Wastewater Treatment and Management Solutions

Cost and Energy Savings

Process Performance

Sludge Management

Process Control

DHI
Solutions in wastewater management

Today, handling of environmental issues by companies and municipalities, is not just a matter of compliance. The situation is much more complex. Issues like economic and environmental sustainability have gained increasing attention with the public in general, and customers and shareholders in particular.

Handling environmental issues should be part of the general asset management of companies and public utilities.

Within the wastewater treatment sector there are several key areas that must be considered when dealing with the multidisciplinary exercise of environmental asset management:

• Balanced extensions and technological upgrading
• Management of industrial point source pollution
• Cost and energy savings
• Capacity evaluation and process performance
• Sludge management
• Collection and management of data on WWTP operation
• Benchmarking
• Communicating environmental strategy to local community and customers/shareholders.

New methods for consulting, construction and operation have emerged in recent years, all focusing on closer cooperation between the client and supplier. Such partnering often includes a common incentive, such as shared cost savings.

DHI delivers services and solutions for environmental asset management in the area of wastewater treatment, with focus on close cooperation with our clients.
Management of industrial point source pollution
Identification of pollution sources, assessment of their impacts and description of the potential for reduction of the emissions are essential elements in a water pollution control programme.

DHI offers a wide range of services, tools and technologies for pollution prevention, reduction and control:

- Strategies for identification of pollution sources
- Regulation strategies for industrial pollution sources
- Development of limit values for discharges of xenobiotics and heavy metals
- Planning and preparation of awareness campaigns on water savings and reuse
- Pollution source tracking in urban wastewater networks
- Fate of pollutants in sewer systems and wastewater treatment plants
- Preparation of discharge permits for complex industries
- Data handling, storage and presentation using DHI’s software tool INDUSTRY

Cost and energy savings
All over the world, energy savings are in focus. Savings allow other investments while the cost of operation can remain stable or even be reduced in the long term. This is an important benchmark for the management.

An energy audit will typically identify a 10-25% reduction in power consumption. Changes with a payback time of less than three years should be implemented immediately. DHI will visit your plant and measure power consumption for aeration, blowers, pumps and ventilation. DHI also provides one-day training courses in energy savings for staff. DIMS online energy and process control system can be installed to maintain and identify new energy savings.

Optimisation and new equipment installations are often necessary to realise the savings. DHI will test control adjustments using a simulation program prior to demonstrate and verify the expected savings.

Better process performance
Requirements for the effluent quality are increasing. Thus, a good understanding and a detailed control of the wastewater treatment processes are essential. At the same time, operating costs should be kept as low as possible.

With the aim of optimising the process performance in terms of effluent quality and operation costs, DHI services include:

- Troubleshooting
- Process control based on online sensors
- Systems for monitoring and assessment of operational data
- Mathematical process modelling
Treatment plant extensions
For most WWTPs, a time comes when upgrading is necessary, either to increase the capacity or to introduce more advanced wastewater treatment – typically nutrient removal. DHI’s research laboratory and years of experience will help you build an efficient new plant.

DHI prepares feasibility studies including:

- Load assessments and forecasts
- Preparation of upgrading concepts
- Preparation of design guidelines

Technology tools
INDUSTRY is an IT tool for planners, administrators and managers in water companies, industrial estates and municipal administrations. It gives a fast and detailed geographic overview of point sources and their specific loads to a sewer catchment area. INDUSTRY is highly valued for analysing loads to WWTPs and effects of changes in catchments.

DIMS is an IT system collecting, presenting and processing data from many sources. It is an excellent tool, which combines data and information for increasing efficiency. At the same time DIMS is a data management system and an intelligent system for optimising operation through SCADA systems. Benefits are: lower costs, increased capacity and a first-rate documentation of operation. Energy and chemical savings using DIMS are high. Together with a possible increase of capacity, cheaper operation gives a short pay back time.

WEST is a flexible, open and powerful modelling system for wastewater treatment plants. It can be used to simulate almost any process and configuration of modern WWTPs. Once configured it can forecast and explain performance and test operational design strategies. It is used for troubleshooting, scenario testing and cost estimation. It is valuable for analysing operation and design and is an important decision support tool for operators.

Sludge management
All wastewater treatment activities generate sludge. The related treatment and disposal costs are high - often 20-40% of the total operational budget. Restrictions on final disposal are increasing and call for a holistic solution.

DHI can prepare integrated sludge handling plans including recommendations for:

- Sludge dry solids minimisation measures
- Recommendations for best sludge dewatering technology
- Solutions for final disposal with a high degree of supply safety
Perstorp - a chemical industrial complex in Sweden
Perstorp has several production units within the complex. INDUSTRY was used for managing monitoring data to highlight and potentially solve several issues and problems, including:

- Identification of heavy metal sources
- Establishing the contribution to total load from individual units
- Discussions on priority and potential for reductions
- Documentation for payment from individual units
- Identification of potential for reuse of clean water between the units

Aars WWTP, Denmark
The objectives of the project were to increase the capacity by at least 20%, to reduce electricity consumption and to minimise sludge production.

DIMS was used to introduce a new cost effective state of operation with four basic strategies and a rain operation.

The following targets were reached:
- Capacity was increased by 25%
- Energy consumption (kWh) was reduced by 25%
- Considerable savings on effluent tax were achieved
- Sludge production was reduced

The investment was 80% lower than an ordinary extension with more tanks.

Marselisborg WWTP, Aarhus, Denmark
Modelling was used to evaluate the effects of internal carbon dosing on denitrification.

The Municipality of Aarhus obtained:
- Reduced nitrogen discharge from the WWTP and thus reduced environmental tax payment
- Pay back time of less than two years for the carbon source project
- Justification of future investments in water infrastructure
Besides, DHI has project and sales offices in Brazil, Japan, Thailand, Vietnam and the United Kingdom.