk, a sceptical attitude from the environmental authorities is expected.

Environmental liability
Solutions 2 and 3 provide technologies that meet current and future environmental requirements.

Solution 1 is not environmentally liable.

The Kachgort WWTF is in an unsatisfactory condition due to the fact that after WWTF reconstruction in 1980-s the main facilities (flotator, aerotanks) were put out of operation and the remaining facilities are only used for waste water settling. Presently WWTF can provide the waste water treatment with a minimal effect; this refers to all contaminating substances.

Reconstruction of the Kachgort WWTF will not meet the environmental requirements – even if the Kachgort WWTF was in a good condition, they would not meet the requirements for the water treatment quality for the content of BOD, ammonium ion, phosphates and other substances stipulating obligatory biological treatment and additional treatment of waste water. In addition it is not possible to achieve the concentration of suspended pollutants of 5.90 mg/l without additional measures. Installation of additional treatment systems on site of the existing WWTF is not possible due to poor condition of the constructions where the facilities are located.

The Bondarny WWTF provides for biological treatment of waste water, but they are not efficient enough to meet the requirements for the treated discharged water in several parameters (BOD, ammonium ion, phosphates).

Technical liability
Solution 2 and 3 provide the advantage that it will be possible to take into account content of waste water in Kachgort and Bondarny district and to meet the requirements to the quality of treated water during design and construction work.

Solution 1 does not provide a technical liable solution due to the following.

Due to ramshackle condition of the building which houses the waste water treatment facilities it is impossible to place additional treatment units on the territory of the existing Kachgort WWTF. Moreover due to the ramshackle condition of the building the owner of the project thinks that construction of new WWTF is required.

Reconstruction of Bondarny WWTF can not provide the capacity of up to 700 m3/day. It is impossible to place additional treatment units on the territory of the existing WWTF.

Financial liability
Solution 3 provides the most cost-effective solution as implementation and operational costs are low.

Solutions 1 and 2 have high implementation costs and low – moderate operational costs. The cost of construction of new facilities (unit cost, per m3 of waste water) according to the traditional technologies will be considerably high. Approximate cost on the basis of 800m^3/day may amount to 35-40 million rubles. Moreover, the possibility to expand WWTF in future will be limited as traditional reinforced concrete facilities cover the most area on the layout and it will not be possible to construct additional facilities to increase production capacity of the WWTF within a small area of the existing WWTF.

Legal liability
Solutions 2 and 3 provide solutions that are within the legal framework and area planning of the district.

Besides, new locations for construction of new WWTF immediately adjacent to the existing ones have to be identified. As Kachgort WWTF already has a site for new construction there is no need to find a location for new facilities.

In order to be environmentally and technically viable, solution 1 should include additional upgrading actions in the reconstruction of the WWTF. It is, however, not possible to locate additional treatment units in the area of the existing WWTF as the area planning does not allow expansion of the WWTF in operation. As for WWTF in Bondarny, a location for new WWTF has to be identified immediately adjacent to the existing ones. The locations for new construction has not been identified neither by local authorities nor by the owner of the project therefore this issue will require some time for settling.

For Solution 1 to be technically viable additional activities on upgrading of WWTF at Kachgort and Bondarny need to be included in the reconstruction plan. However, location of additional units of treatment on the territory of the existing WWTF is impossible due to non-rational layout of the facility which does not allow extension of existing WWTF.

4.2.3 Recommendation of the most appropriate technology

Based on the screening and preliminary assessments and evaluation of the 3 suggested technical solutions, the most appropriate technology for Kachgort and Bondarny WWTF at the given time and situation is solution 3 - *Application of prefabricated block-modular small-size plant to treat wastewater*.

Prefabricated block-modular small size plants currently provides the most viable approach regarding all criteria of

Table , that is social, environmental, technical, financial and legal liabilities.

The advantages of block-modular treatment facilities are:

- Minimum expenditures for construction.
- No smell and noise.
- Possibility to ramp up efficiency owing to installation of additional modular blocks.
- Use of recent drain treatment technologies ensures robust treatment of drains to the characteristics of fishery water bodies.
- Easy to maintain and operate.
- Modest sanitary protection area (approx. 50m).

Block-modular WWTF are the optimal option for remote facilities and small dwelling districts with production efficiency up to 2-3 thousand m^3 of waste water per day. Application of block-modular WWTF allows not only cutting down capital costs under construction of small WWTF but also significantly decreasing operational costs while keeping high quality of waste water treatment.

4.3 Proposal to Modernize WWTFs in the Kachgort and Bondarny Settlements

Pursuant to the implemented analysis in section 4.2, to improve the situation with treatment of wastewater in the settlements of Kachgort and Bondarny, as well as to mitigate negative impact on water bodies and the environment, it is required to consider a complex of actions. The IP will integrate solutions for wastewater treatment in both Kachgort and Bondarny. Implementation of block-modular WWTFs in both settlements involves similar steps and actions.

To mitigate negative impact on the environment from discharge of waste water a construction of a block-modular small-sized plant for treatment of wastewater FOR Kachgort and Bondarny settlements with the efficiency of 1200 and 700m3 per day correspondingly is proposed. The construction requires the following actions to be taken:

1. Preparation of the area for installation of the block-modular small-sized plant for treatment of waste water.
2. Selection, procurement, installation and adjustment of the block-modular plant connecting it to the waste water system.
3. Training of personnel by the equipment supplier.

The block-modular small-sized plant for treatment of waste water shall include the following units:

- Mechanical treatment
- Biological treatment to remove nitrogen and phosphor
- Advanced treatment
- Disinfection by UV irradiation
- Sediment treatment.

Ошибка! Источник ссылки не найден. shows one of possible options for process flow sheet for new WWTF of Kachgort and Bondarny.

Small-sized plants are manufactured from plastic, fiberglass or metal protected from corrosion which ensures plants continuous service. Most suppliers envisage this possibility to increase efficiency of plants through installation of parallel treatment lines (modules) which allows receiving increasing volumes of waste water for treatment if new facilities, residential houses, etc. are connected.

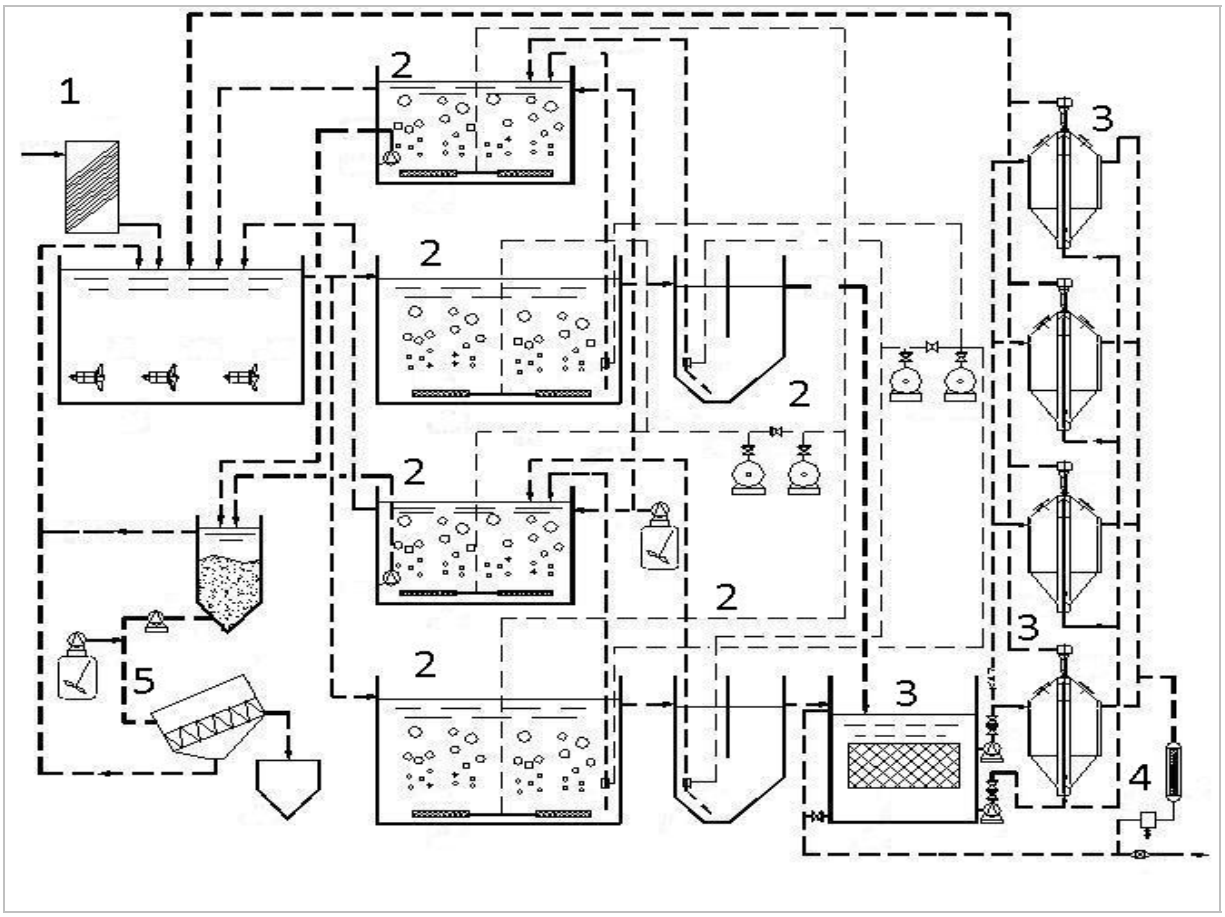
To mitigate negative impact on the environment from discharge of waste water the following actions are proposed:

4. Preparation of the area for installation of the block-modular small-sized plant for treatment of waste water.
5. Selection, procurement, installation and adjustment of the block-modular plant connecting it to the sewage system.
6. Training of personnel by the equipment supplier.

The block-modular small-size plant for treatment of waste water shall include the following units:

- Mechanical treatment
- Biological treatment to remove nitrogen and phosphor
- Advanced treatment
- Disinfection by UV irradiation
- Sediment treatment

Small-size plants are manufactured from plastic, fiberglass or metal protected from corrosion which ensures plants long-term service. Most suppliers envisage this possibility to increase efficiency of plants through installation of parallel treatment lines (modules) which allows receiving increasing volumes of waste water for treatment as far as new facilities, residential houses, etc. are connected.



1. Mechanical treatment unit. 2. Unit of biological treatment along with nitrogen removal. 3. Units for advanced treatment. 4.Unit for UV-disinfection of treated wastewater. 5. Unit for sediment treatment.

Fig. 3. A possible option for process flow sheet on new WWTF in the Kachgort settlement in Naryan-Mar

Small-size plants are manufactured by Russian and foreign manufactures: OOO ORVT, OOO Standard Ecology, ZAO Vodoproekt-Giprokommunvodokanal St.Petersburg, OOO SMB and others.

At present stage of pre-investment studies it is difficult to summarize technical characteristics of these modular plants as they differ significantly among the manufactures: dimensions of plants may be from 10 to 20m in length; modules have horizontal and vertical arrangement; one unit of required capacity or several units of smaller capacity may be installed, etc. To define technical characteristics required for this IP it will be reasonable to carry out a pre-qualification selection among possible manufactures of small-sized wastewater treatment plants.

As for the comments received from MUE Joint Boiler and Heating Systems in May 2010 (Annex 9), Ramboll Barents notes that:

1. The IP report does not contain proposals on particular manufacturers or models of waste water treatment plants. A particular plant is proposed to be selected during competition excluding those potential negative factors mentioned by MUE Joint Boiler and Heating Systems.
2. While selecting a particular model of waste water treatment plant it is necessary to give priority to the models well suited for operational conditions similar to Naryan-Mar conditions.

3. It is obligatory to carry out full scope commissioning attracting the representatives of the plant manufacturer in order to avoid the shortcomings in the plant operation.

An earlier allocated site for reconstruction of WWTF located to the east of the existing facilities approximately 150 metres south-east of the WWTF building (Fig.) is proposed as a site for new WWTF in Kachgort.

Fig. 4. Option for location of WWTF in Kachgort

Several alternative options near the meat factory need to be explored to locate the WWTF in Bondarny, some of them are shown in Fig. .

Fig. 5. Option for location of WWTF in Bondarny

When reviewing the options for location of the new WWTF the possibilities of the existing pumping station should be taken into account. Therefore site (no.1) that is, according to the management of MUE Joint Boiler and Heating Systems, located near the existing sewage pumping station, is proposed as one of the options. Another option for new WWTF location may be site (no.2) which is located next to the existing sewage pumping station. The site needs to be chosen based on the preference of the owner of the project and the Administration of Naryan-Mar with account of technical requirements to the sites from the manufacturers of the block-modular plant and its sizes.

5. PROJECT COST ESTIMATE

This Chapter contains a preliminary assessment of capital and operational costs on construction and exploitation of a pre-fabricated block-modular small-sized facility for treatment of waste water in settlements Kachgort and Bondarny.

5.1 Capital Costs for Modernization of WWTF in Kachgort and Bondarka

The estimate of the project cost is approximate. It is assumed that the detailed cost calculation will be performed during detail design stage of the project.

The capital costs were based on the manufacturers' quotations, consolidated costs of similar facilities, available project documentation, quotations from equipment suppliers.

The capital costs of the prefabricated block-modular WWTF will comprise the following types of expenditures:

1. Engineering geological and geodesic surveys at the WWTF site.
2. Procurement, delivery and assembly of the WWTF.
3. Connection of WWTF to the Kachgort sewage system and pre-commissioning.

The value of capital costs for application of the prefabricated block-modular WWTF in settlements Kachgort and Bondarny is given in Ошибка! Неверная ссылка закладки. and **Ошибка! Источник ссылки не найден.** accordingly.

Based on the data provided by the manufacturers of block-modular WWTF the cost of the WWTF with the efficiency of 1 200m3/day may amount to approximately 40 million roubles and with the efficiency of 700m3/day - 30 million roubles.

Surveys may require approximately 3 million roubles. It is difficult to estimate the cost of connection of the block-modular plant to the sewage system as the scope of works is unknown, but the preliminary cost of connection may be 5 million roubles.

Thus, the total cost of works will amount to approximately 48 million roubles.

Ошибка! Неверная ссылка закладки.**: Capital cost estimates when applying the block-modular WWTF in settlement Kachgort**

Cost component	Value	
	million roubles	euro
Engineering surveys	3	68 200
Procurement and assembly	40	909 100
Connection to the network	5	113 600
TOTAL:	**48**	**1 090 900**

* 1 euro = 44 roubles.

Ошибка! Источник ссылки не найден.**: Capital cost estimates when applying the block-modular WWTF in settlement Bondarny**

Cost component	Value	
	million roubles	euro
Engineering surveys	3	68 200
Procurement and assembly	30	681 800
Connection to the network	5	113 600
TOTAL:	**38**	**863 600**

* 1 euro = 44 roubles.

The amount of capital costs may increase in case an additional pumping of waste water or scheduled replacement of the pumping station at the WWTF in the Kachgort settlement. The cost of a new pumping station and works on its installation may amount to approximately 5 million roubles.

According to the information from the MU EJB and HS, the WWTF in the settlement of Bondarny are in satisfactory condition and at present they don't require replacement.

The preliminary cost estimate may be revised in case the block-modular WWTF manufacturer requires additional payment for the design of WWTF connection to the site facilities and other additional expenditures. Most block-modular WWTF manufacturers include this work into the cost of equipment and they do not influence the overall project cost.

5.2 Operational Costs for Modernization of WWTF in the Kachgort and Bondarny settlements

The estimate of operational costs is approximate. The following assumptions were made to evaluate operational costs:

- Electric power tariff rate - 3 rubles/kWhour.
- Installed power capacity of equipment of block-modular WWTF in the Kachgort and Bondarny settlements - 40 and 30 kW accordingly. The value characterizes one of the most power-consuming options of block-modular WWTF available on the Russian market.

The operational costs related to block-modular WWTF in Kachgort are estimated at 440 000 roubles and in Bondarny – approximately 323 000 roubles (Tables 11 and 12).

Table 11: Operational costs when using the block-modular WWTF in Kachgort

Cost Description	Annual expenditures	
	thousand roubles	euro
Electric power	350,4	7 965
Chemical agents and materials	30	680
Maintenance and repairs of equipment	60	1 365
TOTAL	**440,4**	**10 010**

*1 euro = 44 roubles.

Table 12: Operational costs when using the block-modular WWTF in Bondarny

Cost Description	Annual expenditures	
	thousand roubles	euro
Electric power	263	5 980
Chemical agents and materials	30	680
Maintenance and repairs of equipment	30	680
TOTAL	**323**	**7 340**

* 1 euro = 44 roubles.

The personnel expenditures are not included in the operational costs as the block-modular WWTF operate in automatic mode without permanent personnel. Maintenance and repairs will be carried out by the maintenance personnel of MUE Joint Boiler and Heating Systems.

6. PROJECT PRE-INVESTMENT ASSESSMENT

This chapter includes description of environmental and social assessments of the project which is of great importance to the IP implementation, as well as the technical and economic aspects. So, during the project development it is necessary to take into account natural and environmental peculiarities, living conditions of the population, and, in addition, existing and possible bottlenecks which may appear during IP implementation.

6.1 Environmental Assessment

Implementation of this investment project will certainly allow reducing overall pollution load on local environment as well as global environmental impact.
The environmental assessment is based on the environmental status of the WWTP and assessed dispersion routes of potential pollution from the WWTF.

6.1.1 Current Environmental Status in the Area of Kachgort WWTF

The initial process flow sheet of Kachgort WWTF waste water treatment provided for their clarification in the flotator and biological treatment in two-stage aerotanks which is supposed to provide high-quality treatment. However, due to some reasons the facilities that were built in 1985-86 were not used for their purpose. Since the end of 1980s and till the present moment the tank facilities (flotator, aerotanks) have been used as the sedimentation tanks without carrying out any additional activities to enhance the efficiency of sewage treatment. This leads to sewage water being discharged into the closest water body (nameless lake) with considerable increase of specified concentrations against the basic parameters показателям (see Table).

Table 9: Parameters of the Treated Waste Water of Kachgort WWTF according to the data from MUE Joint Boiler and Heating Systems*

Parameter	Measurement unit	MPD	Actual concentrations, October 2009	
			input	output
Suspensions	mg/dm^3	5,9	99,1	68,7
Biochemical oxygen demand 20	mg/dm^3	4,0	257,9	143,8
Ammonium ions	mg/dm^3	2,0	59,4	54,7
Phosphate ions P	mg/dm^3	3,5	20,0	19,2
Nitrites	mg/dm^3	3,3	0,19	0,22
Nitrates	mg/dm^3	45,0	0,7	0,6

* The data is given by MUE Joint Boiler and Heating Systems (Annexes 10 and 11).

6.1.2 Current Environmental Status in the Area of the Bondarny WWTF

The WWTF in Bondarny are built in accordance with the outdated standards set to the quality of treatment of waste water back then. Water rationing at the water discharge into water body was performed only according to two parameters: suspended substances

and biological oxygen demand (BOD). Modern standards toughen the requirements to the parameters of purified effluent, especially according to biogenic elements (nitrite, nitrate, ammonium, phosphate). The existing process flowsheets cannot provide for the required quality of water.

