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Principal Author: Paul Jehn

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Recipient Name and Address: Ben Grunewald
Ground Water Protection Research Foundation
13308 North MacArthur Boulevard
Oklahoma City, OK 73142

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ABSTRACT/EXECUTIVE SUMMARY

Under the Energy and Environment Initiative, the GWPC/GWPRF will expand the oil and gas electronic commerce initiatives used to enhance the Risk Based Data Management System (RBDMS) and the Cost Effective Regulatory Approach (CERA). The GWPC/GWPRF has identified the following priorities for work efforts during the time period that will act as the base from which selections for each work period will be proposed. Work tasks will be presented for each reporting period by the GWPC from areas selected from the general list of priorities.

RESULTS AND DISCUSSION

Comprehensive Report Task 1: RBDMS Core Development

RBDMS or an RBDMS utility is now installed in 20 states and one Indian Nation, work has begun on installing RBDMS in Illinois and Oklahoma. Future developments for the RBDMS Core Program will concentrate on fixing identified bugs; offer required enhancements, and updating the RBDMS Core to be compatible with new developments in Microsoft Access, migration to Windows Yukon, .net technology, and SQL server. GWPC/GWPRF will also maintain an RBDMS web presence where states may engage in peer-to-peer networking. The RBDMS Core program will also be updated to be compatible with the electronic commerce initiative.

Accomplishments September 1 2004 – April 30 – 2005

The temporary web address for RBDMS is http://virtuales.com:81/RBDMS/default.aspx. This site hosts a discussion list, provides downloads and maintains the official versions of all RBDMS software.

Arkansas and Alabama are being updated to take advantage of new developments in RBDMS. A .net field inspection utility is being tested in Arkansas. A work plan has been developed to install RBDMS in Indiana.

A water quality database for energy activities is under development and will be tested in Ohio. This system will interact with RBDMS and will warehouse monitoring data received by the Ohio DNR.

Accomplishments May 1 – August 31, 2005

The Web address for all RBDMS projects is http://www.rbdmsonline.org:81/projects/rbdms/default.aspx. Work plans and project status reports are continually updated and are available on this site. The RBDMS Core program is being revised to take advantage of .net technology. Iteration 3 workplan is available to download at the web site. RBDMS representatives from New York, Ohio, Kentucky, Alabama, Arkansas, Indiana, Oklahoma, Nebraska, Texas, Utah, New Mexico, Colorado, North Dakota, Nevada and California met and tested new RBDMS modules and discussed methods for continued data sharing and compatibility. The RBDMS .net front end interface can be used in non-RBDMS states.

The University of Texas will be using RBDMS to manage over 10,000 oil, gas and injection wells in west Texas.

Accomplishments September 1, 2005 – February 28, 2006

RBDMS documentation and help manuals have been updated to include recent changes and to make them more user friendly. These are available for downloading and viewing:

The following desktop video files are in zip-to-exe archives that include the .avi (each about 5 minutes long) and video codec. The help files are in Windows .hlp format.

- Desktop video introduction to RBDMS: http://www.rbdmsonline.org/Downloads/EIMSrbdms01AVI_CP.exe
- User and admin help files for generic RBDMS, including well schematic utility and multilateral construction: http://www.rbdmsonline.org/Downloads/RBDMS_WSU_MLhelp020805.zip
- Basic Training Video 1: http://www.rbdmsonline.org/Downloads/Sort_FilterRBDMS01_CP.exe
- Basic Training Video 2: http://www.rbdmsonline.org/Downloads/IntroWellMaster01Avi_CP.exe
- Basic Training Video 3: http://www.rbdmsonline.org/Downloads/MITavi01_CP.exe

The generic Access front end included a menu pick that auto-generated a data dictionary. Many of the RBDMS state agency SQL Server installations were customized, so one data dictionary doesn't exist. However, from part of a recent analysis I did for a project, here is a data dictionary I ran for New York RBDMS: http://www.rbdmsonline.org/IN_DataMapRBDMS/NY_DD.htm and here is another I generated for Arkansas RBDMS: http://www.rbdmsonline.org/IN_DataMapRBDMS/AR_DD.htm.

Please see the video files. We are using these for training and demonstrations.

Accomplishments March 1, 2006 – August 31, 2006

Oklahoma: The Oklahoma Corporation Commission will be installing RBDMS in 2007. Work has begun on the development of the workplan. The attached draft workplan will be finalized by January 2006 with phase I being targeted for completion in June 2007. Oklahoma will build on the .net platform developed for California and Indiana.

Indiana: The Indiana RBDMS system incorporates .net technology and builds on the success of recent developments in California. Indiana RBDMS should be deployed in Spring 2007.

For complete descriptions and accomplishments of this task and of these projects please see the 2006 RBDMS Annual Report (attached) or download from: http://www.gwpc.org/UIC/Data%20Management/uic_data_management_main.htm

Accomplishments September 1, 2006 – February 28 2007

Indiana RBDMS has been completed. The update table structure used in Indiana will be the basis for RBDMS.net. The latest front end installer for Indiana RBDMS is available at http://RbdmsOnline.org/downloads/IN/RBDMSWinSetup.zip the latest database backup is available at http://RbdmsOnline.org/downloads/IN/INRBDMS_Bak.zip . The workplan for Oklahoma RBDMS.net has been finalized and work has been initiated on this project.

Accomplishments March 1, 2007 – August 31, 2007

Work has begun on RBDMS.net for Mississippi and Oklahoma. Mississippi is contributing $500,000 in state match for this project. The alpha version of the administration module was presented to states at the GWPC annual forum (September 2007) in San Diego. The RBDMS technical committee approved the concept. A final version will be demonstrated at the UIC meeting in January in New Orleans.

