advanced solutions for sewerage networks

A Dynamic Approach To Enhance Living Environment

ready for the resource revolution
challenging conventional approaches for innovative sewerage systems

TODAY, WATER POLLUTION DUE TO EFFLUENT DISCHARGE IS A MAJOR CONCERN:

80% of sewage is discharged untreated & directly into natural water bodies in developing countries

70% of industrial effluents are dumped untreated into natural water bodies in developing countries

50% of polluted stormwater is discharged into rivers & beaches

52% on average is lost every year due to floods

There are two main types of sewerage systems. Combined systems discharge some or all of surface water into the foul water drainage system, while separate systems always keep them dissociate. Even if the principles of collection are different, operational standards remain the same.

Performance is a technological, and thus critical factor in choosing a preferred form of sewer management. Meeting the wastewater and stormwater challenge is a transformative act that is able to enhance people’s living conditions and foster cities’ resilience.

In a context of accrued sustainability, transparency, environmental protection, and related regulations, sewer and drainage networks should be considered within the full water cycle, and managed in a responsible, more durable and efficient way.

That’s why SUEZ developed ADVANCED SOLUTIONS FOR SEWERAGE NETWORKS.

PROTECT THE ENVIRONMENT

- Minimize pollutant discharge effects
- Preserve receiving water bodies and biodiversity
- Comply with environmental standards
- Avoid sanitary risk
- Reduce energy consumption

REDUCE EXPENDITURES, OPTIMIZE YOUR ASSETS & RELATED INVESTMENT

- Lower your operational expenditures
- Extend the lifespan of your network with optimized operations and proactive maintenance
- Minimize the construction of additional facilities

IMPROVE SERVICE QUALITY & ENHANCE YOUR CITY’S RESILIENCE

- Guarantee service through sustainable operation and maintenance of your network
- Limit rainfall events’ impact on the economy, daily life and safety
- Prevent emergency situations
- Increase transparency among stakeholders

* U.S. Environmental Protection Agency, UN Water, OECD
ADVANCED SOLUTIONS FOR SEWERAGE NETWORKS:
Manage your sewerage system performance with an integrated solution from a world-class operator

Based on decades of operational experience, SUEZ has developed a suite of 5 flexible and complementary solutions. Our service offer can be customized to meet your objectives.

A DYNAMIC APPROACH TO ENHANCE LIVING ENVIRONMENT

ASSESSMENT
DIAGNOSIS & STRATEGY
Operational and performance assessment to define a Master Plan

IMPLEMENTATION & OPERATION

NETWORK MANAGEMENT
Predictive tools to alert, anticipate and optimize sewerage operations in dry and wet weather

INFLOW MANAGEMENT
Inflow and infiltration assessment, monitoring and treatment to improve system capacity

ASSET MANAGEMENT
Design, construction and sustainable operation of infrastructure

ENVIRONMENTAL PROTECTION
Real-time monitoring and management of receiving water quality, and nuisances

KNOW-HOW TRANSFER
Operational expertise available to local staff
AQUADVANCED® Urban Drainage

INTEGRATED SEWER AND STORMWATER SYSTEM MANAGEMENT SOFTWARE

AQUADVANCED® Urban Drainage is a global decision making software ensuring optimal and transparent management of sewerage systems—from network operations, monitoring and weather forecasting to environmental protection and hydraulic control-through:

» Detailed and continuous overview of your infrastructure and geographical follow-up of network operations
» Energy monitoring
» Alerts and analytics to help operator decide and minimize risk during crisis situations
» Weather forecast with real-time calculation of rainfall impact on sewerage system, city and receiving waters
» Optimized management strategies to ensure the best use of storage capacities while preventing flooding and polluted overflows

our operational expertise means you benefit from:

» An integrated approach coupled with 150 years of experience in water management and day-to-day operation
» A wide range of tools and their tailored implementation taking into account your local conditions
» Cutting-edge technologies
» Our ability in crisis management
» Our proven ability to transfer knowledge to your team
» Our experience in coordinating the utility’s different units (management, technical and financial)
build a master plan for active sewerage management

SUEZ’s proven methodology helps better understand and evaluate your existing infrastructure in terms of efficiency, operation and crisis management in order to define a dedicated Master Plan.

**DIAGNOSIS & STRATEGY**

Understand the local context and assess the existing system performance.

Acquire knowledge on flows and pollution by conducting an operational review through GIS analysis, hydrologic and hydraulic modeling.