The Bondarny WWTF are designed primarily for the treatment of waste water from OAO Myasoprodukty and to treat the waste water delivered by the sewage cesspool tank trucks from the residential area which is not connected to the central sewage system. Despite the complex technological arrangement of the WWTF the concentrations of main pollutants exceed the specified maximum allowable concentrations (see **Ошибка! Источник ссылки не найден.**).

Ошибка! Источник ссылки не найден.**: Parameters of the Treated Waste Water of Bondarny WWTF according to the data from MUE Joint Boiler and Heating Systems***

Parameter	Measurement unit	MPD	Actual concentrations, October 2009	
			input	output
Suspensions	mg/dm^3	3,43	20,4	16,9
Biochemical oxygen demand20	mg/dm^3	4,0	370,5	20,5
Ammonium ions	mg/dm^3	2,0	62,2	61,2
Phosphate ions P	mg/dm^3	3,5	23,5	17,5
Nitrites	mg/dm^3	3,3	0,44	1,44
Nitrates	mg/dm^3	45,0	1,21	6,0

* The data is given by MUE Joint Boiler and Heating Systems (Annexes 10 and 11).

6.1.3 Dispersion routes

Geology and hydrogeology
Naryan-Mar is located on the tundra in the Pechora Region in an area of continuous permafrost. The topsoil layer most probably consists of loamy and peat sediments. Underlying the insulating topsoil layer is continuous permafrost.

The permafrost layer limits the vertical percolation of water to deeper ground water aquifers. Due to the low percolation capabilities of the permafrost local subsurface ground water (not an aquifer) or ponds may be formed in the topsoil active layer.

Surface water recipients
The surface water recipients in Naryan-Mar drain directly to the Pechora River. Discharge of pollutants into surface water recipients entails dispersion into the Pechora River.

The Pechora River drains directly into the Barents Sea. At some locations of the Pechora River concentrations of heavy metals and hydrocarbons have been registered at levels at which the pollutions pose negative environmental impact on the aquatic environment with the risk of altering the aquatic biodiversity.

Waste water from the existing WWTF at Kachgort and Bondary is discharged directly into local surface water recipients at concentrations exceeding the maximum allowable concentrations and are hence dispersed to the Pechora River.

Air
Dispersion routes of air include gas emissions of pollutants, including degradation products of the waste water.

Gas emissions from the polluted site include carbon dioxide and methane from the degradation process and volatile components of the waste water.

Influence of climate change on the dispersion routes
Climate changes are anticipated to cause an increase in the mean annual air temperatures of up to several degrees over much of the Arctic. In addition climate changes are anticipated to cause alteration of precipitation patterns.

Climate changes above ground are often dampened below ground due to the insulating effects of vegetation, organic material and snow cover. In Naryan-Mar the permafrost is expected to persist for some time due to the continuous permafrost conditions. The permafrost may move from being continuous to discontinuous and in the long-term may disappear if global warming continues. The time for degradation is uncertain and may take several decades or centuries.

The degradation of permafrost in areas where the ice content in the ground is high is associated with physical impacts such as soil instability, formation of thawing ponds and increasing drainage to surface water recipients.

The physical impacts of climate change may cause the following impact on the dispersion routes of the WWTF:

- Increase in the vertical dispersion to deeper ground water aquifers
- Increase in formation of thawing ponds
- Increase in direct drainage to Pechora River
- Soil instability (creep/slope failure)

An assessment of the impact of climate change on permafrost in Naryan-Mar is necessary in order to determine whether adaption methods at the WWTFs will be required.

6.1.4 Preliminary environmental risk assessment

The preliminary environmental risk assessment is based on existing environmental data, site inspection observations and the dispersion routes.

Due to the integrated approach of improving the standards of both the Kachgort and Bondarny WWTFs, the total environmental impacts from the two plants are regarded.

In **Ошибка! Источник ссылки не найден.** below the risks of occurrences caused by the WWTFs potentially impacting human health and the environment before, during and after implementation are presented. The current situation and the implementation period are assessed as entailing similar environmental impacts as the existing WWTFs will be used for waste water treatment in the implementation period.

Ошибка! Источник ссылки не найден.**: Assessed risks of occurrences caused by the Kachgort and Bondarny WWTF related to human health and dispersion to the environment before, during and after remediation.**

	Current situation and implementation period		After implementation	
Human health				
Direct contact	**Local settlements** Located in adjacent area of the WWTFs	**Workers** Potential contact with waste water	**Local settlements** Located in adjacent area of the WWTFs No discharge of waste water at concentrations exceeding permitable criteria	**Workers** Limited contact with waste water
	Medium risk	**Medium risk**	**Low risk**	**Low risk**
Exposure - air emissions	**Local settlements** Limited content of volatile components	**Workers** Exposure to waste water	**Local settlements** Limited content of volatile components	**Workers** Limited contact with waste water
	Low risk	**Medium risk**	**Low risk**	**Low risk**
Exposure - water	**Local settlements** Located in adjacent area of the WWTFs Expected contact with surface recipient water	**Workers** Direct exposure to the waste water	**Local settlements** Located in adjacent area of the WWTF No discharge of untreated waste water	**Workers** Limited contact with waste water
	High risk	**High risk**	**Low risk**	**Low risk**
Dispersion in the environment				
Air	**Particles** During dry conditions, risk of particle dispersion	**Emissions** Degradation products Limited emissions of volatile components	**Particles** Limited particle dispersion	**Emissions** Limited emissions of degradation products, volatile components and potentially hazardous chemicals
	Low risk	**Medium risk**	**Low risk**	**Low risk**
Water	**Subsurface water** Leakage to subsurface waters	**Pechora River** Direct discharge of waste water not meeting environmental requirements	**Subsurface water** No leakage in construction	**Lesnaya/Dvina River** No direct discharge into the River
	Low risk	**High risk**	**Low risk**	**Low risk**

Current assessed environmental impact

Human health

The Kachgort and Bondarny WWTFs are located in the immediate vicinity of residential areas. The sites have low accessibility for the local populations. However due to the direct discharge of waste water at concentrations exceeding the environmental requirements into surface water recipients, the WWTFs are assessed as posing a hazardous risk to the health of the local population.

Workers at the WWTF are directly exposed to the waste water. Current activities at the WWTFs are assessed as posing a hazardous risk to workers at the site.

Dispersion to the environment
Dispersion of airborne particles and emissions are assessed as posing a low – medium risk of dispersion to the environment due to the limited degradation processes. The emission of degradation products are assessed as posing a risk to the local environment, rather than the regional/global environment.

The direct discharge of untreated waste water at concentrations exceeding the environmental requirements into local surface water recipients is assessed as posing a hazardous risk to the local and regional environment. The local surface water recipients drain directly into the Pechora River, which flows directly into the Barents Sea, so the WWTFs may pose a hazardous risk to the Arctic marine environment.

Implementation period – assessed environmental impact

In the implementation period the same assessed environmental impacts as the current situation apply.

The potential environmental impacts caused by the physical works of the implementation are presented in **Ошибка! Источник ссылки не найден.**.

Ошибка! Источник ссылки не найден.**: Overview of the consequences, risks and preventive measures for environmental impact in the implementation period**

Description	Consequence/impact	Affected people/environment	Probability/ risk	Preventive measures
Human health				
Transport vehicles and construction machinery	Exposure to air pollution and particles	Workers	High	HSE plan
Dispersion to the environment				
Transport vehicles and construction machinery	Increase in air pollution and particle emissions	Local, regional and global environment	High	Assess the environmental impact Particle filters on vehicles/machines Environmentally friendly use of vehicles/machinery
Accidents	Accidental change in dispersion routes causing unintentional pollution	Local environment	Low	HSE plan including emergency action plan

During the implementation period the project will negatively impact the atmosphere due to the utilization of transport and hardware needed for the construction. The main pollutants are combustion products and greenhouse gasses. The pollution is limited to the implementation period and is expected to be outweighed by the long-term environmental gains of remediating the oil pollution at the site. In order to limit pollution and particle emissions during the implementation period, it is recommended to include a plan for minimizing emissions in the health, safety and environment plan (HSE).

During the implementation period, workers are exposed to the pollution through direct contact, particles and emissions of volatile components. Measures to limit the exposure to the pollution shall be included in the HSE plan.

After implementation

Subsequent to implementation and decommissioning of the existing WWTF, untreated waste water should no longer be discharged into the Lesnaya River and should hence no longer pose a hazardous risk to the human health and the environment.

6.1.5 Environmental Benefits

During the construction period a short-term increase in environmental impacts is expected. The long-term environmental benefits of constructing a new WWTP are however assessed as outweighing the short-term environmental impacts. In general, implementation of this IP will result in decrease of negative environmental impact in Naryan-Mar including adjacent water bodies.

As illustrated in the figures below the implementation of the IP will increase the efficiency of the waste water treatment at both the Kachgort WWTF and the Bondarny WWTF. The estimated amount of suspension, biochemical demand, phosphates and ammonium-nitrogen before and after implementation are plotted in the figures and it is clear that implementation of the IP will significantly reduce the pollutant discharge from the WWTFs.

For calculation of pollutants discharge after the project implementation most probable concentrations of pollutants in treated wastewater were multiplied by the annual waste water discharge. Also elimination of untreated waste water discharge will have significant effect on negative environmental impact reduction.

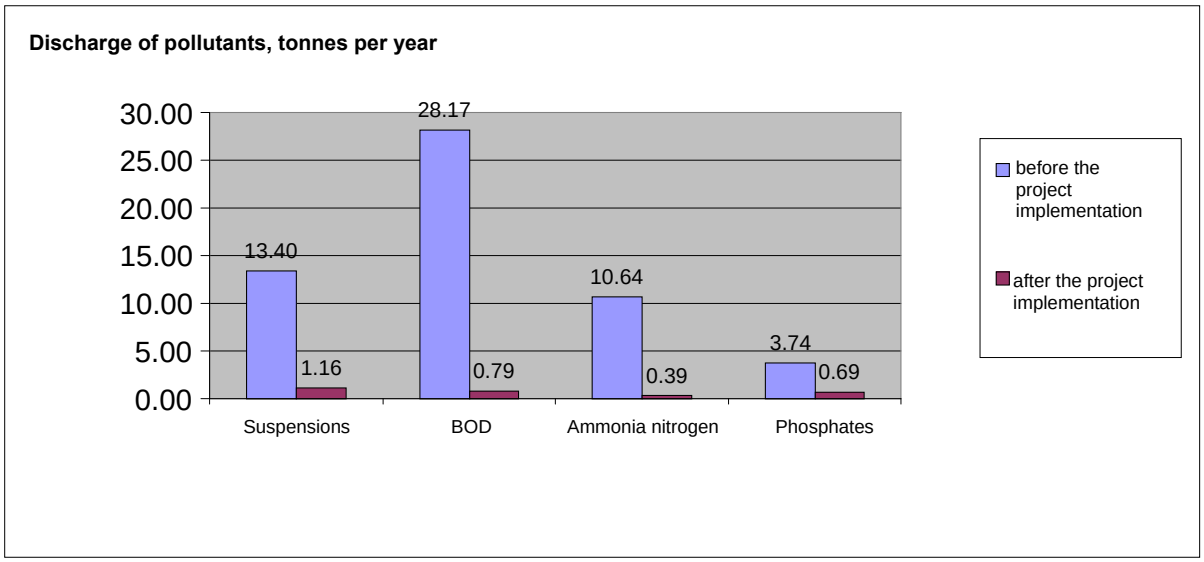


Fig. 7. Reduction of the discharge of pollutants with the waste water from WWTF Kachgort

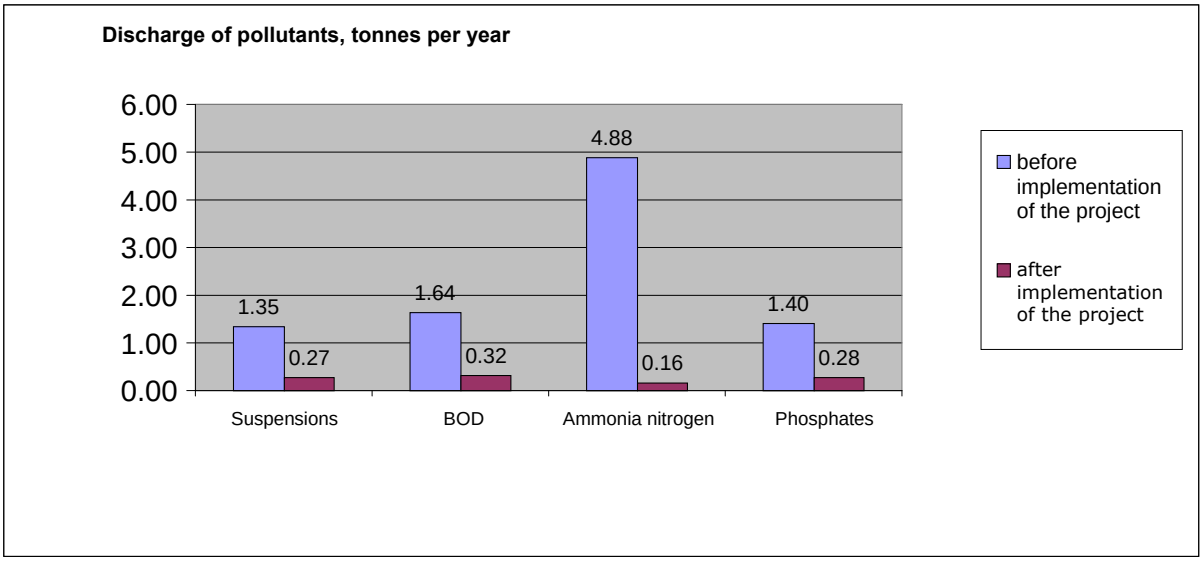


Fig. 8. Reduction of the discharge of pollutants with the waste water from WWTF Bondarny

6.2 SOCIAL ASSESSMENT

Due to ineffective operation of WWTF Kachgort and Bondarny the insufficiently treated waste water is discharged into the water bodies of Naryan-Mar which results in the pollution of the water area.

The existing situation leads to deterioration of both environmental and social situation in the city, particularly increase of social tension, in health impairment of population, and reduction of recreation and tourism areas previously used by population for recreation.

6.2.1 Stakeholder identification

The following stakeholders have been identified in the project:

- Employees at the WWTFs
- Contractors/workers at the WWTFs
- Local citizens
- Local communities in Naryan-Mar
- The Municipal Administration in Naryan-Mar
- The Administration of the Nenets Autonomous Okrug
- The Administration of the Arkhangelsk Region

6.2.2 Social analysis

Thorough social interviews of all stakeholders have not been made. The following social analysis is based on opinions/assessments of the project owner and the local and district administrations, and further on the general socio-economical situation in Naryan-Mar.

The Municipal Administration of Naryan-Mar is very concerned about the improvement of the existing situation, which worsens every year due to the poor technical state of the WWTF equipment, permanently declining the reliability. The meetings held with some of

the stakeholders in Naryan-Mar indicated that the owner of the project, MUE Joint Boiler and Heating Systems, are interested in a rapid problem solving. Administration of Naryan-Mar city and Administration of the Nenets Autonomous okrug consider this project implementation one of its top targets.

6.2.3 Social benefits of IP implementation

The social impact assessment shows that the project implementation will entail the following social benefits, which are difficult to convert to monetary terms:

- Enhancement of sewage system reliability, which is one of the most important life supporting systems.
- Prevention of untreated sewage waters outflow to the surface water bodies of Naryan-Mar city. This will positively influence the environment and will result in improvement of the local population living conditions.
- Improvement of sanitary and epidemiology situation in Naryan-Mar by demolition of septic tanks and cesspits.
- Improvement of habitational conditions by transferring of the housing facilities of the Kachgort, Lesozavod and Noviy settlements into complete public servicing.
- Improvement of habitational conditions will decrease the disease level that in turn will result in the reduction of personal and budget expenses for medical treatment. This could also decrease the migration of population to other regions of the Russian Federation.
- Introduction of a new viable waste water treatment technology in the region. Adapting similar solutions for other areas of environmental and health concerns induces capacity building.

6.3 Stakeholders participation/involvement

Stakeholders Participation

Stakeholder participation in the project is essential for communicating the social benefits of the project.

Measures aimed at public and local population awareness of this IP implementation are taken in the course of pre-investment studies.

The June 2009 Newsletter of the Nordic Council of Ministers "Energy Efficiency in the Barents and Baltic Regions" which is published both in Russian and English contained information about the project.

Community meetings will be held prior to the project implementation to inform the stakeholders and community about the project proper and about the process of its implementation. The meetings will help the owner of the project to identify the potential factors of concern to the stakeholders at an early stage.

Recommendations on the Investment Programme

The Consultant recommends the owner of the project, MUE Joint Boiler and Heating Systems, and Administration of Naryan-Mar together with Administration of the Nenets Autonomous okrug to carry out the development of feasibility study for the reconstruction of water supply and water drainage systems in Naryan-Mar, including elaboration of a long-term investment programme and a detailed short-term priority programme of early

investments. The Consultant recommends turning for assistance in implementation of this work and probable funding to the international financial organisations experienced in funding of large construction projects and reconstruction of infrastructure facilities, including municipal water supply and water drainage systems such as EBRD, NEFCO, Northern Investment Bank and others.

7. PROJECT FINANCIAL VIABILITY

This chapter covers the financial justification for the implementation of the proposed measures on WWTF modernization at Kachgort and Bondarny Settlements of Naryan-Mar. This chapter contains the results of the preceding chapters' analyses and financial justification for the proposed investment plan.

7.1 Approaches of Economic Evaluation

The main goal of evaluation is to determine financial viability and economic efficiency of the investment project. After economic evaluation the financial viability, payback and possibility of profit earning are estimated, subsequently leading to the decision about reasonability of the IP implementation.

The reasonability evaluation is based on comparison of the current situation and expected situation after project implementation.

It should be noted that WWTF in Kachgort and Bondarny are in poor condition, the technologies used for treatment of waste waters do not comply with the regulatory requirements to the quality of waste water treatment. The situation is getting worse from year to year. If this IP is not implemented, this tendency is expected to continue.

When evaluating the project it becomes clear that there is no direct economic effect after project implementation because the project does not envisage the reduction of net cost or additional profit. Kachgort WWTF fulfils the function of sedimentation tanks for the waste water. The Bondarny WWTF can not be acknowledged highly effective either. Other factors and effects, such as environmental and social impact, are also considered in the assessment of the project's feasibility. So, many of the benefits cannot be evaluated in money equivalent.

7.2 Financial Status of MUE Joint Boiler and Heating Systems

The financial status of MUE Joint Boiler and Heating Systems was not analysed. Despite numerous requests of the Consultant to provide the financial reporting documentation of the enterprise which is required for the analysis and notification about exclusion of the project from the priority list for the Russian Arctic area in case the necessary information is not provided (Annex 12), the data was not provided. Enquiries to the owner of the project - MUE Joint Boiler and Heating Systems met no response either. The Consultant got an impression that the enterprise were waiting for guidance from the city administration which they didn't get.

7.3 Project Financing

7.3.1 IP Financing Schedule

Investment expenses for implementation of the project and IP financing schedule are presented in this chapter. The total project cost is 1 954 500 euro (86 mln. rubles) 1 090 900 euro (48 mln. rubles) of which is reconstruction of Kachgort WWTF and

863 600 euro (38 mln. rubles) – reconstruction of Bondarny WWTF. The investment costs are capital costs for reconstruction of WWTF at Kachgort and Bondarny (**Ошибка! Источник ссылки не найден.**).