Accomplishments September 1, 2007 – March 31, 2008

A complete listing of accomplishments for Mississippi RBDMS can be found at http://www.rbdmsonline.org:81/Projects/MS/Lists/Work%20Products%20Delivered/AllItems.aspx. Contact pauljehn@adelphia.net for access to this site.

On-site quarterly meetings are held at the Mississippi oil and gas commission. The Administrative module for RBDMS.net has been completed and is available for download from the RBDMS share point site. The RBDMS Entity Bond Module has been released in beta format. GWPC released a RFP to customize the entity bond module for Oklahoma. Bids are due to GWPC by April 11, 2008.

Accomplishments March 1 – September 30 2008

Work Products Delivered	Date Delivered
MS Original (Classic) RBDMS ERD and Data Dictionary	09/10/2007
RBDMS.NET ERD and Data Dictionary	11/08/2007 01/09/2008 08/16/2008
Needs Assessment document and use cases	09/13/2007 final 06/10/2007 business process review
Re-work of E-B data structure	10/09/2007
Kickoff Meeting Summary	11/01/2007 published
RBDMS GIS updates	11/26/2007 01/22/2008 04/20/2008
Data migration plan	11/02/2008
Revised data structure per San Diego directive	11/07/2007

Work Products Delivered	Date Delivered
SQL Server 2005 .bak file of MSRBDMS.NET	01/22/2008 05/16/2008 06/26/2008 08/14/2008
SSIS packages for MS RBDMS.NET in VS.NET2008 Project	04/25/2008 posted to SPS 01/22/2008 reported implemented
Data Mining Pre-release including reports	01/11/2008
RBDMS Data Mining, with GIS Beta, Reports, Queries, Filters--Beta Release	02/18/2008
Southern Geological Society meeting, onsite training	02/19/2008
Installer for RBDMS WinAdmin.NET	09/22/2007 11/02/2007 01/22/2008 02/21/2008 03/14/2008 04/15/2008 05/21/2008 06/12/2008 06/20/2008
MS RBDMS Security SQL Server Backup	03/07/2008 03/14/2008 05/21/2008 06/13/2008 06/30/2008 08/14/2008
RBDMS WinAdmin.NET User Help, Word Version WebHelp Version	11/02/2007 03/26/2008 06/20/2008
WPF Front-End Application	01/22/2008 E-B, ref 04/17/2008 well, E-B, ref 06/23/2008 well, E-B, ref (LINQ) 10/17/2008 (plan) permit, well, E-B, ref
eReport pre-alpha	08/22/2008
Board Reports	11/26/2007 02/22/2008 04/14/2008 08/22/2008
ALL PRODUCTS AND DOCUMENTATION IS AVAILABLE FOR VIEWING AND DOWNLOADING FROM THE RBDMS SHAREPOINT SITE: http://www.rbdmsonline.org:81/projects/rbdms/default.aspx	

Accomplishments October 1, 2008 – March 31 2009

- RBDMS Entity Bond Module installed in Oklahoma
- Needs assessment and workplan developed for RBDMS well module for the Oklahoma Corporation Commission
- Work initiated on installing RBDMS Classic in Illinois
- Work initiated on needs assessment for Pennsylvania RBDMS
- Iteration 4 Mississippi RBDMS has been released

Iteration 4 Mississippi RBDMS.net - Contents

File Locations

Files related to the installation have been posted to the /Downloads folder of the rbdmsonline.org development server:
RBDMSSecurity.bak: http://www.rbdmsonline.org/Downloads/MS/RBDMSSecurity.zip
MSRBDMS.bak: http://www.rbdmsonline.org/downloads/MS/MSRBDMS.zip
WPF application installation: http://RbdmsOnline.org/downloads/MS/RBDMS WPF MS 4 20090219b.zip
Test case documents: SharePoint site Shared Documents library, Test Cases folder

New Modules and Functions

In Release 4, MSOGB will be getting its first look at the following new functionality:
Dockets: Create docket items, set hearing dates, add the wells, facilities, and fields associated with the docket item, and create orders.
Payments: Create and track payment records that include multiple instruments and allocations, and associate payment allocations to specific docket, permit, or other transaction type codes.
Inspections: Create new inspection records for NORM, MIT, Bradenhead, and pit operation, run reports of inspections due, and retrieve inspection records by API number.
Permits: In addition to creating a routing Form 2s through approval steps, create and route plugging (Form 6) and pit permits (Form 18).
POFR: From the Processes menu, generate a report of annual unpaid well fees for grouping and sorting by API, Operator, or Due Date.

Known Issues

Installation Notes

After you install the RBDMS WPF client, the application configuration file /AppData/GWPC_MS.xml must be manually edited with NotePad or Visual Studio consistent with the test case document Installation and Database Setup to make the map images on the home page available on application start. Otherwise, the user will receive a file not found exception message as the application opens. This will be addressed in a later development cycle.

Comment Boxes

Many of the text area controls in place in the application for comment, remark, and description fields are not allowing text wrapping and carriage returns in this release. This problem has been corrected, but the remedy was not included in the last build before Iteration 4 release.

Permits

-Plugging (Form 6) The development team needs guidance for how the MSOGB is currently assigning permit numbers for plugging requests. For the time being, we have assigned plugging permit numbers in the same way described in the Needs Assessment use case for pit permit numbers from Millie's manual log entries, e.g., "2009-seqnoPLUG." We will adjust this if necessary in the next iteration.

