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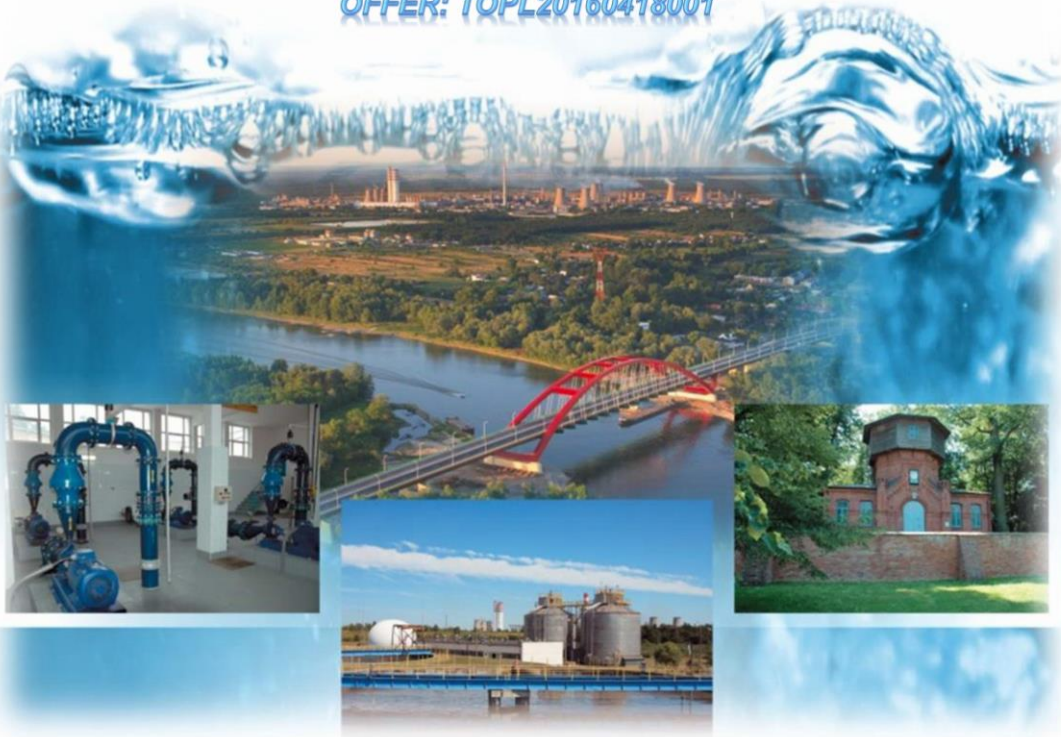
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产品创新 - 转让的标准商业

方法论实行一体化管理系统技术基础设施公司的

PRODUCT INNOVATION - TRANSFERABLE UTILITY MODEL  
METHODOLOGY OF IMPLEMENTATION OF INTEGRATED SYSTEM TECHNICAL  
INFRASTRUCTURE MANAGEMENT COMPANY

该项目由欧洲联盟从欧洲区域发展基金在业务计划创新经济下共同出资

# 你想有效地管理网络 和金融公司

## - 投资 在现代信息系统

你知道吗，现代化的信息系统提供：



- 需要的信息可靠的现代化水平 供水和污水网络的管理;
- 规划水和污水处理系统的膨胀时优良的诊断可能性;
- 减少供水管网故障的风险和污水处理;
- 缓解供水网;
- 在污水处理系统限制渗透系数;
- 对网络的性能完全和提示信息;

作为唯一的市场，我们有信息和技术方案 - 集成的基础设施管理技术企业供水和污水处理系统

产品组成可购买复杂作为一个整体模块10，或根据需要分别每个。每个模块包括在知识和技术信息和基于软件的许可证的形式制定了一个标准的实施方法论



图1.系统GIS



该系统用于支持全面的管理措施，管理人员，员工，剥削他们在公司的供水和卫生设施的日常工作，在感兴趣的领域：

- **管理公司的监督和管理**（整个公司的控制，集成电子公文流转系统，报表和计划，技术经济分析）；
- **部门经济，行政，财务和会计公司**（计费，即系统：收集，水，计费远程抄表，收债，银行，韩国银行，电子书，电子发票，工资，财务和人力资源，物资管理和仓储，固定资产，帐单和成本分配）；
- **技术部门和技术公司**（电子注册网络和供水和污水处理设施 - 运行，故障，水的损失评估，液压和分质供水和污水处理系统的车型 - 地理信息系统的空间系统，供水和卫生，废物改造的数据库类型SCADA控制和监视在水区 - 污水处理，电力监控供水和污水处理设施，实验室）。

科技的产品是值得推荐给其他供水和卫生公司部署和制定标准和管理工具方面使用水和污水管理方面的工作

以全面的方式，包括方法的实用模式展示了如何整合技术领域 - 技术和行政 - 经济基础，利用地理空间信息系统，金融系统的类型，系统远程水表抄表和SCADA系统在供水和污水处理公司

综合基础设施管理技术企业供水和污水处理系统能够在想用自己的全部功能，公司全面执行模块。实施方案的好处是在40% - 在供水和卫生设施分别应为40%提交给财政节约90%的工作在企业范围涉及网络资产的管理工作的效率增加90%

## 我们鼓励您使用 我们的报价

向工业伙伴，研究机构，供水公司，国际协会提供。

我们在技术转让和实施过程中提供我们的知识和帮助。

合作伙伴关系 - 技术协助商业协议，许可协议

## **模块一：“实现地理空间信息系统的综合管理系统技术基础设施公司的水和污水的中型开发的数据库类型的方法”**

该方法的实质是地理空间信息系统的数据库类型提供了一个平台，整合各个组件（子系统）综合管理系统基础设施技术，集成管理系统基础设施技术的所有元素的作品，是开放既增加它们的功能（模块）和面积与新组件（子系统）集成管理系统的技术基础设施和分期实施的方法工作。