Ошибка! Источник ссылки не найден.**: IP implementation costs, euro**

	Costs	Cost	
		rubles	euro
1.	**Capital costs, Kachgort WWTF**		
	Engineering survey	3 000 000	68 200
	Procurements and assembly	40 000 000	909 100
	Connection to the network	5 000 000	113 600
	Total, Kachgort WWTF	**48 000 000**	**1 090 900**
3.	**Capital costs, Bondarny WWTF**		
	Engineering survey	3 000 000	68 200
	Procurements and assembly	30 000 000	681 800
	Connection to the network	5 000 000	113 600
	Total, Bondarny WWTF	**38 000 000**	**863 600**
	TOTAL IP costs:	**86 000 000**	**1 954 500**

The ability of MUE Joint Boiler and Heating Systems to cover the investment and the financing costs of the proposed investment programs were analyzed. The proposed investment programs are presented earlier in this document.

The financial data and information for the financial analysis was received from the accounts of MUE Joint Boiler and Heating Systems, by interviewing the management and by making estimates by using previous experience of the consultant.

The financial analysis was made by using the following assumptions which are same for both WWTPs, Kashgort and Bondarny:

- The constructions start in the beginning of 2011 and ends in the end of 2011. The treatment plants are in full use in the beginning of 2012.
- The conditions for the IFI loans are assumed to be:
  - 10 year maturity including 1 year grace period;
  - disbursement period is 1 years;
  - the loan is nominated in EUR;
  - interest rate is 0%
  - there are no other costs related to the loan.
- The interest rate used in NPV calculations is 5%.
- The monetary figures in 2009 and forward presented in the tables are in the constant 2009 money value.
- Exchange rate used is 44 RUB/EUR.
- Depreciation of assets was made by using straight line method and by assuming 30 years depreciation time.
- Income tax rate was assumed to be 18%. Other taxes were not considered in the analysis. VAT rate is 18% - however, VAT is not a cost for MUE Vodokanal, hence the tariff rates are presented without VAT.
- Tariffs are the same for all the customer groups. In 2009 the waste water tariff was RUB 29.72 per m^3. It is also assumed that 100% of tariffs are collected.

- The financial analyses for the investments were made only for the new investments for the period 2011 - 2025. It was assumed that the old waste water treatment plants are obsolete and their operations end when the new plant starts operation.
- Working capital requirements are set to: 90 days for both accounts receivable and payable. Cash in hand and raw material inventory are assumed to be for 30.

Kachgort WWTF

The financing schedule by financier and the year is presented in the Table 18 below. The financing schedule is preliminary and represents a typical structure of IFI financed waste water treatment project in Russia.

Table 18: Financing Schedule by Financier and Year for Kachgort WWTF, thousand rubles

WWTF Kachgort Investments	2 011	2 012	TOTAL	Share, %
International funds, loan	19 200	0	19 200	40%
Grant	9 600	0	9 600	20%
Local funds	19 200	0	19 200	40%
TOTAL investments	**48 000**	**0**	**48 000**	**100%**

* Change in particular years of project implementation will require adjustment of financial indicators of the project.

The Kachgort specific assumptions used are:

- The capital costs of the investment are of the value RUB 48 million and consists of engineering and survey costs RUB 3 million, procurement and assembly RMB 40 million and connection to the network RUB 5 million.
- The investments are assumed to be made by using following financing sources:
  - local financing 40% of the investment, which is RUB 19,2 million
  - international grant 20% of the investment, which is EUR 218182 (RUB 9,6 million) and
  - International Financing Institution (IFI) loan 40% of the investment, which is EUR 436364 (RUB 19.2 million).
- The annual volumes of waste water treated are estimated based on the present estimated waste water flow during the first operation year, 400 m^3/day (146 000 m^3/year) and by assuming 10% increase annually until the waste water flow reaches the design capacity 1200 m^3/day (438 000 m^3/year).
- Unit costs for variable costs (power, chemicals and materials), which are linearly dependent on the waste water volume treated, are at the design capacity, 1200 m3/day:
  - electric power RUB 350 000 per year, however the real value of it is assumed to increase by 10% annually for next 5 years and to keep unchanged after that until the end of the analysis period.
  - chemical agents and materials RUB 30 000 per year.
- Fixed costs (maintenance and repairs of equipment) of the new WWTP are assumed to be RUB 60 000 annually and stay on the same real value level throughout the project.

For financial analysis results of Naryan-Mar Kachgort WWTP see Annex 13. The annexes include the following information:
- Summary sheet for the financial analysis,
- Production and sales program,
- Cash flow for financial planning,

- Sensitivity of IRR.

The present tariff level is adequate for covering the investment, loan and operation related costs. However, the operation costs are unusually low compared to the investment costs.

Based on the IRR analysis the internal rate of return for the investment is 11%. The NPV by using 5% discounting rate is RUB 33 million. The investment is profitable.

The investment is not sensitive for changes in operating costs as most of the operating costs are variable costs. The investment is most sensitive for changes of sales revenues and costs of fixed assets. If the sales revenue decreases or cost of fixed assets increase by 12% the IRR decreases to 10%. In general the investment is not very sensitive to changes in costs.

Bondarny WWTF

The financing schedule by financier and the year is presented in the table below. The financing schedule is preliminary and represents a typical structure of IFI financed waste water treatment project in Russia.

Table 10: Financing Schedule by Financier and Year for Bondarny WWTF, thousand rubles

WWTF Bondarny Investments	2 011	2 012	TOTAL	Share, %
International funds, loan	15 200	0	15 200	40%
Grant	7 600	0	7 600	20%
Local funds	15 200	0	15 200	40%
TOTAL investments	**38 000**	**0**	**38 000**	**100%**

* Change in particular years of project implementation will require adjustment of financial indicators of the project.

The Bondarny specific assumptions used are:

- The capital costs of the investment are of the value RUB 38 million and consists of engineering and survey costs RUB 3 million, procurement and assembly RMB 30 million and connection to the network RUB 5 million.
- The investments are assumed to be made by using following financing sources:
  - local financing 40% of the investment, which is RUB 15,2 million
  - international grant 20% of the investment, which is EUR 172747 (RUB 7,6 million) and
  - International Financing Institution (IFI) loan 40% of the investment, which is EUR 345455 (RUB 15,2 million).
- The annual volumes of waste water treated are estimated based on the present estimated waste water flow during the first operation year, 213 m^3/day (77 745 m^3/year) and by assuming 10% increase annually until the waste water flow reaches the design capacity 700 m^3/day (255 500 m^3/year).
- Unit costs for variable costs (power, chemicals and materials), which are linearly dependent on the waste water volume treated, are at the design capacity 700 m3/day:
  - electric power RUB 263 000 per year, however the real value of it is assumed to increase by 10 annually for next 5 years and to keep unchanged after that until the end of the analysis period.
  - chemical agents and materials RUB 30 000 per year.

- Fixed costs (maintenance and repairs of equipment) of the new WWTP are assumed to be RUB 30 000 annually and stay on the same real value level throughout the project.

For financial analysis results of Naryan-Mar Bondarny WWTP see Annex 14. The annexes include the following information:
- Summary sheet for the financial analysis,
- Production and sales program,
- Cash flow for financial planning,
- Sensitivity of IRR.

The present tariff level is adequate for covering the investment, loan and operation related costs. However, the operation costs are unusually low compared to the investment costs.

Based on the IRR analysis the internal rate of return for the investment is 7%. The NPV by using 5% discounting rate is RUB 9 million. The investment is profitable.

The investment is not sensitive for changes in operating costs as most of the operating costs are variable costs. The investment is most sensitive for changes in sales revenues and costs of fixed assets. If the sales revenue decreases or cost of fixed assets increase by 12% the IRR decreases to 6%. In general the investment is not very sensitive to changes of costs.

7.3.2 Planned Project Co-financing

Presently there is no information about the project co-financing.

Earlier the funds for implementation of projects on reconstruction of Kachgort and Bondarny WWTF were allocated in the budget of the Arkhangelsk Region within the framework of the long-term target programme of the Arkhangelsk Region "Co-financing of construction of social and engineering infrastructure on the territory of the Nenents Autonomous Okrug for the period of 2009-2011". However the funding of the projects for 2009 was not provided for by the above mentioned regional programme due to difficult financial situation.

In 2009 the Administration of Naryan-Mar approved a long-term programme "Provision of clear water to the population of Naryan-Mar (2010-2013)" which also includes the projects on reconstruction of Kachgort and Bondarny WWTF. Naryan-Mar Administration can not guarantee that the funds allocated for this purpose in the programme will be supplied in 2010.

Presently the issue of co-financing remains open and will have to be addressed at the later stages of the project. It has to be resolved in parallel to development and approval of the IP financing structure.

7.3.3 Possible Sources of Financial Support from Interested Stakeholders

The project does not have direct economic effect. However, there are some possibilities to attract the local and regional investments for the project implementation. Possible Russian financing sources:

- Long-term target programme of the Arkhangelsk Region "Co-financing of construction of social and engineering infrastructure on the territory of the Nenets Autonomous Okrug for the period of 2009-2011".

As can be seen from Table 20 even though the projects were included in the regional target programme their funding from regional and local budgets in 2009 was not envisaged. Besides the difficult financial situation one of the reasons was lack of municipal target programme which would stipulate the relevant volume of funding to construction of municipal property at the expense of the local budget.

Table 11: IP financing within the framework of the long-term target programme of the Arkhangelsk Region "Co-financing of construction of social and engineering infrastructure on the territory of the Nenets Autonomous Okrug for the period of 2009-2011", thousand rubles

Project	Funding source	Volume of funding			
		total	2009	2010	2011
Kachgort WWTF reconstruction	total	124 414	-	30 000	94 414
	including				
	regional budget	92 914	-	15 000	77 914
	local budget	31 500	-	15 000	16 500
Bondarny WWTF reconstruction	total	54 428	-	23 500	30 928
	including				
	regional budget	34 428	-	13 500	20 928
	local budget	20 000	-	10 000	10 000

In case the funds for project implementation are allocated within the regional target programme the project may be funded from consolidated funds of the local and regional budgets under co-financing.

- Long-term municipal programme "Provision of clear water to the population of Naryan-Mar (2010-2013)"

The above programme which was developed in 2009 includes the projects on reconstruction of Kachgort and Bondarny WWTF. The annual projects financing is presented in Table 21.

Table 12: IP financing within the framework of Long-term municipal programme "Provision of clear water to the population of Naryan-Mar (2010-2013)", thousand rubles

Project	2010	2011	2012	2013	TOTAL
Kachgort WWTF reconstruction	6 000 (design)	30 000	47 207	47 207	124 414 (without the design)
Bondarny WWTF reconstruction		34 500	30 928	9 084	74 512

The programme envisages the 3% contribution from the municipal budget; the remaining 97% of the total cost of each project are to be funded by the okrug budget.

- Long-term okrug programme "Provision of clear water to the population of Naryan-Mar". In 2009 for allocation of okrug funds for implementation of IP a similar

programme was developed. The volume of funds and time frames fully comply with the municipal programme (Table 21).

- Investment programme of MUE Joint Boiler and Heating Systems. For the purpose of financial stability of the project it is worthwhile considering inclusion of IP implementation costs in the investment programme of the enterprise. According to the existing practice the investment expenses are included in the tariffs; this entails increase of payments by the population for the housing and utilities services and therefore leads to discontent of the population. Thus this measure should firstly be approved by the Council of Naryan-Mar city.

- State programme "Clear water". At the moment of negotiations with the Administration of Naryan-Mar this programme was not being considered by the Administration as a potential source of co-financing.

Additional consultations have been made to clarify existing possibilities of the IP financial support from involved authorities and the project owner, as well as to identify potential International Financing Institutions.

Administration of Naryan-Mar municipal district has confirmed its interest in the IP implementation (Annex 15). Within the implementation of long-term programmes financing of activities carried out in the territory of the municipal district is made subject to co-financing from the regional budget in the amount of 97% of the costs and municipal budget in the amount of 3% of the costs (Annex 16). Co-financing from the regional budget is made in the form of subsidies. In connection with the lack of own income and decrease of the grant size allocated from the Arkhangelsk region budget, Administration of Naryan-Mar is interested in the IP implementation and international grant. Administration of Naryan-Mar municipal district is able to implement the project subject to financial support from IFI and Nenets Okrug budget.

MUE Joint Boiler and Heating Systems has not confirmed possibility to participate in this project referring to the lack of available funds (Annex 9). The enterprise expects that this IP may possibly be implemented under the targeted programme "Provision of clean water to Nenets Okrug population".

Possibilities to attract international financing sources were considered besides Russian investments. Consultations with IFI - International Finance Corporation (IFC), European Bank for Reconstruction and Development (EBRD), the Global Environment Facility (GEF Earth Fund), Northern Dimension Environmental Programme (NDEP), NEFCO, UNEP, the Nordic Investment Bank (NIB) showed that large credit organizations such as EBRD and NDEP believe that financing of this IP is possible subject to the appropriate conditions.

EBRD expressed its interest in the project implementation in Naryan-Mar having noted that the bank is also interested in the increase of the investment programme scope. The bank experts are ready to meet personally with the representatives of the enterprise and authorities to discuss the project details (Annex 17).

NDEP provides financing for the projects developed by international financing institutions using financial schemes combining loans and grants (Annex 18). NDEP is open to consider possibility to project financing in the form of grants based on the proposals from IFIs. NDEP has forwarded the message to partner institutions: NIB and NEFCO. NDEP also noted that it is ready to continue negotiations under this IP in case of assurance from the Nents Okrug Administration about unconditional support of the IP and relevant guarantees.

Information about this project was submitted to NEFCO representatives (Henrik Fosstrom, Senior advisor). Preliminary talks were held with NEFCO representatives in Arkhangelsk in autumn 2009 on the similar project which presents a block-modular plant for WWTF modernization at Lesnaya Rechka district. NEFCO expressed their interest in participation in the project but have preliminarily pointed out that they are only beginning the work on projects related to the water sewage sector; they do not have the experience of implementation of pilot or similar projects and no mechanisms of financing of such projects. In the letter dated 12.06.2010 NEFCO noted the certain progress in negotiations with the Russian Ministry of Natural resources with respect to the projects connected with various types of hazardous waste and pollutions (Annex 19). Such activity will be coordinated with the Arctic and Barents organizations that will allow implementing pilot projects in Northwest Russia. According to their opinion, Nenets Autonomous Okrug can be one of the pilot sites.

Involvement of additional financing is necessary for implementation of the project in the shortest possible time. With the existing financing structure the implementation of the project may linger for several years. This would inevitably lead to even greater deterioration of sanitary and environmental situation in the city.

7.4 State Support

Administration of Naryan-Mar pays particular attention to the development of municipal sector. Improvement of the quality of life of the population is one of the key goals of the city administration. And therefore increase of provision of social and engineering infrastructure to the population of Naryan-Mar is of paramount importance.

The major activities of the city administration are as follows: drinking water supply, waste water treatment, solid domestic waste reprocessing. Apart from the social effect these projects have the environmental effect which allows reducing the negative impact on Naryan-Mar environment and adjacent territories, including the marine water objects. As suggested by the Regional Administration this IP was selected as one of the priority projects for the development of pre-investment studies.

In 2007 the Council of the city of Naryan-Mar (Resolution No.235-r of 29 November 2007) approved the municipal target programme "Development of the material and technical basis of municipal organizations within the housing and utilities sector which operate the systems of housing and utilities infrastructure in the sphere of heating, water supply and sewage and waste water treatment in the city of Naryan-Mar for the period of 2008-2010". The programme is aimed at improvement of quality and reliability of housing and utilities services provided to the population and improvement of the material and technical base of MUE Joint Boiler and Heating Systems. The major projects of the programme are: construction of the administrative building, carpenters, maintenance, transport workshops as well as fencing and improvement of the territory of the base. Thus, the implementation of the programme would provide: the required maintenance of municipal property used for the purpose of providing the housing and utilities services to the population; improving the technical condition of the above mentioned property; growth of main assets and would allow proper location of the property with a view to its rational use; would allow reducing the operational costs for the engineering infrastructure facilities and expenses for housing and utilities services.

It is obvious that in the course of the recent years the Naryan-Mar administration have been actively working on improvement of the municipal housing and utilities infrastructure. Naryan-Mar administration, NAO administration and the owner of the project MUE Vodokanal are extremely interested in the IP implementation.

The present IP was chosen on the initiative of the Nenets Autonomous Okrug Administration as one of the priority projects for PINS (Annex 1).

Thus, the project is supported on all levels from the owner to the local and okrug authorities.

7.5 Legal or Other Types of Restrictions for Russian and Foreign investors

The project will be implemented on the territory without any restrictions. Russian and foreign investors can participate in co-financing of the project.

8. PROJECT STATUS AND ACTIONS

8.1 Present Situation

The Administration of Naryan-Mar together with the project owner MUE Joint Boiler and Heating Systems are interested in implementation of the project on construction of new waste water treatment facilities in the Kachgort and Bondarny settlements that has been more than once emphasised during pre-investment studies meetings.

Projects on reconstruction of WWTFs in Kachgort and Bonadrny are two separate projects. But considering complexity of the situation of the waste water treatment in Naryan-Mar and the desire of the City Administration, these two projects were joined into one IP.

8.2 Project Implementation Plan

The project implementation will include several stages:

- receiving a loan, grant;
- tender documents preparation and tender procedures;
- contract negotiation;
- design documentation development and approval;
- production and procurement;
- installation;
- personnel training and equipment commissioning;
- equipment maintenance and monitoring of the project's economic status.

The project implementation schedule is presented in
with 2011 as a starting point. If the financing plan is changed, the project implementation plan will also require revision, but the implementation periods will not change. The project duration will be 2 years from the start of contract negotiations till project completion.

In case of failure to attract local funding resources in 2010 and 2011, as in some situations it is to be approved in the previous year as well as due to the difficult financial situation in 2010, implementation of works will need to be postponed until 2012.

: Project implementation plan on the modernization of the WWTFs in Kachgort and Bondarny

	Works Description	2010	2011	2012
1	Surveys and design development			
2	Kachgort WWTF: delivery and installation of equipment			

3	Bondarny WWTF: delivery and installation of equipment			
4	Kachgort WWTF: pre-commissioning			
5	Bondarny WWTF: pre-commissioning			

It is worth considering that this project implementation plan is very tentative and depends on how quickly an investor will be identified, because the project owner and the Naryan-Mar Administration cannot afford financing of this project on their own account.

In case of impossibility to fund the IP in full it can be broken down into 2 separate projects. This approach is not the most preferred as it requires significant increase of temporary and labour costs relevant to development and implementation of 2 separate projects. Otherwise the IP may be broken down into stages: Stage 1 – Reconstruction of the WWTF in Kachgort and Stage 2 – Reconstruction of the WWTF in Bondarny. After the reconstruction of the WWTF in Kachgort works under Stage 2 can start. In this case only the project implementation schedule is changed and all other aspects of development and implementation of the IP remain without changes. The works stipulated in Table 22 in items nos. 2 and 4 can be performed in 2011 and in items nos. 3 and 5 – in 2012.