Evaluate vulnerabilities, risk of flooding, and environmental impact.

Conduct a structural audit on all the collection components.

**OPERATIONAL & PERFORMANCE INFRASTRUCTURE ASSESSMENT**

**STRATEGIC MASTER PLAN**

Design network, equipment and storage infrastructure to regulate flows, solve hydraulic failures, and reduce environmental impacts.

Anticipate and respond to climate events.

Optimize network performance, storage and discharge.

Capitalize on SUEZ’s experience with specific technical assistance adapted to your needs.

Define a Master Plan to achieve a high return on investment and optimize both CAPEX and OPEX.

**PROJECT MANAGEMENT**

Benefit from our technical and managerial expertise to ensure the effective implementation of the Master Plan.

Monitor the results through Key Performance Indicators.

Synchronize actions with urban planning.

Steer governance across project implementation.

**BENEFITS**

- Prioritize actions to be taken
- Increase profitability
- Enhance response capabilities
- Monitor your system performance
- Support urban planning

**REFERENCES**

**SANTIAGO DE CHILE - CHILE**

- **10,554 km** of sewerage network modeled through innovative software
- Quantitative and qualitative simulation of network and WWTP functioning
- Simulation of urban surface water flow and sewerage discharge impact on the receiving water body

**CASABLANCA - MOROCCO**

- **5,300 km** of sewerage network modeled
- Analysis of network operational issues in dry and wet weather
- Analysis of recurring flood issues due to urban runoff
- Definition of a Master Plan including major infrastructure works
activate your network for real-time operations

SUEZ’s solution increases network capacity and reduces risk of overflows by anticipating and managing events in real time.

SMART EQUIPMENT FOR ACTIVE MANAGEMENT

- **Benefit** from high quality data transmission by installing advanced level, flow and quality sensors.
- **Turn** your system into an active infrastructure powered by AQUADVANCED® Urban Drainage, to optimize network storage capacity and behavior (valves, pumps, gates).

REAL-TIME SEWER MONITORING & EARLY WARNING

- **Monitor** hydraulic and environmental performance of sewer network and stormwater infrastructures.
- **Follow-up** day-to-day network maintenance operations and energy consumption through Key Performance Indicators.
- **Anticipate** flooding, overflows and pollution risk using weather forecasting, and real-time modeling tools.

SMART NETWORK OPERATIONS

- **React** efficiently to storm and pollution events by managing hydraulic operations, storage, and treatment plants in real time.
- **Maximize** the system’s available storage capacity, thus reducing related investment.
- **Implement** a control plan, while complying with regulatory standards.

AQUADVANCED® Urban Drainage
INTEGRATED SEWER & STORMWATER SYSTEM MANAGEMENT SOFTWARE

- **Monitoring Module**: Follows-up hydraulic network operations and quality of receiving waters in real time thanks to a comprehensive dashboard.
- **Early Warning Module**: Predicts flood and pollution risk.
- **Advanced Control Module**: Enables optimized control and automatic operation of the system.

REFERENCES

Bordeaux - France

- **2,100 km** of network operated using smart equipment.
- **More than 4,000** parameters monitored in real time.
- **300** significant rain events anticipated and managed.

Barcelona Metropolitan Area – Spain

- **+ 3 million** people served in 36 municipalities.
- **300 km** of interceptors.
- **33** pumping stations and **7** WWTPs.
- **10** municipal sewerage systems with advanced infrastructure.

BENEFITS

- Prevent flooding, overflows and pollution risk.
- Reduce reaction time to events.
- Lower investment.
- Increase storage and treatment capacities.
- Comply with regulatory standards.

MONITORING MODULE:
Follow-up hydraulic network operations and quality of receiving waters in real time thanks to a comprehensive dashboard.

EARLY WARNING MODULE:
Predict flood and pollution risk.

ADVANCED CONTROL MODULE:
Enables optimized control and automatic operation of the system.

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INTEGRATED SEWER & STORMWATER SYSTEM MANAGEMENT SOFTWARE

KM

+ 3

MILLION

300 km

33 pumping stations and 7 WWTPs

10 municipal sewerage systems with advanced infrastructure.
INFLOW MANAGEMENT

make the most of your system capacity

SUEZ’s solution enables comprehensive management of inflows to secure system capacity and water treatment.

