

XLReporter for the Water and Wastewater Industry



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Company Profile

SYTECH IS “THE REPORT COMPANY”

SyTech “TheReportCompany”, Inc. specializes in the manufacture and distribution of reporting software. With over 10 years of experience, SyTech quickly recognized the need for an “off-the-shelf” reporting solution and responded by manufacturing and distributing Report Manager.

The increase in Customer requirements, together with the rapid changes in technology, led to the launch of XLReporter Professional in 2000. XLReporter Professional is designed to take advantage of the powerful features and functionality of Microsoft Excel. The product has been called “The Complete Reporting Solution” since it solves all the reporting needs of manufacturing and industry and is designed to be readily usable by both production and management.

**XLReporter’s creative design was awarded the coveted
Control Engineering Editor’s Choice Award**

Reporting with Microsoft Excel

THE EXCEL PRODUCT

Microsoft Excel has always been a popular tool to collect data and provide reports in the Water and Wastewater industry. Why is it so popular? In his Control Engineering article, “Use Microsoft Excel as a report writer”, author Dave Harrold explains:

“People will cite lots of reasons, but they all boil down to trust. Spreadsheets have been around so long that people have evolved their ‘favorite’ spreadsheet-based reports. They can see and validate formulas, and they trust the results produced. After all, if you’re sending a report with lots of ‘crunched numbers’ to your boss and/or your bosses’ boss, you need to trust the underlying technology used to develop those reports. Possibly the most-used spreadsheet today is Microsoft Excel. Excel’s ability to manipulate, analyze, and report numerical data is unquestioned.”

Almost everybody has some experience with Excel, tabulating data recorded on clipboards, processing laboratory results, constructing daily and monthly reports, charting, statistics; the list is endless. Engineers and operators are comfortable working in the intuitive Excel environment and so it has evolved as the “de facto standard” in producing reports for the Water and Wastewater industry.

Many states, like Indiana, Michigan and Texas, now require regulatory reports to be submitted in the format of Excel files. They, and many other states, have even taken steps to design all their reporting requirements in Excel forms and have made them available on the internet. The advantage of this initiative is that these states now have their reports submitted to them with the uniformity they require for effective reviewing and evaluation. Furthermore, there is no ambiguity in the reporting process, since the production facilities are given an easy to use and consistent reporting directive.

EXCEL REPORTING

Even though Excel report forms are readily available, there is still a significant amount of time and energy required to produce a report. For example, in a monthly operating report data has to be manually collected and processed in order to handcraft end-of-month values that are eventually entered into the Excel form. Needless to say, this manual approach is repetitive as well as time consuming and very expensive.

Consequently, the substantial effort of manually creating reports raises the question on whether there is a better method to generate Excel based reports. The answer is found in *report automation*.

THE BENEFITS OF AUTOMATED REPORTING

Reduction in Cost

Substantial savings in labor, time and cost. The administrative chores of the plant personnel greatly diminish.

Accurate Data collection and storage of the reports

Data is collected automatically, eliminating human error. The data is used to update various reports namely; daily, weekly and monthly report files.

“Real-time” Distribution

With reports stored electronically, they can be automatically distributed to the right people at the right time. Personnel are able to view any report from the past to determine the cause of a process disturbance and to assess water usage demands.

Optimization

Plant personnel are able to enhance the system by generating additional reports that capture values such as the daily usage of chemical ingredients, the minimum and maximum values of essential process parameters and the equipment runtimes. This information allows them to perform preventive maintenance. Better information leads to improved decision making, increased productivity and improved regulatory compliance.

AUTOMATED REPORTING SOLUTIONS

Essentially, there are two ways of achieving report automation with Excel, a customized solution or an off-the-shelf solution:

Customized Solution

A customized solution is built for a specific system, either by an in-house programmer or outside source, such as a System Integrator. The final implementation will satisfy the current reporting needs very well, but brings with it high development costs, high maintenance costs and requires a skilled level of expertise. Custom solutions often lack flexibility and more importantly, configurability. The solution is reliant on the proximity and availability of the programmer and typically is abandoned when the programmer moves on to another job.

Off-the-shelf Solution

An off-the shelf solution is built by a manufacturer that provides a versatile set of building blocks that, when applied according to the users specification, addresses their complete reporting needs. Furthermore, the

flexibility of such products allows them to be easily applied to other reporting needs that may arise in the future.