8.3 Organizational Measures / Key Decision Points

Prior to the initiation of the project the following organizational measures should be performed:

- MUE Joint Boiler and Heating Systems and the Administration of Naryan-Mar to develop a project implementation plan considering recourses available
- To develop the project funding model according to the foreign investor's requirements and possibilities of the municipality and the project owner.
- The Naryan-Mar Administration to provide funds in the municipal budget for co-funding of the project for 2011-2012.
- The Administration of the Nenets Autonomous okrug to allocate funds in the district budget for co-funding of the project for 2011-2012.
- The Arkhangelsk Regional Government to allocate funds from the regional budget for the project co-funding.
- MUE Joint Boiler and Heating Systems to develop an investment programme of the enterprise which would allow funding a part of investment costs under the IP for the account of the tariffs for water drainage and connection of water consumers to the sanitary sewage system.

8.4 Own Resources of MUE Joint Boiler and Heating Systems for Project Implementation

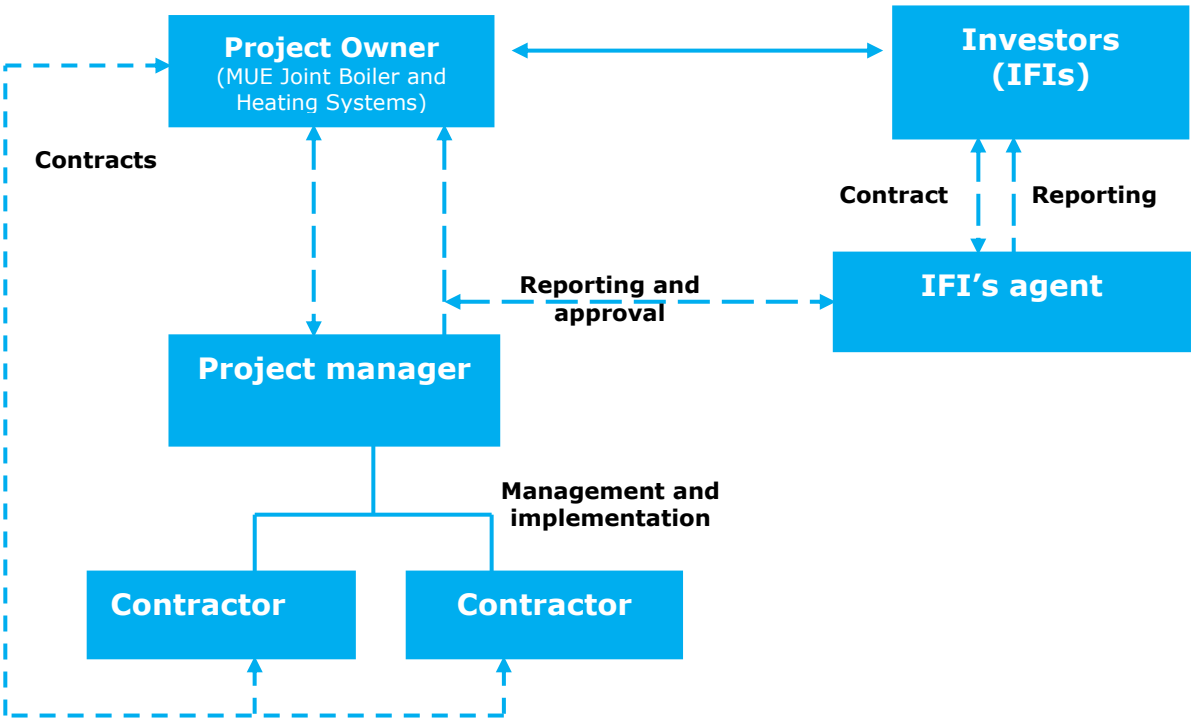
MUE Joint Boiler and Heating Systems hasn't resources/experts for the project implementation. Field survey and construction, as well as equipment procurement and installation in similar projects are performed by special external subcontractors, selected on a tender basis.

8.5 Project Organization Structure

MUE Joint Boiler and Heating Systems is the owner of the project and possible future loan receiving party (if the loan is granted).

To enhance project implementation efficiency and to use the experience of project development and implementation in the north-west Russia, the following project organization structures is proposed on **Ошибка! Источник ссылки не найден.** below as one of possible options for implementation of the IP.

As for the project management, the international experience shows that an independent project manager is one of the obligatory requirements for international projects from International Financing Institutions.



Ошибка! Источник ссылки не найден.. **Example of possible project organization chart**

The project organization chart can be slightly altered if necessary and in case of change in the project participating parties.

The managing function will be performed by the Project Manager whose responsibilities will include daily project progress monitoring at every project stage. Main responsibilities include:

- to coordinate and approve project activities;
- to coordinate work on the project;
- to ensure the project reports comply with the requirements;
- to arrange project progress meetings;
- to prepare documents for the project financing management in due time;
- to coordinate procurement and contractors' activities;
- to approve and monitor project expenses;
- to control contractors' activities;
- to coordinate all changes in the project.

The owner of the project MUE Joint Boiler and Heating Systems is responsible for the project implementation in accordance with the contracts with the investor and contractors; performs co-financing of the project, and bears full financial and legal liabilities for the project.

The Naryan-Mar Administration acts as a project guarantor, monitors the progress of the project, co-finances the project, bears full legal and financial liabilities in case the project owner fails to fulfil its responsibilities.

Selection of contractors is based on tender procedures. The candidates should confirm their technical, organizational and financial abilities with documents (obligatory requirements: licence received according to the established procedure, registration certificate, tax-payer certificate, etc). The winner of the tender is awarded a contract with the Customer.
The tender board is formed by the Customer's decision involving its personnel as agreed with the municipal administration. Representative of the Project Manager has advisory vote only aiming to make an impartial assessment of the tender procedure.

During project implementation the participants should follow the requirements of the Russian legislation, federal standards, industry requirements and standards, as well as other requirements regulating investment and construction activity.

9. ASSESSMENT OF RISKS AND JUSTIFICATION OF PROJECT SELECTION

This chapter contains preliminary risk assessment and project selection justification. As the project is at the starting stage, the specific information on the project is limited. Preliminary assumptions are based on the collected information, basic knowledge of the field and professional experience in similar projects.

9.1 Risk Evaluation

Project evaluation includes the following investment risk assessment:

- Technological risk
- Environmental risk
- Implementation risk
- Social risk
- Financial risk
- Legislative risk
- Responsibility risk

Technological risk
Technical solutions proposed for the project are quite common in Russian and foreign practice of waste water treatment. There are no considerable risks in implementing these solutions provided that surveys and design are performed by a qualified designer and construction is performed with a high quality.

Environmental risk
Environmental risks will be reduced significantly compared to the existing situation, as the proposed solutions will help to reduce negative impact of waste water discharge into Naryan-Mar surface water recipients and further dispersion into the Pechora River.

During periods of the project in which physical work is undertaken, an increase in greenhouse gas emissions is expected. In order to reduce gas emissions, it is suggested that preventive measures are included in a health, environment and safety plan for the project.

Implementation risk
The time frame for the project has not been determined yet because the first priority for development of a complete and specific project plan is to find an investor and approve the local financing.

It is necessary to consider companies with positive references from similar projects as a Principal Contractor for the project. Considering the economic efficiency it may be reasonable to sign turnkey contracts with subcontractors and suppliers with a fixed price.

Social risk
The project is expected to have an overall positive effect on the social situation of Naryan-Mar. Some of the population may however feel that money allocated for this project, would be better spent on other social improvements in the municipality.

Prior to project initiation, the project owner will hold public hearings in Naryan-Mar involving citizens of the municipality and other stakeholders in the project. The aim of the hearings is to identify potential social risks that can be taken into account early in the planning process.

Financial risk
The financial risk for this project is the financial crisis of this year that can lead to insufficient project funding and higher project implementation costs.

To reduce financial risk of the project it is reasonable to provide for external financing sources in the form of a grant or a loan with more beneficial terms than is used in common practice.

In addition, to minimize the financial risk the decision of including the project in the Regional Program for allocation of regional and municipal financing should be taken at the end of this year, when the budgets for the next year are developed and approved. In addition, possible increase of tariffs of MUE Joint Boiler and Heating Systems at the expense of investment component for project implementation should be considered.

Legislative risk
There are no obstacles for the project implementation in the Russian legislation.

Responsibility risk
The owner of the project has been defined and will bear the legal and financial risk.

To reduce the responsibility risk, the Naryan-Mar Administration must act as a guarantor of the project implementation and provide guarantees by adding special articles into the budget for 2010-2011 to cover possible loan.

9.2 Selection Justification

This IP of modernizing the waste water system was initiated by MUE Joint Boiler and Heating Systems and supported by the Naryan-Mar Administration.

The implementation of the project entirely meets the objectives and goals as pertaining to the environmental safety provided by the fundamentals of the state policy of the Russian Federation in the Arctic for the period until 2020 and subsequently (approved by the President of the Russian Federation as of 2008), as well as the Strategic action plan for the environmental protection of the Arctic area of the Russian Federation (approved by the Marine Board under the Government of the Russian Federation as of June 19, 2009).

Project implementation will contribute to improvement of the environmental and social situation in Naryan-Mar. Taking into account that the pollution sources of the two waste water treatment facilities is located in close proximity to the Pechora River, flowing directly into the Barents Sea, this can be regarded as a step towards an integrated approach of improving the environmental situation of the Pechora Region, including the Arctic aquatic environment.

10. CONCLUSION

This chapter summarizes work related to preparation of regional investment studies for modernisation of the waste water system in Naryan-Mar.

Environmental and social aspects

The settlements of Kachgort and Bondarny are part of the city of Naryan-Mar, situated along the riverbank of the Pechora River. The Pechora Region (northern part of the Komi Republic and the Nenets Autonomous region) has extensive natural resources supporting forestry, oil, coal and gas industries. Historically the region has hence been affected by extensive potentially polluting activities. At some locations of the Pechora River, concentrations of heavy metals and hydrocarbons have been registered at levels assessed to negatively impact the aquatic biodiversity.

The existing waste water treatment facilities in Kachgort and Bondarny are in a critical state due to outdated methods for treatment of wastewater that do not meet the environmental requirements. The WWTFs are continuously discharging wastewater to nearby water bodies, which drain directly into the Pechora River. Since the Pechora River flows directly into the Barents Sea, the existing WWTFs are assessed as posing a hazardous risk to the local and regional environment, including the Arctic marine environment. In addition the WWTFs pose a potential risk to the health of workers and local residents.

Technical aspects

Based on preliminary assessments of 3 solutions for modernizing the WWTFs in Kachgort and Bondarny, the most appropriate technology was prefabricated block-modular small-sized plants to treat wastewater. The technological solution provides treatment of wastewater to levels that meet the environmental requirements of discharge into fishery water bodies. In addition the solution provides advantages such as low construction and operational costs, possibilities of expanding the designed plants, easy to maintain and operate.

Financial aspects

Based on the existing information for wastewater treatment capacity and environmental requirements, construction costs amount to 86 million roubles, of which 48 million roubles are the costs for modernization of the WWTF in Kachgort and 38 million roubles are costs for modernization of the WWTF in Bondarny.

The financial structure of investments is supposed to comprise the IFI credit – 40%, international grant – 20%, local funding – 40%.

The annual operational costs, including maintenance and repair amount to a total of approximately 760 thousand roubles.

The present level of tariffs reasonably refunds reimbursement of investment, credit and operational expenses. Based on the analysis the internal profit rate of investment of the Kachgort and Bondarny settlements is 11% and 7% correspondingly. Investment is cost effective.

Recommendations

Risks identified in the project are not critical and can be met by using professional and experienced companies for design and construction, and involving stakeholders at as early a stage in the project as possible. In addition the Naryan-Mar Administration must act as guarantor of the IP to ensure the implementation and financial responsibility.

Considering the average cost of the project as compared to similar international projects, this IP has got practical conditions for its implementation. In case the Administration of Naryan-Mar gets interested in the implementation of the project under the financial support of the IFI, the city administration is required to revise its line with respect to supplying of financial information as well as to specify the estimated scopes of co-funding of the IP from enterprise's, municipal, district and regional funds.

Implementation of the project is expected to contribute in reducing the environmental strain on the local and regional environment, including the Arctic marine environment. Due to the environmental and social benefits of the project as well as in order to overcome financial uncertainty related to the implementation of the project, it is recommended to continue development of a full scale investment plan which envisages coming into contact and negotiations between the governmental authorities of Naryan-Mar and the Nenets Autonomous okrug and the international financial institutions, in particular with those that expressed their interest in funding the project.

ANNEXES

Annex 1. Letter from the Administration of the Nenets Autonomous okrug regarding the proposed investment projects, 15th May 2009
Annex 2. Map of the Kachgort settlement
Annex 3. Map of the Bondarny settlement
Annex 4. Map of the location of the WWTF in the Kachgort settlement
Annex 5. Map of the location of the WWTF in the Bondarny settlement
Annex 6. Process flow sheet of the Kachgort WWTF from the design of 1985 (not used)
Annex 7. Process flow sheet of the Bondarny WWTF
Annex 8. Visit of the project team to the facilities in Naryan-Mar on 09 June 2009
Annex 9. Letter of Naryan-Mar Municipal Unitary Enterprise Joint Boiler and Heating Systems with comments on IP dated of 27.05.2010.
Annex 10. Maximum allowable concentrations of pollutants for water discharge at Naryan-Mar WWTF
Annex 11. Actual concentrations of pollutants in the water discharged by Naryan-Mar WWTF
Annex 12. Letter to administration of Naryan-Mar with notice on possible exclusion from priority list of projects dated of 30.12.2009.
Annex 13. Results of the analysis of the financial condition of the Kachgort WWTF in Naryan-Mar
Annex 14. Results of the analysis of the financial condition of the Bondarny WWTF in Naryan-Mar
Annex 15. Letter of administration of Naryan-Mar on project support of 28.05.2010
Annex 16. Letter of administration of Naryan-Mar to administration of NAO with request to support project of 29.04.2010
Annex 17. Letter of EBRD on project support of 19.04.2010
Annex 18. Letter of NDEP on project support of 05.04.2010
Annex 19. Extract of the letter of Nefco on project perspectives of 12.06.2010

Annex 1. Letter from the Administration of the Nenets Autonomous okrug regarding the proposed investment projects, 15th May 2009

Администрация Ненецкого автономного округа

ул. Смидовича, 20, г. Нарьян-Мар
Ненецкий автономный округ, 166000
тел. (81853) 4-21-13
тел./факс (81853) 4-22-69

от _____2009 № _____

ООО «Рамболь Стурвик»

пр.Обводный канал, 13/3
163046 г. Архангельск
www. ramboll.com

На № 09-А от 23.04.2009

В дополнение Администрации Ненецкого автономного округа направляет Вам наименование проектов «Управление отходами в г. Нарьян-Маре и пос. Искателей», «Реконструкция канализационных очистных сооружений в жилом районе Бондарка г. Нарьян-Мара» (либо «Строительство новых канализационных очистных сооружений в пос. Качгорт»).

Translation

Administration of the Nenets Autonomous okrug
Smidovicha st., 20, Naryan-Mar
Nenets Autonomous okrug. 166000
Tel. (81853) 4-21-13
Fax (1853) 4-33-69
dated _____ 2009 No. _____

