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National Urban Wastewater Treatment Program: Assessment of Task Implementation

Abstract

This paper presents an assessment of the state of advancement of work on tasks encompassed by the National Urban Wastewater Treatment Program that are vital in meeting the transitional goals as defined in the Poland's Treaty of Accession to the European Union in the section relating to Council Directive 91/271/EEC concerning urban wastewater treatment. Reasons behind delays in completing planned projects with respect to deadlines earmarked in the National Urban Wastewater Treatment Program are discussed, as are the consequences of the delays. Environmental effects in the area of biodegradable pollutants as achieved in 2009 in terms of individual voivodeships and the country as a whole have also been calculated.

1. Introduction

Achievement of the primary aim of European Union water policy – a good state of waters by the year 2015—is linked with implementation of tasks as defined in over a dozen detailed directives in the area of water quality to which Poland obligated itself on joining the European Community. One of the main directives in the area of urban wastewater discharge and treatment is Council Directive 91/271/EEC concerning urban wastewater treatment (commonly referred to as the “wastewater directive”) (*Directive...1991*).

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It applies to the collection, treatment, and discharge of urban wastewater as well as the treatment and discharge of wastewater from certain industrial sectors. Its objective is the prevention of adverse effects on the environment caused by the discharge of insufficiently treated urban wastewater.

In the case of Poland, agreement negotiated with the European Union concerning the “Environment” sector was transferred to the Poland’s Treaty of Accession to the European Union¹. That document obligates the Government of the Republic of Poland to build, expand, and/or modernize urban wastewater treatment plants and collection systems in agglomerations² by the end of 2015. The consequences of failure to meet the obligations found in the Accession Treaty would be the application by the European Commission of financial penalties.

The Minister of the Environment developed the “National Urban Wastewater Treatment Program” (KPOŚK) in order to identify actual needs in the area of wastewater management as well as the ordering of implementation so as to meet Treaty obligations. This Program is the primary instrument for meeting obligations by the Government of the Republic of Poland as assumed in the Treaty of Accession and one of the major investment projects that faced Poland over recent years.

In July of 2010, the National Water Management Authority (KZGW) officially confirmed the occurrence of delays in the implementation of projects in 121 agglomerations that, in line with the second program revision (AKPOŚK 2009) should have achieved a waste water treatment effect by the end of 2010. This being the case, it is vital to urgently approve a third revision (AKPOŚK 2010) defining realistic deadlines for project completion.

Unfortunately, delays in the building and modernization of wastewater treatment plants and collection systems are a fact. There is general concern that the existing delays will have a negative impact on the achievement of intermediate goals in the implementation of Directive 91/271/EEC, especially on the elimination of the load of biodegradable pollutants in wastewater by 86% of total load as defined for the whole of Poland for the close of 2010. Failure to complete tasks as encompassed by the Program may result in many adverse

¹ Journal of Laws of 2004, No. 90, item 864, with subsequent amendments – Journal of Laws L236 of September 23, 2003, p. 33, with subsequent amendments.

² The term *agglomeration* signifies an area where the population and/or economic activities are sufficiently concentrated for urban wastewater to be collected and conducted to an urban wastewater treatment plant (Article 43, Clause 2 of the Water Code). The voivodeship parliament bears responsibility for designating agglomerations by way of resolution as of November 15, 2008 (see more *Rozporządzenie...*2010).

consequences, including the application of severe financial penalties on Poland. For this reason it is important to conduct studies indicating if there is indeed a threat of non-performance of this primary tasks of the National Urban Wastewater Treatment Program and calculating, on the basis of data contained in reports submitted by voivodeship marshals for 2009, of the total level of reduction of biodegradable pollutant.

2. National Urban Wastewater Treatment Program

The National Urban Wastewater Treatment Program contains a list of agglomerations with a population equivalent (p.e.)³ greater than 2,000, with a simultaneous indication of necessary ventures in the area of construction, expansion, and modernization of urban wastewater treatment plants collection system to be executed in those agglomerations by the end of 2015 as well as for intermediate period entered into the Treaty of Accession. Thus, by the end of 2005, Poland was to have achieved agreement with the wastewater directive in the case of 674 agglomerations (which accounts for 69% of biodegradable pollutants), 1,069 agglomerations by the end of 2010 (86% of pollutants), and reach a total of 1,165 agglomerations by December 31, 2013, and all agglomerations (100% of pollutants) by the end of 2015 (see more *Poradnik...2010*, pp. 19-26).

The first National Urban Wastewater Treatment Program was passed by the Council of Ministers in 2003. It encompassed a total of 1,635 agglomerations that were subdivided into three groups in terms of size—small (2,000–15,000 p.e.), medium (up to 100,000 p.e.), and large (over 100,000 p.e.) (*Krajowy Program...2003*).

The first Revised National Urban Wastewater Treatment Program 2005 was approved by the Council of Ministers in 2005 (*Pierwsza Aktualizacja...2005*) with the second Revised National Urban Wastewater Treatment Program 2009 being passed in March of 2010 (*Druga Aktualizacja...2010*).