-Pits (Form 18) The ellipse button for the pit selector on the Inspections | Pit subpage now shows all permits. The development team requests guidance on whether this selector should be filtered for only pit permits. Is it appropriate to leave it as it is so that well permit numbers also can be referenced?

Payments

The initial release of the Payments module has been re-factored to address various MSOGB transaction scenarios, and linkages between the Payments and Permits and Dockets module have been developed. After a conversation with Dianne on January 28, the development team altered the direction of this communication, so that the linkages between payment records and permit and docket records can be created from within the Payment module. The development team requests MSOGB guidance on whether these processes are now flowing in the correct way because some confusion about process details remains.

The quality control check at the top of the Payment Information form will be removed in the next iteration since this field is not editable. It is calculated from information entered on the subpages, as MSOGB requested.

Dockets

The development team is still working on the details of automating the assignment of multiple field numbers to docket items. Current thinking is that, since many fields can be associated with a docket item on the Docket | Members page, perhaps the reports can be used to display the correctly formatted docket number based on the docket members. MSOGB comment about this approach is invited.

Inspections

The data structure to accommodate Inspections has been in continual evolution during this iteration while the forms were in development. Therefore, SSIS routines have not yet been run to populate this module. The development team requests that the MSOGB staff members enter test data and assess how these newly released forms fit agency requirements. The SSIS task will be undertaken when comments about this release have been received and incorporated.

Reports

Report work is ongoing and, data structure changes that were made at the request of the Technical Committee affected the performance of some of the existing reports. Many of these issues have been addressed in this release, and others are known but are still outstanding. The reports still in need of debugging are the two on the Reports menu under the Permits node.

Suggested Testing Focus

The development team believes that there is enough system architecture in place to test process flow through the modules. We suggest that the MSOGB staff put together a hypothetical scenario of a new operator walking in the door with a letter of credit, a check, an affidavit, a Form 2 for OPI, and a Form 18 in hand along with the need to compress the processes of the next 12 months into 30 minutes. Such a test will exercise, in order, the RBDMS processes that model the regulatory requirements:

- Creating the entity and financial responsibility record
- Processing the payment and docket requests
- Inputting the permits to drill and to construct a pit through the approval process
- Creating the well record through permit approval
- Adding spudding and construction details
- "Conducting" an MIT inspection
- The development team expects that such a test will reveal much about what may be potentially missing from RBDMS.NET and ways in which the application can be re-factored to smooth these processes. We suggest that the *tester tester* login account continue to be used for testing.

In Process Now for Iterations 5 and 6

We are working on the following inclusions for the next release:

- Printing and export features from the Permit and Docket modules will be advanced.
- A splash screen will be added.
- The home page GIS map features will be advanced.
- Work will begin to integrate links to the imaging system.
- Product Deliverability (Form 4a): A Production Test tab will be added in the Construction module at the same level as the Casing, Geophysical, and Perforations tabs.
- An Injection tab will be added at the top subpage level of the Well Information form to match the Production summary report.
- Publications tracking will be added to the Processes menu.
- Gas Plant, Refiner, and Transporter subforms will be added to a Production explorer to supplement the eReport.NET application.
- Changes will be made in the Reference module to improve data entry flow.
- Work on administrative and user help files will be begun.

All RBDMS core products are available for download at http://rbdmsonline.org:81. Contact Paul Jehn if you need a password to this site.

Accomplishments April 1 – 2009 – September 11, 2009

- RBDMS.net is installed in Mississippi. Final testing is currently underway
- Classic RBDMS is being beta tested in Illinois
- RBDMS.net entity bond module is deployed in Oklahoma
- Work plan for RBDMS.net has been submitted to PA. Installing RBDMS.net in

PA will be included in the next workplan between DOE and GWPC.

- RBDMS Classic and .net versions have been updated to be compatible with electronic commerce activities.
- Peer to peer networking is achieved through the RBDMS sharepoint site http://rbdmsonline.org:81 and the new RBDMS document management page www.rbdmsonlie.org.

FINAL Period Report Task 1 – RBDMS Core Development

RBDMS or an RBDMS utility is now installed in 20 states and one Indian Nation. Future developments for the RBDMS Core Development task will concentrate on required enhancements and updating the RBDMS Core to be compatible with new developments such as Windows Yukon, .NET technology, and SQL Server upgrades and providing migration pathways out of the older Microsoft Access environment. The Recipient shall maintain an RBDMS web presence where states may engage in peer-to-peer networking.

The Recipient shall continue to hold an annual training event where states receive training in the use of RBDMS and electronic commerce applications. This highly successful event is the primary technology transfer mechanism for the RBDMS program. This training is organized and conducted by states and specifically designed to meet their RBDMS needs. These training events are held at or near one of the RBDMS state agency locations for an opportunity to further highlight and benefit the host agency's information management processes.

Under this task, state travel will also be supported to attend RBDMS/electronic commerce workshops. In these workshops, the RBDMS Technical Committee develops program direction, reviews software applications, and works with industry and state/federal agencies to develop common solutions.

FY09 Milestones:

RBDMS.NET Front-end Application - Update to .NET technology and Silverlight user interface for improved performance, speed, and reliability.

- Mississippi beta test: ***Completed, RBDMS.net is in the final stages of testing in Mississippi***
- rollout to industry in MS: ***Completed data mining and electronic reporting are operational in Mississippi***
- beta testing of portions in OK: ***Completed, Entity bond and well modules are installed in Oklahoma***
- rollout to other member-state agencies: ***Completed and on-going: RBDMS.net applications are being used in Nebraska, Colorado, Arkansas, New York and Ohio***

RBDMS.NET Security Application - Enhancements to meet requirements of multiple states, as specified by work plan.