在上述领域中的信息和技术。基于软件许可证模块：ORACLE数据库，ERP系统和GIS，ESRI许可工具 - ARC GIS软件许可的金融系统和安装在服务器上的地理信息系统的空间。

## **模块二：“供水网络故障的测试和评估方法和排污”**

该方法的实质是一个综合研究计划，其中包括以下主要里程碑：

- I. 结构分析：功能材料，年龄，网络库存水/污水
- II. 研究的分类发展
- III. 开发一个系统，用于收集有关突发事件数据
- IV. 分析和研究设施的故障评价扩展到评估的可靠性

评估和在水向消费者供应故障和中断的风险方面的研究对象的分类和相关的水损失。

在上述领域中的程序。基于软件许可证模块：ORACLE数据库，为企业财务系统和地理信息系统的空间ESRI许可工具 - ARC GIS，企业财务系统和安装在服务器上的地理信息系统的空间。



### 模块三：“方法来创建和供水网络的原型模型的开发校准供水管网的模式”

该方法是基于活动的后期阶段：

- 结构和液压配水系统的分析
- 供水系统制定生产和用水量的平衡
- 制备供水系统的结构与所述数据的所述数值模型的说明
- 开发的算法为网络中的计算用水量节点
- 建立的规则和执行校准样品制备的供水网络的原型模型
- 在供水系统中的杂质分解的发展情景模拟分析和仿真实例，特别是关于消毒剂的使用分解

在上述领域中的程序。基于软件许可证模块：ORACLE数据库，为企业财务系统和地理信息系统的空间，ESRI许可工具 - 为安装在服务器上的企业财务系统和地理信息系统空间ARC GIS软件许可证。

### 模块四：“创造中心调度运动的方法”

该方法的本质是控制室的主要功能的制剂。定义中心调度业务的基本功能，主要包括：监管和公司，在公司实施过程中的当前数据分布的当前活动的协调，对管理报告，信号在供水和污水系统显著风险，控制紧急最重要的作品的状态执行，支持内部危机和理性的决策，协调合作公司在特殊情况下，市级技术协调服务。

在模块的区域综合基础设施管理技术企业供水和污水处理的基础上安装了SCADA服务器的软件许可证合作上的软件SCADA：Oracle数据库为金融系统业务和地理信息系统，许可证工具ESRI - 所造成的金融公司ARC GIS许可证的软件系统并安装在服务器上的地理信息系统

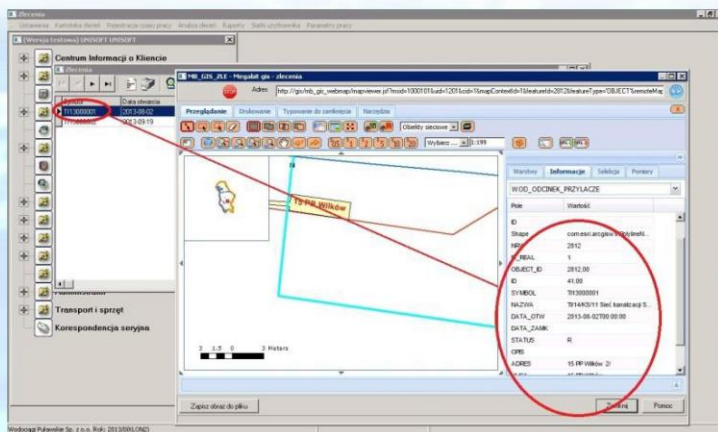


图2. ERP与GIS的整合

## 模块五：“供水设施监测系统的方法论和污水处理系统（监视装置中的功“

为建设监控系统的发展原则的出发点是分析监测建筑物的节能性能领域的现有局面。分析是在该公司制造的，其结果是在测量所有的供水和排水设施仪器，参数和能量测量的频率领域的初步发现的间隙。此外，它分析监测的这些对象的工艺参数的进展情况。

监测供水和污水处理设施（电力设备的监控）的模块系统上的程序是基于安装功率分析仪，它被引入到数据采集软件和数据可视化。

## 模块6：“减少供水网络中水损失的方法”

要特别注意的网络，这显著影响了水的损失的大小的技术条件。技术状况的初步评估失败的基础上作出的。故障率低表示网络的良好技术状态，因为它的维护和操作中进行了有计划，精心组织，以及故障和相关的泄漏被迅速检测到并删除。和高失败率表明导线的技术状况差，其效果是增加水的损失。

降低综合基础设施管理技术企业供水和污水处理系统的下水管损失的方法是基于许可的软件：Oracle数据库为金融系统业务和地理信息系统，许可证工具ESRI - ARC GIS 许可证的软件系统，企业财务和地理系统空间信息被安装在服务器上。

## 模块7：“供水网络的监控系统的方法”

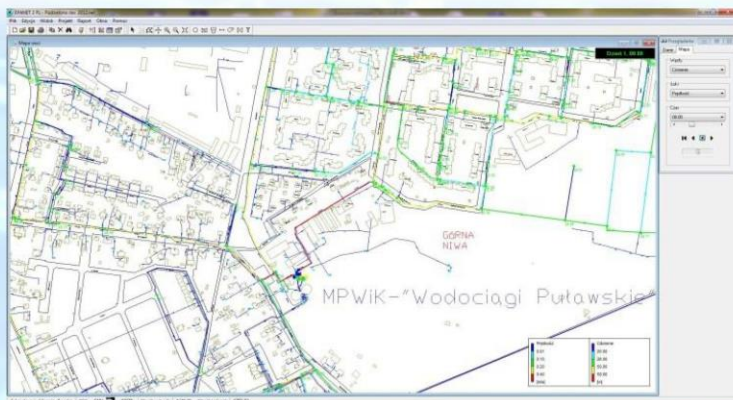
为创建供水监控系统的方案包括多项任务，在执行中需要给出，即保全令：

1. 确定的网络监控的目标和范围
2. 确定约束的实施
3. 监控的位置点网络设置
4. 选择的方法和测量装置
5. 测定的测定数据的登记的原则
6. 准则测量站的设计和建造的制剂
7. 的监视系统的维护和操作的原理的制剂。