Revised National Urban Wastewater Treatment Program 2009 encompasses a total of 1,635 agglomerations listed in two attachments. Attachment No. 1 encompasses 1,313 agglomerations with a total load

³ Population equivalent (p.e.) – The unit pollutant load in wastewater as discharged by one inhabitant over a twenty-four hour period defined as BOD₅ (biochemical oxygen demand) equal to 60 g O₂/day (Article 43, Clause 2 of the Water Code).

accounting for 97% of total Program p.e. It is for this reason that they are assigned priority in terms of meeting the provisions of the Treaty of Accession. The Ministry structured its plans so that available funds should first be directed to the execution of projects found on the priority list. It is for this reason that local governments made significant efforts to have their projects entered into the Program, where negotiations took up almost two years.

Financial outlay on implementation in the area of the material–financial scope of the ventures listed in this Attachment was estimated at a total amount of approximately PLN 30.1 billion for the period up to 2015. These funds are mainly intended for the building of wastewater collection systems. It is the view of local government that the amount approved by the government is too small, less than half as much as planned by local government. Limited amounts of available funding for the financing of the Revised National Urban Wastewater Treatment Program 2009 over the period up to 2015 make impossible the meeting of all needs as submitted by municipalities with respect to implementation of sanitary infrastructure. Essentially, this resulted in many municipalities cancelling projects this year and may also result in delays in the future.

Attachment No. 2 encompasses 322 agglomerations that are not a priority in terms of meeting Treaty requirements. Projects found in this Attachments will be implemented as funds become available for their execution with appropriate project preparations in terms of environmental and economic efficiency.

For its part, the second Revised National Urban Wastewater Treatment Program published in May of 2010 was immediately outdated. No threats to deadlines for many water–sewage projects were verified earlier and no steps were taken to evade the reporting disarray on various levels, the number of agglomerations was not detailed, and their selection was not justified. It reflected wastewater management needs in the years 2007–2008. The scope of collected data was insufficient for analysis of the reasons behind the delays and for verification of project execution deadlines within the framework of Revised National Urban Wastewater Treatment Program 2009. For this reason it was urgently decided that a third Revised National Urban Wastewater Treatment Program was needed, which was to reflect the state of advancement of project implementation within the framework of the Revised National Urban Wastewater Treatment Program 2009 as of June 30, 2010.

September of 2010 saw the publication of the draft version of the third Revised National Urban Wastewater Treatment Program 2010 (*Trzecia Aktualizacja...2010*). The scope of this document encompassed only data relating to project implementation deadlines and its objective was analysis of the state of advancement of project implementation as well as analysis of the

reasons for existing delays, leading to the establishing of realistic deadlines for their completion. This situation applied to 120 agglomerations with over 15,000 p.e. and one agglomeration below 15,000 p.e. from the Revised National Urban Wastewater Treatment Program 2009 that, due to project delays, will not meet planned project completion by the end of 2010. All other information and data remain in agreement with Revised National Urban Wastewater Treatment Program 2009.

May of 2010 saw the publication of the inspection report of the Supreme Audit Office (NIK) in connection with the elapse of the midpoint in the period assigned for implementation of the National Urban Wastewater Treatment Program (*Informacja...2010*). The inspection encompassed sixty entities: Ministry of the Environment, National Water Management Authority, National Fund for Environmental Protection and Water Management, and fifty-seven municipality offices implementing the National Urban Wastewater Treatment Program.

Supreme Audit Office inspectors found improprieties in the reporting of National Urban Wastewater Treatment Program implementation as well as a failure to take into account progress on project execution in the submitted report forms⁴. This undoubtedly greatly hinders the establishing of the actual state of advancement of the Program.

What the inspectors determined indicates that although local governments made significant investments in the wastewater economy and many treatment plants were the sites of construction or modernization work, the rate of task performance varies. Approximately 10% of inspected leading municipalities failed to commence implementation of Program tasks, while over one-half of the municipalities were found by the Supreme Audit Office to have delays creating serious threats to keeping to the deadlines or in reducing pollutant levels in discharge wastewater.

In line with the Supreme Audit Office assessment, it was mainly the organizational mess that resulted in the municipalities utilizing too little—approximately 25%—of funding earmarked in the National Urban Wastewater Treatment Program for the construction and modernization of treatment plants and collection systems over the period subject to investigation. In the case of collection systems, the barrier was often what is known as the concentration

⁴ “National Urban Wastewater Treatment Program Implementation Inspection Results: Information” [in Polish], Department of Environment, Agriculture, and Spatial Management, Supreme Audit Office, Warsaw, 2010, pp. 6–8.

indicator—120 persons per 1 km of network. In practice, this eliminated small agglomerations as well as those with dispersed housing.

The Supreme Audit Office also rated the flow of information among individual municipalities leading in agglomerations⁵ poorly. Unfortunately, there are still no legal regulations obligating the municipalities to cooperate in these matters. It was also determined that since government administration has at its disposal incomplete data or even erroneous data, it is not capable of assessing the level of completion of the Program.

3. National Urban Wastewater Treatment Program: Voivodeship Marshal and National Water Management Authority Reports

The Water Code⁶ obligates village managers as well as town and city mayors to submit annual reports to voivodeship marshals on implementation of the National Urban Wastewater Treatment Program. Reporting for the year 2009 encompassing agglomerations listed in the Revised National Urban Wastewater Treatment Program 2009.