XLReporter from SyTech, "TheReportCompany.com" is such a reporting product. The product is built with the industrial robustness expected from software that executes 24 hours a day, 7 days a week. The software configuration tools make the entire process of report design a snap. If a state form is available then it can be used as the basis of the report design, avoiding the need to "re-invent the wheel".

XLReporter uses the Excel "engine", a recently added concept to Excel by Microsoft, to write data into worksheets, create workbooks, calculate, print and provide every other function you would expect from a good reporting product. All this functionality at a very affordable price makes XLReporter the solution of choice for automated reporting.

THE COMPLETE REPORTING SOLUTION

XLReporter is SyTech's second generation reporting product and consequently, contains a considerable number of years of experience. The report cycle, as viewed by SyTech, consists of four steps: **D**esign, **R**eport, **M**anage and **P**ublish.

Step1 : Design

In the comfortable environment of Excel, the user designs a report template that contains the layout of the report and the data sources it will use. XLReporter can report on data from a host of data sources as follows:

- . **Real-time Interface** : The real-time interface gives access to current values of the process. In the context of reporting, current values can be reported as a "snapshot" e.g., end of day flow totals for a pumpage report, or added incrementally to the report, e.g., 15 minute turbidity samples for a Turbidity report.
- . **Historical Interface** : The historical interface gives access to archived values from any local or networked workstation. Multiple servers can be accessed simultaneously. A wealth of standard aggregate calculations is provided, including maximums, minimums, averages and much more e.g., the maximum flow over a day, or the total volume pumped over a month.

. **Database Interface** : The database interface makes XLReporter compatible with any relational database and is available from any workstation that has access to the database. The interface provides access to the journal/alarm logs, with options to filter records based on tag name, time period, alarm status, alarm value and much more.

The interface provides a powerful query builder that creates SQL (structured query language) statements without any knowledge of the SQL language. The point and click environment of the builder enables the user to select the tables and columns for the report, together with time frames, filter criteria and sort conditions.

. **Aggregates** : An aggregate database is provided by XLReporter as an additional source of data for reporting purposes. By selecting a process value in the real-time server, an array of statistics and other valuable information are automatically calculated. The following aggregates are provided:

- **Profiles** This calculation is based on the state changes of digital values, i.e., ON or OFF. From the state change, the total number of ON states, OFF states, ON duration, OFF duration and more are calculated. This information is ideal for equipment utilization and downtime reports.

- **Difference** This calculation is based on the difference of consecutive samples of a real-time value. For example, to calculate the daily pumpage from a totalizer that represents the total gallons pumped, the difference of a totalizer from the start of the day to the end of the day is calculated.

- **Statistics** This calculation is based on the real-time values. A multitude of calculations, such as minimum, time of minimum, average and more is provided.

. **Manual data entered by the user** : Typically, laboratory data or manually derived data needs to be added to monthly operation reports. Generally, each water or wastewater plant has some data that cannot be automatically added to the report.

Step 2 : Report

This step in the reporting cycle populates the report with data based on template design. The report can be updated periodically e.g., every 15 minutes to add a turbidity sample to the report, every 4 hours to collect a chlorine sample, every day to print results over the day, or even once a year to complete the summary of the yearly flow report. In addition, the report can also be updated on events, e.g., when a pump comes on or when a filter pressure exceeds a threshold.

However, not all reports are necessarily scheduled. Some reports require personnel to specify certain reporting parameters such as start and end times, in order to get a result. SyTech recognized the importance of on-demand reporting and built features into XLReporter to produce reports interactively from Excel, the desktop and HMI displays.

Step 3 : Manage

Analysis and data enhancement are integral parts of the report generation cycle. The use of tabular representation, charts, sorted data and color-coding of values greatly enhances the information presented in a report. XLReporter's built-in Management functions are provided to process data in existing worksheets. The functions are pivotal in solving complicated regulatory requirements where standard Excel functions are insufficient e.g., conditional calculations during a backwash.

