



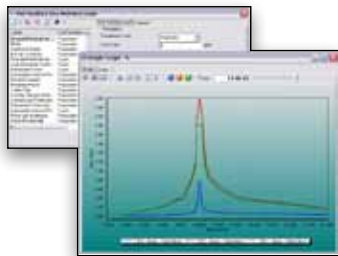
SewerGEMS®

Urban Sanitary and Combined Sewer Modeling

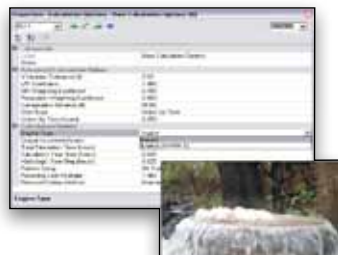
From urban sewer planning to overflow remediation analysis, to optimized Best Management Practices designs, SewerGEMS provides an easy-to-use environment for engineers to analyze, design, and operate sanitary or combined conveyance sewer systems, using built-in hydraulic and hydrology tools, and a variety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



Create models easily using 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 users to evaluate systems for surcharges and overflows

One Product, One Model File Four Included Platforms

Users of SewerGEMS enjoy the power and versatility afforded by the ability to work 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,
- AutoCAD for convenient CAD layout and drafting

Utilities and consultants can share a single data set 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

SewerGEMS' capability to run within ArcGIS 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

With SewerGEMS scenario management center, users can configure, evaluate, visualize, and compare an unlimited number of scenarios within a single file. Engineers can evaluate design, operational, sanitary loading, and network topology strategies for better decision-making support.

Wastewater and Stormwater Loading Allocation and Estimation

The included LoadBuilder™ module helps modelers 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 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.

Engineers can also load models with wet weather runoff flows derived from precipitation, using SewerGEMS built-in rainfall distributions, 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.

Dynamic Engines, Extended Period Simulations, and Steady-State Analyses

Engineers can choose to use SewerGEMS' explicit EPA SWMM solver or the implicit dynamic wave engine, which solve the Saint Venant equations. These dynamic engines account for storage effects within structures and quantify overflows should they occur.

SewerGEMS also includes SewerGEMS Sanitary (same features as SewerCAD®), which includes a convex/gradually varied flow solver. Modelers can use steady-state analysis with various standard peaking factors and extended period simulations, as well as the powerful and easy-to-use automatic design features.

System Requirements

Processor:

Pentium: IV or Athlon XP – 2+ GHz

Operating System:

Windows 7, Windows Vista, 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

Platform pre-requirements:

Stand alone: none; ArcGIS: 9.3.1;
MicroStation: V8i; AutoCAD: 2011

Support for older platform software versions is available if required. Contact your Bentley representative for details.

Find out about Bentley at: www.bentley.com

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SewerGEMS At-A-Glance

Interface and Graphical Editing

- Stand-alone Windows interface included
- Ability to run within ArcGIS (ArcMap)
- Ability to run within MicroStation
- Ability to run within AutoCAD
- Import/export of InRoads® Storm and Sanitary files
- Unlimited undo/redo of layout and editing
- Element morphing, splitting, and reconnection
- Merge nodes in close proximity tool
- Automatic element labeling
- Scaled, schematic, and hybrid environments
- Element prototypes (one-click setup)
- Dynamic zooming
- Multiple background file support
- Image, CAD, and GIS background layer support

Interoperability and Model Building

- Single set of model files for four compatible interfaces
- Shapefile, Geodatabase, Geometric Network, and SDE support
- Polyline-to-pipe conversion from DXF and DWG files
- Oracle Locator/spatial data connection
- GIS-ID property (to maintain associations between records in source file and elements in model)
- Seed files (new models template)
- 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
- Long-term continuous simulation

- Aquifer simulation
- Control structures (weirs, orifices, depth-flow curve)
- Rule-based controls
- Pollution analysis with optional definition of land use categories and land surface characteristics
- Variable-speed pumping
- Convex/gradually varied flow solver
- Steady-state simulations
- Extended period simulations
- Flow profile methods: capacity and backwater analysis
- Automatic constraint-based design
- Totalizing flow meters
- Air valves for high points in force mains
- Complex manifolded pump stations/force mains

Sanitary Load Allocation and Estimation

- Drawing review tools for connectivity consistency
- Automatic topology review
- Orphaned node and dead-end pipe queries
- ProjectWise® / ProjectWise® Geospatial Management support
- Sub-model management
- 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

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 Management

- Custom data fields (with user-assigned or formula-based values)
- Unlimited scenarios and alternatives
- Comprehensive scenario management
- Scenario comparison
- 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