方法分和描述如何选择和安装设备用于监测供水系统来测量压力，流速，流动方向，和质量参数：浊度，游离氯的浓度为可扩展到其他。从测量设备的数据被发送到信息和技术。确定所述参数压力，流量，和水的质量的测量点的位置的方法是基于接收到的专利（222928，222929，222930）。



图3.使用模型经理在许多GIS的合作模式下，EpaNET供水网络模型



### 模块8：“用于创建和模型校准下水道网络，与网络的原型模式一起方法论”

所述数值模型的污水网络的应用的范围很宽。提出的方法是在作战任务的实践中，可以通过计算机模拟来解决最有用的。

与原型模型沿模型污水管网的开发和标定的信息和技术是基于安装的软件上，该数据来自监控设备的污水处理系统。

### 模块9：“下水道网络监控系统的方法（监测液压的）”

一个污水管网监测系统的建立包括多项任务，在执行中需要给出，即保全令：

1. 确定的网络监控的目标和范围
2. 确定在何种条件下工作的污水处理系统，以及条件是限制性实施过程
3. 监控的位置点网络设置
4. 选择的方法和测量装置
5. 测定的测定数据的登记的原则
6. 准则测量站的设计和建造的制剂
7. 的监视系统的维护和操作的原理的制剂。

供水和排水的上述模块中的综合管理系统的技术基础设施是基于来自在下水道的测量设备和流量数据。





图4. SWMM中的模型污水系统使用模型管理器与许多GIS工作模型

## 第10单元：“综合管理系统技术基础设施公司的水和污水中型的发展创造远传水表读数的系统的方法”

创建ZOW选择特定解决方案的系统的建议的方法是基于对最终结果的标准为供水和污水处理公司，包括功能特点，经济（投资成本，运营成本）和技术（部署之后）（参考公司所经营的水的技术状态根类型的水表）。

创建一个具体的解决方案的远程抄表水表选择的系统的建议的方法是基于对最终结果（部署之后）的标准对公司的供水和卫生设施，其中包括功能特性，经济（投资成本，运营成本）和技术（在参考了技术条件的公司所经营的水和污水类型的水表）。

实事求是地范围 - 金融提供的技术在欧洲企业网络和数据库可用

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	模	价格的产品/服务网	价格的产品/服务税	期限
1	实现类型的空间信息系统的地理数据库的方法。中等规模的综合管理系统基础设施技术供水和卫生企业的发展	EUR/RMB	EUR/RMB	30-80天
2	供水和污水处理的故障的研究和评估方法	EUR/RMB	EUR/RMB	30-80天
3	降低供水管网的水损失的方法	EUR/RMB	EUR/RMB	30-80天
4	与供水管网的原型模式的发展而创造模型的修正及供水管网的方法	EUR/RMB	EUR/RMB	30-80天
5	创造中心调度运动的方法	EUR/RMB	EUR/RMB	30-80天
6	监控系统的方法论和污水处理设施（电力设备的监控）	EUR/RMB	EUR/RMB	30-80天
7	供水管网的监控系统的方法	EUR/RMB	EUR/RMB	30-80天
8	校准模型和污水管网的方法，与网络的原型模式一起	EUR/RMB	EUR/RMB	30-80天
9	方法下水道网络监测系统（监测液压的）	EUR/RMB	EUR/RMB	30-80天
10	对于中等规模的综合管理系统基础设施技术供水和卫生企业的发展创造远传水表读数的系统方法论	EUR/RMB	EUR/RMB	30-80天



我们的产品是业务方案创新经济的框架内进行的，这些年来2007工程“的综合管理系统基础设施技术企业的目标，编制和实施”的结果 - 2013年，衡量1.4。优先轴1研究专项和现代技术的发展促进并衡量4.1。实施研发优先级4个投资于创新项目成果的支持，欧盟从欧洲区域发展基金共同出资。

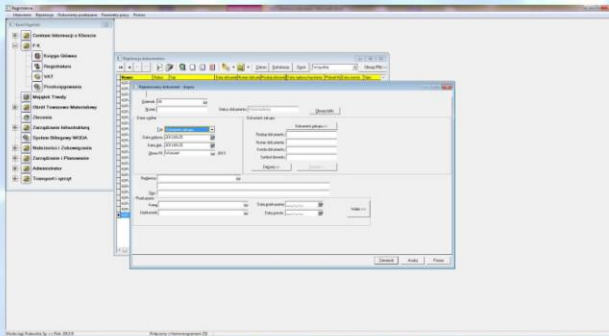


图5.系统ERP

技术卢布林大学华沙大学：该方法是在与研究的科研人员我们公司的研发人员共同开发。



WODOCIĄGI PUŁAWSKIE  
Spółka z o.o.



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信息技术 - 集成基础架构管理技术企业水和Kanalizacyjnego在合作中实现与商业公司我们公司的研发人员

监督分配和执行的方法进行细胞研究与发展

欢迎联系

# **Invention in the filed of water supply monitoring**

## **发明在供水监测领域**

**The manner of determining the location of pressure-measurement points in respect of water distributed in water-supply networks - Patent No 222930**

**确定供水网络中水分压力测量点位置的方式 - 专利号222930**

**The manner of determining the location of flow-rate measurement points in respect of water distributed in water-supply networks - Patent No 222929**

**确定供水网络中水分流量测量点位置的方式 - 专利号222929**

**The manner of determining the location of quality-measurement points in respect of water distributed in water-supply networks - Patent No 222928**

**确定供水网络分配水质测量点位置的方式 - 专利号222928**

The method of determining the location of water quality measurement points sent in water supply networks and water pressure in water supply networks is that the first point of measurement of water quality is located in the place / places of the water supply network, and the subsequent points of water quality measurement are located in a way Recurring, in the first approximation, examining the subdivisions of the settlement units served by the water supply network, and in the second approximation, the water supply nodes of this settlement unit, based on the ranking of the indicator.