- enhancements set to roll with associated projects ***Completed: the upgraded RBDMS security feature in being used in e-commerce applications in Colorado, Nebraska, Arkansas, Ohio, Mississippi, New York and Pennsylvania***

Install RBDMS Classic in Illinois

- beta install RBDMS Classic ***Completed: RBDMS Classic beta is installed in Illinois, final install is scheduled for January 2010***

CO2 Geosequestration Module Development

- review proposed national and state CO_2 regulations and make recommendations for a RBDMS CO_2 module. ***GWPC completed a review of the needs of Montana and North Dakota for CO2 data needs.***
- develop a beta version of the CO_2 module to pilot test in North Dakota ***A beta version of the CO2 module has not been complete. GWPC is waiting the final outcome of Montana and North Dakota legislative requirements as well as the federal rule making. RBDMS modules which will compliment the CO2 module are in beta testing. These include RBDMS water and eForms. EForms will allow industry to submit CO2 geosequestration and hydraulic fracturing data to state regulatory agencies.***

Comprehensive Report Task 2 - Electronic Commerce

The activities for task two focuses on reaching consensus among oil and gas states, industry, USDOE and BLM/MMS on a common approach to electronic commerce for oil and gas regulatory programs and continuing the development and implementation of electronic commerce based on these results and GWPRF's current work with XML schemas. Electronic commerce activities include:

1. On-line data access

GWPC/GWPRF has developed two pilot projects that allow industry to access state RBDMS data. These pilot projects use Java, Cold Fusion, and/or Crystal Reports to access data on-line. Under this task, GWPC/GWPRF will continue to develop, refine, and install the national on-line data access utility for RBDMS states. Possible solutions include a .net interactive GIS front end. This initiative will enable industry to reduce exploration and compliance costs and improve environmental performance by providing real-time on-line access to data. On-line data access allows dynamic data access via the Internet and can run as an application over a local or wide area network. The programs include data filtering, downloading, and advanced querying of the database. It will also provide a sound scientific basis for cost-effective, risk-based regulatory decisions and improve access to public lands and sensitive environments.

Accomplishments September 1 2004 – April 30 – 2005

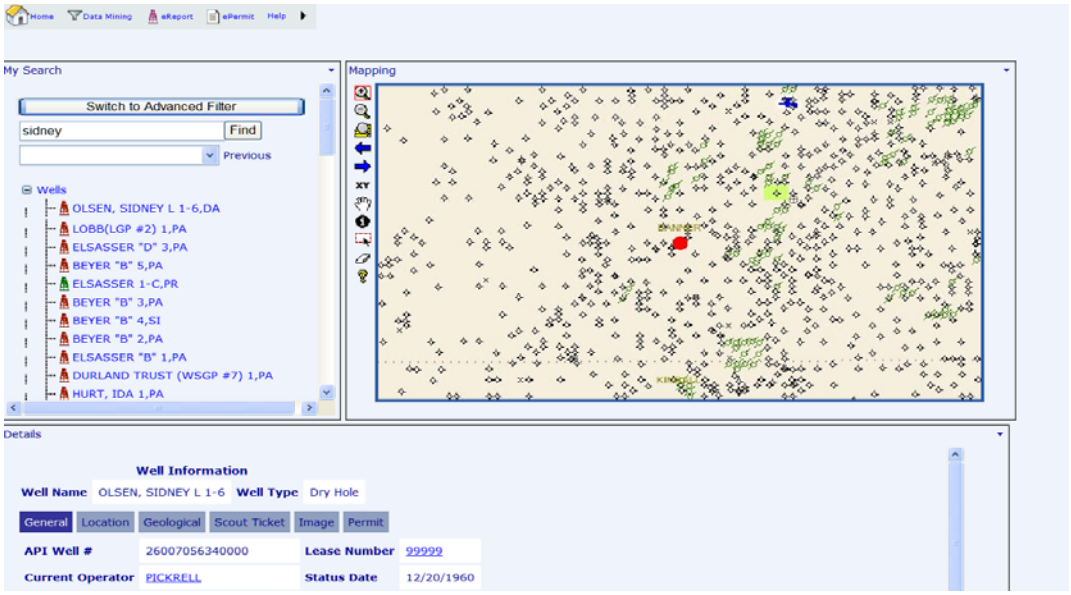
The Alaska Oil and Gas Commission data mining page http://www.state.ak.us/local/akpages/ADMIN/ogc/publicdb.htm provides on-line access to RBDMS. This will be used as the basis for future RBDMS data mining applications. This uses a .net/GIS interface and has gained acceptance by industry and regulators. A work plan is under development to install in Montana. The .net/GIS interface will be the basis for all future RBDMS projects.

Accomplishments September 1, 2005 – February 28, 2006

A new data mining interface is under development. A beta can be viewed and tested at http://rbdmsonline.org/rbdmsonlinedev

Accomplishments March 1, 2006 – August 31 2006

The new data mining interface is being update and customized for Nebraska. Full deployment is scheduled for late 2006. In this interface, the user will be able to view a GIS mode and easily click for more information. This same interface will also be deployed in Ohio, Osage Nation and Mississippi in early 2007.



Accomplishments September 1, 2006 – February 28 2007

The Nebraska data miner has been finalized and installed. This module will be the basis of the RBDMS training in May 2007.

Accomplishments March 1, 2008 – September 30 2008

The RBDMS online data miner has been installed in Mississippi as part the the RBDMS.net package

The Alaska Oil and Gas Conservation Commission's data miner page has been updated using RBDMS technology (www.-aogcc-alaska.gov). This iste provides up-to-date information to the industry public and regulatory agencies. There is no cost to access Alaska's RBDMS system through this site. The new enhanments have made the site faster and easier to use.

