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URGENT ISSUES

Water and Environment Protection Development in Kaunas and its Progress Perspectives

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At the beginning of the 16th century the wealthy residents of Kaunas already started thinking of centralised water supply network construction.

In the middle of the 16th century three clean water wells were found in Žaliakalnis district, between Pakalnės and Mackevičiaus streets and the wells were used as a basis for the construction of water supply network of wooden pipes. A waste water network above the ground was constructed in Kaunas in parallel with the wooden water supply network. However, the wooden network was destroyed by wars, fires and time.

After the declaration of independence in 1918 and later when Kaunas became the temporary capital of the Republic of Lithuania, the need for centralised water supply and waste water networks emerged. In 1924 the construction of waste water network was started. It was based on the design prepared by company "David Grove" from Berlin and in 1928 the water supply network construction was commenced. During the Soviet period (1944-1990) Kaunas became a large industrial, research and cultural centre. A lot of water handling facilities and networks were constructed, however, the town was short of water during some periods.

Kaunas was one of a few towns in Europe which had no waste water treatment plants (WWTP). Untreated waste water was discharged to the Nėris and Nemunas rivers through 13 outlets. No beaches were functioning in Kaunas, water sports and tourism were not developed. Discussions on the site for waste water treatment plant construction lasted for 20 years. Eventually in 1989 a visit of specialists to Stockholm was arranged by the water supply-waste water system managing staff. Swedish specialists assisted in making decision on WWTP site and in the plant design and the Government of the Republic of Lithuania solved the financing issues.

After the restoration of independence of Lithuania the first task for the country and town leaders was to start the construction of WWTP. The construction was started in 1992 and finished on in 1999. WWTP cost is 235 MLTL.

In 1992 the town started implementing the Water and Environment Project. The first stage of the project covered the modernization of four well-fields, 11 booster stations, 52 third lift drinking water stations, 56 waste water pumping stations by using funds from different European, Lithuanian and the enterprise "Kauno vandenys" financing sources. The energy, IT, transport, water metering systems as well as networks services of the company were modernized too. 10.93 MLTL from different funds were allocated to serve this purpose. The first stage of Water and Environment Project was accomplished in 2002.

In 2005 the second stage of Water and Environment Project was started in UAB "Kauno vandenys". During this stage the company will construct a plant for iron and manganese removal in Petrašiūnai well-field. Starting with the year of 2005 all the drinking water supplied by the company will be of good and very good quality.

The start of WWTP extension with biological treatment is planned for 2005. After the implementation of above mentioned WWTP extension the company will be exempted from pollution tax. At the 2nd stage the networks extension which will enable to increase supplied water amounts, improve sanitarian conditions in the suburbs is planned. The cost of Water and Environment Project, stage II is estimated at 37.44 MEuros. The main problem the company encounters is water payments. The consumers pay for water as shown by readings of individual water meters installed in the flats and not by bulk water meter readings. The difference between the bulk meters and individual meters readings makes 20-30% loss for the company (due to unaccounted for, consumed water). Every month the company incurs 672 thousand LTL losses. The situation should be tackled by the Government of the Republic as soon as possible.

Keywords: *the effect of balanced Water and Environment Project implementation sanitarian condition improvement.*

Introduction

Perfect nature implanted into a living organism the instinct for cleanness. When a human being reached a higher cultural level with the help of science, his instinct was to transform into awareness. If a nation or a group of people did not reach this, the nature gave them lessons in cruel ways; thus due to poor sanitary conditions epidemics devastated and still devastate human residence places by killing culprits without mercy.

Epidemics were regarded as the divine scourges and prayers, fasts, processions, pogroms of Jews or other heretics blamed for that were supposed to be the best way to fight them. The towns were growing and the water consumption was increasing too. In Kaunas as well as in other European towns the sanitary conditions were getting worse, a lot of people were ill with infectious diseases.

Cholera killed about 170 thousand people in Prussia alone and this influenced negatively the country development and survival.

The sanitary conditions in the towns started significantly improving after finding the great routes to America, India and after the merchant republics were founded by the Mediterranean and Baltic seas. Trade was developing, the merchants

expanded their activities in Europe and also in Kaunas, higher sanitary standards were established as well.

The basis for waste water network and cetralised water supply was created by capitalistic economy in Kaunas and its rapid development.