Step 4 : Publish

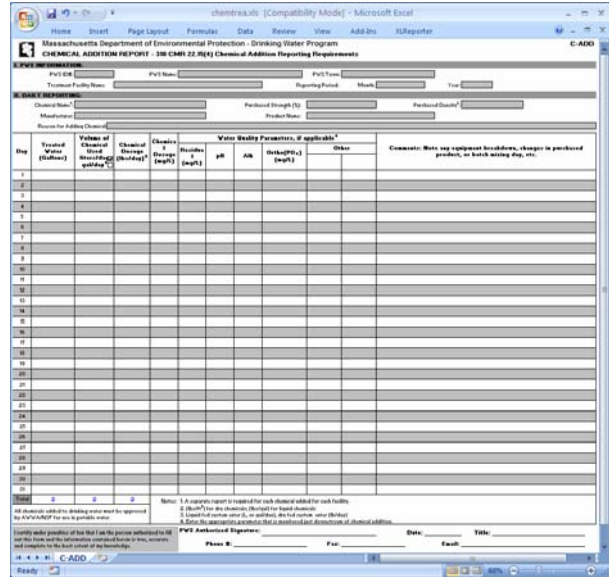
Finally, the user determines the format of the final report and the people who will receive it. Completed reports are stored in XLS, PDF or HTML format and may be sent automatically to printers, email, file servers and web servers.

REGULATORY REPORT EXAMPLES

Reporting requirements differ from state to state. In the following, a small sampling of reports generated by XLReporter is presented.

Chemical Treatment

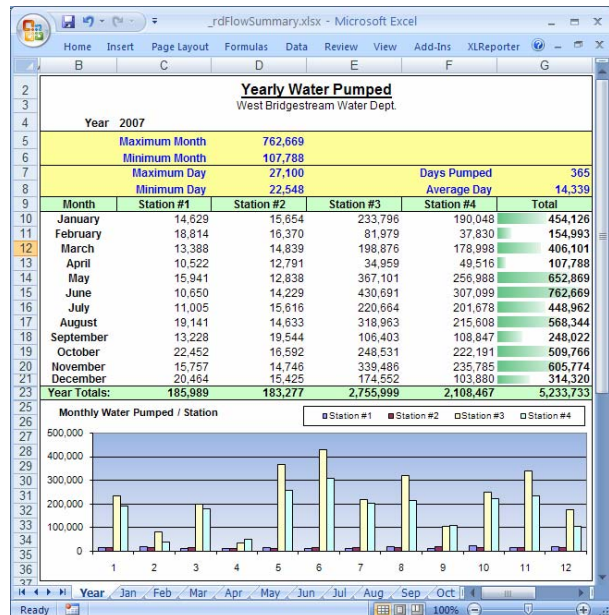
The chemical treatment report is a monthly report that shows the quantities of chemical additives for each day. In the past, the daily volume values were manually entered, but now with XLReporter, the values are automatically inserted for each day. If the chemical additive values and pH are available from the collection system, the report is completely generated without any operator input. If these values are not available, they would be manually entered.



Flow Summary

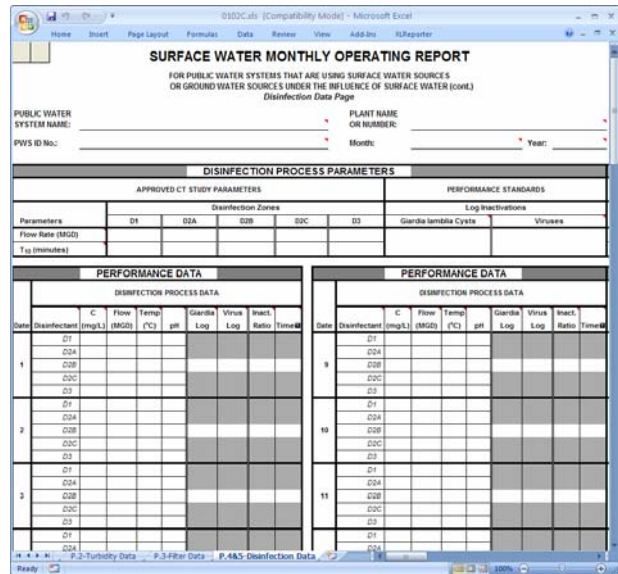
The flow summary report displays the daily and monthly quantities of pumped water. It also includes a yearly summary that shows the minimum and maximum monthly flow over the year. With the use of Excel, these, and many other significant statistics, are easily calculated in the report, saving many hours of paper computations.

This type of report is updated once a day, adding the daily volume to each monthly report sheet. In a typical installation, XLReporter's scheduler performs all of this automatically, generating a complete report without operator input. The report is sent to the state once a year.