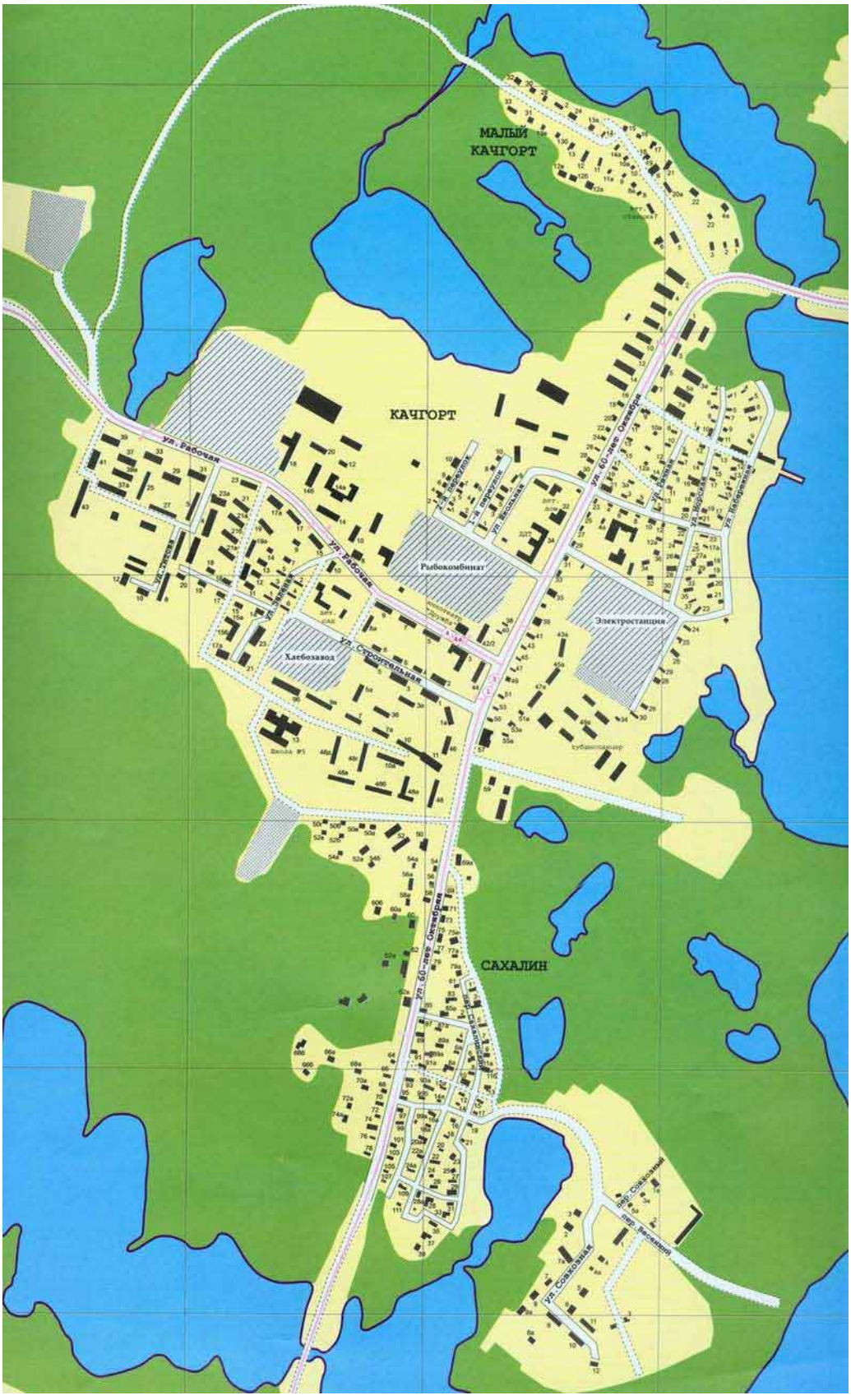
OOO Ramboll Storvik

pr. Obvodniy canal, 13/1
163046 Arkhangelsk
www.ramboll.com

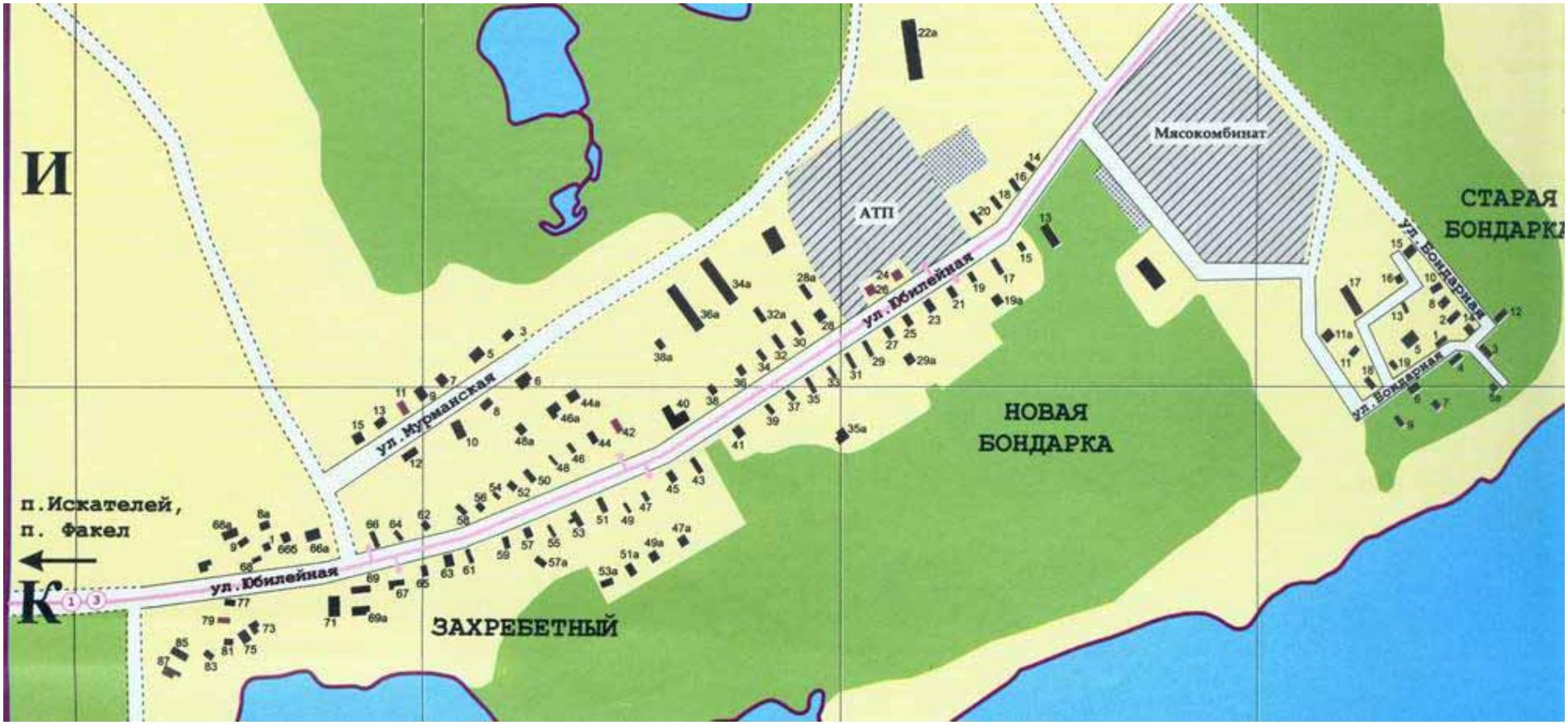
to No. 09-A dated 23.04.2009

In addition the Administration of the Nenets Autonomous okrug is sending to you the names of the projects: "Waste Management in Naryan-Mar and Iskateley settlement", "Reconstruction of Waste Water Treatment Facilities in Residential District Bondarny in Naryan-Mar" (or "Construction of New Waste Water Treatment Facilities in the Kachgort Settlement").

Annex 2. Map of the Kachgort settlement



Annex 3. Map of the Bondarny settlement



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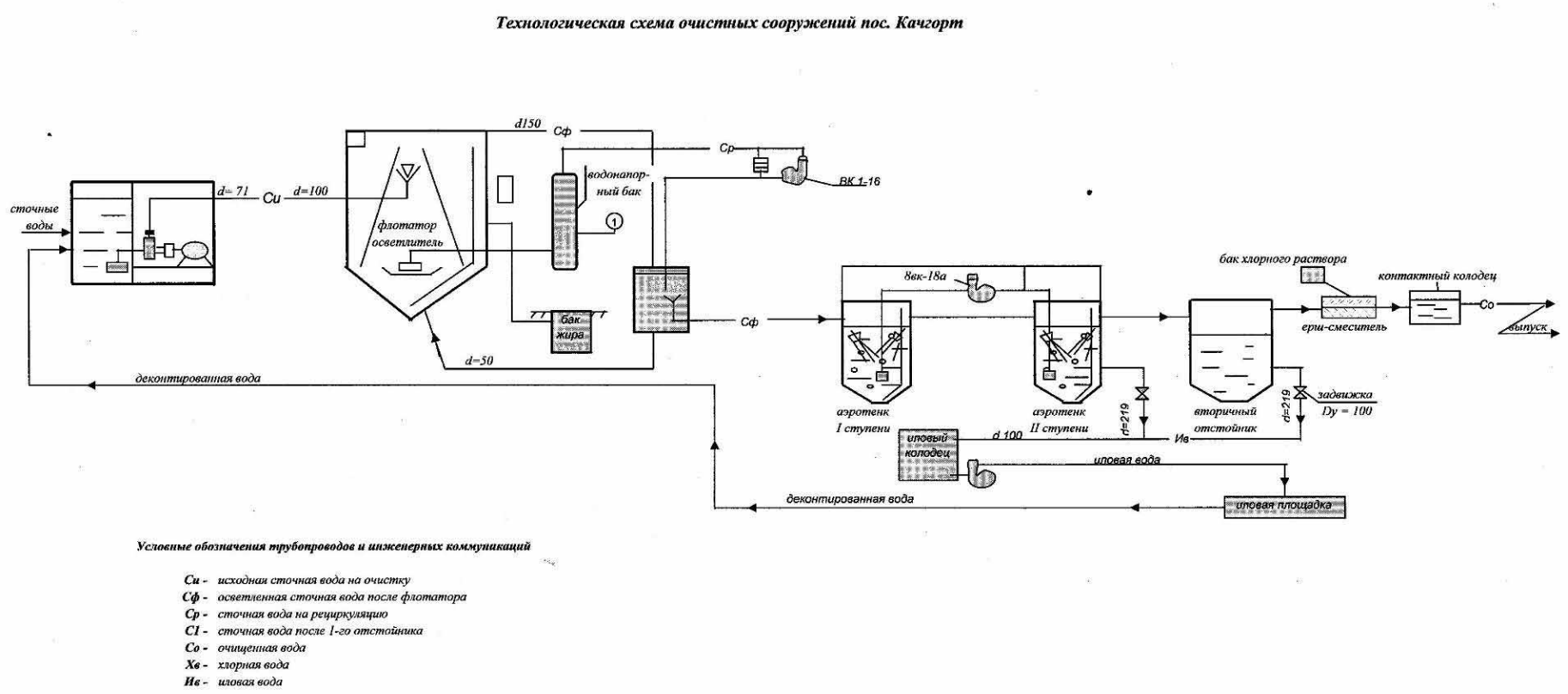
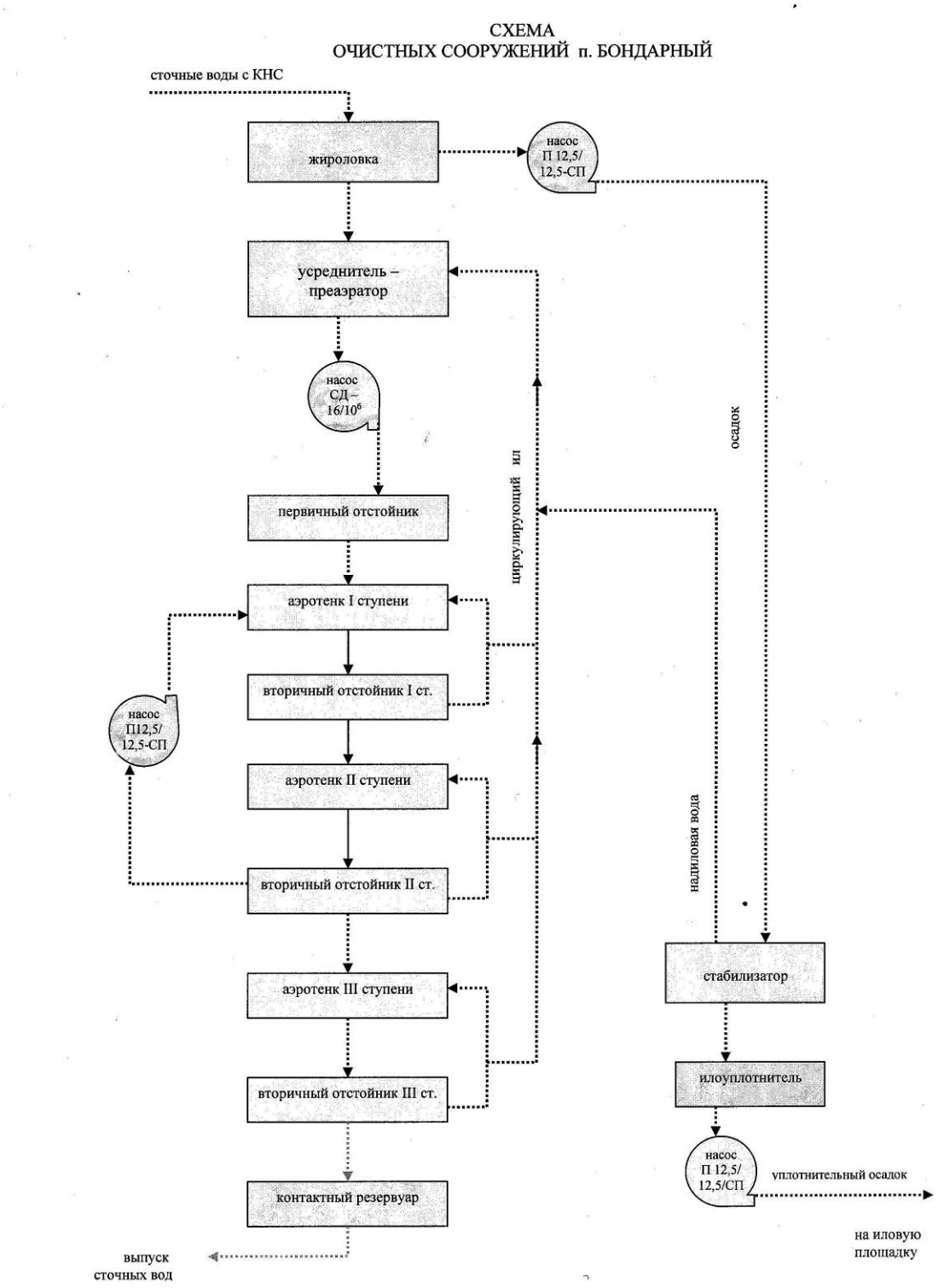
Annex 6. Process flow sheet of the Kachgort WWTF from the design of 1985 (not used)



Annex 7. Process flow sheet of the Bondarny WWTF



Annex 8. Visit of the project team to the facilities in Naryan-Mar on 09 June 2009

1. The waste water treatment facilities in the Kachgort settlement in Naryan-Mar

Photo 1. Kachgort WWTF, view of the entrance

Photo 2. Kachgort WWTF, view from the sludge pit

Photo 5. Kachgort WWTF, ceiling beams

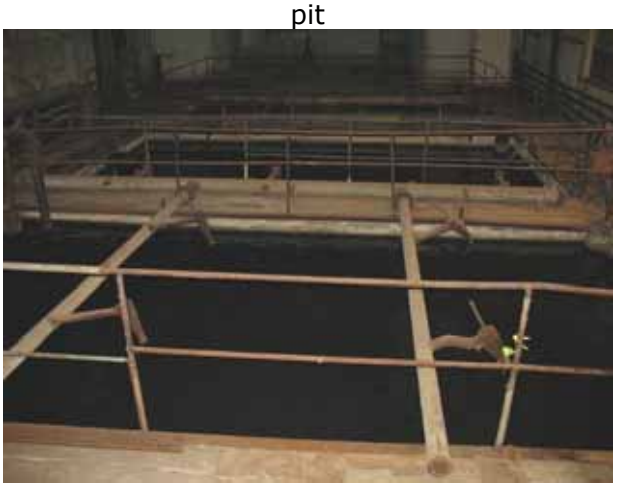


Photo 4. Kachgort settling tanks

Photo 6. Waste water pumping station of the Kachgort WWTF

Photo 6. Waste water pumping station of the Kachgort WWTF

2. The waste water treatment facilities in the Bondarny settlement in Naryan-Mar

Photo 1. Building of the Bondarny WWTF, view from the water discharge point

Photo 2. Facilities of the Bondarny WWTF

Photo 3. Sludge beds of the Bondarny WWTF

Photo 4. Facilities of the Bondarny WWTF

Annex 9. Letter of Naryan-Mar Municipal Unitary Enterprise Joint Boiler and Heating Systems with comments on IP dated of 27.05.2010.

ОТ:ПОК И ТС НОМЕР ТЕЛЕФОНА:45311 27 МАЙ 2010 14:33 СТР1

Нарьян-Марское муниципальное унитарное предприятие
объединенных котельных и тепловых сетей

166001, г. Нарьян-Мар, ул. Рабочая, д.18 а, тел (81853) 43643 , факс (81853) 45311,
e-mail: teplo@atnet.ru

Исх. № 2132 от 25.05.2010

Директору
Индустриального сектора
ООО «РАМБОЛЬ-БАРЕНЦ»
И.Н. ПОПОВОЙ

Уважаемая Ирина Николаевна!

Рассмотрев Ваш проект по пред инвестиционным исследованиям объектов ЖКХ в г.Нарьян-Маре сообщаем, что предприятие МУ ПОК и ТС не располагает свободными денежными средствами для участия в данной программе. В частности, это прерогатива Администрации Ненецкого автономного округа, там разработана целевая программа «Обеспечение населения Ненецкого автономного округа чистой водой» в рамках которой может быть реализован данный проект. Государственным заказчиком целевой программы выступает Управление строительства и ЖКХ по НАО (контактный телефон 8 (81853) 2-19-23 ; 2-19-22).

Со своей стороны обращаем Ваше внимание, что предложенная в исследованиях блочно-модульная установка для очистки сточных вод имеет ряд существенных недостатков, а именно:

1. Нет достаточного эксплуатационного опыта данных установок;
2. Быстрое обрастание модульной загрузки биомассой потребует ее частой очистки, а это приведет к увеличению эксплуатационных затрат (возрастет доля дополнительного неквалифицированного труда; потребуется приобретение дополнительного грузо-подъемного оборудования);
3. На период очистки потребуется вывод из технологического режима отдельных блоков очистных сооружений или всего комплекса в целом;
4. Очистка модулей сопряжена с захламлением территории очистных сооружений остатками отмершей биомассы с выделением резкого специфического запаха. Это крайне не желательно, учитывая, что очистные сооружения расположены в черте города.

Надеемся, что Вы учтете наши замечания в данной программе.

Директор Нарьян-Марского МУ ПОК и ТС Э.Е. Егиазарян

Исп. Ермолина И.В.
Тел. 4-33-28

Annex 10. Maximum allowable concentrations of pollutants for water discharge at Naryan-Mar WWTF

List and Quantity of Pollutants Allowed for Discharge

No.	Pollutant	Allowable concentration of pollutants at discharge, mg/l		
		Central WWTF	Bondarny WWTF	Kachgort WWTF
1	Suspended substances	5,18	3,43	5,90
2	BOD 5	4,00	4,00	4,00
3	Ammonium - ion	2,00	2,00	2,00
4	Nitrite - ion	3,30	3,30	3,30
5	Nitrate - ion	45,00	45,00	45,00
6	Phosphates (P)	3,50	3,50	3,50
7	Synthetic surfactants	0,50	0,23	0,50
8	Chloride - ion	67,00	314,00	52,7
9	Solid residue	348,00	1000,00	348,00

Permit No. 3 for Discharge of Pollutants into Environment.
Date of issue: 15.04.2009
Pechora Interregional Department for Technical and Nuclear Supervision.

Head of the Town WWTF (signature) I.V. Ermolina

Annex 11. Actual concentrations of pollutants in the water discharged by Naryan-Mar WWTF

Composition of the waste water at the Central, Bondarny and Kachgort WWTF as of 20.10.2009

(WWTF laboratory data)

No.	Pollutant, mg/l	Central WWTF		Bondarny WWTF		Kachgort WWTF	
		intake, mg/l	discharge, mg/l	intake, mg/l	discharge, mg/l	intake, mg/l	discharge, mg/l
1	BOD 20	201,1	6,6	370,5	20,5	257,9	143,8
2	Suspended substances	111,2	4,3	20,4	16,9	99,1	68,7
3	Chlorides	56,2	50,3	399,1	216,3	51,6	50,6
4	Solid residue	333,6	318,2	909,8	618,9	397,3	354,4
5	Nitrites /N	0,16/0,05	0,61/0,18	0,44/0,13	1,44/0,43	0,19/0,06	0,22/0,07
6	Nitrates /N	0,59/0,14	63,6/14,6	1,21/0,28	6,0/1,4	0,7/0,16	0,6/0,15
7	Ammonium /N	54,4/42,4	2,0/1,6	62,2/48,5	61,2/47,7	59,4/46,3	54,7/42,7
8	Phosphate /P	16,0/5,2	11,6/3,8	23,5/7,7	17,5/5,7	20,0/6,5	19,2/6,3
9	Anionic surfactant	4,2	0,08	3,46	0,06		

Head of the Town WWTF (signature) I.V. Ermolina

Annex 12. Letter to administration of Naryan-Mar with notice on possible exclusion from priority list of projects dated of 30.12.2009.

Телефакс

RAMBOLL

Кому:	Саутиной Валентине Викторовне заместителю главы Администрации по инфраструктурному развитию Администрация МО «Городской округ «Город Нарьян-Мар»	Факс №:(81853) 49971	ООО «Рамболь Стурвик» Портовый проезд, д. 21 г. Мурманск 183038 Россия Тел.: +7 8152 488290 Факс: +7 8152 690290 Тел. прям.: +7 8152 488 297 www.ramboll-barents.com
Копия:	Усакову В.П.	№:(81853) 45311	Дата: 30.12.2009 Исх. №: 112
	Директору МУПОК и ТС		
Кол-во стр.:	1		

Кас.: Проект прединвестиционных исследований объектов ЖКХ г. Нарьян-Мара

Уважаемая Валентина Викторовна!

Компания «Рамболь Стурвик» информирует Вас, что подготовка отчёта по прединвестиционным исследованиям КОС пос. Качгорт и Бондарка г. Нарьян-Мара завершена. Отчёт будет направлен в Дирекцию проекта НПД-Арктика и в Исполнительную организацию проекта (Министерство экономического развития РФ).