Already in the 16th century centralised water supply network of wooden pipes was constructed on the iniciative of the rich residents of Kaunas. In Žaliakalnis district, between Pakalnės and A.Mickevičiaus streets there were found three fresh water wells and the water from them was supplied by gravity pipes to the wealthy residents, pubs, City Hall. In parallel with the wooden water supply network a waste water network above the ground was constructed. However the wooden network was destroyed by wars, fires and time.

After the declaration of independence on 16.02.1918 and later when Kaunas became the temporary capital of the Republic of Lithuania, one of the most important tasks for the young government of the Republic of Lithuania was to construct a centralised water supply and waste water networks. This difficult task was undertaken by the signatory of Lithuanian Independence Act engineer St. Kairys. He was assisted by engineers S. Vabalevičius, B. Petrulis, A. Andriūnas and others.

Steponas Kairys employed the most modern European science achievements in the construction of water supply and waste water networks. The water supply network was constructed in cooperation with a company from Berlin "David Groxe" in 22 months. The water was supplied from underground wells. Kaunas was and still is the only town in Europe which is supplied by drinking water from underground wells.

Engineer Kairys later became a professor of Vytautas Magnus University, Head of Hygiene and Sanitary Department. His students S. Vabalevičius, B. Petrulis were also professors at Kaunas Polytechnical University. Engineers educated by them constructed, operated and managed water supply objects in Kaunas and other towns.

In the Soviet period Kaunas became a large industrial, scientific, cultural centre. A lot of industrial, scientific and cultural objects were built in the town. The water management objects were constructed by applying science and technical innovations. The Water Supply Company was one of the best companies of this kind according to the technical level not only in Lithuania but also in Soviet Union. The Company was rewarded the State Premium of the Council of Ministers of Lithuania.

However Kaunas was one of a few towns in Europe which had no waste water treatment plants (WWTP). Untreated waste water was discharged to the Nėris and Nemunas rivers through 13 outlets. No beaches were functioning in Kaunas, water sports and tourism were not developed. Discussions on the site for waste water treatment plant construction lasted for 20 years. Eventually a Swedish company K-Konsult was applied for assistance and in 1989 it made decision on WWTP site and in the plant design and the Government of the Republic of Lithuania solved the financing issues.

WWTP was designed by employing the most up-to-date technologies and at present is still the most modern WWTP in Lithuania.

WWTP design work was supervised by the professor Janennerfelt from Stockholm.

After the restoration of the independence of Lithuania the first task for the leaders of the country and the enterprise "Kauno vandenys" was to start the construction of WWTP. The construction was started in 1992 and finished in1999.

The **objective** of this work is to summarize the importance of water and waste water plants in the world and to present problems and tasks arising in Kaunas supply with water.

The most modern **methods** – analysis and investigation of statistic data presented in scientific literature on the towns supply with water.

Tasks – water supply and waste water treatment in Kaunas should ensure that progress reached in economy and science is used for the good of people and Kaunas environment.

Object – the enterprise "Kauno vandenys".

Novelty – historical, political and problematic summary of scientific achievements and forecast of their development. The enterprise "Kauno vandenys" acitivity perspectives.

Water management system development in Kaunas

In 16^{th}-21^{st} centuries three clean water wells were found in Žaliakalnis district, between Pakalnės and Mackevičiaus streets and the wells were used as a basis for the construction of water supply network of wooden pipes. The water from the wells was supplied by gravity pipes to the City Hall, pubs, inns, wealthy residents. However the wooden water supply network was destroyed by wars, fires, time. In parallel with a wooden water supply gravity network a waste water network above the ground was constructed in Kaunas. In the locations where the slope was sufficient channels were excavated directly in the ground to make the waste water drain. Later when the destruction of channels sides under influence of running water and rain was observed they were reinforced with boards. We can hardly imagine what smell was in the town in summertime, a lot of people sufferred from infectious diseases. In 1540 Kaunas Magistrate obligated the Check-up Committee to make the residents clean the channels.

After the declaration of independence on 16.02.1918 and later when Kaunas became the temporary capital of the Republic of Lithuania, the need for centralised water supply and waste water networks emerged.

In 1924 the construction of waste water network was started based on design prepared by company "David Grove" from Berlin and in 1928 the water supply network construction was commenced. The water supply network construction was completed in 22 months. The construction of water supply and waste water networks and facilities was supervised by the signatory of Lithuanian Independence Act, professor of Vytautas Magnus University Steponas Kairys. When retreating from Kaunas on in 1944 German Army exploded the main well-field in Eiguliai, booster station in Aleksotas, fresh water reservoir in Žaliakalnis. In 22 days after Kaunas liberation Eiguliai well-field was partially restored and started water supply to the town.