**确定供水网络发送的水质测量点位置和供水网络水压的方法是将水质量度的第一点位于供水网络的地点/地点，以及后续点 水质测量的定位方式是循序渐进的，首先近似，检查供水网络服务的定居单位的细分，在第二次近似的情况下，该结算单位的供水节点根据 指标。**



# Invention in the filed of water supply monitoring

## 发明在供水监测领域

The method of determining the location of the measurement points the flow rate of water networks is that that the first measurement point, the water flow is localized at the point / feed points water supply system water and another measurement point water flow, localized in the recursive way, based on a change in resolution observation network, enabling visualization of wires with smaller and smaller diameters, wherein by visualizing these conduits are isolated smaller area of supply customers in water, and flow rate measurement points localized at the site / feed points of the zones in water.

确定测量位置的方法指出了水网的流量，即第一测量点，水流位于点/进料点供水系统水和另一测量点水流，局部在递归方式，基于分辨率观察网络的变化，实现具有更小和更小直径的电缆的可视化，其中通过可视化这些导管是水中供应客户的隔离较小的区域，以及定位在位置/馈送点的流量测量点 水域。

### WHY HAVE YOU PATENTS?

- To ensure the comfort and safety of the customers, which depends to a large extent on the efficient water monitoring system transmitted by the water supply network,
- For the key application in designing the location of the measurement points of the water supply network monitoring system,
- As the overriding solution to the old solutions that did not completely solve the problem of the proper location of the monitoring points
- The methods of inventions, as opposed to very laborious and demanding advanced computational methods, are economically and qualitatively efficient

### 为什么有专利？

- 为确保客户的舒适和安全，这在很大程度上取决于供水网络传输的高效水监测系统，
- 对于供水网络监控系统测量点位置设计的关键应用，
- 作为旧解决方案的首要解决方案，并没有完全解决监控点正确位置的问题
- 与非常费力和苛刻的先进计算方法相反，发明的方法在经济和质量上都是有效的

## REASONS TO STUDY METHODS

- domination factor heuristic, the need for detailed knowledge of both the network and its customers.
- the use of the fractal nature of the water supply networks, It allows primarily on the use of the characteristics of self-similarity of the network and hierarchy of scales contained therein.
- a reference to the principles of the physiology of the human circulatory system, in the course of evolutionary development living organisms, including first and foremost the man developed an optimal system control blood parameters

Development of proposed methods required at the initial stage to prove that every water supply system, regardless of its type and complexity, can be described by the language of fractal geometry. By the way the formula was created to describe any geometric structure of the water supply system, and a new method of classification of these structures.

## 研究方法的原因

- 支配因素启发式，需要对网络及其客户的详细知识。
- 利用供水网络的分形特征，主要使用网络自身相似性和其中包含的尺度层次结构的行为。
- 提及人体循环系统的生理学原理，在进化生物生物过程中，首先是人类发展出最佳的系统控制血液参数

开发初始阶段所需的方法，以证明每一个供水系统，无论其类型和复杂程度如何，都可以用分形几何语言来描述。顺便说一句，公式被创造来描述供水系统的任何几何结构，以及一种新的这些结构分类方法。

## BENEFITS OF THE PROPOSED METHODS:

- universality, independence from the type and complexity of the water supply network,
- simplicity, the opportunity to use the mid-level technical staff,

## 拟议方法的优点：

- 普遍性，独立于供水网络的类型和复杂性，
- 简单，有机会使用中级技术人员，



## VERSATILITY OF THE INVENTION

- Dedicated measurements for applications based on any type of meter to measure water quality indicators transmitted in water networks
- Dedicated to the existing on the market, the IT sector programs, modeling and control of the water supply network, as well as a simple system solutions Epanet
- Dedicated applications for water quality measurements transmitted in the water supply networks, regardless of their size and structural arrangement.

## 本发明的多样性

- 根据任何类型的仪表进行专用测量，以测量水网中传输的水质指标
- 致力于市场上现有的IT部门计划，供水网络的建模和控制，以及一个简单的系统解决方案 Epanet
- 供水网络传输的水质测量专用应用，无论其尺寸和结构安排如何。

### Area selection

区域选择



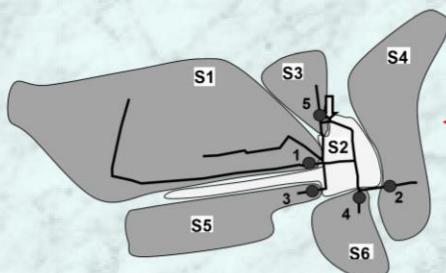
### Location of quality and pressure measurement points