В связи с тем, что Администрация г. Нарьян-Мар в ответ на многочисленные запросы не предоставила информацию для анализа финансового состояния Нарья-Марского муниципального унитарного предприятия объединенных котельных и тепловых сетей и отказалась сообщить, в какой срок эта информация может быть представлена исполнителю прединвестиционного исследования, отчет не будет содержать сведений об оценке финансовой жизнеспособности данного проекта. По этой причине проект не будет рекомендован для финансирования его реализации и будет исключен из списка инвестиционных проектов.

С уважением,

ООО «Рамболь Стурвик»

Блинов В.А.
старший консультант

тел.: (8152) 488 290
факс: (8152) 690 290
e-mail: vladimir.blinov@ramboll.com

Annex 13. Results of the analysis of the financial condition of the Kachgort WWTF in Naryan-Mar

The Annex includes the following information:
- Consolidated table of financial condition analysis,
- Programme of production and sales,
- Flow of funds for financial planning,
- Internal rate of return sensitivity.

CONSOLIDATED TABLE

Project name:	Kachgort WWTF, Naryan-Mar		
Date:	25.12.2009		
Project category:	New project		
Construction stage:	1.2011 - 12.2011		
Duration:	1 year		
Production stage:	1.2012 - 12.2026		
Duration:	15 years		
Estimation currency:	National currency (roubles)		
Units:	Absolute		
National currency:	National currency (roubles)		
INVESTMENT COSTS			
	Total	Total	Total
	construction	production	investment
Total fixed investment costs	48 000 000,00	0,00	48 000 000,00
Total pre-production expenses	0,00	0,00	0,00
Pre-production expenses (exclusively of %)	*0,00*	*0,00*	*0,00*
Interest	*0,00*	*0,00*	*0,00*
Increase in working capital	0,00	7 500,00	7 500,00
TOTAL INVESTMENT COSTS	48 000 000,00	7 500,00	48 007500,00
FUNDING SOURCES			
	Total	Total	Total
	construction	production	capital inflow
Aggregate equity capital	28 800 000,28	0,00	28 800000,28
Foreign	*9 599 999,64*	*0,00*	*9 599 999,64*
Local	*19 200 000,64*	*0,00*	*19 200000,64*
Aggregate long-term credit	19 199 999,72	0,00	19 199999,72
Foreign	*19 199 999,72*	*0,00*	*19 199999,72*
Local	*0,00*	*0,00*	*0,00*
Aggregate short-term credit	0,00	0,00	0,00
Foreign	*0,00*	*0,00*	*0,00*
Local	*0,00*	*0,00*	*0,00*
Accounts payable	0,00	122 956,10	122 956,10
TOTAL FUNDING RESOURCES	48 000 000,00	122 956,10	48 122956,10

	CONSOLIDATED TABLE		
INCOME AND EXPENSES, OPERATIONS			
	First year	Reporting year	Last year
	2012	2015	2026
SALES REVENUE	4 339 120,00	5 775 368,72	13 017 360,00
Manufacturing expenses	221 840,00	275 408,80	491 702,00
Administrative overheads	0,00	0,00	0,00
OPERATIONAL COSTS	221 840,00	275 408,80	491 702,00
Amortisation	1 600 000,00	1 600 000,00	1 600 000,00
Financial expenditures	0,00	0,00	0,00
TOTAL COSTS OF PRODUCTION	1 821 840,00	1 875 408,80	2 091 702,00
Marketing expenses	0,00	0,00	0,00
COSTS OF PRODUCTION	1 821 840,00	1 875 408,80	2 091 702,00
Short-term deposit interest	0,00	0,00	0,00
PRODUCTION GROSS PROFIT	2 517 280,00	3 899 959,92	10 925 658,00
Extraordinary revenue	0,00	0,00	0,00
Extraordinary loss	0,00	0,00	0,00
Depreciation expenses	0,00	0,00	0,00
GROSS PROFIT	2 517 280,00	3 899 959,92	10 925 658,00
Investment allowance	0,00	0,00	0,00
ASSESSABLE INCOME	2 517 280,00	3 899 959,92	10 925 658,00
Income (corporate) tax	453 110,40	701 992,79	1 966 618,44
NET PROFIT	2 064 169,60	3 197 967,13	8 959 039,56
FACTORS			
Net present value of aggregate investment assets	at 5,00%	32 973 834,79	
Investments internal rate of return (IRR)	11,34%		
Investments revised IRR	11,34%		
Net present value of aggregate own invested capital	at 5,00%	46 948 103,30	
Equity internal rate of return (IRRE)	20,06%		
Equity revised IRR	20,06%		
Net discounted capital value	12.2011		

PROGRAMME OF PRODUCTION AND SALES - TOTAL

National currency

	Production	Production	Production	Production	Production	Production	Production	Production	Production
	2012	2013	2014	2015	2016	2017	2018	2019	2020
Capital stock brought forward	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Produced quantity	146 000,00	160 600,00	176 660,00	194 326,00	213 758,60	235 134,46	258 647,91	284 512,70	312 963,97
Balance carried forward	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Sold quantity	146 000,00	160 600,00	176 660,00	194 326,00	213 758,60	235 134,46	258 647,91	284 512,70	312 963,97
Gross value per unit (average)	29,72	29,72	29,72	29,72	29,72	29,72	29,72	29,72	29,72
Gross sales	4 339 120,00	4 773 032,00	5 250 335,20	5 775 368,72	6 352 905,59	6 988 196,15	7 687 015,77	8 455 717,34	9 301289,08
After sales tax	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Net sales	4 339 120,00	4 773 032,00	5 250 335,20	5 775 368,72	6 352 905,59	6 988 196,15	7 687 015,77	8 455 717,34	9 301289,08
Subvention	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
SALES REVENUE	4 339 120,00	4 773 032,00	5 250 335,20	5 775 368,72	6 352 905,59	6 988 196,15	7 687 015,77	8 455 717,34	9 301289,08
Foreign share (%)	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00

PROGRAMME OF PRODUCTION AND SALES - TOTAL National currency						
	Production 2021	Production 2022	Production 2023	Production 2024	Production 2025	Production 2026
Capital stock brought forward	0,00	0,00	0,00	0,00	0,00	0,00
Produced quantity	344 260,36	378 686,40	416 555,04	438 000,00	438 000,00	438 000,00
Balance carried forward	0,00	0,00	0,00	0,00	0,00	0,00
Sold quantity	344 260,36	378 686,40	416 555,04	438 000,00	438 000,00	438 000,00
Gross value per unit (average)	29,72	29,72	29,72	29,72	29,72	29,72
Gross sales	10 231 417,98	11 254 559,78	12 380 015,76	13 017 360,00	13 017 360,00	13017360,00
After sales tax	0,00	0,00	0,00	0,00	0,00	0,00
Net sales	10 231 417,98	11 254 559,78	12 380 015,76	13 017 360,00	13 017 360,00	13017360,00
Subvention	0,00	0,00	0,00	0,00	0,00	0,00

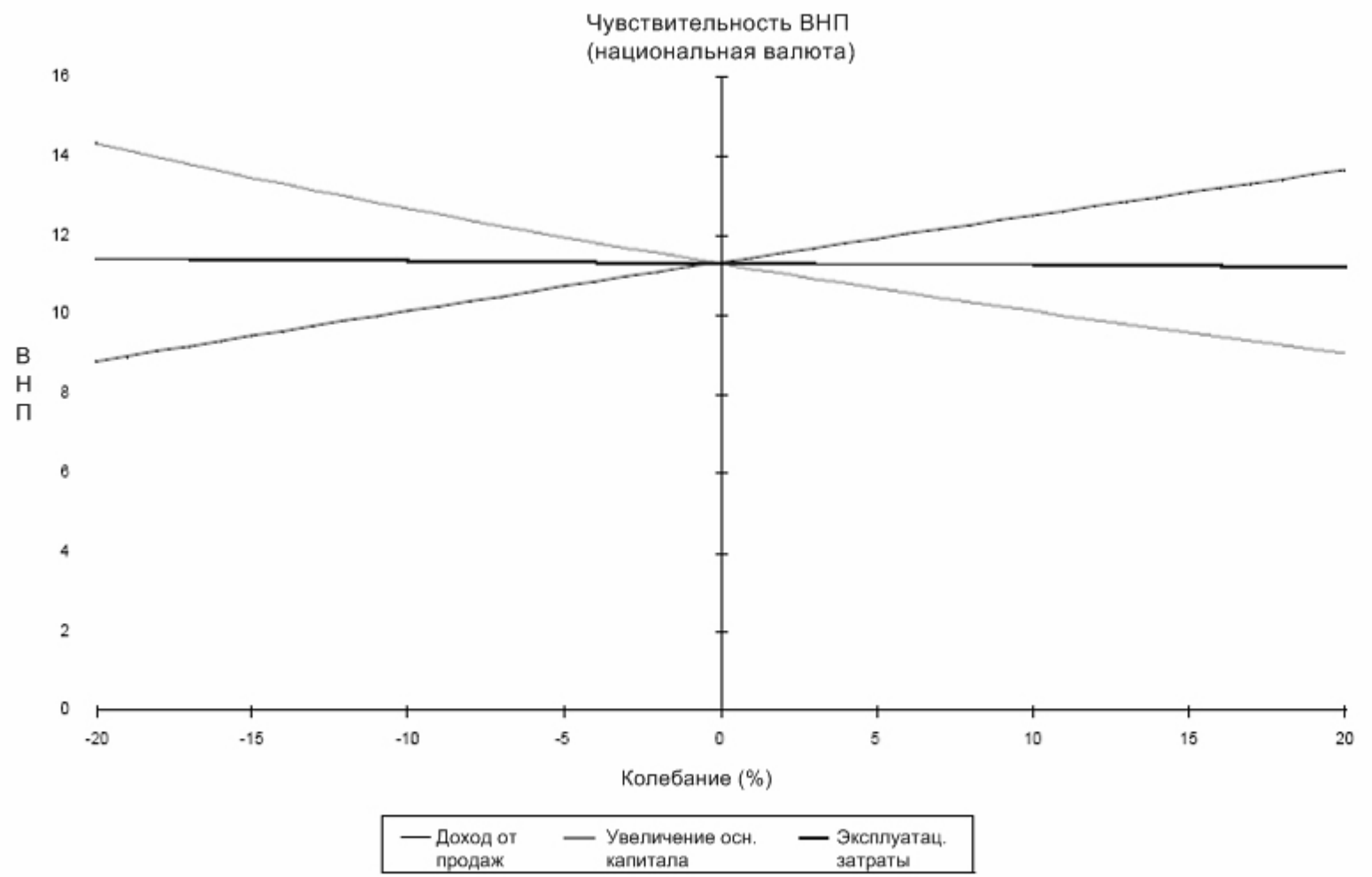
FLOW OF FUNDS FOR FINANCIAL PLANNING - TOTAL
National currency

	Construction 2011	Production 2012	Production 2013	Production 2014	Production 2015	Production 2016	Production 2017	Production 2018
TOTAL CASH FLOW	48 000 000,00	4 394 788,33	4 776 890,50	5 254 787,78	5 780 266,71	6 358 293,38	6 992 840,12	7 692 124,13
Income funds	48 000 000,00	55 668,33	3 858,50	4 452,58	4 897,99	5 387,79	4 643,97	5 108,37
Income activities	0,00	4 339 120,00	4 773 032,00	5 250 335,20	5 775 368,72	6 352 905,59	6 988 196,15	7 687 015,77
Other income	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
TOTAL CASH OUTFLOW	48 000 000,00	2 656 243,71	2 690 454,75	2 791 379,79	2 902 398,09	3 024 518,07	3 153 360,51	3 296 369,80
Increase of capital stock	48 000 000,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Increase of working capital	0,00	61 293,33	4 129,33	4 542,17	4 996,53	5 496,19	4 763,21	5 239,53
Operational costs	0,00	221 840,00	238 024,00	255 826,00	275 408,80	296 949,88	315 514,67	335 935,93
Marketing expenses	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Income (corporate) tax	0,00	453 110,40	528 301,44	611 011,66	701 992,79	802 072,03	913 082,67	1 035 194,37
Financial expenses	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Credit repayment	0,00	1 919 999,97	1 919 999,97	1 919 999,97	1 919 999,97	1 919 999,97	1 919 999,97	1 919 999,97
Dividends	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Refund of registered capital	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
NET SURPLUS (DEFICIT)	0,00	1 738 544,63	2 086 435,75	2 463 407,99	2 877 868,62	3 333 775,32	3 839 479,61	4 395 754,33
OVERALL CASH BALANCE	0,00	1 738 544,63	3 824 980,38	6 288 388,37	9 166 256,99	12 500 032,31	16 339 511,92	20 735 266,25
Foreign net surplus (deficit)	28 799 999,36	-1 919 999,97	-1 919 999,97	-1 919 999,97	-1 919 999,97	-1 919 999,97	-1 919 999,97	-1 919 999,97
National net surplus (deficit)	-28 799 999,36	3 658 544,60	4 006 435,73	4 383 407,96	4 797 868,59	5 253 775,29	5 759 479,58	6 315 754,30
Foreign overall cash balance	28 799 999,36	26 879 999,39	24 959 999,42	23 039 999,44	21 119 999,47	19 199 999,50	17 279 999,53	15 359999,56
National overall cash balance	-28 799 999,36	-25 141 454,76	-21 135 019,03	-16 751 611,07	-11 953 742,48	-6 699 967,19	-940 487,61	5 375 266,69
Net funds flow	48 000 000,00	-1 864 331,64	-1 916 141,47	-1 915 547,39	-1 915 101,98	-1 914 612,18	-1 915 356,00	-1 914 891,61

FLOW OF FUNDS FOR FINANCIAL PLANNING - TOTAL
National currency

	Production 2019	Production 2020	Production 2021	Production 2022	Production 2023	Production 2024	Production 2025	Production 2026
TOTAL CASH FLOW	8 461 336,55	9 307 470,20	10 238 217,22	11 262 038,94	12 388 242,84	13 021 992,76	13 017 360,00	13 017 360,00
Income funds	5 619,20	6 181,12	6 799,24	7 479,16	8 227,08	4 632,76	0,00	0,00
Income activities	8 455 717,34	9 301 289,08	10 231 417,98	11 254 559,78	12 380 015,76	13 017 360,00	13 017 360,00	13 017360,00
Other income	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
TOTAL CASH OUTFLOW	3 453 680,02	3 626 721,26	3 817 066,63	2 106 446,56	2 336 764,45	2 463 099,04	2 458 351,04	2 458 320,44
Increase of capital stock	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Increase of working capital	5 763,48	6 339,83	6 973,81	7 671,19	8 438,31	4 778,60	0,00	0,00
Operational costs	358 399,33	383 109,06	410 289,77	440 188,54	473 077,20	491 702,00	491 702,00	491 702,00
Marketing expenses	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Income (corporate) tax	1 169 517,24	1 317 272,40	1 479 803,08	1 658 586,82	1 855 248,94	1 966 618,44	1 966 618,44	1 966 618,44
Financial expenses	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Credit repayment	1 919 999,97	1 919 999,97	1 919 999,97	0,00	0,00	0,00	30,60	0,00
Dividends	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Refund of registered capital	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
NET SURPLUS (DEFICIT)	5 007 656,53	5 680 748,94	6 421 150,59	9 155 592,39	10 051 478,39	10 558 893,72	10 559 008,96	10 559039,56
OVERALL CASH BALANCE	25 742 922,77	31 423 671,71	37 844 822,31	47 000 414,69	57 051 893,08	67 610 786,80	78 169 795,76	88 728835,32
Foreign net surplus (deficit)	-1 919 999,97	-1 919 999,97	-1 919 999,97	0,00	0,00	0,00	0,00	0,00
National net surplus (deficit)	6 927 656,50	7 600 748,91	8 341 150,57	9 155 592,39	10 051 478,39	10 558 893,72	10 559 008,96	10 559039,56
Foreign overall cash balance	13 439 999,58	11 519 999,61	9 599 999,64	9 599 999,64	9 599 999,64	9 599 999,64	9 599 999,64	9 599 999,64
National overall cash balance	12 302 923,19	19 903 672,10	28 244 822,67	37 400 415,05	47 451 893,44	58 010 787,16	68 569 796,12	79 128835,68
Net funds flow	-1 914 380,77	-1 913 818,85	-1 913 200,74	7 479,16	8 227,08	4 632,76	-30,60	0,00

FLOW OF FUNDS FOR FINANCIAL PLANNING - TOTAL National currency	
	As of the end of the period under review 2027
TOTAL CASH FLOW	24 130 425,50
Income funds	0,00
Income activities	0,00
Other income	24 130 425,50
TOTAL CASH OUTFLOW	122 925,50
Increase of capital stock	0,00
Increase of working capital	0,00
Operational costs	0,00
Marketing expenses	0,00
Income (corporate) tax	0,00
Financial expenses	0,00
Credit repayment	122 925,50
Dividends	0,00
Refund of registered capital	0,00
NET SURPLUS (DEFICIT)	24 007 500,00 112 736 335,32
OVERALL CASH BALANCE	0,00
Foreign net surplus (deficit)	24 007 500,00
National net surplus (deficit)	9 599 999,64
Foreign overall cash balance	103 136 335,68
National overall cash balance	-122 925,50


Чувствительность ВНП
(национальная валюта)
16
14
12
10
8
6
4
2
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В
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П
-20
-15
-10
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0
5
10
15
20
Колебание (%)
Доход от продаж
Увеличение осн. капитала
Эксплуатац. затраты

Range (%)	Sales revenue	Increase of capital stock	Operational costs
-20,00 %	8,84 %	14,35 %	11,44 %
-16,00 %	9,36 %	13,67 %	11,42 %
-12,00 %	9,86 %	13,03 %	11,40 %
-8,00 %	10,36 %	12,43 %	11,38 %
-4,00 %	10,85 %	11,87 %	11,36 %
0,00 %	11,34 %	11,34 %	11,34 %
4,00 %	11,82 %	10,84 %	11,32 %
8,00 %	12,29 %	10,37 %	11,30 %
12,00 %	12,75 %	9,92 %	11,28 %
16,00 %	13,21 %	9,49 %	11,26 %
20,00 %	13,66 %	9,09 %	11,24 %

Annex 14. Results of the analysis of the financial condition of the Bondarny WWTF in Naryan-Mar

The Annex includes the following information:
- Consolidated table of financial condition analysis,
- Programme of production and sales,
- Flow of funds for financial planning,
- Internal rate of return sensitivity.