INFLOW/INFILTRATION MANAGEMENT

- Locate and evaluate the extent of inflow and infiltration through data collection and treatment, measurement campaigns in dry and wet weather, and inspections.
- Implement a structural assessment of the network to avoid failures caused by geotechnical disruptions or sealing issues due to infiltration.
- Set up inflow/infiltration zoning, and implement a multiannual action plan to better manage assets and connections.

DOMESTIC & PUBLIC CONNECTIONS MANAGEMENT

- Minimize inflow/infiltration volumes by implementing the right design, construction and repair processes with new operational tools.
- Drive inspection campaigns on connections (smoke pattern tests, colorant control, etc.).
- Benefit from building permits consulting services to prevent inadequate inflow.

INDUSTRIAL DISCHARGE MANAGEMENT

- Identify and inventory potential sources of industrial pollution.
- Receive methodological support on waterway discharge agreements.
- Define a quality control plan and drive it through monitoring and laboratory analysis.
- Benefit from comprehensive legal and regulatory assessment to process fines, discharge authorizations, etc.

BENEFITS

- Improve system capacity
- Reduce energy consumption
- Extend your facilities’ lifespan
- Optimize investment
- Preserve surroundings

REFERENCES

BORDEAUX – FRANCE
131,000 M³/DAY

WWTP managed

- Implementation of smoke pattern tests on 19,000 connections.

DOHA – QATAR
180,000 M³/DAY

WWTP managed

- Support to field investigations and long-term strategy to deal with industrial connections.

DIAGRAP SEWERAGE NETWORK INSPECTION TOOL

- Provides fast structural assessment of network condition thanks to pole cameras.
- Procures GIS-based notation of pipe defaults.
- Brings support to detailed CCTV investigation or renewal plans.

SUEZ’s solution enables comprehensive management of inflows to secure system capacity and water treatment, allowing you to make the most of your system capacity.
ASSET MANAGEMENT

shape

innovative techniques for
greater system reliability

Provides comprehensive knowledge of network real state, operations performed and results
Determines where, when and how often cleaning is necessary
Provides a choice of the most appropriate resources for each requirement

GALIA
ADVANCED OPERATION & MAINTENANCE

Provide: comprehensive knowledge of network real state, operations performed and results
Determines where, when and how often cleaning is necessary
Provides a choice of the most appropriate resources for each requirement

NETWORK CONDITION ASSESSMENT & INVESTMENT

Evaluate network structural and functional conditions through assessment and inspections
Build-up an inventory of network and electromechanical assets
Design and plan new equipment and storage infrastructure to regulate flows, and limit network vulnerability
Establish an annual cost-effective rehabilitation plan to optimize works, and better manage investment

NETWORK MAINTENANCE

Benefit from innovative inspection and cleaning solutions adapted to your network needs
Implement innovative, predictive and preventive maintenance of electromechanical assets to improve performance, reduce costs, and avoid failure risk
Increase data traceability when inspecting confined spaces and reduce operational risk thanks to drones
Monitor hydraulic and quality performance of infrastructures regarding overflow, pumping efficiency, inflow, and infiltration
Manage black spots to lower risk related to hydrogen sulphide in anaerobic conditions and avoid odors

NETWORK REHABILITATION

Select the most adapted materials and techniques to renew your network while minimizing the impact on the surrounding environment
Train field teams to guarantee high quality work

BENEFITS

- Lower operational costs
- Optimize treatment and storage capacities
- Limit your investment
- Extend your facilities’ lifespan
- Avoid odors and reduce nuisances

REFERENCES

NASSAU COUNTY (NEW YORK) – USA

+30% of productivity gained by optimizing cleaning and inspection scheduling
400 km of Innovative Acoustic Inspections (SL-RAT)
200 km of Pole Camera and CCTV inspections

ALICANTE – SPAIN

-33% on preventive maintenance costs while preserving quality of service
Annual investment on network rehabilitation reduced by 20%
Annual breakage rate reduced by 2.5%
Network lifespan enhanced by 15%

SUEZ’s solution prioritizes innovative techniques for sewerage network rehabilitation and maintenance to optimize efficiency and investment

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AQUADVANCED®
Urban Drainage
COMPATIBLE
ENVIRONMENTAL PROTECTION

monitor quality, tackle nuisances & promote transparency

SUEZ’s solution forecasts risk to efficiently enhance the quality of receiving water and people’s living conditions.