The water supply network restoration works were supervised by S. Vabalevičius and B. Petrulis, the students of professor S. Kairys. Later the professors S. Vabalevičius and B. Petrulis conducted this work at Kaunas Polytechnical Institute. During the Soviet period (1944-1990) Kaunas became a large industrial, research and cultural centre. Water supply and waste water facilities and networks were rapidly constructed in the town. In forty six years water

supply and waste water discharge amounts increased 20 times and reached 240 m^3/d. The length of water supply and waste water networks increased accordingly. The length of waste water network increased from 90 km to 540 km and water supply network from 89 km to 730 km. By the way, between the wars and in Soviet period water from the water columns was supplied to the residents free of charge. In the Soviet period a lot of energy, ideas and work was devoted to the extension of water system by senior engineer, Kaunas Polytechnical Institute associate professor, dr. J. Jurjonas. In Soviet period three well-fields, seven drinking water booster stations, nine waste water pumping stations were constructed in Kaunas. The stations were automated, mechanized and were one of the best in Lithuania and Soviet Union according to the technical level achieved at that time.

In 1986 Kaunas Water Company was awarded the State Premium of Lithuanian Council of Ministers for design and putting into operation an automatic control system (supervisor associate professor, dr B.Kriščiūnas). It was the highest rating ever achieved by utility services company in the history of Lithuanian utility services development.

In 1972 Kaunas Water Supply Museum was established. It was the first cultural institution established in Lithuanian utility services company.

In spite of rapid and numerous constructions of water supply and waste water networks and facilities the town was short of water in certain periods. The water supply mains were made of steel and cast iron pipes without inner insulation which resulted in the water quality deterioration.

Kaunas was one of a few towns in Europe which did not have waste water treatment plants. Untreated waste water was discharged to the Nėris and Nemunas rivers through 13 outlets. The water in the Nemunas and Nėris like in all Lithuanian waters was polluted. No beaches were functioning in Kaunas, water sports and tourism were not developed. Discussions on the site for waste water treatment plant construction lasted for 20 years. A lot of options were proposed however all of them were criticized. Assistance of specialists from other European countries on the site selection was required. American environment specialist Mr V. Adamkus was applied for help however he did not provide any definite advice or assistance.

Eventually in 1989 a visit to Stockholm was arranged by the representatives of the managing staff from Kaunas water supply-waste water company (associate professor, dr B. Kriščiūnas, engineers V. Cėringis, A. Dipartas). Company K-Konsult was contacted and provided assistance in selection a site for WWTP construction in Kaunas. Stockholm company K-Konsult was represented by professors JAN RENNERFELT and KARL ERIK RAMSTROM.

Although the company was engaged in a lot of other projects it decided to make an exception and assist independence seeking country. In 1989 after Lithuanian Government solved financial issues with the help of Swedish specialists, WWTP design works started. In 1990, after the independence restoration Kaunas as well as other Lithuanian towns prepared water and environment projects. The main task of Kaunas Water and Environment Project, stage I was to construct WWTP in accordance with design prepared by Swedish specialists. The WWTP construction started on 22 April 1992 and was completed in September 1999.

Planning of the enterprise "Kauno vandenys" water and environment protection objects after independence restoration

- **Stage I, 1992-2002**

The design of waste water mechanical-chemical treatment plant was started in 1989. The construction started April 22, 1992 and was completed in September 1999. The design capacity of WWTP is 232 thousand m^3 effluent per day. Actual load was 58,6 thousand m^3/d in the course of 2004.

WWTP construction in Kaunas was a large investment into the nature. The plant prevents from 16 tons pollutants discharge into the waters every day. Coarse screeenings are stopped by screen bars. Sand is settled in aerated grit chambers. The waste is taken by special cars equipped with containers to the landfill. Further the waste water is supplied to the primary sedimentation tanks and settled waste (sludge) is processed by employing anaerobic process. Biogas resulting from organic matter decomposition process is used in WWTP boiler-room and excess gas not used there is supplied to Noreikiškės district boiler-house. In 2004 about 3 Mm^3 biogas was produced, 1,5 Mm^3 of it was supplied to Noreikiškės boiler-house. The income for it made about 300,0 thousand LTL. Dewatered sludge is transported to the sludge disposal area. After some time the sludge is taken from there to the energy forest areas.