The Montana data mining site has also been updated and offers Internet access to all scanned and generated Board orders in Adobe format.

In New York wseb traffic has increased from about 500 hits a day to over 3000 in the past 5years. The New York DEC indicates that this is a direct result of RBDMS technology that makes data easy to obtain on the web.

Accomplishments April 1 2009 – September 11, 2009

GWPC has updated the RBDMS data miner to take advantage of Silverlight and .net technology. RBDMS data access web sites have been upgraded in Montana, North Dakota, Nebraska, Illinois, Indiana, Ohio, New York and Mississippi.

2. Electronic permitting and reporting

RBDMS states have developed a prototype electronic reporting system that is being tested in Utah, Montana, and California. Under this task, GWPC/ GWPRF will collaborate with the BLM, MMS, and industry to refine the electronic reporting module. GWPC/GWPRF and BLM have developed a business case which will guide the development and implementation of electronic permitting and reporting. GWPC will host an electronic commerce forum at the GWPC Annual Forum in September 2004. Participants include states (including states which do not use RBDMS), industry, BLM and MMS. A goal for this meeting will be standardizing XML schema development, which will serve as a platform for XML translator software using an N-tier data base model. This translator will facilitate the XML data exchange among multi-agencies using different data systems.

Accomplishments September 1 2004 – April 30 – 2005

Phase one of RBDMS on-line has been completed. This forms the administrative basis of electronic permitting and reporting. Documentation and work plans can be downloaded at http://www.state.ak.us/local/akpages/ADMIN/ogc/publicdb.htm.

The goals of RBDMS e-commerce are:

- Support state and industry data exchanges
- Provide a phased implementation plan
  - Production Reporting
  - Permitting-Sundry Notice
  - Full life cycle reporting

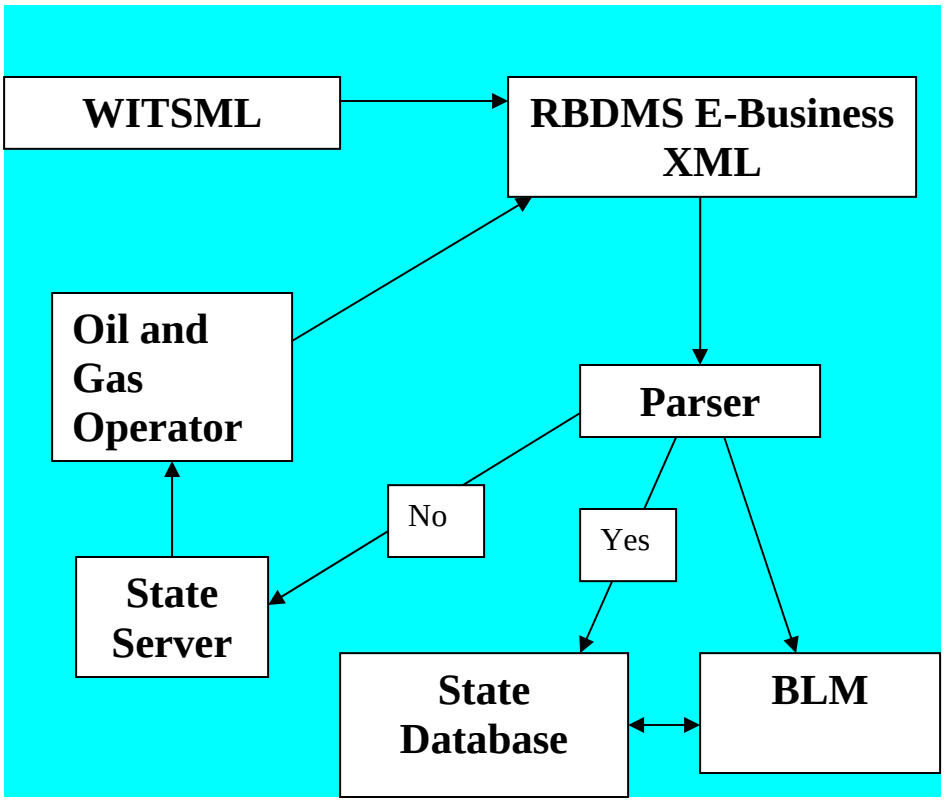
Electronic reporting is now available in the following states:

- Montana (monthly)
  - Web based, xml submission and flat ascii
- Utah (monthly)
  - Full featured: web, .net, and xml submission
- Pennsylvania (annual)
  - Web entry, pre-populated mdb's supplied
- New York (annual)
  - .net, mdb's and xml submission
- Nebraska (monthly)
  - Full featured: web, .net, mdb's, and xml submission

The XML schema for electronic permitting has been developed and is being reviewed by states and POSC. After this review, industry comments will be solicited.

Accomplishments May 1 – August 31, 2005

Industry is now testing the XML e-permitting schema in California. By soliciting feedback from industry, BLM and MMS, and states, the RBDMS user group has refined the e-permit data flow diagram.



As can be seen from the above diagram, WITSML is being used as the model standard. WITSML has been accepted by industry as the standard for XML activities. The RBDMS e-business XML is a subset of WITSML and is being modified to meet the business needs of all oil and gas producing states.

Accomplishments September 1, 2005 – February 28, 2006

Colorado, Alaska, Kentucky and Alabama are the pilot states for electronic permitting. Based on the work completed in California, GWPC has developed a functional design document which will guide the e-permit development. See appendix for the functional design document.