定位点质量测量和压力

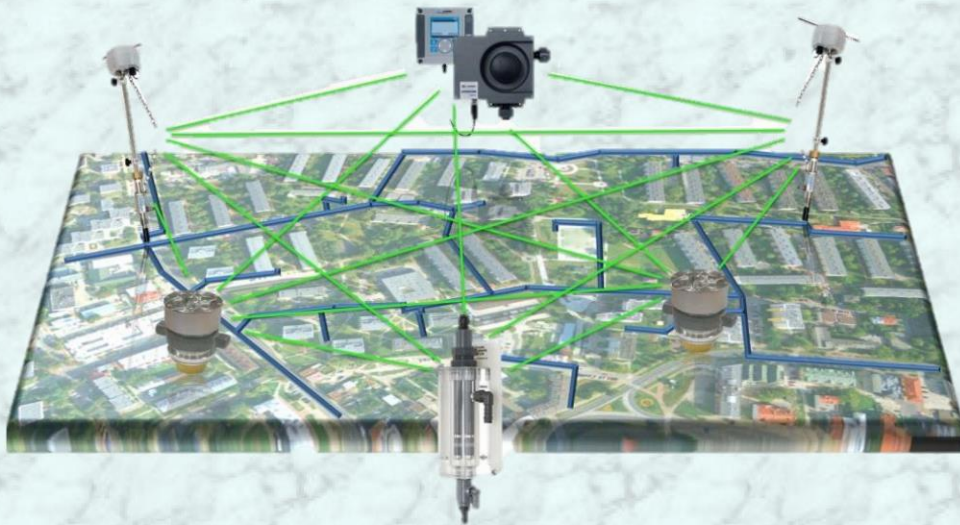


### Node selection

节点选择



Location of water flow measurement points  
水流量的测量点的位置



## BENEFITS OF THE INVENTION

- Improvements in the processes of collection, treatment and delivery of water (eg through the use of the invention to control, regulate, monitor and model the operation of water supply systems) - efficiency from 40% to 80%
- Facilitate the assessment of water supply reliability to the recipient - efficiency up to 100%
- Assessment of the amount of water leaks from the network - efficiency up to 100%
- Positive qualitative and economic effects in the management of the water supply system (inter alia by application of the invention to support the operation, modernization and development of water supply networks) - efficiency from 40% to 90%
- Efficient and cost-effective implementation of the water supply monitoring system, thanks to the appropriate selection and location of measurement points relative to each other in the network of measuring nodes - efficiency from 40% to 90%
- Eliminate unnecessary labor consuming when analyzing measuring nodes - efficiency from 20% to 70%
- Protect the water resources of the natural environment in which we live and respect the natural balance (availability of natural water resources for us and for future generations).

Proven use of the invention was the implementation of effective location of measurement points in the monitoring system of water supply network Pulawy by MPWiK "Waterworks of Pulawy" Ltd. in Pulawy in cooperation from the Lublin University of Technology during the Project entitled. " Preparation assumptions and implementation of an Integrated Management System Technical Infrastructure Companies " under the Operational Programme Innovative Economy, years 2007 - 2013.



## 本发明的益处

- 关于收集，处理和递水（包括使用的本发明的用于控制，调节，监视和建模的供水系统的工作）的改进的方法 - 从40%的效率，以80%的
- 促进供水给收件人的可靠性评估 - 效率高达100%
- 网络中水泄漏的评估 - 高达100%的效率
- 在供水系统（包括本发明以辅助操作，现代化和供水的发展的应用程序）的管理质量和成本的积极效果 - 效率从40%至90%
- 效率定性和经济监测系统供水网络的实施方式中，通过位置的适当选择和测量点到在网络测量每个其它节点的分配 - 效率从40%至90%
- 分析测量节点时，没有过多的努力 - 从20%的效率70%
- 水资源，我们生活在其中，尊重自然平衡（的天然水资源为我们的可用性和后代），保护环境。

本次发明的有效利用是在卢布林理工大学合作项目“MPLi”Pulawy“Pulawy”水厂在供水网络Pulawy监测系统中实施测量点的有效位置。2007年 - 2013年“运营计划创新经济”下的“综合管理系统技术基础设施公司的准备假设和实施”。

## OWNER OF THE INVENTION:

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LTD. IN PULAWY, Puławy / PL

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### The inventors at the MPWiK „Waterworks of Pulawy” Ltd. In Pulawy:

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mgr inż. Mierzwa Aneta

**More information about the invention: [www.mpwik.pulawy.pl/patenty](http://www.mpwik.pulawy.pl/patenty), [www.pollub.pl](http://www.pollub.pl)  
or through direct contact with the owner of the invention.**

**We encourage you to familiarize yourself with the details offered by our invention**

发明人：

LUBLIN科技大学，卢布林/ PL;

市政水务公司“PULAWY”有限公司 普洛瓦，普瓦维/普拉维亚

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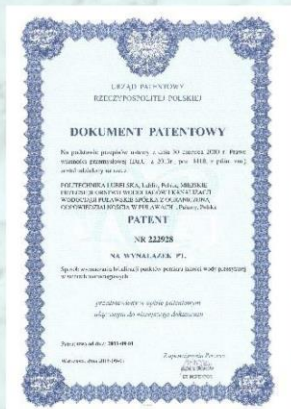
mgr inż. Duklewski Wiesław, inż. Dziak Stanisław, mgr inż. Mierzwa Aneta,  
mgr inż. Czajka Sławomir

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## Achievements 成就







# Do you want to efficiently manage networks and financial company – invest in modern system

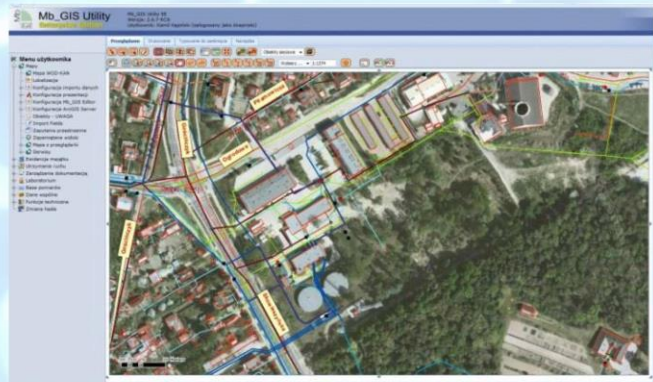
Did you know that modern systems provide:



- Modern and reliable level of information needed for the management of water supply and sewerage networks;
- Excellent diagnostic capabilities when planning the development of water supply and sewerage system;
- Reducing the risk of failure of the water supply and sewerage networks;
- Reducing water losses in water distribution networks;
- Reducing the coefficient of infiltration and exfiltration in sewer networks;
- Complete and timely information about the performance of the network;
- Many other additional.