Monthly Operating Report (MOR)

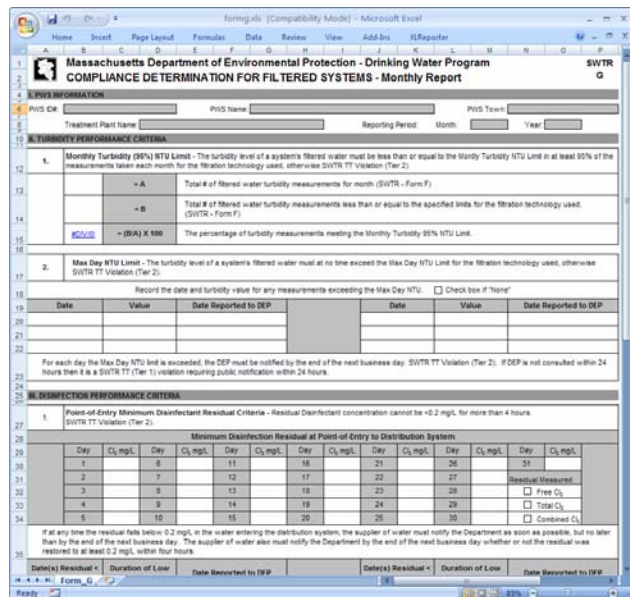
The MOR differs from state to state. In the displayed example for the state of Texas (issued by the TNRCC), the report records turbidity and residual chlorine data used for a facility with surface water sources. Typically, XLReporter can enter the repetitive data retrieved from the HMI system. In most installations, some manual data must be entered before the report is complete.



Turbidity and Chlorine Residual Report

The Turbidity and Chlorine Report is a monthly report required by a number of states. In the state of MA, Form G is used to record any daily turbidity and chlorine violations within the month.

Since February 2002, surface water providers must meet a number of requirements for storing and reporting of water turbidity measurements. Turbidity samples for each 15 minute interval must be archived for all individual filters and maintained for at least 3 years.



Turbidity values that exceed the maximum NTU must be carried forward for up to 3 months to determine violations in the current and future months. Valid turbidity measurements for the individual filters start 4 hours after every backwash.

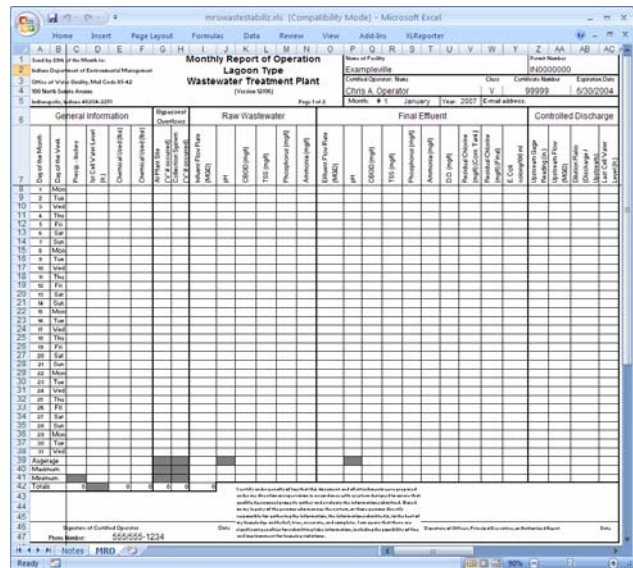
These reports clearly require an automated solution that provides periodic data sampling and a sophisticated calculation engine that determines whether the plant turbidity was within regulation over the course of a month. The old-fashioned data collection method, where an operator is recording values on a clipboard, cannot deliver the requirements of these new regulations.

SyTech's XLReporter is used successfully to fulfill these complicated requirements. It provides a monthly report that fills in the regulatory template with an absolute minimum of operator input. XLReporter's use of Excel as the calculation engine is indispensable in creating these reports. The built-in Analysis functions contribute greatly to the implementation of the many conditional calculations.

Discharge Monthly Report (DMR)

The Discharge Monthly Report is filed by wastewater facilities. Many states make these reports available on their web site; this example shows the report required for the state of Indiana.

XLReporter creates a new report for each month, entering the day of the week information on a daily basis and, dependent on how many data points are available from the automation system, fills in as many values as it can.