The voivodeship marshal prepares and presents the amassed material to the Minister responsible for the environment, including on the state of urban wastewater system and treatment plant facilities in the agglomerations as well as information on progress in projects defined in the National Urban Wastewater Treatment Program. This information, supplied by individual agglomerations, allows the Minister of the Environment to assess progress in implementation of Accession obligations with respect to wastewater management in individual voivodeship and in the country as a whole.

In its report⁷, the Supreme Audit Office points to a lack of appropriate organization and supervision over implementation of National Urban Wastewater Treatment Program tasks in the municipalities as well as the unreliability of annual reports on National Urban Wastewater Treatment

⁵ This name was used by the National Water Management Authority with respect to municipalities with a planned concentration of wastewater from the area of the designated agglomeration found on the list making up an integral part of the National Urban Wastewater Treatment Program.

⁶ Article 43, Clause 3c of the Act of July 18, 2001 – The Water Code (Journal of Laws of 2005, No. 239, item 2019, with subsequent amendments).

⁷ “National Urban Wastewater Treatment Program Implementation Inspection Results: Information,” *op. cit.*, p. 22.

Program implementation as developed by village managers, and town and city mayors. For the most part, municipalities making up the individual agglomerations failed to cooperate with each other and with leading municipalities in the area of implementation of tasks included in the Program, while municipalities leading in agglomerations did not have complete data on the state of implementation of the National Urban Wastewater Treatment Program at their disposal. In their turn, the village managers, and town and city mayors failed to supplement the missing data in information received from water and sewage companies and in putting together the required information by themselves and forwarding it to the provincial governors, they included data from entire municipalities, not the parts encompassed by the agglomerations.

The analysis conducted by the Supreme Audit Office identified errors, primarily relating to the true numbers of residents using the sewage network or served by gully emptiers, the total length of the sewage network as well as that built in the given year, the volume of wastewater being generated and treated, and investment outlay on implementation of the wastewater collection system and treatment plant facilities. The reports did not take into account information concerning progress in project implementation, subdivision into investment tasks relating to the wastewater collection system with respect to newly-built and modernized networks, and items making possible the direct defining of the level of reduction in biodegradable pollutant loads generated by the given agglomeration.

As assessed by the Supreme Audit Office, the verification of voivode reports for 2006 and 2007 as conducted by the National Water Management Authority was ineffective as they continued to be incomplete, encumbered by errors, and did not reflect the real state of implementation tasks as contained in the National Urban Wastewater Treatment Program. Furthermore, in the report on National Urban Wastewater Treatment Program performance over the years 2006–2007 as developed by the National Water Management Authority, no state of advancement of the National Urban Wastewater Treatment Program with respect to December 31, 2010 was presented, agglomerations in which timely completion of National Urban Wastewater Treatment Program tasks was threatened were not listed, and difficulties as well as reasons for possible failure to meet sewage network construction and modernization deadlines were not shown. This report also failed to contain much significant information on progress in achieving environmental effects with respect to those defined in the Treaty.

4. Delays in National Urban Wastewater Treatment Program Implementation

Construction and modernization of wastewater treatment plants and collection systems is facing delays on a national scale. Thus, there is a risk that Poland will fail to meet accepted obligations within deadlines. In spite of significant progress, the threat of exceeding deadlines for reducing pollutants in discharged wastewater is probable.

Pursuant to assumptions, agglomerations exceeding 15,000 p.e. should achieve an appropriate wastewater treatment level by the end of 2010. In the case of agglomerations from the 2,000–15,000 p.e. range, the wastewater treatment level must be achieved by the end of 2015.

As early as the 2008 and 2009 reports, some municipalities signaled problems with keeping to the deadlines for completing investment tasks defined in the National Urban Wastewater Treatment Program. This situation is especially a cause for concern in the case of agglomerations with over 15,000 p.e., which bear responsibility for the greatest polluting of the aquatic environment. Regulating the water and sewage economies within the limits of these agglomerations should guarantee performance of obligations as stemming from the Treaty of Accession. Delays signaled during work on updating the Revised National Urban Wastewater Treatment Program 2009 pertained to projects in 130 agglomerations. Moreover, by the end of June of 2010, delays in project implementation as found in the Revised National Urban Wastewater Treatment Program 2009 document, published in March of 2010, were announced by 157 agglomerations (Table No. 1).

The National Water Management Authority coordinating implementation of the National Urban Wastewater Treatment Program collected detailed data throughout July of 2010 from voivodeship marshals⁸ on agglomerations of over 15,000 p.e. that announced delays and failure to meet the required environmental effects by the end of 2010. Among a multitude of documents the voivodeship marshals were obliged to present detailed time schedules, inclusive of deadlines for completion of specific phases up to and including project completion, with detailed information on problems facing the investment process as well as actions taken to complete projects by the end of 2010.

⁸ Pursuant to Article 43, Clause 3b of the Water Code, the voivodes, and the voivodeship marshals as of November 15, 2008, are obliged to present annual reports on implementation of the National Urban Wastewater Treatment Program in the voivodeship to the Minister of the Environment.