CONSOLIDATED TABLE

Project name:	Bondarny WWTF, Naryan-Mar
Date:	25.12.2009
Project category:	New project
Construction stage:	01.2011 - 12.2011
Duration:	1 year
Production stage:	01.2012 - 12.2026
Duration:	15 years
Estimation currency:	National currency (roubles)
Units:	Absolute
National currency:	National currency (roubles)

INVESTMENT COSTS			
	Total construction	Total production	Total investment
Total fixed investment costs	38 000 000,00	0,00	38 000000,00
Total pre-production expenses	0,00	0,00	0,00
Pre-production expenses (exclusively of %)	*0,00*	*0,00*	*0,00*
Interest	*0,00*	*0,00*	*0,00*
Increase in working capital	0,00	5 000,00	5 000,00
TOTAL INVESTMENT COSTS	38 005000,00	5 000,00	38 005000,00

FUNDING SOURCES			
	Total construction	Total production	Total capital inflow
Aggregate equity capital	22 799 980,00	0,00	22 799980,00
Foreign	*7 599 980,00*	*0,00*	*7 599 980,00*
Local	*15 200 000,00*	*0,00*	*15 200000,00*
Aggregate long-term credit	15 200 020,00	0,00	15 200020,00
Foreign	*15 200 020,00*	*0,00*	*15 200020,00*
Local	*0,00*	*0,00*	*0,00*
Aggregate short-term credit	0,00	0,00	0,00
Foreign	*0,00*	*0,00*	*0,00*
Local	*0,00*	*0,00*	*0,00*
Accounts payable	0,00	93 603,64	93 603,64
TOTAL FUNDING RESOURCES	38 000 000,00	93 603,64	38 093603,64

CONSOLIDATED TABLE

INCOME AND EXPENSES, OPERATIONS			
	First year	Reporting year	Last year
	2012	2015	2026
SALES REVENUE	2 310 581,40	3 075 383,84	7 593 460,00
Manufacturing expenses	154 195,71	195 304,26	374 302,00
Administrative overheads	0,00	0,00	0,00
OPERATIONAL COSTS	154 195,71	195 304,26	374 302,00
Amortisation	1 266 666,67	1 266 666,67	1 266 666,67
Financial expenditures	0,00	0,00	0,00
TOTAL COSTS OF PRODUCTION	1 420 862,38	1 461 970,92	1 640 968,67
Marketing expenses	0,00	0,00	0,00
COSTS OF PRODUCTION	1 420 862,38	1 461 970,92	1 640 968,67
Short-term deposit interest	0,00	0,00	0,00
PRODUCTION GROSS PROFIT	889 719,02	1 613 412,92	5 952 491,33
Extraordinary revenue	0,00	0,00	0,00
Extraordinary loss	0,00	0,00	0,00
Depreciation expenses	0,00	0,00	0,00
GROSS PROFIT	889 719,02	1 613 412,92	5 952 491,33
Investment allowance	0,00	0,00	0,00
ASSESSABLE INCOME	889 719,02	1 613 412,92	5 952 491,33
Income (corporate) tax	160 149,42	290 414,33	1 071 448,44
NET PROFIT	729 569,60	1 322 998,60	4 881 042,89
FACTORS			
Net present value of aggregate investment assets	at 5,00%	9 014 470,72	
Investments internal rate of return (IRR)	7,33%		
Investments revised IRR	7,33%		
Net present value of aggregate own invested capital	at 5,00%	20 077 418,19	
Equity internal rate of return (IRRE)	13,44%		
Equity revised IRR	13,44%		
Net discounted capital value	12.2011		

PROGRAMME OF PRODUCTION AND SALES - TOTAL
National currency

	Production 2012	Production 2013	Production 2014	Production 2015	Production 2016	Production 2017	Production 2018	Production 2019	Production 2020
Capital stock brought forward	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Produced quantity	77 745,00	85 519,50	94 071,45	103 478,60	113 826,45	125 209,10	137 730,01	151 503,01	166 653,31
Balance carried forward	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Sold quantity	77 745,00	85 519,50	94 071,45	103 478,60	113 826,45	125 209,10	137 730,01	151 503,01	166 653,31
Gross value per unit (average)	29,72	29,72	29,72	29,72	29,72	29,72	29,72	29,72	29,72
Gross sales	2 310 581,40	2 541 639,54	2 795 803,49	3 075 383,84	3 382 922,23	3 721 214,45	4 093 335,90	4 502 669,49	4 952 936,43
After sales tax	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Net sales	2 310 581,40	2 541 639,54	2 795 803,49	3 075 383,84	3 382 922,23	3 721 214,45	4 093 335,90	4 502 669,49	4 952 936,43
Subvention	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
SALES REVENUE	2 310 581,40	2 541 639,54	2 795 803,49	3 075 383,84	3 382 922,23	3 721 214,45	4 093 335,90	4 502 669,49	4 952 936,43
Foreign share (%)	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00

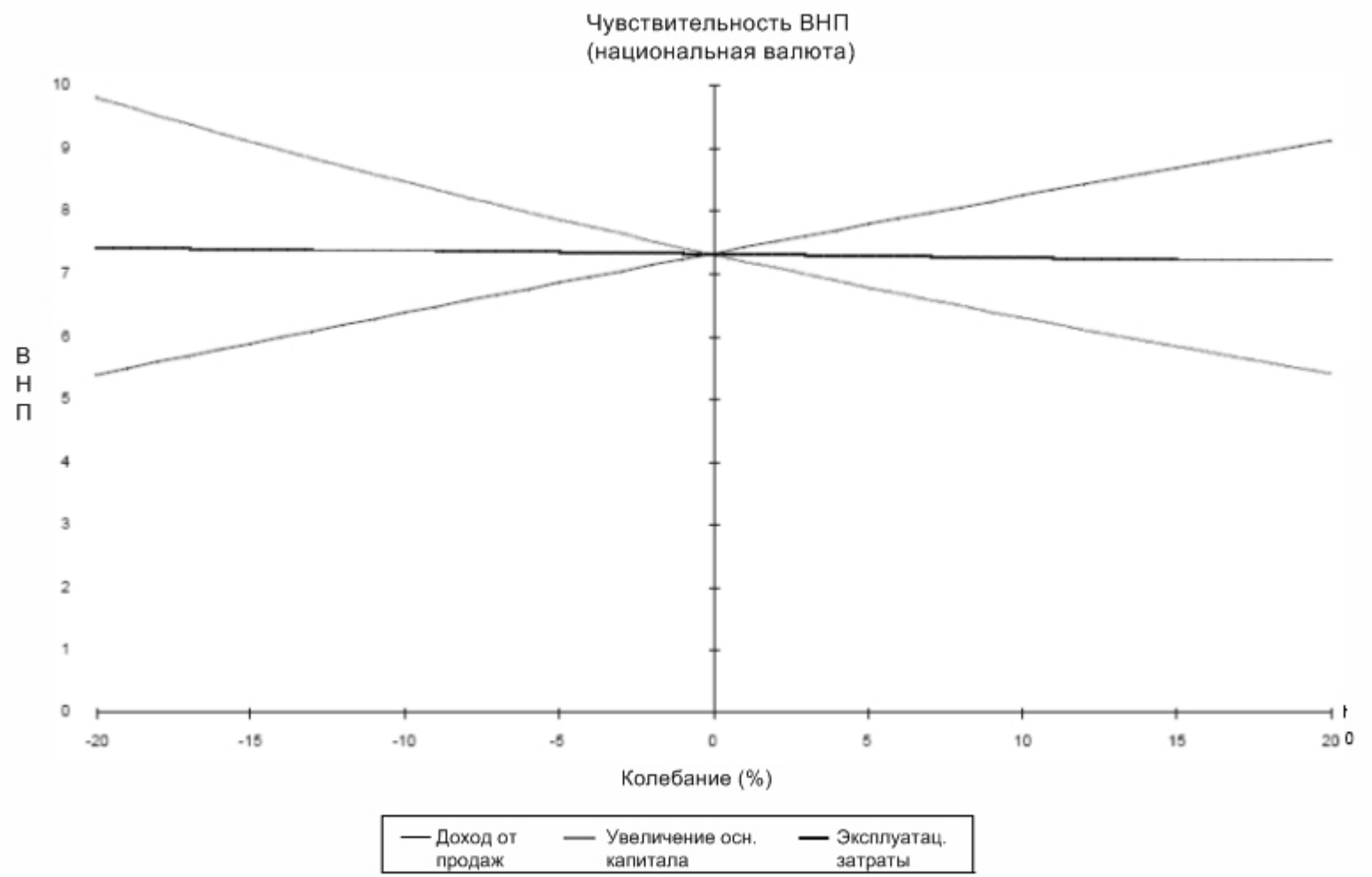
PROGRAMME OF PRODUCTION AND SALES - TOTAL National currency						
	Production 2021	Production 2022	Production 2023	Production 2024	Production 2025	Production 2026
Capital stock brought forward	0,00	0,00	0,00	0,00	0,00	0,00
Produced quantity	183 318,64	201 650,51	221 815,56	243 997,11	255 500,00	255 500,00
Balance carried forward	0,00	0,00	0,00	0,00	0,00	0,00
Sold quantity	183 318,64	201 650,51	221 815,56	243 997,11	255 500,00	255 500,00
Gross value per unit (average)	29,72	29,72	29,72	29,72	29,72	29,72
Gross sales	5448230,1	5 993 053,08	6 592 358,39	7 251 594,23	7 593 460,00	7593460,0
After sales tax	0,00	0,00	0,00	0,00	0,00	0,00
Net sales	5448230,1	5 993 053,08	6 592 358,39	7 251 594,23	7 593 460,00	7593460,0
Subvention	0,00	0,00	0,00	0,00	0,00	0,00

FLOW OF FUNDS FOR FINANCIAL PLANNING - TOTAL
National currency

	Construction 2011	Production 2012	Production 2013	Production 2014	Production 2015	Production 2016	Production 2017	Production 2018
TOTAL CASH FLOW	38 000 000,00	2 349 320,51	2 544 573,27	2 799 220,68	3 079 142,90	3 387 057,19	3 724 480,30	4 096 928,33
Income funds	38 000 000,00	38 739,11	2 933,73	3 417,18	3 759,05	4 134,96	3 265,85	3 592,44
Income activities	0,00	2 310 581,40	2 541 639,54	2 795 803,49	3 075 383,84	3 382 922,23	3 721 214,45	4 093 335,90
Other income	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
TOTAL CASH OUTFLOW	38 000 000,00	1 876 156,78	1 889 302,62	1 946 572,25	2 009 569,59	2 078 866,51	2 149 603,60	2 228 696,99
Increase of capital stock	38 000 000,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Increase of working capital	0,00	41 809,64	3 180,96	3 498,96	3 849,01	4 233,91	3 374,70	3 712,17
Operational costs	0,00	154 195,71	166 615,29	180 276,41	195 304,26	211 834,88	224 888,17	239 246,79
Marketing expenses	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Income (corporate) tax	0,00	160 149,42	199 504,37	242 794,87	290 414,33	342 795,72	401 338,73	465 736,04
Financial expenses	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Credit repayment	0,00	1 520 002,00	1 520 002,00	1 520 002,00	1 520 002,00	1 520 002,00	1 520 002,00	1 520 002,00
Dividends	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Refund of registered capital	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
NET SURPLUS (DEFICIT)	0,00	473 163,73	655 270,66	852 648,43	1 069 573,31	1 308 190,67	1 574 876,71	1 868 231,34
OVERALL CAHS BALANCE	0,00	473 163,73	1 128 434,38	1 981 082,81	3 050 656,12	4 358 846,79	5 933 723,50	7 801 954,84
Foreign net surplus (deficit)	22 800 000,00	-1 520 002,00	-1 520 002,00	-1 520 002,00	-1 520 002,00	-1 520 002,00	-1 520 002,00	-1 520 002,00
National net surplus (deficit)	-22 800 000,00	1 993 165,73	2 175 272,66	2 372 650,43	2 589 575,31	2 828 192,67	3 094 878,71	3 388 233,34
Foreign overall cash balance	22 800 000,00	21 279 998,00	19 759 996,00	18 239 994,00	16 719 992,00	15 199 990,00	13 679 988,00	12 159986,00
National overall cash balance	-22 800 000,00	-20 806 834,27	-18 631 561,62	-16 258 911,19	-13 669 335,88	-10 841 143,21	-7 746 264,50	-4 358 031,16
Net funds flow	38 000 000,00	-1 481 262,89	-1 517 068,27	-1 516 584,82	-1 516 242,95	-1 515 867,04	-1 516 736,15	-1 516 409,56

FLOW OF FUNDS FOR FINANCIAL PLANNING - TOTAL National currency								
	Production 2019	Production 2020	Production 2021	Production 2022	Production 2023	Production 2024	Production 2025	Production 2026
TOTAL CASH FLOW	4 506 621,17	4 957 283,28	5 453 011,61	5 998 312,77	6 598 144,05	7 257 958,46	7 596 731,67	7 593 460,00
Income funds	3 951,68	4 346,85	4 781,54	5 259,69	5 785,66	6 364,22	3 271,67	0,00
Income activities	4 502 669,49	4 952 936,43	5 448 230,08	5 993 053,08	6 592 358,39	7 251 594,23	7 593 460,00	7 593 460,00
Other income	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
TOTAL CASH OUTFLOW	2 315 699,73	2 411 402,74	2 516 676,05	1 112 474,69	1 239 855,39	1 379 974,17	1 449 160,79	1 445 778,58
Increase of capital stock	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Increase of working capital	4 083,38	4 491,72	4 940,90	5 434,99	5 978,48	6 576,33	3 410,35	0,00
Operational costs	255 041,26	272 415,19	291 526,51	312 548,96	335 673,66	361 110,82	374 302,00	374 302,00
Marketing expenses	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Income (corporate) tax	536 573,08	614 493,82	700 206,64	794 490,74	898 203,25	1 012 287,01	1 071 448,44	1 071 448,44
Financial expenses	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Credit repayment	1 520 002,00	1 520 002,00	1 520 002,00	0,00	0,00	0,00	0,00	28,14
Dividends	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Refund of registered capital	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
NET SURPLUS (DEFICIT)	2 190 921,44	2 545 880,55	2 936 335,56	4 885 838,09	5 358 288,66	5 877 984,29	6 147 570,89	6 147 681,42
OVERALL CASH BALANCE	9 992 876,28	12 538 756,82	15 475 092,39	20 360 930,47	25 719 219,13	31 597 203,42	37 744 774,30	43 892455,73
Foreign net surplus (deficit)	-1 520 002,00	-1 520 002,00	-1 520 002,00	0,00	0,00	0,00	0,00	0,00
National net surplus (deficit)	3 710 923,44	4 065 882,55	4 456 337,56	4 885 838,09	5 358 288,66	5 877 984,29	6 147 570,89	6 147 681,42
Foreign overall cash balance	10 639 984,00	9 119 982,00	7 599 980,00	7 599 980,00	7 599 980,00	7 599 980,00	7 599 980,00	7 599 980,00
National overall cash balance	-647 107,72	3 418 774,82	7 875 112,39	12 760 950,47	18 119 239,13	23 997 223,42	30 144 794,30	36 292475,72
Net funds flow	-1 516 050,32	-1 515 655,15	-1 515 220,46	5 259,69	5 785,66	6 364,22	3 271,67	-28,14

FLOW OF FUNDS FOR FINANCIAL PLANNING - TOTAL National currency	
	As of the end of the period under review 2027
TOTAL CASH FLOW	19 098 575,50
Income funds	0,00
Income activities	0,00
Other income	19 098 575,50
TOTAL CASH OUTFLOW	93 575,50
Increase of capital stock	0,00
Increase of working capital	0,00
Operational costs	0,00
Marketing expenses	0,00
Income (corporate) tax	0,00
Financial expenses	0,00
Credit repayment	93 575,50
Dividends	0,00
Refund of registered capital	0,00
NET SURPLUS (DEFICIT)	19 005 000,00
OVERALL CASH BALANCE	62 897 455,73
Foreign net surplus (deficit)	0,00
National net surplus (deficit)	19 005 000,00
Foreign overall cash balance	7 599 980,00
National overall cash balance	55 297 475,72
Net funds flow	-93 575,50


Чувствительность ВНП
(национальная валюта)
ВНП
10
9
8
7
6
5
4
3
2
1
0
-20
-15
-10
-5
0
5
10
15
20
Колебание (%)
Доход от продаж
Увеличение осн. капитала
Эксплуатац. затраты

Range (%)	Sales revenue	Increase of capital stock	Operational costs
-20,00 %	5,40 %	9,83 %	7,44 %
-16,00 %	5,80 %	9,27 %	7,42 %
-12,00 %	6,19 %	8,74 %	7,40 %
-8,00 %	6,58 %	8,24 %	7,38 %
-4,00 %	6,96 %	7,78 %	7,36 %
0,00 %	7,33 %	7,33 %	7,33 %
4,00 %	7,71 %	6,92 %	7,31 %
8,00 %	8,07 %	6,52 %	7,29 %
12,00 %	8,43 %	6,14 %	7,27 %
16,00 %	8,79 %	5,78 %	7,25 %
20,00 %	9,14 %	5,43 %	7,23 %

Annex 15. Letter of administration of Naryan-Mar on project support of 28.05.2010

ОТ:АДМИНИСТРАЦИЯ Г. НАРЬЯН-МАРА ТЕЛ:8 8185349971 07 ИЮН. 2010 17:34 СТР1

Администрация
МО "Городской округ "Город Нарьян-Мар"
166000 Ненецкий автономный округ
г. Нарьян-Мар, ул. Ленина-12
т. 4-20-69 т/факс - (81853) 4-99-71
E-mail: goradm@atnet.ru
ОКПО 04022317, ОГРН 1028301646779
ИНН/КПП 8301020090/298301001

28.05.2010 № 3634/01-11
На № от 26.05.2010

Общество с ограниченной ответственностью "Рамболь Баренц"

В.А.Блинову

Уважаемый Владимир Александрович!

Администрация муниципального образования "Городской округ "Город Нарьян-Мар" подтверждает заинтересованность в реализации инвестиционного проекта "Модернизация системы очистки сточных вод поселков Качгорт и Бондарный г. Нарьян-Мара".

По информации Управления природных ресурсов и экологии Ненецкого автономного округа проект планируется включить в пакет приоритетных инвестиционных экологических проектов для Арктической зоны Российской Федерации. Общие затраты на проект составят 86 000,0 тыс. рублей (копию письма от 24.04.2010 прилагаем).

В связи с острой необходимостью реконструкции и строительства очистных сооружений, постановлением Администрации МО "Городской округ "Город Нарьян-Мар" от 16.10.2009 № 1646 утверждена долгосрочная целевая программа "Обеспечение населения города Нарьян-Мара чистой водой (2010 - 2013 годы)". Программой предусматривается осуществление мероприятий:

1. Разработка ПСД на строительство очистных сооружений в п. Качгорт. Объем финансирования составляет 6 000,0 тыс. рублей в 2010 году.

2. Строительство очистных сооружений в п. Качгорт. Объем финансирования составляет 124 414,0 тыс. рублей, в т.ч. по годам: 2011 год – 30 000,0 тыс. рублей, 2012 год – 47 207,0 тыс. рублей, 2013 год – 47 207,0 тыс. рублей.

3. Реконструкция очистных сооружений в п. Бондарка с корректировкой ПСД. Объем финансирования 74 512,0 тыс. рублей, в т.ч. по годам: 2011 год – 34 500,0 тыс. рублей, 2012 год 30 928,0 тыс. рублей, 2013 год – 9 084,0 тыс. рублей.

Общая сумма средств на реализацию мероприятий составляет 204 926,0 тыс. рублей.

В соответствии с программой финансирование мероприятий осуществляется за счет средств окружного бюджета и бюджета муниципального образования МО "Городской округ "Город Нарьян-Мар" на условии софинансирования. Софинансирование программы из окружного бюджета осуществляется в форме субсидий. За счет средств бюджета Ненецкого автономного округа на указанные мероприятия в соответствии с программой планируется выделить средства в объеме 198 778,22 тыс. рублей, за счет средств муниципального образования – 6 147,78 тыс. рублей (в т.ч. в 2010 году средства окружного бюджета - 5 820,0 тыс. рублей, средства городского бюджета – 180,0 тыс. рублей).