Kaunas WWTP was designed by Swedish company "VA-Projekt", AB "Pramprojektas", AB "Energetikos tinklų projektas" and AB "Hidroprojektas". The construction works were carried out by the enterprise "Kausta". The cost of engineering and construction works made 235 MLTL.

The waste water network in the town collects household and industrial waste water as well as storm water. In 2004 the company ran 936 km total waste water network (household, industrial, storm water). The network is laid of different pipes: ceramic, concrete, reinforced concrete, stone, cast iron and asbestos-cement.

With regard to consumers category there are two waste water systems in the town: separate and combined. In 2004 the company operated 56 waste water pumping stations.

- **Water production, supply, quality**

Lithuania is the only country in Europe which uses ground water for household needs. Kaunas, the second largest Lithuanian town is situated in the confluence of rivers Nemunas and Nėris. Its residents are supplied with drinking water from Eiguliai, Kleboniškis, Vičiūnai and Petrašiūnai well-fields. The first two well-fields are situated by the Nėris and the rest are related to the Nemunas water. The ground water in these well-fields are fed by water from the Nėris and Nemunas which is filtrated through sand-grit layers and in 3-12 months is treated mechanically and bacteriologically and later supplied by pumps to the consumers.

The implementation of Kaunas Water and Environment Project included the reconstruction of all well-fields, rehabilitation and reconstruction of wells, booster stations and third lift water stations. In 2004 the company operated 11 booster stations and 52 third lift water stations. After the well-fileds reconstruction when Soviet pumps were replaced by Western type pumps the energy consumption per one m^3 water lift makes only 0.3-0.4 kWh. In 2004 the town was supplied with

64.5 thousand m^3 ground water per day. The drinking water network is circular type. It is laid of steel, cast iron, polyethylene pipes. In 2004 the company operated 1101 km water supply network. However the network service time, its technical condition and decreased water comsumption cause the network operation problems. In spite of good functioning of network service teams the breakdown rate in the network is quite high (3.4 breakdowns/1 km/year). Taking into consideration the network service life and physical condition about 320 km water supply network shall be replaced or rehabilitated. The water quality is stable and meets the requirements of Lithuanian water hygiene norm HN 24:2003. The best quality water is supplied from Eiguliai, Kleboniškis water-fields, good quality water from Vičiūnai and worse quality water from Petrašiūnai well-field. The water from the latter well-field contains excessive concentrations of manganese and iron. These substances damage the pipes as they form sediments and thereby decrease the pipes cross-sections. A change in the water flow direction or pressure results in turbid water which is sometimes supplied to the consumers.

In 2003 the Drinking water laboratory was certified after physical, chemical and bacteriological tests performed in accordance with regulations established by the State Food and Veterinary Service. The laboratory is equipped with the highest quality equipment which even some water companies in West Europe do not have.

- **Energy system**

In the change of times, situations of economy and energy system, the policy and priority of the company's energy system does not change radically. The aim of Energy enterprise service is to ensure uninterrupted, safe, and economical operation of electrical equipment. Service of the company's head energy department serves 131 object with total 48000 thousand installed and 19400 thousand kW of dischargeable electric capacity. (The Joint-Stock Company) the enterprise "Kauno vandenys" is the biggest consumer of energy in Kaunas city. Company's economy of energy and measuring instruments are served by 52 qualified specialists of the workshop of electricity maintenance and measuring instruments constituting head energy department

The reconstruction of water-supply stations completed in 2003, as well as effective usage of frequency gears made preconditions not only for saving the energy, but also to reduce water waste in the system. Water is supplied with equal pressure regardless of required water quantity, there is no overpressure in the system.

Due to efficient filling of water tanks not only electric power is saved, but also general electricity tariff is reduced during the night in the stations of second raise. Company's energy service in respect of its technical, organizational level is one of the best in the Republic of Lithuania.

- **Transport**

The workshop of motor transport is important structural subdivision of the company, since the enginery available is operating in most of subdivisions. In the course of company's development the need of vehicles rapidly grew, but previously bought transport equipment and mechanisms do not meet the requirements of nowadays. Over a short period of time nearly entire economy was modernized, which in different periods of time was comprised of around 150 vehicles. Recently modern machinery for system wash and diagnostics was acquired. Teams of the system service go to the objects by smaller bearing capacity economical cars.

