

BENTLEY® SEWERGEMS®

Urban Sanitary and Combined Sewer Modeling

SewerGEMS® is a fully-dynamic, multi-platform, sanitary and combined sewer modeling solution. Engineers can analyze sanitary or combined conveyance sewer systems using built-in hydraulic and hydrology tools and a variety of wet-weather calibration methods. From urban sewer planning to overflow remediation analysis, to optimized Best Management Practices designs, SewerGEMS provides an easy-to-use environment for engineers to analyze, design, and operate sanitary and combined sewer systems.

One product. One model file. Four included platforms.

Users of SewerGEMS enjoy the power and versatility afforded by working across CAD, GIS, and stand-alone platforms while accessing a single, shared, project data source. With SewerGEMS, utilities and consultants have built-in support for four interoperable platforms, all packaged together in a single product:

- Windows stand-alone for ease of use, accessibility, and performance,
- ArcGIS for GIS integration, thematic mapping, and publishing,
- MicroStation® for bridging geospatial planning and engineering design environments, and
- AutoCAD for integrated compatibility with the world's most popular CAD platform.

Utilities and consultants can share a single dataset using different interfaces, and modeling teams can leverage the skills of engineers from different departments. Engineers can flatten learning curves by choosing the environment they already know and provide results that can be visualized on multiple platforms.

ArcGIS integration and geospatial model-building

The ArcGIS interface in SewerGEMS allows GIS professionals to leverage ESRI's geodatabase architecture to guarantee a single dataset for modeling and GIS. They can create, edit, calculate, and visualize SewerGEMS models directly from ArcMap with full access to every hydraulic and hydrology modeling tool.

Engineers can leverage geospatial data, CAD drawings, databases, and spreadsheets to jumpstart the model building process. SewerGEMS provides synchronized database connections, geospatial links, and advanced model-building modules that connect with virtually any digital data format. SewerGEMS also provides drawing and connectivity review tools to guarantee a hydraulically coherent model.

Comprehensive scenario management

The Scenario Management Center in SewerGEMS gives engineers full control to configure, run, evaluate, visualize, and compare an unlimited number of scenarios within a single file. Engineers can easily make decisions by comparing unlimited scenarios to evaluate design, operational, sanitary loading and even network topology strategies for better decision-making support.

Wastewater and stormwater loading allocation and estimation

The LoadBuilder™ module included in SewerGEMS helps engineers allocate sewer loads based on a variety of GIS-based sources such as customer water use billing data, area-wide flow measurement or polygons with known population or land use.

Sewer loading in SewerGEMS can also be applied as user-defined hydrographs, pattern-based loads, and unit loads. Engineers can access and customize the comprehensive unit (dry weather) load engineering library with numerous typical unit loads based on population, area, count, and discharge. SewerGEMS also allows users to input and save an unlimited number of flow patterns, to accurately model flow changes over the course of a day.

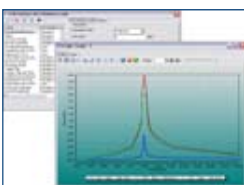
In addition engineers can load models with wet weather runoff flows derived from precipitation, using the built-in rainfall distributions in SewerGEMS, or user-defined rainfall events. Runoff flows are modeled and calibrated using a choice of hydrograph methods, including RTK, SCS, Modified Rational, EPA-SWMM, or user-defined generic unit hydrographs.

Dual dynamic engines

The two dynamic engines of SewerGEMS account for storage effects within structures and quantify overflows should they occur. The flexibility of choosing between the EPA-SWMM engine as well as an extremely fast, stable implicit engine to solve the complete set of wave components behind the Saint Venant equations gives added comfort to those modelers that are accustomed to modeling with SWMM and familiar with its capabilities and limitations.