ASSESSMENT & IMPLEMENTATION OF RECEIVING WATER MONITORING SYSTEM

- Evaluate quality of the receiving water in real-time and forecast pollution risk thanks to predictive models
- Determine the best sensor equipment and placement through site expertise
- Identify monitoring parameters and the right type of facility to be installed

RECEIVING WATER QUALITY MANAGEMENT

- Monitor quality of the receiving water in real-time
- Increase transparency by sharing information with stakeholders and citizens
- Protect sea and fluvial environments in order to comply with regulatory standards
- Support authorities in managing beach, lake and river closures/re-openings, and alert in case of water quality degradation

NUISANCES MANAGEMENT

- Monitor system nuisances and identify critical areas
- Assess, prevent and treat odors thanks to in-house comprehensive methodology (NOSE)
- Reduce the impact of works and interventions on population, and improve safety

COWAMA COASTAL WATER MANAGEMENT

- Continuously measures relevant parameters through Sirene® sensors
- Monitors in real time the state of natural water bodies in discharge situations
- Forecasts bathing water quality
- Alerts public authorities and citizens
- Enables the implementation of comprehensive dashboards and apps, such as iBeach®

BENEFITS

- Limit pollution risk
- Protect people and property
- Reinforce territory attractiveness
- Enhance transparency
- Comply with regulatory standards
- Optimize environmental protection investment
- Preserve resources and promote biodiversity

REFERENCES

COWAMA

ALICANTE – SPAIN

- 29 discharge points monitored, impact modeling and early warning
- 24 rain gauges and 51 level gauges installed
- Stormwater retention tank of 60,000 m³

ALGIERS – ALGERIA

- +32 beaches reopened since 2006
- 63 combined sewer overflows monitored
- 2/3 of pumping stations rehabilitated
- 95% of connected households

- -95% of polluted discharge to receiving water during storm events

AQUADVANCED® Urban Drainage COMPATIBLE
advanced solutions for sewerage networks

Operational & performance infrastructure assessment
Strategic Master Plan
Project management

Network management
Predictive tools to alert, anticipate and optimize sewerage operations in dry and wet weather
Smart equipment for active management
Real-time sewer monitoring & early warning
Smart network operations

Inflow management
Inflow and infiltration assessment, monitoring and treatment to improve system capacity
Infiltration management
Elemental & public connections management
Industrial discharge management

Asset management
Design, construction and sustainable operation of infrastructures
Network condition assessment & investment
Network maintenance
Network rehabilitation

Environmental protection
Real-time monitoring and management of receiving water quality, and nuisances
Assessment & implementation of receiving water monitoring system
Receiving water quality management
Nuisance management

tracking map
For years, SUEZ’s worldwide research and technical centers have been pooling their water cycle expertise. Supported by the Group’s expert networks and our track record of successful implementations, SUEZ has developed an innovative and comprehensive approach for transferring know-how to local operations.

SUEZ helps you achieve high degree of institutional competency and full autonomy.

In accordance with your specific needs, we address the elementary core business processes and help water operations improve their efficiency. We assist you in defining, implementing and monitoring tailor-made action plans for the effective transfer of knowledge to your local staff.

**BENEFITS**

- Achieve a high degree of institutional competency and full autonomy
- Transfer relevant know-how and expertise to local staff
- Improve operational efficiency

**REFERENCES**

- 400 researchers and experts across the world
- 6 research centers and over 65 research programs
- More than 120 research partners

**SUEZ key figures**

A GLOBAL LEADER IN WATER AND WASTE MANAGEMENT SERVICES

OPERATING IN MORE THAN 70 COUNTRIES ON 5 CONTINENTS

- Municipal and industrial clients
- People benefit from our drinking water supply services
- People benefit from our sanitation services
- Wastewater treatment plants
- Sewer connections maintained
- Employees worldwide
- Sewer lines maintained
- Kilometers of wastewater treated each year
- Billion M³ of drinking water produced each year
- Employees worldwide

**a unique profile**

- Operator
- Customized & innovative solutions developer
- Solution integrator

**they trust us**

Paris, Bordeaux, Dijon (France), Barcelona, Alicante, Murcia (Spain), Bristol (UK), Casablanca (Morocco), Algiers, Oran (Algeria), Jeddah (Saudi Arabia), Doha (Qatar), Santiago (Chile), Macau, Chongqing (China), New Delhi, Mumbai (India), Adelaide, Perth (Australia), New York (USA), Cartagena (Colombia)