General Information		Raw Wastewater		Final Effluent		Controlled Discharge	
Day of the Month	Day of the Week	Flow (MGD)	BOD (mg/l)	Flow (MGD)	BOD (mg/l)	Flow (MGD)	BOD (mg/l)
1	Mon						
2	Tue						
3	Wed						
4	Thu						
5	Fri						
6	Sat						
7	Sun						
8	Mon						
9	Tue						
10	Wed						
11	Thu						
12	Fri						
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98	Sun						
99	Mon						
100	Tue						

XLREPORTER PRODUCT REVIEWS

Industrial Waterworld

"A new software reporting system is making quick work of generating reports. The software uses automatically collected data as well as manually input data and also allows analysis and review. Microsoft's Excel software forms the core of the system that generates customized reports that can be saved and distributed in many formats." View the complete article at www.sytech.com/comworld.htm

Control Engineering

"Use Microsoft Excel as a report writer. SyTech (Walpole, Mass.) recognized and set out to address the challenges of using Excel as an integrated and automated report generation solution. The result is SyTech's XLReporter product." View the complete article at www.sytech.com/comceng1.htm

Editor's Choice Award from Control Engineering

"The 35 winners of Control Engineering's 15th annual Editors' Choice Awards showed once again that control and automation's creators will likely never run out of useful ideas and solutions." View the complete article at www.sytech.com/comceng2.htm

XLREPORTER IS USED BY TOP SYSTEM PROVIDERS

Camp Dresser McKee

Ch2M Hill

Malcolm Pirnie

US Filter

Woodard and Curran

plus hundreds of local System Integrators

XLREPORTER'S COMPATIBILITY

GE Cimplicity
Wizcon Supervisor
Emerson DeltaV
Intellution FIX, iFix, iHistorian
Iconics Genesis
Kepware OPC Servers
Matrikon OPC Servers
Misubishi MX
OSI PI
NI Lookout
Citect
Rockwell RSLinx®, RSView®32, RSView® SE
Seimens WINCC
Wonderware InTouch, InSQL
Any OPC Server
Any Relational Database

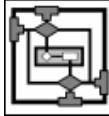
APPLICATION NOTE

XLReporter is the reporting system of choice for the drinking water plant in West Bridgewater, MA. The complete text of the application note, describing the project requirements and installed solution, is available at: www.sytech.com/prxlap.htm

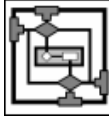
WATER/WASTEWATER FACILITIES USING XLREPORTER

XLReporter is installed at hundreds of facilities throughout the United States. A sampling over various states, for both large and small installations, is presented below.

AR East Johnson County Water
AZ South Sebastian Water, Greenwood
AZ City of Mesa Water Plant
CA City of Fairfield
CA Eastern Municipal Water District
CA LA Department of Water
CA Orange County Water District
CA Pagosa Area Water & Sanitation District
CA Palmdale Water District
CA Santa Clara Valley Water District
CA Yucaipa Valley Water District
CO City of Arvada
CO City of Loveland
CO South Adams County
CT City of New Britain Water Department
CT City of Waterbury
CT Southington Water Department
FL City of Boca Raton – Wastewater Treatment
FL City of Cocoa - Water Plant
FL City of Dunedin - Wastewater Division
FL City of Tamarac Utilities - Water
FL City of West Palm Beach Water Plant
FL South Central Regional Wastewater
GA Cobb County Marietta Water Authority
GA Columbia County Water Utility
GA City of Roswell Water Treatment
GA Clayton County Water Authority
GA Peachtree City Water and Sewage
IA Sioux City Water Department
IA Larchwood Water Plant / WSRW Rural Water
ID North Kootenai Water District
IL City of Atlanta Water Dept.



IL City of Kewanee
IL Village of Wauconda Water Department
IN Anderson Water Utility
IN Indianapolis Water Co. (USFIW)
IN Jasper Water Treatment Plant
IN Marion City Water Works
IN Mishawaka Utilities Water
KS Johnson County Waste Water
KY Harlan Municipal Waterworks
LA City of Gretna Wastewater Treatment Plant
LA City of Bossier
MA Boston Water & Sewer Commission
MA City of Brockton Water Commission
MA City of Lowell - Water Department
MA City of Worcester
MA Cohasset Water Department
MA Haverhill Water Department
MA Marshfield Waste Water Plant
MA Shrewsbury Water Department
MA Town of Needham
MA Town of Norfolk
MA Town of Walpole
MA Town of West Bridgewater
MA Town of Wellesley
MA West Boylston Water District
ME Auburn Water District
ME Lewiston Water & Sewer Department
ME Portland Water District
ME Sanford Water District
MI City of Ann Arbor - Utilities-Wastewater
MI Genesee County Water & Waste Services
MO Kansas City Missouri Water Services Department
MS City of Jackson Water and Sewer
NC Cherokee Water Treatment Plant
NC City of Asheville/Water Resources
NC Dare County Water