The California e-permit schema, which is based on WITSML, was reviewed against the requirements of the 4 pilot states. In additional industry was asked to review and comment on the proposed schema. The results of this evaluation are contained in: E-Commerce Project

Existing Schema Review and Industry Survey. The full text of the document is contained in the appendix.

A model business process analysis is being conducted in Utah and will be used as a model for the pilot e-permit states. A complete workplan for the project is contained in the appendix.

Accomplishments March 1, 2006 – August 31, 2006

The Business analysis for Utah has been completed.

Accomplishments September 1, 2006 – February 28 2007

The e-permit schema has been reviewed by States, BLM, and MMS. An updated version is currently under review by industry. The latest schema, workplan and timeline for e-permitting can be downloaded here http://www.rbdmsonline.org:81/Projects/ePermit/default.aspx. Contact pauljehn@adelphia.net if you need a user id/password.

Accomplishments March 1, 2007 – August 31, 2007:

E-report has been installed in North Dakota. The attached document ND Forms to ereport mapping, is designed to assist companies in generating XML files for electronic reporting.

The E-commerce detailed design document has been completed and approved by RBDMS states.

The Colorado Oil and Gas Conservation Commission will be testing electronic permitting for APDs in the summer of 2007.

For complete descriptions and accomplishments of this task and of these projects please see the 2006 RBDMS Annual Report (attached) or download from: http://www.gwpc.org/UIC/Data%20Management/uic_data_management_main.htm

Accomplishments September 1, 2007 – March 31, 2008

GWPC has begun to add water quality data to the Nebraska Data Mining site (www.nogcc.ne.gov). Additional data and a statistical analysis package will be added in 2008.

Work on e-permit was suspended in September 2007 due to budget shortages. Work has now resumed and Colorado expects to test an on-line APD in summer of 2008.

Electronic reporting has been updated in New York and Pennsylvania and is underway in Arkansas. The workplan for the .net version has been approved and is scheduled to be tested in Mississippi in summer of 2008.

Accomplishements March 1, - September 30, 2008

- RBDMS ereport.net is being tested in Arkansas
- RBDMS ePermit has been released for testing in Colorado.
- Utah and North Dakota are now accepting applications to drill electronically, NewYork is in the process of modifying the Utah ePermit (Cold Fusion Technology) for use for accepting application to drill permits.

- myQuery.net has been developed and is being tested in Montana
- RBDMS Analytical Capabilities: States have discussed this option and would like to add features to their web sties specific for DOE. DOE/GWPC/State meeting to be help in Pittsburgh in early 2009. NETL to schedule.

Accomplishments: October 1, 2008 – March 31 2009:

- In Colorado, the GWPC is developing a Web-based permitting system that includes several tiers of data quality control, a public comment forum, and a notification system that alerts industry and sister-agency users of permit status. ePermit also was launched in Utah and New York.
- The Colorado RBDMS.net epermit is being tested in Colorado and will be ready to accept permits in spring of 2009
- RBDMS data mining has been updated in Nebraska
- Arkansas is testing the latest version of RBDMS ereport

Accomplishments April 1, 2009 – September 11, 2009

The GWPC and RBDMS states have developed a generic eforms application which can be used electronic reporting and electronic permitting.

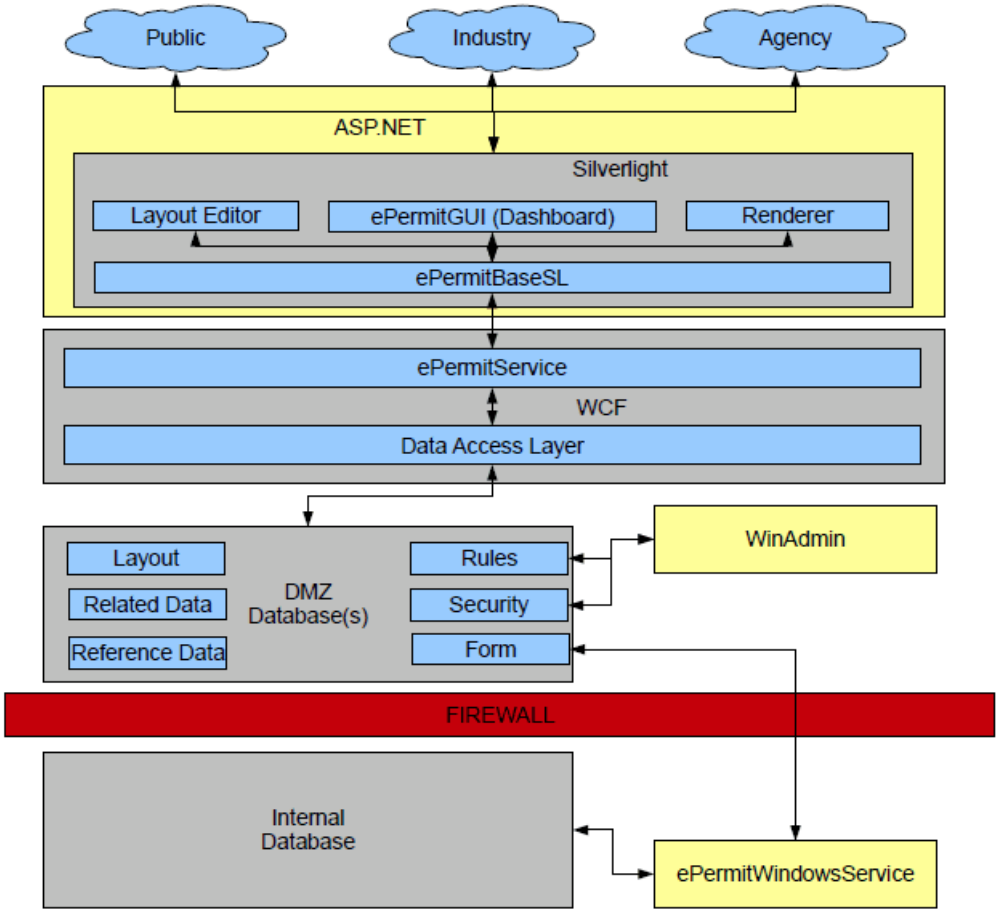
The eForms application is an electronic permitting Web application that could be established to eliminate duplication of data entry and storage of permit applications. It was conceptualized as a way for industry operators to provide permit information online only once and then have multiple agencies share access to the data, if desired. As the eForms project has matured, the GWPC has realized that the architecture also can be used to support other types of online forms submission, such as oil and gas production and water quality reporting.