The National Water Management Authority analyzed documents forwarded by the voivodeship marshals as well as information culled from Revised National Urban Wastewater Treatment Program 2009 and Attachment No. 1 implementation reports in terms of justification for moving proposed deadlines for project completion and achievement of the required environmental effects. It is on their basis that realistic deadlines for completion of the projects planned as a part of the Revised National Urban Wastewater Treatment Program 2009, encompassing 134 wastewater treatment plants in 1,212 agglomerations, were established. The list of agglomerations for which deadlines for project completion were extended are found in the Revised National Urban Wastewater Treatment Program 2010 (Table No. 1).

Table 1. Number of agglomerations over 15,000 p.e. and numbers of treatment plants in those agglomerations demonstrating delays in project implementation by the end of 2010

Voivodeship name	Number of agglomerations (state as of June 30, 2010)	Number of agglomerations as per the Revised National Urban Wastewater Treatment Program 2010	Number of treatment plants as per Revised National Urban Wastewater Treatment Program 2010
Dolnośląskie [Lower Silesia]	17	11	11
Kujawsko-pomorskie [Kuyavia-Pomerania]	7	5	5
Lubelskie [Lublin]	3	2	2
Lubuskie [Lubusz]	5	3	3
Łódzkie [Łódź]	7	7	7
Małopolskie [Lesser Poland]	23	20	28
Mazowieckie [Mazovia]	22	13	14
Opolskie [Opole]	1	1	1
Podkarpackie [Subcarpathia]	6	3	3
Podlaskie [Podlaskie]	6	4	4
Pomorskie [Pomerania]	5	2	2
Śląskie [Silesia]	12	12	13
Świętokrzyskie [Świętokrzyskie]	7	9	10
Warmińsko-mazurskie [Warmia-Masuria]	8	7	7
Wielkopolskie [Greater Poland]	17	13	15
Zachodniopomorskie [Western Pomerania]	11	9	9
TOTAL	157	121	134

Source: Own research based on National Water Management Authority data.

Modifications for project completion deadlines apply to nineteen agglomerations over 100,000 p.e. with a total pollutant load amounting to approximately 6.9 million p.e., 101 agglomerations in the 15,000–100,000 p.e. range (3.2 million p.e.), and one agglomeration in the 2,000–15,000 p.e. range (9,500 p.e.). Pursuant to the Revised National Urban Wastewater Treatment Program 2009, the above agglomerations should achieve their wastewater treatment level by the end of 2010. Due to occurring delays in project implementation, these agglomerations shifted the deadlines for their completion. In the case of fifteen treatment plants, project completion shall occur in 2011, 2012 in the case of sixteen, 2013 in the case of twenty–two treatment plants, and 2014 in the case of seven treatment plants. Agglomerations with new deadlines for project completion with respect to those assigned in the Revised National Urban Wastewater Treatment Program 2009 shall be subject to detailed project implementation monitoring.

Moving project deadlines into the year 2013 was possible assuming that there was a valid building permit for the wastewater treatment plant, the agglomeration was provided with a sewage network on an appropriate level allowing its successive expansion over the years 2010–2015 as documented by information forwarded to the voivodeship marshal, a financial structure making possible the implementation of the project as confirmed by financial resource decision–makers, completion of tender processes covering the major part of the project, and signed agreements for construction of the wastewater treatment plants.

Prerequisite for shifting project completion into the year 2015 was the undertaking of actions aimed at completing the construction and modernization projects as stated in information forwarded to the voivodeship marshals, but a failure to meet all of the above criteria.

5. Reasons Behind Project Completion Delays

Information relating to the causes behind delays in the execution of projects planned for the end of 2010 as well as actions taken in order to complete those projects were included in information forwarded for the Revised National Urban Wastewater Treatment Program 2010 as well as in voivodeship marshal National Urban Wastewater Treatment Program progress reports for the

year 2009⁹. It seems that there are many reasons for delays in performing obligations with respect to the European Union.

Among the many different causes for failure to complete projects by the end of 2010 as described by the investors, the main ones are unending administrative procedures for preparing the project, and long-term tender procedures called for by regulations governing public procurement or a lack of a consistent approach to the tender procedures on the part of contractors resulting in delays in commencement of the construction process. Significant difficulties on the part of the municipalities in preparing documentation and applications for financing for the projects out of national and foreign funds, which sometimes prolonged the time needed for preparing the applications, was often indicated as a cause.

Many agglomerations indicated that a reason for delays was difficulties in attracting funding for implementation of the given task or their complete absence as well as long waiting periods for decisions by the European Commission regarding funding out of Cohesion Fund resources. Unending procedures for preparing and signing memos concerning project financing using European Union funds was also frequently cited as a reason for delays.

Apart from destruction, the flooding that touched many Polish municipalities in May and June of 2010 caused the flooding of some wastewater treatment plants and systems, including those currently under construction or subject to modernization. Among them were ventures for which increased fees for environmental use were deferred to the end of 2010. Many investors were forced to verify their financial plans, including for reasons of an increase in construction costs.