To improve company's image, as well as to promote the service supplied the brand new cars are used, which constantly work in the streets of the city and catch the attention of Kaunas inhabitants and guests.

- **Informational Technologies**

New company's website started in 2003 provides inhabitants of the city with detailed information about the company, everyday data, water supplied and cleaned, number of accidents.

The Company has sophisticated computer network, comprising 250 computers, and optimally allocating informational flows. Computers in the company's subdivisions with a help of optic and other special cables as well as wireless computer connection equipment connected to service stations in the department of computer technologies. Programmes of financial accounting and payment of subscribers, systems of water-supply and wasted water purification, digital maps, as well as database of management systems of technologic processes of pump-houses and wasted water cleaner's, also information processing programmes function at the Service stations.

With a help of the programme of subscribers' accounting and payments more than 129000,0 invoices for water supplied to consumers are formed every month. At the Subscribers' service Geographic Informational System (GIS) was implemented, with a help of which it is possible to effectively determine the location and connections of water supply and sewerage systems. Telltale computer connection equipment was installed at the reconstructed watering-places: pump-houses of the second, the third raise. Computers and service stations at the central dispatcher office ensure liable water supply and optimal equipment control.

- **Stage II, 2002-2006**

During implementation of the stage II of the project, equipment for iron removal will be placed at Petrašiūnai watering-places in 2005, therefore all consumers will obtain water of very high quality. Quality of water supplied by the company will conform to both standards of the Republic of Lithuania, and requirements of the European Union directives. This project is financed by the European commission (ISPA) program, and program of state investments, as well as from the bank of the European reconstruction and development loan lent to the enterprise "Kauno vandenys". The project and construction of water purification equipment of Petrašiūnai watering-place will cost 16.26 mln.EUR.

For the building of biological purification equipment the company has signed the contract with ISPA, and also with SIDA (International agency of development and cooperation in Sweden). Projecting and building of biological purification equipment will cost 14.7 mln.EUR. The building process of biological purification equipment it is planned to begin in 2005. In 2005-2006 on the ISPA funds the expansion of water-supply and wasted water systems is foreseen in the suburbs of the city, and it will cost 6.48 mln.EUR. For the implementation of water and environment protection project of Kaunas city (stage II) it is provided for to assimilate 37.44 mln.EUR.

Problems

In 1990-2003, after modernization of technologic processes of industrial enterprises, after closing uneconomic, needless to the Republic of Lithuania industrial enterprises, and after installing water meters in inhabitants' flats, water supply to the city significantly decreased. While the price of water and wasted water has significantly increased, and presently amounts to 3,93Lt for one m^3 of water. 93% of Kaunas city residents have installed water meters in their flats. The inhabitants pay for water to the company not according to leading-in water meter, but according to readings of water meters mounted in the flats. The difference between the readings of lead-in meter and meters in the flats, is 20-30% to company's disadvantage.

Water meters mounted in the flats made a huge financial shock to water suppliers of Lithuanian Republic and Kaunas city.

According to estimates of VGTU (Vilnius Technical University of Gediminas) scientists, every flat of block-house having autonomous water meter makes 6 Lt loss for water suppliers every month (due to consumed but not recorded water). Under the data of Department of Statistics of Lithuania there are 776 thousand in Lithuania, and 112 thousand in Kaunas of flats with water meters. It is not difficult to determine, that a drive supported by Lithuanian Government to install water meters in the flats, now every month brings to water suppliers of the Republic:

776 x 6 = 4656 thousand Lt.,

in Kaunas respectively 112 x 6 = 672 thousand Lt of losses.

Water suppliers lose over a year:

672 x 12 = 8.064 mln.Lt.

Of course there can not be any discussions about prohibition for flat owner to have autonomous water accounting unit (house belonging to communities) and to pay for water consumed in community houses according to its readings. Precision of water meters has to be inspected every two-four years. However, when in 1997 the concern was taken about the revise of meters mounted in the flats, huge opposition arose (partly reasonable, since the revise and reinstallment of such a big number of meters is related to establishment of new services), which forced the Ministry of Economy to revoke its decision. There is no juridical basis to acknowledge them as inappropriate for the accounting, and nobody is obliged to check them. Besides, no one does anything for free. Thus, Kaunas water suppliers sustaining losses amounting to millions to solve existing problem need to:

- determine legally the longest allowable term for meters' usage;
- replace invalid meters in the flats with new conforming meteorological class meters (on the account of water consumer);
- use only meteorological meters of C or D class in the newly mounted water accounting units of small consumers;
- join capacities of all lawyers, water suppliers, scientists, and water consumers in Lithuanian Republic, to make settlement of water suppliers and consumers for the water only according to lead-in meter.