As shown in the figure on the next page, the eForms project is an integrated set of server tools that are based on Silverlight Web clients (one external and one internal), a Windows Communication Foundation (WCF) middle tier, and a SQL Server 2008 intermediary database in a DMZ that is replicated to the production database behind a firewall. The server tools include the following components:

- ePermit Silverlight Web application
- Forms Designer
- ePermitService
- ePermitWindowService
- RBDMS WinAdmin.NET
- Schema and parser

This training guide is meant to document only the uses and inner workings of the eForms application. Information about the availability, installation, configuration, use, and maintenance of Microsoft development tools and enterprise software such as SQL Server, Reporting Services, and Visual Studio is available from the Microsoft Web site (http://www.microsoft.com/en/us/default.aspx).

eForms Application Architecture.



The entire training manual for eFOrms can be downloaded from http://www.rbdmsonline.org/RbdmsOnline/default.aspx

Utah and New York have updated on-line permitting systems using ColdFusion

Electronic Reporting has been upgraded in: Montana, Illinois, Nebraska, New York, Pennsylvania, Mississippi and Arkansas

FINAL Period Task 2 – Electronic Commerce

This task focuses on reaching consensus among industry, state oil and gas agencies, and federal agencies (e.g., USDOE, BLM and MMS) on a common approach to electronic commerce for oil and gas regulatory programs, and continuing the development and implementation of electronic commerce based on these results and the Recipient's current work with XML schemas. The Recipient's electronic commerce activities shall include:

Subtask 2.1. Data Mining and On-line Data Access

State agencies have historically offered some level of data availability from their Web sites, usually static data file downloads. The Recipient is working to integrate much of the data from either state or federal regulatory agency databases; making it useful to the oil and gas industry and to regulatory decision making processes. The Recipient's Data Mining application has improved this mode of data delivery through full-text searching, sophisticated ad hoc querying, and geographical information system (GIS) integration with the data display to make information highly accessible to the users.

The Recipient's Data Mining application is a public Web interface for RBDMS that is offering unprecedented opportunities for targeting oil and gas exploration activities online. This ASP.NET application pairs a GIS window with full-text database searching of the agencies' existing SQL Server oil and gas database. When a keyword is entered, the search results are categorized in a tree control embedded in the Search pane, with the list elements hyperlinked for either a Details display or zoom-to-location operation in the Map pane. These features make browsing data fast and easy for both casual and sophisticated users.

FY09 Milestones:

Application Enhancements - Provide public Web interface for agency database with full-text search, GIS, integrated reporting and print output.

- rollout to industry
- rollout of upgrades to other states (e.g., NE, AL, OH, OK) ***Completed in Nebraska, Ohio, Mississippi, New York testing is currently underway in Alabama and Oklahoma.***

myQuery.NET Enhancement - Create a tool that can use existing RBDMS Data Stores for Ad-Hoc Query analysis techniques using .NET web technologies.

- beta test and final rollout ***Completed and installed in Montana***

RBDMS Analytical Capabilities – Through coordination with DOE/NETL staff, the Recipient shall explore creating enhanced analytic capabilities within RBDMS that provide information useful for federal government or public analyses and evaluations. Examples of RBDMS enhancements include, but are not limited to: internet-based historical oil and gas production data with plot application tool, decline curve analysis techniques and economics; state-level produced water statistics; water quality/quantity data; and, analytical tools to compile permit activity from multiple states to show active oil and gas plays .

- conduct training session with NETL personnel and solicit input for RBDMS analytical enhancements
- create limited analytical tools and beta test. ***This task on hold as requested by DOE. The data mining feature can be used to obtain information from state web sites.***

Subtask 2.2. Electronic Reporting

eReport is the Recipient's highly successful multi-tiered Web application that oil and gas

owners and operators use to report oil and gas production and Underground Injection Control (UIC) data directly to state agency databases. Although user interfaces and data requirements differ among the agencies as a result of statutory differences, state agency eReport installations are based on the same unifying format, an extensible Markup Language (XML) schema document (XSD) called eReport. eReport demonstrated the efficacy of using XML for such data transfers, serving as a model for the ongoing ePermit project. The eReport schema, now in version 3.5, is a recommended standard of the American Petroleum Institute (API). The application is now in use in Nebraska, Utah, New York, Pennsylvania, Montana, and North Dakota, and new installations will be launched in Arkansas and Mississippi in 2008. Also, after 5 years of using the earliest Access utility version of eReport, Pennsylvania will update their installation this year to use the latest version of the eReport smart client and .NET web service in time to capture the 2008 production reports from industry.

eReport is replacing the ASCII-formatted data transfers that industry operators were previously using in some of these states. The ASCII format required extensive manual review and error tracking in re-work loops that were time consuming for both agencies and operators. In some cases, the process of discovering and correcting errors in these flat-file or paper submittals took days or even weeks. eReport's automated data quality checks and XML schema eliminated these re-work loops and greatly simplified the monthly and annual production and injection reporting cycles.