В связи с недостаточностью собственных доходов и уменьшением размера дотации на выравнивание бюджетной обеспеченности, выделяемой из бюджета Архангельской области, Администрация муниципального образования "Городской округ "Город Нарьян-Мар" заинтересована в реализации предложенного инвестиционного проекта и в

ОТ:АДМИНИСТРАЦИЯ Г.НАРЬЯН-МАРА ТЕЛ:8 8185349971 07 ИЮН. 2010 17:35 СТР2

получении средств международного гранта. Это позволит сократить средства окружного и городского бюджета, предусмотренные на реализацию программы.

Администрация муниципального образования "Городской округ "Город Нарьян-Мар" при финансовой поддержке МФО и бюджета Ненецкого АО, имеет возможность реализовать проект.

Приложение: на 2 л. в 1 экз.

Заместитель главы Администрации МО
"Городской округ "Город Нарьян-Мар"
по инфраструктурному развитию В.В.Саутина

Сочнева Елена Андреевна
4 93 83

Annex 16. Letter of administration of Naryan-Mar to administration of NAO with request to support project of 29.04.2010

ОТ:АДМИНИСТРАЦИЯ Г.НАРЬЯН-МАРА ТЕЛ:8 8185349971 07 ИЮН. 2010 17:36 СТР4

Администрация
МО "Городской округ "Город Нарьян-Мар"
166000 Ненецкий автономный округ
г. Нарьян-Мар, ул. Ленина-12
т. 4-20-69 т/факс - (81853) 4-99-71
E-mail: goradm@atnet.ru
ОКПО 04022317, ОГРН 1028301646779
ИНН/КПП 8301020090/298301001

29.04.2010 № 2977/01-11
На № 03-04/855 от 23.04.2010

Заместителю главы Администрации
Ненецкого автономного округа –
начальнику Управления природных
ресурсов и экологии
Ненецкого автономного округа

И.М. Михайлову

Уважаемый Игорь Михайлович!

Администрация муниципального образования "Городской округ "Город Нарьян-Мар", рассмотрев предложения компании "Рамболь Барепц" о возможности софинансирования проекта "Модернизация системы очистки сточных вод поселков Качгорт и Бондарный г. Нарьян-Мара", сообщает.

В рамках исполнения долгосрочных программ, реализуемых на территории муниципального образования, сформировалась следующая практика: из бюджета Ненецкого автономного округа выделяются средства на исполнение мероприятий в размере 97% от объема затрат, из средств бюджета МО "Городской округ "Город Нарьян-Мар" – 3%.

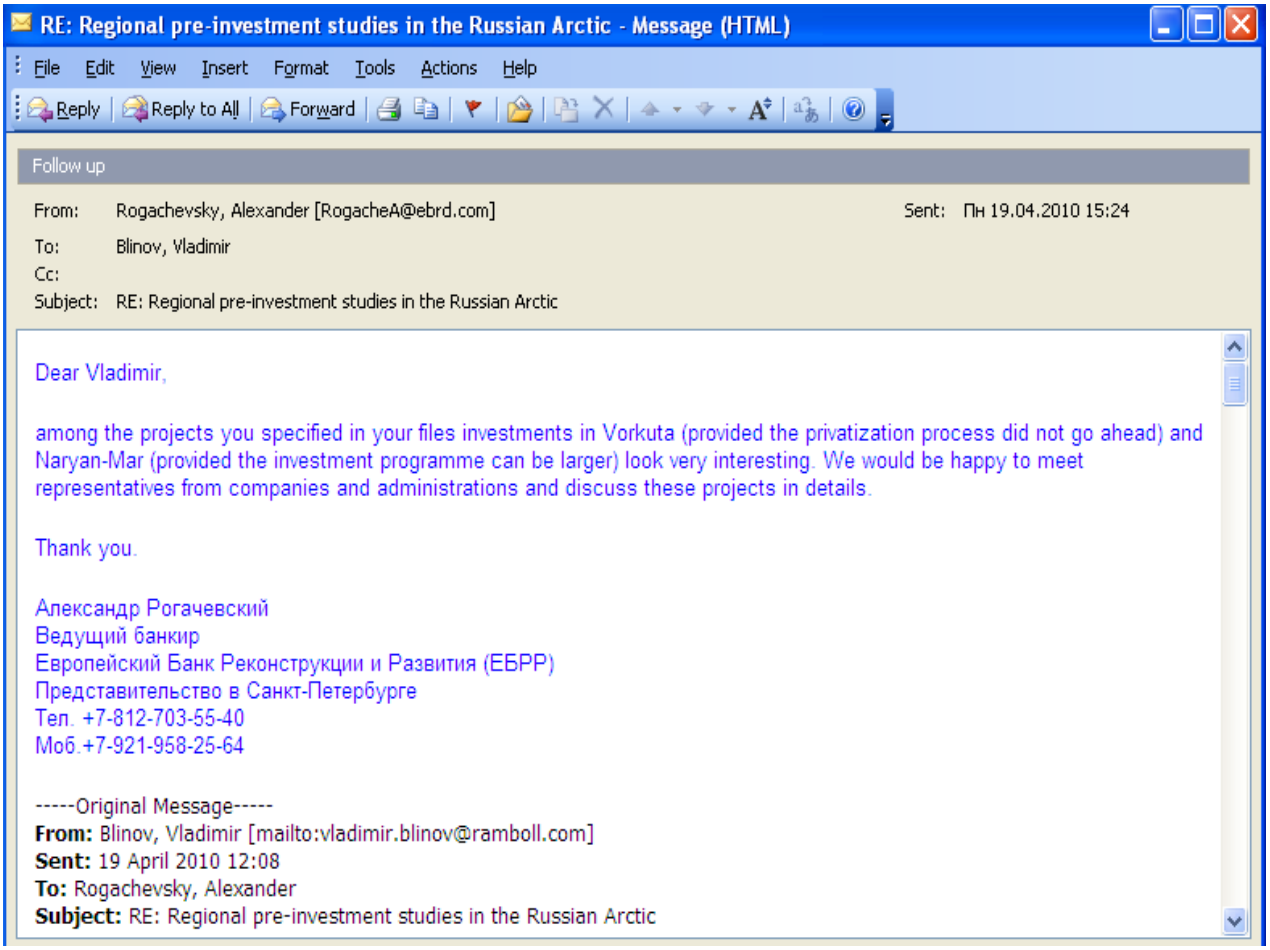
В связи с недостаточностью собственных доходов и уменьшением размера дотации на выравнивание бюджетной обеспеченности, выделяемой из бюджета Архангельской области, предлагаем сохранить сложившуюся схему финансирования.

Средства международного гранта позволят сократить расходы окружного бюджета, предусмотренные на реализацию долгосрочной целевой программы "Обеспечение населения Ненецкого автономного округа чистой водой". Программа предусматривает оказание финансовой помощи муниципальным образованиям на реконструкцию существующих и создание новых очистных сооружений сточных вод. Государственным заказчиком программы является Управление строительства и жилищно-коммунального хозяйства Ненецкого автономного округа.

Заместитель главы Администрации МО
"Городской округ "Город Нарьян-Мар"
по инфраструктурному развитию В.В.Саутина

Сочнева Елена Андреевна
4 93 83

Annex 17. Letter of EBRD on project support of 19.04.2010



RE: Regional pre-investment studies in the Russian Arctic - Message (HTML)

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Reply | Reply to All | Forward

Follow up

From: Rogachevsky, Alexander [RogacheA@ebrd.com] Sent: Пн 19.04.2010 15:24

To: Blinov, Vladimir

Cc:

Subject: RE: Regional pre-investment studies in the Russian Arctic

Dear Vladimir,

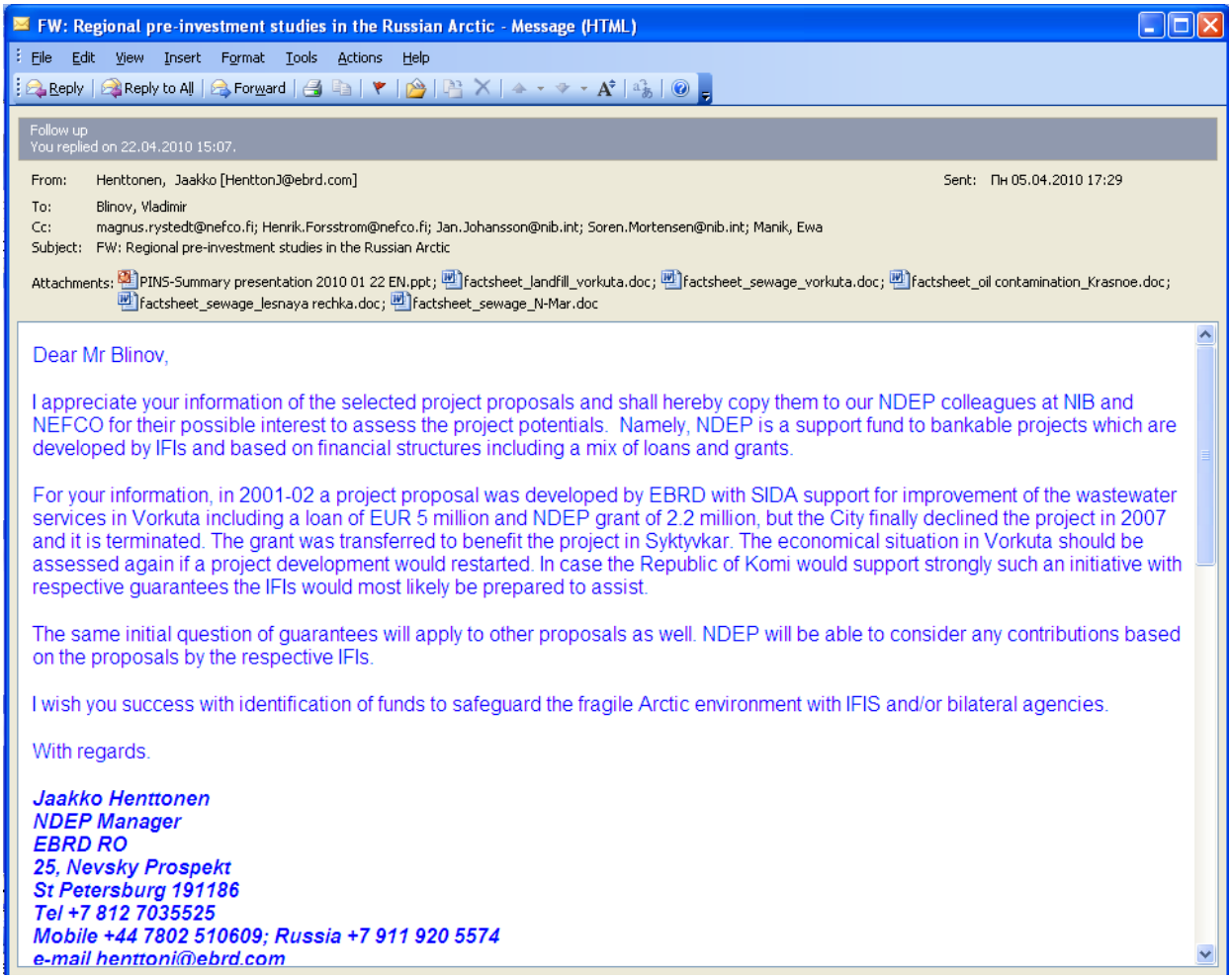
among the projects you specified in your files investments in Vorkuta (provided the privatization process did not go ahead) and Naryan-Mar (provided the investment programme can be larger) look very interesting. We would be happy to meet representatives from companies and administrations and discuss these projects in details.

Thank you.

Александр Рогачевский
Ведущий банкир
Европейский Банк Реконструкции и Развития (ЕБРР)
Представительство в Санкт-Петербурге
Тел. +7-812-703-55-40
Моб.+7-921-958-25-64

-----Original Message-----
From: Blinov, Vladimir [mailto:vladimir.blinov@ramboll.com]
Sent: 19 April 2010 12:08
To: Rogachevsky, Alexander
Subject: RE: Regional pre-investment studies in the Russian Arctic

Annex 18. Letter of NDEP on project support of 05.04.2010



FW: Regional pre-investment studies in the Russian Arctic - Message (HTML)

File Edit View Insert Format Tools Actions Help

Reply | Reply to All | Forward

Follow up
You replied on 22.04.2010 15:07.

From: Henttonen, Jaakko [HenttonJ@ebrd.com] Sent: Пн 05.04.2010 17:29

To: Blinov, Vladimir

Cc: magnus.rystedt@nefco.fi; Henrik.Forsstrom@nefco.fi; Jan.Johansson@nib.int; Soren.Mortensen@nib.int; Manik, Ewa

Subject: FW: Regional pre-investment studies in the Russian Arctic

Attachments: PINS-Summary presentation 2010 01 22 EN.ppt; factsheet_landfill_vorkuta.doc; factsheet_sewage_vorkuta.doc; factsheet_oil contamination_Krasnoe.doc; factsheet_sewage_lesnaya rechka.doc; factsheet_sewage_N-Mar.doc

Dear Mr Blinov,

I appreciate your information of the selected project proposals and shall hereby copy them to our NDEP colleagues at NIB and NEFCO for their possible interest to assess the project potentials. Namely, NDEP is a support fund to bankable projects which are developed by IFIs and based on financial structures including a mix of loans and grants.

For your information, in 2001-02 a project proposal was developed by EBRD with SIDA support for improvement of the wastewater services in Vorkuta including a loan of EUR 5 million and NDEP grant of 2.2 million, but the City finally declined the project in 2007 and it is terminated. The grant was transferred to benefit the project in Syktyvkar. The economical situation in Vorkuta should be assessed again if a project development would restarted. In case the Republic of Komi would support strongly such an initiative with respective guarantees the IFIs would most likely be prepared to assist.

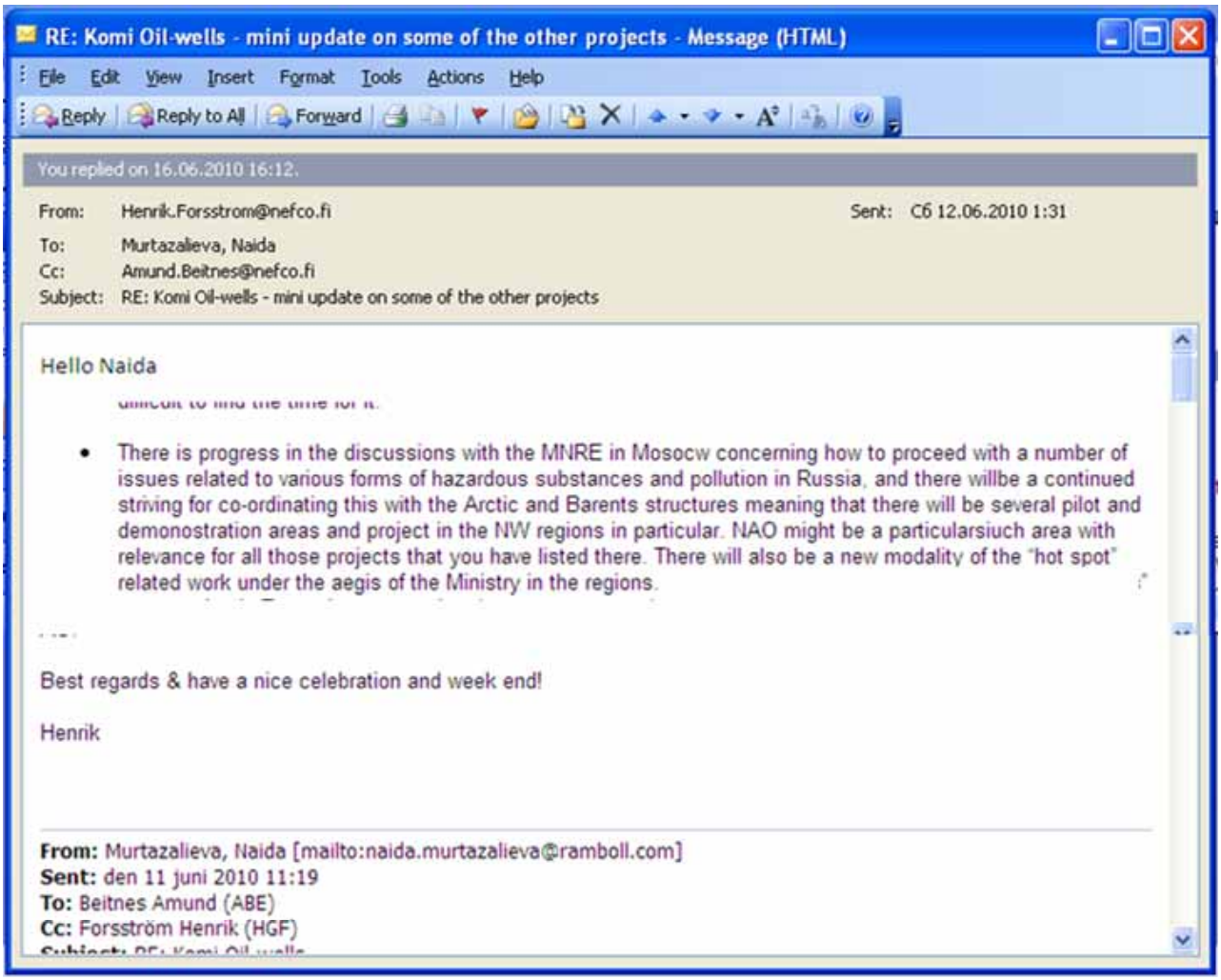
The same initial question of guarantees will apply to other proposals as well. NDEP will be able to consider any contributions based on the proposals by the respective IFIs.

I wish you success with identification of funds to safeguard the fragile Arctic environment with IFIS and/or bilateral agencies.

With regards.

Jaakko Henttonen
NDEP Manager
EBRD RO
25, Nevsky Prospekt
St Petersburg 191186
Tel +7 812 7035525
Mobile +44 7802 510609; Russia +7 911 920 5574
e-mail henttonj@ebrd.com

Annex 19. Extract of the letter of Nefco on project perspectives of 12.06.2010



RE: Komi Oil-wells - mini update on some of the other projects - Message (HTML)

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Reply | Reply to All | Forward

You replied on 16.06.2010 16:12.

From: Henrik.Forsstrom@nefco.fi Sent: Сб 12.06.2010 1:31

To: Murtazalieva, Naida

Cc: Amund.Beitnes@nefco.fi

Subject: RE: Komi Oil-wells - mini update on some of the other projects

Hello Naida

- There is progress in the discussions with the MNRE in Mosocw concerning how to proceed with a number of issues related to various forms of hazardous substances and pollution in Russia, and there willbe a continued striving for co-ordinating this with the Arctic and Barents structures meaning that there will be several pilot and demonostration areas and project in the NW regions in particular. NAO might be a particularsiuch area with relevance for all those projects that you have listed there. There will also be a new modality of the "hot spot" related work under the aegis of the Ministry in the regions.

Best regards & have a nice celebration and week end!

Henrik

From: Murtazalieva, Naida [mailto:naida.murtazalieva@ramboll.com]
Sent: den 11 juni 2010 11:19
To: Beitnes Amund (ABE)
Cc: Forsström Henrik (HGF)