Management and financing: The construction of the enterprise "Kauno vandenys" WWTP and the implementation of Water and Environment Project, stage I were governed by General Manager of the company Mr V.Burokas. The investments from various funds for the designing and construction of WWTP made 235 MLTL.

10,132 MLTL from various funds were used for the Water and Environment Project, stage I. The works were carried out by general contractor the enterprise "Požeminiai darbai". The contractual works were paid by the European Bank for Reconstruction and Development. All the works were finished in 2002. With the successful completion of this contract the implementation of Water and Environment Project, stage I was completed as well and the implementation of stage II started.

The financing of stage II will be provided from the funds of the EU, the Republic of Lithuania and UAB "Kauno vandenys".

Conclusions and recommendations

Although recently great progress has been made in solving issues of water pollution reduction, high quality water supply and water accounting in Kaunas, the problems related to water pollution, waste water treatment, especially nitrogen and phosphorus removal, drinking water quality and metering still remain the most important problems for the water suppliers.

The main strategic priorities in the sphere of water resources measuring and protection for Kaunas are as follows:

1. To reduce the water pollution with household and industrial waste water (to ensure that untreated waste water is supplied from the suburbs to WWTP);
2. To improve the drinking water quality (start the operation of Petrašiūnai Water Purification Plant in 2005);
3. To reduce the pollution of open water reservoirs with hazardous substances (follow strictly EU standards);
4. To improve the condition of water reservoirs used for recreation purposes (restore Karmelitų, Šančių, Santakos beaches);
5. To reduce the pollution of the Baltic Sea (extend WWTP with biological treatment);

To improve billing system, tax collection for water and waste water.

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Bronius Kriščiūnas

Kauno vandens ir aplinkosaugos plėtra ir jos vystymo perspektyvos

Santrauka

Kaunas yra antras pagal dydį Lietuvos miestas; jo 157 km^2 plote gyvena 380,0 tūkst.gyventojų. Miesto geografinė padėtis turėjo didelės įtakos jo istorinei raidai.

Nepaliaujami karai trukdė miestui augti, vystyti pramonę, prekybą, kultūrą, mokslą. Tik po Žalgirio mūšio, sutriuškinus kryžiuočių ordiną, prasidėjo ramesnis miesto gyvenimas. Puikūs vandens keliai Nemunu ir Nerimi padėjo vystyti prekybą.

Jau XVI a. pradžioje pasiturintiems Kauno gyventojams kilo centralizuoto vandentiekio statybos idėjos. XVI a. viduryje Žaliakalnyje, tarp Pakalnės ir A.Mackevičiaus gatvių buvo surasti trys švaraus vandens šaltiniai, sąlygoję medinių vamzdžių vandentiekio tinklų tiesimą. Iš minimų šaltinių vanduo savitaka buvo tiekiamas miesto rotušei, karčemoms, turtingiems miesto gyventojams.

Pastačius Kaune medinį savitakį vandentiekį, atsirado ir atviras nuotekų tinklas, kad nešvarūs vandenys pagal nuolydį galėtų nutekėti į Nemuną ir Nerį. Galima įsivaizduoti, koks mieste vasarą buvo oras. Daug gyventojų sirgdavo užkrečiamosiomis ligomis. Kauno magistratas 1540 m. įpareigojo gyventojus kanalus valyti. Lietuvai 1918-02-16 paskelbus nepriklausomybę, o vėliau Kaunui tapus Lietuvos Respublikos laikinąja sostine, teko tiesti centralizuotą vandentiekį ir požeminę kanalizaciją.

1924 m. pagal David Grove firmos iš Berlyno parengtą projektą pradėta tiesti kanalizacija, o 1928 m. – vandentiekis. Vandentiekis Kaune nutiestas per 22 mėnesius. Nepriklausomoje Lietuvos Respublikos sostinėje sparčiai buvo tiesiami vandentiekio ir kanalizacijos tinklai.