NC Fort Bragg Water Treatment
NH Portsmouth Waste Water Plant
NH City of Rochester
NH Raymond Water Treatment
NY City of Olean
NY City of Oswego - Water Department
NY Erie County Water Authority
NY Fort Edward Water Treatment Plant
NY Lake Placid Waste Water Plant
NY Monroe County Water Authority
NY Town of Colonie
NY Town of Harriman Water Treatment Plant
NY Town of Tonawanda Water Department
NY Village of Liberty - Water Dept.
OH City of Cleveland
OH City of Columbus
OH City of Oregon
OH Newton Falls Water Treatment
OK City of Sapulpa Water
OR City of Florence
OR City of Drain
OR City of St. Helens
OR Raleigh Water District
PA Easton WasteWater
PA Pottstown Water Treatment Plant
PA Western Berks Water Authority
PA Warrington Township Water
RI City of Newport
RI Cumberland Water Department
RI Kent County Water Authority
SC Greenville Water System
SC Powdersville Water District
SD Aberdeen Waste Water Facility
SD Vermillion Water Treatment Plant
TN City of Johnson City
TX City of Deer Park Surface Water

TX Clear Lake City Water Authority
TX El Paso Water Utilities Public Service Bd
TX Greenbelt Municipal & Ind'l Water Author
TX San Patricio Municipal Water District
TX Tarrant Regional Water District
TX Travis County Water
UT Central Utah Water C. D. – Duchesne
UT Timpanogos Wastewater Treatment Plant
VA Dinwiddie County Water Authority
VT Vergennes Water Treatment Plant
WI City of Janesville
WI Neenah Water Utility

LINKS TO STATE REPORT FORMS

A sample list of links to state forms that are available on the internet is given below:

AL	www.adem.state.al.us/DeptForms/Formpdf.htm
AK	www.dnr.state.ak.us/mlw/forms/#water
AR	www.adeq.state.ar.us/water/branch_npdes/permits/default.htm
AZ	www.azwater.gov/dwr/Content/Find_by_Category/Permits_Forms_Applications/default.htm
CA	www.dms.water.ca.gov/mao_public/index.cfm
CO	www.cdphe.state.co.us/wq/drinkingwater/PublicWaterSystemReportingForms.html
CT	www.ct.gov/dph/cwp/view.asp?a=3139&q=387316&dphNav_GID=1824&dphNav =
DC	http://doh.dc.gov/doh/cwp/view,a,1374,Q,586631,dohNav_GID,1811,.asp
DE	www.dnrec.state.de.us/water2000/SiteMap/SiteMap1.asp?Type=FO
FL	www.doh.state.fl.us/environment/water/manual/encl1.htm
GA	www.gaepd.org/Documents/epdforms_wpb.html
IA	www.iowadnr.com/forms.html
ID	www.idwr.idaho.gov/about/Forms_Rules_Statutes%20Links.htm
IL	www.epa.state.il.us/water/forms.html
IN	www.in.gov/idem/permits/water/index.html
KY	www.water.ky.gov/dw/profi/mrr/drinking+water+forms.htm
MA	www.mass.gov/dep/service/online/forms.htm
ME	www.maine.gov/dhhs/eng/water/Templates/DownloadDocuments/downloaddocuments.htm
MI	www.deq.state.mi.us/documents/deq-swq-biosolids-DMR.xls
MN	www.dnr.state.mn.us/waters/forms.html
MO	www.dnr.mo.gov/forms/index.html#DrinkingWater
NC	www.deh.enr.state.nc.us/pws/forms/forms_%20pg.htm
NE	www.dnr.state.ne.us/docs/formlist.html
NJ	www.nj.gov/dep/watersupply/wsa_formssdw.htm
NM	www.nmenv.state.nm.us/dwb/Resources.html
PA	http://164.156.71.80/WXOD.aspx?fs=cb7cd840f80b00008000014d0000014d&ft=1
RI	www.health.ri.gov/environment/dwq/reportingforms.php
SC	www.scdhec.net/environment/admin/htm/eqforms.htm#DW
SD	www.state.sd.us/denr/des/drinking/download.htm
TN	http://tennessee.gov/environment/permits/h2oforms.shtml
TX	www.tceq.state.tx.us/cgi-bin/comm_exec/forms.pl#Water



To find out more about SyTech and XLReporter visit www.TheReportCompany.com. Here you will be able to download a free version of XLReporter and see for yourself that reporting can be made easy once you have the right tools. If you wish to discuss your reporting needs, please contact us.

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