Other significant causes for delays included the sheer size of the project, failure on the part of design offices to develop technical documentation for the expansion and modernization of wastewater treatment plants, and delays in the development of technical documentation caused by changes in assumed solutions in the decision issuing stage due to protests by inhabitants with respect to the location of sanitary systems, jointly-designed with wastewater treatment plants.

In many cases delays were also caused by a failure to settle land ownership questions or difficulties in acquiring property rights for land earmarked for the project. Information provided by some voivodeship marshals

⁹ The reports of the marshals of individual voivodeships on National Urban Wastewater Treatment Program progress for the year 2009 may be found on the web pages of the National Water Management Authority—www.kzgw.pl

indicated that delays were the result of the current economic crisis. According to assessments by the National Water Management Authority, responsibility for delays does not usually rest with the municipalities.

However, as early as April of 2010, the Supreme Audit Office called attention to the lack of reliability of National Urban Wastewater Treatment Program progress reports as submitted to the voivodes by municipality bodies each year as well as the poor involvement of public administration (including the Ministry of the Environment and the National Water Management Authority) in executing tasks as stemming from the National Urban Wastewater Treatment Program¹⁰. According to the Supreme Audit Office evaluation, the conservative approach of officials, universal legal disparity among legislative acts, directives of individual ministries, and guidelines of the National Fund for Environmental Protection and Water Management have resulted in serious devastation in the process of implementing the National Urban Wastewater Treatment Program.

The Supreme Audit Office report also pointed to the fact that delays in work on the Second Revision resulted in uncertainty in many municipalities making up agglomerations as to their participation in the Program. This, in turn, made impossible their applying for financial resources out of assistance programs for implementation of tasks planned by the National Urban Wastewater Treatment Program.

6. How Can Implementation of the National Urban Wastewater Treatment Program Tasks Be Accelerated and Facilitated?

Despite occurring delays, many agglomerations took action to keep to the deadlines for completing the wastewater treatment plant projects planned for the end of 2010. Some agglomerations re-estimated financial outlay for the entire project, other submitted applications to the National Fund for Environmental Protection and Water Management, still others developed feasibility studies. Some agglomerations issued orders for modernization of wastewater treatment plants, completing technical documentation and construction work simultaneously over the years 2009–2011.

However, the third revision of the National Urban Wastewater Treatment Program, urgently developed in the second half of 2010, was vital in order to provide realistic project deadlines. Many arguments made this necessary. First

¹⁰ “National Urban Wastewater Treatment Program Implementation Inspection Results: Information,” *op. cit.*, pp. 8–11.

and foremost, there was the large number of agglomerations announcing delays. Many projects were not launched until 2009, after forwarding data for the Revised National Urban Wastewater Treatment Program 2009. Moreover, many municipalities in Poland were touched by flooding in May and June of 2010. Among them are projects for which payment of increased fees for specific use of water were deferred up to the end of 2010.

The moving of deadlines for the completion of projects by the Revised National Urban Wastewater Treatment Program 2010 may serve as a basis for further deferral of increased fees for the use of the environment and thus prevent increased rates for water and sewage services. This will mollify the burden placed on the population in the event of significant hikes in fees for sewage services caused by increased fees. The shifting of deadlines will also mollify the financial problems of companies executing the delayed ventures in the area of wastewater treatment.

Currently, there is no doubt that it is necessary to significantly curtail the material and financial development as well as modernization of wastewater systems, particularly restrictions on investment programs in the field of wastewater collection system in areas of low building intensity in agglomerations with more than 10,000 p.e. The efficiency of services in the connected areas should be confirmed by a feasibility study.

It shall also be necessary to limit the area and boundaries of agglomerations so that the wastewater collection system guarantees almost 95% of the population equivalent of the agglomeration. If the feasibility study does not provide justification, then the agglomerations shall be moved to the “small agglomeration ” program and excluded from the National Urban Wastewater Treatment Program. It is necessary to cease financing the development of wastewater networks in areas earmarked for development out of assistance funds.

There is also an urgent need to develop a program for household sewage treatment plants for areas with extensive building development (see more *Poradnik...2010*, pp. 59-79) as European Union funds are insufficient and national resources will be depleted if each and every authority will be bent on creating a successive agglomeration.

It is also urgently necessary for develop a database—the National Urban Wastewater Treatment Program Information System—guaranteeing the possibility of monitoring the progress of National Urban Wastewater Treatment Program projects as well as facilitating work involving its coordination and reporting.

This being the case, it seems that the appeal of the Supreme Audit Office¹¹ to the Minister of the Environment requesting the guaranteeing of financial assistance to municipalities implementing the Program is justified. This is especially true of those municipalities that, for various reasons, cannot attract European Union resources. Village managers as well as town and city mayors have been asked by the Supreme Audit Office to increase supervision over performance of the National Urban Wastewater Treatment Program, cooperate with other municipalities in their agglomerations, and finally, to develop reliable reports submitted on time to the voivodeship marshals. The meeting of these recommendations will make possible the more effective execution of the Program in the future.