***As the only market we have a program of information-technology - Integrated Management System Technical infrastructure water and sewage companies.***

***The product consists of 10 modules available for purchase comprehensively as a whole or by the needs of each separately. Each module consists of a standard implementation methodology developed in the form of know-how and software information and technology based on licenses.***



Picture 1. System GIS



The system is used to support comprehensive management actions, officers, employees, exploiters in their daily work at the company water supply and sanitation in areas of interest:

- management, supervision and management of the company (controlling, integrated electronic document circulation system throughout the company, rankings and plans and technical and economic analysis);
- departments, economic, administrative, and finance and accounting in the company (system of billing, namely: collection, remote reading of water, billing, debt collection, banks, BOK, e-BOK, e-invoicing, payroll, finance and human resources, materials management and warehousing , fixed assets, billing and cost allocation);
- technical and technological departments in a company (Electronic Registry Network and water and sewage facilities. - Database GIS - geographic spatial information system on water and sewage system. Economy repair - operational, failures, assess water losses, hydraulic models and qualitative water and sewage networks., Systems for monitoring and SCADA control in the area of water - wastewater management, energy monitoring water and sewage facilities., lab).;

Technology Offer is recommendable to other enterprises water supply and sanitation to deploy and use in terms of developing standards and management tools work in the area of water and sewage management.

***Utility model consisting of methodologies in a comprehensive manner shows how to integrate the technical areas - technical and administrative - economic database using GIS, ERP, system Remote Water Meter Reading (ZOW) and SCADA in water and sewage companies.***

***Integrated Management System Technical infrastructure water and sewage companies. It provides comprehensive implementation of the modules in companies wanting to use their full functionality. Advantages the implementation of the program are at 40% - 90% increase efficiency of work related to the management of network assets water and sewage.***

***For the purchase of Innovative Technology Entrepreneurs will have the opportunity to take advantage of tax deductions.***

## **WE ENCOURAGE YOU TO USE OUR OFFER:**

Offer to industrial partners, research institutes, water supply companies, international associations.

We offer our knowledge and assistance in the process of technology transfer and implementation.

Type of partnership – commercial agreement with technical assistance, license agreement

## **Module 1: “Methodology for the implementation of a GIS database for the development ZSZIT water and sewerage companies of medium size”**

The essence of the method is that the GIS database provides a platform for integrating various elements (subsystems) ZSZIT, works with all elements ZSZIT, is open both to increase the area of its functionality (modules) as well as the opportunity to work with new elements (subsystems) and ZSZIT way of staging the implementation process.

Program information and technological developments related to the above. module is based on software license: ORACLE database for ERP and GIS, ESRI license tool - ARC GIS, ERP software licenses and GIS software installed on servers.

## **Module 2: “Methodology of testing and evaluation of water network failure and sewage”**

The essence of the method is an integrated research program, which consists of the following major milestones:

- I. Analysis of the structure: functional, material, age, bulk water supply / sewerage
- II. Developing classification of research
- III. Develop data collection system for emergency events
- IV. Failure analysis and evaluation of research facilities extended to assess the reliability of

Assessment and classification of research facilities for the risk of failure or disruption in the supply of water to consumers and related water losses.

The program in terms of the above. module is based on software license: ORACLE database for ERP and GIS, ESRI license tool - ARC GIS, ERP software licenses and GIS software installed on servers.



### **Module 3: “Methodology for the creation and calibration of the model of water supply network with the development of the prototype model of the water supply network”**

The methodology is based on the implementation of the following steps as:

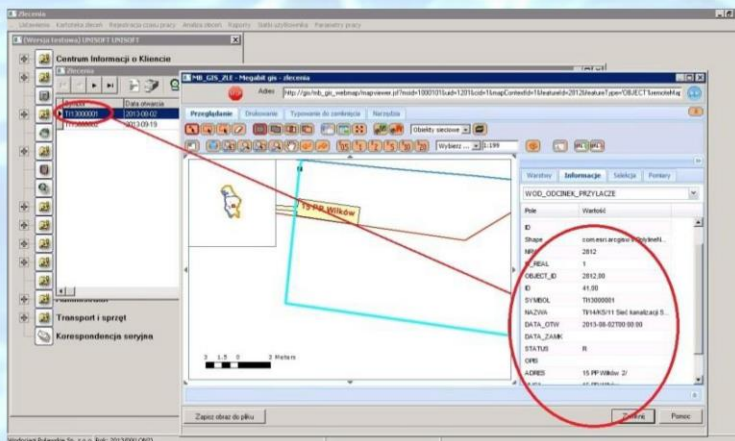
- an analysis of structural and hydraulic water distribution system,
- drawing up the balance of production and consumption of water in the water supply,
- preparation of the water supply network structure and a description of the data for the numerical model
- develop an algorithm for calculating water consumption nodes in the network,
- define the principles and conduct of the calibration sample prepared a prototype model of water supply network,
- develop scenarios of simulation analysis and simulation examples in the distribution of contaminants in the water supply, with particular emphasis on distribution of disinfectant

The program in terms of the above. module is based on software license: ORACLE database for ERP and GIS, ESRI license tool - ARC GIS, ERP software licenses and GIS software installed on servers.

### **Module 4: “Methodology to create the Central Control Room Movement (CDR)”**

The essence of the method is to formulate the main functions of the control room. Defined the basic functions of the CDR, which mainly include: supervision and coordination of ongoing activities of the company, the current data distribution processes implemented in the enterprise, create reports for management, signaling significant threats to water supply and sewerage system, monitor the status of implementation of the most important works of emergency, power coordination of internal crisis and rational decision making, coordination of business cooperation with municipal technical services in specific situations.

Integrated Management System Technical infrastructure water and sewage companies. in terms of the module is based on SCADA software installed on the server SCADA software co-operating with licenses: ORACLE database for ERP and GIS, ESRI license tool - ARC GIS, ERP software licenses and GIS software installed on servers.



Picture 2. The integration of ERP and GIS

## Module 5: “Methodology of monitoring system of water supply facilities and sewerage systems (monitoring of power equipment)”

The starting point for the development of principles for the construction of the monitoring system is to analyze the existing to monitor the energy performance of buildings. The analyzes carried out in the company, and it results in a preliminary determination of shortages of measuring devices, parameters and frequency of measurement of energy in all water and sanitation facilities. In addition, the analysis shall be monitoring the progress of technological parameters of these objects.