Sovietmečiu (1945-1990) Kaunas tapo stambiu pramonės, mokslo, kultūros centru. Mieste buvo sparčiai statomi vandentiekio ir kanalizacijos įrenginiai, tiesiami tinklai. Per 46 metus vandens tiekimas ir nuleidimas padidėjo apie 20 kartų (nuo 12 tūkst.m3/par. iki 240 tūkst. m3/par.). Atatinkamai išsiplėtė ir nuotekų tinklai. Vandentiekio kanalizacijos įrenginiai, stotys mechanizuotos, automatizuotos ir pagal tuometinį lygį buvo vienos geriausių Lietuvoje ir Sovietų Sąjungoje. 1986 m. Lietuvos Vyriausybė už automatizuotos valdymo sistemos įdiegimą paskyrė Kauno vandentiekio kanalizacijos valdybai valstybinę premiją.

Nors vandentiekio ir nuotekų įrenginiai buvo statoma daug ir sparčiai, bet atskirais metų periodais miestui geriamojo vandens trūkdavo. Kaunas neturėjo nuotekų valymo įrengimų. Nevalytos nuotekos buvo išleidžiamos į Nemuną ir Nerį. Kaune neveikė pliažai, nebuvo vystomas vandens sportas, turizmas. Apie du dešimtmečius atsakingi Kauno darbuotojai, projektuotojai, mokslininkai ginčijosi dėl nuotekų aikštelės valymo įrenginiams parinkimo. Pasiūlyta daug variantų, bet visi atmesti.

1989 m. Kauno vandentiekio vadovaujantys darbuotojai išvyko į Stokholmą, kur užmezgė ryšius su K-Konsult firma. Minėtos firmos specialistai, atvykę į Kauną 1989 m., padėjo parinkti aikštelę valymo įrenginiams statyti (beje ji parinkta toje vietoje, kur siūlė ir Kauno specialistai).

1990 m. Lietuvai atkūrus nepriklausomybę, Kaune buvo parengtas vandens ir aplinkosaugos projektas. Pirmas projekto uždavinys buvo pastatyti nuotekų valymo įrenginius. 1999 m. pastatyti ir pradėjo veikti nuotekų valymo mechaniniai įrenginiai.

Pirmajame vandens ir aplinkosaugos projekto etape buvo modernizuotos visos keturios vandenvietės, antrojo ir trečiojo geriamo vandens kėlimo ir nuotekų siurblinės, energetinis ūkis, abonentų tarnyba, transportas, laboratorijos. Pirmasis projekto etapas baigtas 2002 m. Iš įvairių Europos ir Lietuvos Respublikos investicinių fondų panaudota 10,73 mln.Lt.

Baigus pirmąjį vandens ir aplinkosaugos projekto etapą, 2005 m. prasidėjo antrasis etapas. Per šį etapą bus pastatyta biologinio valymo įrenginiai, Petrašiūnų geriamojo vandens nugeležinimo įrenginiai. Pastačius šiuos objektus, nuotekos bus išvalytos pagal Europos Sąjungos reikalavimus, o geriamasis vanduo bus tiekiamas tik geros ir labai geros kokybės. Be to, bus renovuojami, perklojami nuotekų ir vandentiekio pasenę tinklai, statomi nauji tinklai miesto pakraščiuose.

UAB "Kauno vandenys" susiduria su sunkiai sprendžiamais klausimais. Vienas jų yra vandens apskaita daugiabučių namų butuose. Butuose pastatyta 93% skaitiklių; jie pasenę, neatitinka metrologinių reikalavimų. Gyventojai už vandenį atsiskaito ne pagal namo įvadinį skaitiklį, bet pagal butuose įrengtus vandens apskaitos prietaisus. Įvadinio ir butuose esančių skaitiklių rodmenys skiriasi apie 20-30%, o dėl kiekvieno buto Kauno vandens tiekėjai patiria per mėnesį 6 Lt nuostolį (dėl neužfiksuoto, bet sunaudoto vandens). Per metus, VGTU (Vilniaus Gedimino technikos universiteto) mokslininkų apskaičiavimais Kauno vandens tiekėjai netenka 8,064 mln.Lt. Šį klausimą skubiai turi spręsti Lietuvos Respublikos Vyriausybė.

Raktažodžiai: *UAB „Kauno vandenys", subalansuoto vandens ir aplinkosaugos projekto įtaka miesto sanitarinei padėčiai gerinti.*

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