The success of Program implementation is, to a great extent, dependent on initiative displayed by municipality local government as well as skill in attracting financial resources. Expenditures for this purpose stemming from environmental protection and water management funds have been assigned priority. Credit and preferential loans have been set up in order to guarantee project financing. The Cohesion Fund also provides opportunities for large agglomerations or groups of agglomerations to receive funding for projects involving water and sewage management. These instruments encourage local government entities to accelerate implementation of ventures found in the National Urban Wastewater Treatment Program, which translates into Poland achieving the environmental effect. However, local government must itself invest significant billions in the water and sewage economy.

Even municipalities assigned priority in the Revised National Urban Wastewater Treatment Program 2009 will not receive subsidies immediately. They must first present documentation confirming the economic efficiency of the project, where one of the most important requirements to meet is the hook-up of at least 120 inhabitants to each kilometer of sewage network.

8. The Consequences of Delays with Respect to Required Deadlines

Matters relating to the consequences of failure to maintain deadlines for the performance of the National Urban Wastewater Treatment Program are of utmost importance. In the nearest future the Polish government will be obligated to present explanations before the European Union as to programs for executing

¹¹ "National Urban Wastewater Treatment Program Implementation Inspection Results: Information," *op. cit.*, p. 12.

delayed projects that are sufficiently exhaustive and complete with justification so as to evade the accrual of penalties for nonperformance of obligations taken on in the Treaty of Accession.

Noncompletion of projects within their planned deadlines as entered into the Program is also tied with the collection by voivodeship marshals of increased fees for special utilization of water¹². Such regulations were introduced into the Environmental Protection Code in order to effectively force the timely completion of projects and Treaty-related obligations. The Environmental Protection Code assumes the possibility of waiving the obligation of payment of increased fees only in cases of the execution of projects encompassed by the National Urban Wastewater Treatment Program on time. This obligation is deferred for a period as necessary for the undertaking of projects aimed at eliminating the cause of accrual of this burden. This mechanism is intended to mobilize municipalities and water and sewage companies to keep to the deadlines for project completion. However, regardless of these, there were reasons behind the delays with respect to deadlines planned in the National Urban Wastewater Treatment Program 2003.

This being the case, collection from the companies or municipalities of fees for special utilization of water would result in an additional, very significant and demanding financial burden on the population using water and sewage services due to an increase in the cost of such services up to several times over. Thus, for social reasons, wastewater companies should not be encumbered by excessively high fees as this may lead to the bankruptcy of water and sewage companies and result in an increase in service prices exceeding 3% of household incomes, which is in excess of levels that can be accepted by the public.

For this reasons, in spite of possible restrictive actions on the part of the European Commission caused by the delays in completion of treaty obligations, water and sewage companies should not pay for delays for which often they bear no responsibility.

The third revision is intended to enter realistic deadlines for projects in the agglomerations into the Program so as to eliminate the causes for incurring increased fees of administrative penalties. The realistic deadlines entered into the Revised National Urban Wastewater Treatment Program 2010 for completion of the projects provide significant guarantees for the further execution of the investment process in the discharge and treatment of sewage. However, in the event of a failure by the municipality to keep to deadlines as

¹² Environmental Protection Code, Articles 316–321 (Journal of Laws of 2008, No. 25, item 150, with subsequent amendments).

stated in the Revision for equipping the agglomeration with a wastewater treatment plant—vital to achieve the appropriate environmental effect—the entity discharging wastewater into the aquatic environment (in this case the waster and sewage company and the municipality) will incur fees for the introduction of wastewater into waters or the earth increased by 500%¹³.

9. Environmental Effect Achieved in 2009

Completion of planned projects is equivalent to the achieving of the environmental effect in the area of wastewater treatment or sludge management. The Revised National Urban Wastewater Treatment Program 2010 assumes the following as the achievement of wastewater treatment environmental effect within the deadlines for project completion¹⁴:

1. Achievement of requirements of the Directive of the Minister of the Environment of July 24, 2006 on conditions to be met in discharging wastewater into waters or the earth as well as on substances that are particularly hazardous to the aquatic environment (Rozporządzenie...2006).
2. Achievement of a wastewater treatment plant output in line with the biodegradable loads generated by agglomerations.
3. Achievement by the year 2015 of agglomeration urban wastewater collection systems supplying treatment plants and guaranteeing a level of agglomeration servicing by those systems at a level of 95% in the case of agglomerations $\geq 100,000$ p.e. and 90% in the case of agglomerations $\geq 15,000$ p.e. and $< 100,000$ p.e.

Pursuant to the “wastewater directive,” the defining of the level of reduction of biodegradable pollutants in the total (cumulative) load collected by all urban wastewater treatment plants should, in essence, be based on the application of a measurement methodology and reliable methods for calculating input loads as well as measurement of the output load for all urban wastewater treatment plants discharging the treated effluent into receptors (see more *Terms...2007*).

¹³ Third Revision of the National Urban Wastewater Treatment Program 2010, Ministry of the Environment, Warsaw, 2010, p. 20.

¹⁴ Third ..., op. cit., p. 8.

The percentage of reduction in total biodegradable pollutant load as generated by agglomerations in 2008 was assessed by the National Water Management Authority on the basis of data from reports forwarded by voivodeship marshals. It was estimated at 75%¹⁵.