Program in the module system for monitoring water supply and sewerage facilities (monitoring of power equipment is based on the installed energy analyzers from which data are entered into the software to collect and visualize data.



## **Module 6: “Methodology of reducing water losses in the water supply distribution system”**

Pay particular attention to the technical condition that affects a significant effect on the size of the water loss. Preliminary assessment of the technical condition was made on the basis of failure. Low failure rate indicates a good technical condition, as its maintenance and operation are carried out in a planned and well organized, and the failures and associated spills are quickly detected and removed. However, the high failure rate indicates poor condition lines, and its effect is very significant loss of water.

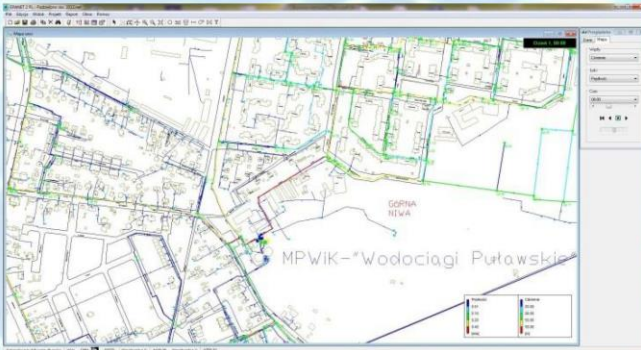
Methods of reducing losses in water mains under the Integrated Management System Technical infrastructure water and sewage companies. It is based on software license: ORACLE database for ERP and GIS, ESRI license tool - ARC GIS, ERP software licenses and GIS software installed on servers.

## **Module 7: “Methodology of monitoring the water supply system network”**

The proposed framework for the creation of the monitoring system of water supply includes a number of tasks that entail the behavior specified order, namely:

1. Determining the purpose and scope of the monitoring network;
2. Identify the limiting process of implementing;
3. Location of monitoring points of the network parameters;
4. Selection methods and measuring devices;
5. Establishing rules for recording measurement data;
6. Formulation of guidelines for the design and construction of measuring;
7. The wording of the principles of maintenance and operation of the monitoring system.

Methodology indicates and describes how to select and install monitoring devices to measure water mains pressure, flow velocity, flow direction and quality parameters: turbidity, the concentration of free chlorine with possibility of extension for another. The data from the measuring devices are transferred to the program information and technology. A method of determining the location of the measurement points for the parameters pressure, flow, and water quality is based on received patents (222928, 222929, 222930).



Picture 3. Model of water supply network in the Epanet using the model manager under cooperation model with many GIS

## **Module 8: “Methodology development and model calibration sewer system, along with a prototype model of the network”**

The scope of application of the numerical model sewerage system is very wide. The methodology presented are most useful in practice operational tasks that can be solved by computer simulation.

Program information and technology in the development and calibration of the sewer network model with the prototype model is based on software installed, the data come from the monitoring device sewerage system.

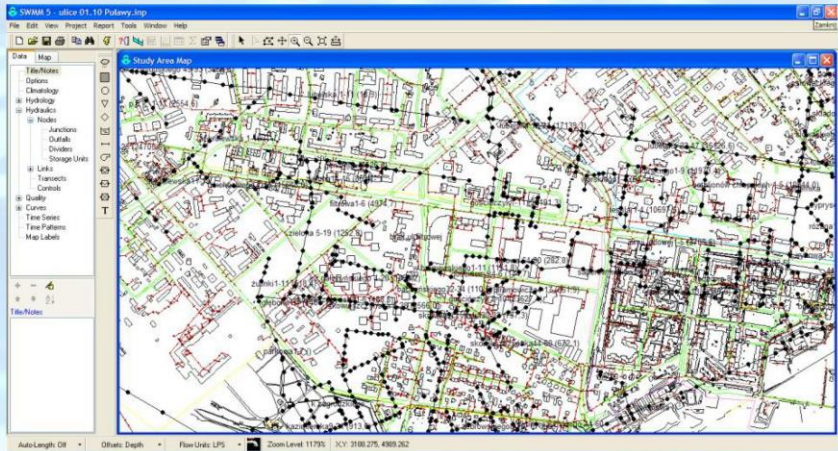
## **Module 9: “Methodology of the sewerage network monitoring system (monitoring hydraulic)”**

The creation of the sewage network monitoring system includes a number of tasks, the implementation of which requires compliance with the order, namely:

1. Determining the purpose and scope of the monitoring network;
2. Identify the conditions under which it operates sewage system, which are conditions to limit the implementation;
3. Location of monitoring points of the network parameters;
4. Selection methods and measuring devices;
5. Establishing rules for recording measurement data;
6. Formulation of guidelines for the design and construction of measuring;
7. The wording of the principles of maintenance and operation of the monitoring system.

Integrated Management System Technical infrastructure water and sewage companies. in the range above mentioned. module is based on data from measurement devices and flow into the sanitary sewage system.





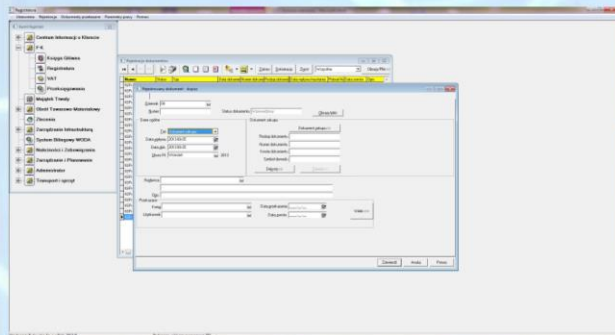
Picture 4. Model sewerage system in the SWMM using the Model Manager to work model with many GIS

## Module 10: “Methodology of creating Remote Reading Water Meter System for the development ZSZIT water and sewerage companies of medium size”

The proposed methodology of creating a system of Remote Reading Water Meter selection of a particular solution is based on the criterion of the final result (after deployment) for the enterprise water and sewerage, including functional characteristics, economic (investment costs, operating costs) and technical (with reference to the technical state operated by the company of plumbing types of water meters).