Create models easily using your choice of the stand-alone, MicroStation, ArcGIS, or AutoCAD platforms



SewerGEMS provides a broad range of tools for estimating and allocating sewer loadings



SewerGEMS' full dynamic engine allows to evaluate systems for surcharges and overflows



SewerGEMS includes four interoperable platforms: ArcGIS, AutoCAD, MicroStation, and Windows stand-alone



Manage your sanitary load data from totally customizable unit load libraries



Locate overflows quickly using thematic mapping, FlexTables, and dynamic profiles

BENTLEY SEWERGEMS SYSTEM REQUIREMENTS

Processor

Pentium IV or Athlon XP – 2+ GHz

Operating System

Windows 2000 (Service Pack 4), Windows XP, and Windows Server 2003

Memory

512 MB or more

Hard Disk

500 MB of free storage space (or more depending on data files)

Display

1280 x 1024 or better resolution at 256 colors or more, 64 megabyte graphics card or better

SewerGEMS runs without platform restrictions using the stand-alone interface. If integration with GIS and/or CAD platforms is desired, these are the requirements:

ArcGIS: 8.x, 9.x

MicroStation: V8 XM Edition

AutoCAD: 2004, 2005, 2006

Interface and graphical editing

- Stand-alone Windows interface included
- ArcGIS-based interface (ArcMap) included
- MicroStation-based interface included
- AutoCAD-based interface included
- Unlimited undo and redo
- Element morphing, splitting, and reconnection
- Automatic element labeling
- Scaled, schematic, and hybrid environments
- Element prototypes
- Dynamic zooming
- Multiple background file support
- Image, CAD, and GIS background layer support

Interoperability and data connections

- Single set of model files for four compatible interfaces
- Bidirectional synchronized connections
- Shapefile, Geodatabase, Geometric Network and SDE support
- Polyline-to-pipe conversion from DXF and DWG files
- Spreadsheet, database, Shapefile, and ODBC connections

Hydraulics and operations

- Two engines for solving the full set of St. Venant equations included
- Implicit dynamic engine included
- Explicit dynamic engine included (EPA-SWMM)
- Evaporation definition
- Aquifer simulation
- Pollution analysis with optional definition of land use categories and land surface characteristics
- Treatment analysis
- Rule-based controls
- Variable-speed pumping

Results presentation

- Direct ArcMap visualization and mapping
- Thematic mapping
- Dynamic, multi-parameter, and multi-scenario graphing
- Advanced dynamic profiling
- Advanced tabular reporting with FlexTables®
- Property-based color coding and symbology
- Property-based annotation

Model building

- Polyline-to-pipe conversion from DXF and DWG files
- Spreadsheet, database, shapefile, and ODBC connections

Model management

- Unlimited scenarios and alternatives
- Comprehensive scenario management
- Tabular reports global editing
- Sorting and persistent filtering on tabular reports
- Statistical analysis from tabular reports
- Customizable engineering libraries
- Dynamic and static selection sets
- Global engineering-units management
- Drawing review tools for connectivity consistency
- Automatic topology review
- Orphaned node and dead-end pipe queries

Sanitary load allocation and estimation

- Automatic sanitary load allocation from geospatial data
- Geospatial load allocation from billing meters
- Load allocation using flow monitoring distribution
- Land use-based load distribution
- Sewer load assignment based on phased land use projections and population projections
- Dry-weather load assignment using hydrographs, unit loads, and pattern-based loads
- Customizable area-, count-, discharge-, and population-based unit sanitary loading library
- Inflow and infiltration calibration using RTK tables

Stormwater load allocation and estimation

- Infiltration and runoff methods: SCS Runoff, CN with automatic CN weighting, Loss, Green and Ampt, Horton (User Defined), EPA SWMM Runoff
- Time of concentration methods: User-Defined, Carter, Eagleson, Espey/Winslow, Federal Aviation Agency, Kerby/Hathaway, Kirpich (PA and TN), Length and Velocity, SCS Lag, TR-55 Sheet Flow, TR-55 Shallow Concentrated Flow, and TR-55 Channel Flow
- Hydrograph methods: Generic unit hydrograph, RTK, SCS, EPA SWMM, and Modified Rational

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Bentley North American Headquarters

Bentley Systems, Incorporated
685 Stockton Drive
Exton, PA 19341 USA
Phone: +1 800 BENTLEY (+1 800 236 8539)
Outside the US +1 610 458 5000
Fax: +1 610 458 1060

Haestad Methods Solution Center

Bentley Systems, Incorporated
27 Siemon Co. Drive. Suite 200W
Watertown, CT 06795 - USA
Toll-Free 1-800-727-6555
Worldwide +1-203-755-1666
Fax: +1-203-597-1488

GeoModeling

Ilica 191F
HR-10 000, Zagreb
CROATIA
tel: +385-1-3775-411
fax: +385-1-3775-412
info@geomodeling.hr
www.geomodeling.hr

To find a local Bentley office, please visit www.bentley.com/corporate/contacts.