This publication provides calculations of the environmental effect as achieved for 2009 with respect to the efficiency of biodegradable pollutant removal on the basis of data from reports on National Urban Wastewater Treatment Program execution progress by individual voivodeship in 2009¹⁶. The following input data from the reports was used in the calculations:

1. Quantity of total urban wastewater over the year.
2. The BOD5 value for wastewater supplied to the treatment plant and for treated wastewater discharged from the treatment plants.
3. The total biodegradable pollutant load in the agglomerations equal to the agglomeration p.e. pursuant to the directive establishing the agglomerations.

The following was also assumed in the study methodology:

1. The BOD5 indicators (subsequently serving the defining of the level of reduction) were defined by the treatment plants on the basis of data collected at a sufficient frequency and length of time over the course of the year sufficient to receive relatively representative and comparable data, where the frequency of sample collection meets the requirements of Council Directive 91/271/EEC.
2. Information contained in the reports of the voivodeship marshals concerning National Urban Wastewater Treatment Program progress for 2009 contain reliable data subject to detailed checking and verification, where all errors and improprieties were eliminated taking into account all comments and recommendations as found in the Supreme Audit Office report concerning implementation of the National Urban Wastewater Treatment Program and relating to the reports of the voivodeship marshals and National Water Management Authority.

First and foremost, the study methodology encompassed calculations for individual voivodeships of the following parameters: Average wastewater throughput, [m³/d].

¹⁵ Information on Progress in the National Urban Wastewater Treatment Program in 2008, National Water Management Authority, Warsaw, 2009, p. 35.

¹⁶ Reports of the voivodeship marshals of the individual voivodeships on National Urban Wastewater Treatment Program progress for the year 2009 may be found on the web page of the National Water Management Authority: www.kzgw.gov.pl

1. Average annual BOD₅ indicator for wastewater delivered to the treatment plant and treated wastewater discharged from the treatment plant, [gO₂/m³].
2. Real load generated by the agglomerations (L_{incoming load}) and the biodegradable pollutant load in the treated wastewater (L_{outgoing load}), [p.e.]¹⁷.
3. Level of biodegradable pollutant removal in treated wastewater on the basis of the following formula, [%]¹⁸.

$$\eta = [1 - (L_{\text{incoming load}} / L_{\text{outgoing load}}) * 100\%]$$

where:

η – level of treatment, percent reduction,

L_{incoming load} – load delivered to the treatment plant, and

L_{outgoing load} – load discharged from the treatment plant.

Results received for individual voivodeships provided a basis for the calculation of the average annual BOD₅ value in wastewater delivered to the treatment plants as well as in wastewater discharged from the treatment plants throughout the country. In 2009 these values amounted to 505 gO₂/m³ and 17.7 gO₂/m³, respectively. At the same time, the average throughput of wastewater in Poland in 2009 amounted to 4,971,074 m³/d.

The average annual BOD₅ value and the average daily flow by individual voivodeships makes possible the conducting of calculations of the load levels generated as well as of the biodegradable pollutant load in wastewater delivered to treatment plants. The levels of these loads provided a basis for calculating the level of biodegradable pollutant load reduction in treated wastewater in each voivodeship as well as with respect to the country as a whole (Table No. 2).

¹⁷ The pollutant load was calculated by multiplying the average BOD₅ value by its daily flow in the treatment plant and subsequently divided by 60 gO₂/d (see more *Dymaczewski...1997*, pp. 26-28).

¹⁸ The level of wastewater treatment for a selected pollutant is the ratio of the quantity of the pollutant stopped in the treatment plant to the pollutant quantity found in raw wastewater and characterizes the efficiency (output) of the wastewater treatment plant.

Table 2. Efficiency of biodegradable pollutant removal by individual voivodeship and on a national scale in 2009

Voivodeship name	Agglomeration p.e. pursuant to the Directive establishing the agglomerations	Load generated by the agglomerations in wastewater delivered to the treatment plants [p.e.]	Biodegradable pollutant load in wastewater delivered to the treatment plant [p.e.]	Biodegradable pollutant load in wastewater reduction [%]
Dolnośląskie [Lower Silesia]	3572562	2559358	104109	95.9
Kujawsko– pomorskie [Kuyavia– Pomerania]	2312416	1761494	73922	95.8
Lubelskie [Lublin]	1994080	1398214	55616	96.0
Lubuskie [Lubusz]	1183946	1001050	23461	97.7
Łódzkie [Łódź]	2676927	3015340	74801	97.5
Małopolskie [Lesser Poland]	4930960	6090475	349394	94.3
Mazowieckie [Mazovia]	6024844	5422959	295838	94.5
Opolskie [Opole]	1108488	725380	22887	96.8
Podkarpackie [Subcarpathia]	2463723	2654234	111118	95.8
Podlaskie [Podlaskie]	1305491	1668524	40835	97.6
Pomorskie [Pomerania]	2595488	2170933	52086	97.6
Śląskie [Silesia]	5518626	4669472	139607	97.0
Świętokrzyskie [Świętokrzyskie]	1251274	855092	30282	96.5

Warmińsko-mazurskie [Warmia–Masuria]	1549301	1278519	49634	96.1
Wielkopolskie [Greater Poland]	4559828	4591719	95158	97.9
Zachodniopomorskie [Western Pomerania]	2814821	1234850	45954	96.3
TOTAL	45862774	41834541	1469093	96.5

Source: Own research based on National Water Management Authority data.