**Module creation of a system for remote reading of water meters under the program is based on the use of water meters with radio-transmitting modules. Data from the reading system used in the Integrated Management System Technical Infrastructure Companies addition to the objectives of the settlement with the customers also as data to create and calibrate the model of water supply and sewerage system.**

Our product is the result of the Project **"Preparation assumptions and implementation of an Integrated Management System Technical Infrastructure Companies"** conducted under the Operational Programme Innovative Economy, years 2007 - 2013, Measure 1.4. Support for special projects Priority Axis 1 Research and development of new technologies and Measure 4.1. Support for the implementation of the results of R & D Priority Axis 4 Investments in innovative projects co-financed by the European Union from the European Regional Development Fund.



Picture 5. System ERP

The methodology was developed in collaboration with R & D staff Municipal Water and Sewage Company "Waterworks of Pulawy" Ltd. In Pulawy of academics Research Units: Warsaw University of Technology, Lublin University of Technology.



Researchers:

Lublin University of Technology: prof. dr hab. inż. Beata Kowalska, dr hab. inż. Dariusz Kowalski, mgr inż. Anna Musz;

Warsaw University of Technology: prof. dr hab. inż. Marian Kwietniewski, dr inż. Jarosław Chudzik, dr inż. Katarzyna Miszta-Kruk, dr Maciej Grzenda

Workers Municipal Water and Sewage Company „Waterworks of Pulawy” Ltd. in Pulawy: mgr inż. Aneta Mierzwa, mgr inż. Kamil Kępiński, mgr inż. Janusz Piechnat, inż. Radosław Jaśkowski, Artur Reksa

Program information and technology - Integrated Management System Technical infrastructure water and sewage companies. was implementer in cooperation with the deployment of workers Municipal Water and Sewage Company "Waterworks of Pulawy" Ltd. In Pulawy with commercial companies.

**Supervision of the distribution and implementation methodology leads R&D Development**

**Welcome to contact us**



Scope of -factly - financial offer technology available in the database of the Enterprise Europe Network and [www.mpwik.pulawy.pl/oferta-handlowa](http://www.mpwik.pulawy.pl/oferta-handlowa)

Lp.	ZSZITP module	Net price product / service MPWiK Pulawy	Gross price product / service MPWiK Pulawy	Term execution
1	Methodology for the implementation of a GIS database for the development ZSZIT water and sewerage companies of medium size.	EUR/RMB	EUR/RMB	80 days
2	Methodology of testing and evaluation of water network failure and sewage	EUR/RMB	EUR/RMB	80 days
3	Methodology for the creation and calibration of the model of water supply network with the development of the prototype model of the water supply network	EUR/RMB	EUR/RMB	80 days
4	Methodology for creating a numerical model water supply	EUR/RMB	EUR/RMB	80 days
5	Methodology to create the Central Control Room Movement (CDR)	EUR/RMB	EUR/RMB	80 days
6	Methodology of monitoring system of water supply facilities and sewerage systems (monitoring of power equipment)	EUR/RMB	EUR/RMB	80 days
7	Methodology of monitoring the water supply system	EUR/RMB	EUR/RMB	80 days
8	Methodology development and model calibration sewer system, along with a prototype model of the network	EUR/RMB	EUR/RMB	80 days
9	Methodology of the sewerage network monitoring system (monitoring hydraulic)	EUR/RMB	EUR/RMB	80 days
10	Methodology of creating Remote Reading Water Meter System for the development ZSZIT water and sewerage companies of medium size	EUR/RMB	EUR/RMB	80 days

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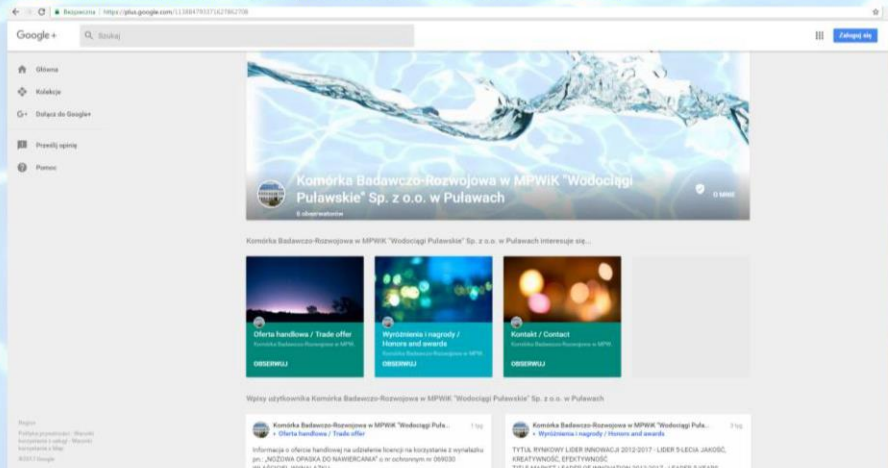
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IWIS 10-12<sup>TH</sup> of October 2016

The project co-financed by the European Union from the European Regional Development Fund under the Operational Programme Innovative Economy



市水务局与排水公司“水厂普瓦维”有限责任公司在普瓦维

**Municipal Water and Sewage Company „Waterworks of Pulawy” Ltd. In Pulawy**

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KRS 0000026128 prowadzony przez Sąd Rejonowy Lublin-Wschód w Lublinie z siedzibą w Świdniku  
VI Wydział Gospodarczy Krajowego Rejestru Sądowego,  
www.mpwik.pulawy.pl/aktualnosci-innowacyjna-gospodarka.html  
http://een.org.pl/index.php/nowa-baza-ofert-pod.html

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