Study results indicate that the average level of reduction achieved by agglomerations in specific voivodeships is relatively high and meets the requirements of the Directive of the Minister of the Environment (*Rozporządzenie...2006*)¹⁹. The greatest efficiency of biodegradable pollutant removal was achieved in 2009 in the agglomerations of the Voivodeship of Greater Poland (97.9%). On the other hand, in the case of agglomerations of the Voivodeship of Mazovia, the average level of reduction is at a level of 94.5% and is one of the lowest in the country. This is determined by the situation in the Warsaw agglomeration, where due to the large volume of generated wastewater, it has an enormous impact on the environmental effect of restricting pollutant loads discharged into waters, including on a national scale. Until such a time as the Czajka Sewage Treatment Plant of Warsaw achieves its design throughput, almost 40% of the capital's sewage effluent shall be discharged directly into the Vistula River.

It has been calculated that the load generated by agglomeration wastewater directed to treatment plants accounts for 91.2% of the total agglomeration p.e.

As a result, on the basis of the above data, reduction percentage of the total biodegradable pollutant load was calculation, specifically:

$$0.912 \times 0.965 = 0.88$$

So calculated, the reduction percentage of the total biodegradable pollutant load from all agglomerations in Poland in 2009 is equal to 88%.

¹⁹ This Directive defines the highest allowable values for pollutant indicators or the minimal degree of elimination of pollutants for treated urban wastewater discharged into waters or into the earth.

10. Conclusion

The following may be stated on the basis of all collected source information as well as conducted studies:

1. Execution of projects contained in the National Urban Wastewater Treatment Program has been commenced and the municipalities and water and sewage companies have already undertaken financial and organizational efforts aimed at completing the required projects. They should be helped in this as opposed to disrupting investment processes by additional financial burdens.
2. Since 121 agglomerations have announced delays in project implementation up to the end of 2010 for reasons usually beyond their control, in addition to approval of the third revision of the Program, actions of organizational and legal nature should be undertaken to make sure all possible ways are used to support all municipalities in performing tasks as found in the National Urban Wastewater Treatment Program.
3. Failure to meet European Union deadlines in implementing the National Urban Wastewater Treatment Program brings with it the threat of high penalties as well as an increase in fees for the discharge of wastewater, the necessity of returning European Union aid by a part of the local governments, and drastic increases in fees for wastewater discharge for inhabitants. Thus, what is needed is the more efficient coordination of municipality and water and sewage company actions in completing sanitary infrastructure within their limits.
4. The directing of money exclusively to projects found on the priority list increases the chances of achieving the greatest environmental effect as well as the meeting by Poland of its accession obligation by the year 2015.
5. Pursuant to the Treaty of Accession of the Republic of Poland to the European Union, the implementation of Urban Waste Water Treatment Directive (91/271/EEC) is to be completed on December 31, 2015. Any shifting of dates relating to deadlines for the implementation of projects encompassed by the Revised National Urban Wastewater Treatment Program 2009 should not cause the exceeding of this final deadline on a national scale.
6. An inspection by the Supreme Audit Office indicated many improprieties in reporting on the execution of tasks as contained in the National Urban Wastewater Treatment Program. However, assuming that existing errors and absences have been corrected and supplemented following the publication of the Supreme Audit Office report, it may be assumed that

final data contained in the reports for 2009 and made available by the National Water Management Authority are reliable and can serve as a basis for the performance of studies and analyses.

7. The total reduction in biodegradable pollutants in wastewater from all agglomerations in Poland calculated on the basis of information contained in the reports of the voivodeship marshals on implementation of the National Urban Wastewater Treatment Program in 2009 amounts to 88%. On a national scale, this is a satisfactory result that creates a realistic basis to assume that by the end of 2010 (in spite of delays in the implementation of many projects) the biodegradable pollutant load shall be eliminated in agglomerations up to a level of 86% of the load defined for the whole of Poland (pursuant to the requirements of the Treaty of Accession).

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Streszczenie

OCENA REALIZACJI ZADAŃ OKREŚLONYCH W KRAJOWYM PROGRAMIE OCZYSZCZANIA ŚCIEKÓW KOMUNALNYCH

W artykule przedstawiono ocenę zaawansowania zadań ujętych w Krajowym programie oczyszczania ścieków komunalnych, niezbędnych dla spełnienia celów pośrednich określonych w Traktacie Akcesyjnym Polski do Unii Europejskiej w części dotyczącej Dyrektywy Rady 91/271/EWG w sprawie oczyszczania ścieków komunalnych. Omówiono przyczyny opóźnień w realizacji zaplanowanych inwestycji w stosunku do przyjętych w Krajowym programie terminów oraz konsekwencje tych opóźnień. Dokonano również obliczenia efektu ekologicznego w zakresie zanieczyszczeń biodegradowalnych osiągniętego w 2009 r. w odniesieniu do poszczególnych województw oraz całego kraju.