In the agencies that have customized eReport to match their business rules, the application has eliminated rework loops for both the operator and the agency stemming from incomplete or incorrectly formatted submittals. eReport applications have built-in automated, multi-level data validations, so formatting and other errors are flagged as the operator completes the forms. The application also checks to make sure that required fields are filled in and that valid codes are used.

FY09 Milestones:

eReport.NET - Enable industry to report production, injection, disposition through a WinForm smart client that converts the input to eReport schema-compliant XML with multiple layers of automated data quality control checks.

- rollout to industry in MS and PA. ***Completed in MS, PA, NE, Arkansas and New York***

Subtask 2.3. Electronic Permitting

At a time when the processes for developing North America's energy resources increasingly require technological innovation, oil and gas regulatory agencies nationwide are receiving a record number of applications for permission to drill (APDs). In response, the Recipient is working with the USDOE, Energistics [formerly the Petrotechnical Open Standards Consortium (POSC)], the BLM, MMS, API, and state oil and gas regulatory agencies to develop a Web application to automate portions of the oil and gas well permitting process.

As the first step in automating the permitting process over the Web, the Recipient has

developed an XML schema that defines the regulatory lifecycle of oil, gas, and associated wells. The schema is compatible with the Wellsite Information Transfer Standard Markup Language (WITSML), an internationally accepted industry standard for e-commerce.

The second step, now underway, is to develop a dynamic Web application that uses the schema to automate permit submission. The participating agencies are building an extensible application framework that will allow industry operators to submit single or multiple permits over the Internet or by other electronic methods. ePermit will use the schema and parser to transmit and process data from industry operators. Each form page will be editable, and submissions will be either accepted or rejected by individual form. Data rejections can then be easily corrected through the agencies' Web sites.

FY09 Milestones:

ePermit: Directional Drilling - Allows industry users to submit witsml-compliant XML-formatted directional drilling surveys through the familiar user interface of Excel, with automated QC and schema validation checks.

- beta testing with industry (Colorado) and release to industry: ***Programming completed, currently under beta testing in Colorado***

ePermit: WebForm Designer, Edit Engine, and Multiple Form Processor – Designer offers a table-driven controls library application used to design custom web forms configured to the meet data requirements needs for ePermit and can be used for web form submissions of any type of applications or regulatory forms so that industry has non-restrictive data entry flow, saving, and editing features. Edit engine verifies that the data the industry submits meets the business rules established by the agency and includes error logging and display to users. Multiple forms processor renders large XML submittals into individual forms, assigns the unique document number, assigns the attachments the proper ids, and places the information into the agency's document management and workflow process systems.

- ***beta test in Colorado and release to industry: Completed, in use in Colorado and being beta tested in Mississippi***

ePermit: regReporting Schema Expansion, Web Query Interface, and Submittal Status Notification Development- Expansion of the witsml-compliant schema will provide the ability to track surface facilities (pipelines, tank batteries, other equipment) and environmental matrices (wildlife, water, soil, air) through XML reporting. This project also will create a dashboard for the staffs of multiple agencies to view all submitted forms and their current status. Users will be able to review the data associated to the forms, view the attachments, and have the ability to filter the results of the dashboard by various criteria. This application also will allow the public read-only access to view submitted forms and attachments and then to forward comments for agency review.

- schema review by industry, beta test and rollout to industry ***Completed in Colorado and Nebraska***

ePermit: Integration - Integrate all ePermit applications and provide printable output for regulatory forms. Ensure that the ePermit applications are easy for industry to use and well documented for rollout to other states.

- rollout to industry and to other states ***Completed in Colorado and beta testing underway in Mississippi. Work plan developed for Pennsylvania and Alabama***

Comprehensive Report Task 3: RBDMS/Electronic Commerce Travel and Training

GWPC holds an annual training event where states receive training in the use of RBDMS and electronic commerce applications. This highly successful event is the primary technology transfer mechanism for this program. This training is conducted by states and specifically designed to meet RBDMS state needs. These training events are being held at, or near, one of the RBDMS state agency locations for an opportunity to further highlight the host agency's information management processes.

Under this task, state travel will also be supported to attend RBDMS/electronic commerce workshops. In these workshops the RBDMS Core and Technical committees develop program direction, review software applications, and work with industry and BLM/MMS on interagency solutions.

Accomplishments

Training events:

September 19 – 22, 2004, GWPC Annual Forum, Charleston, South Carolina. States in attendance: New York, Ohio, Indiana, Kentucky, Alabama, Arkansas, Nebraska, New Mexico, North Dakota, Utah, California. Topics include electronic permitting, electronic reporting, and XML schema development.

January 16 – 18, 2005, GWPC UIC Meeting New Orleans Louisiana. States in attendance: New York, Ohio, Indiana, Kentucky, Alabama, Arkansas, Nebraska, New Mexico, North Dakota, Utah, California and Louisiana. Topics include .net development and XML schema for permitting.

March 20 – 22, 2005. GWPC Policy Meeting. RBDMS Steering committee meeting.

April 17 – 20, 2005. Galveston, Texas. RBDMS Annual Training Event. States in attendance: New York, Ohio, Indiana, Kentucky, Alabama, Arkansas, Nebraska, New Mexico, North Dakota, Utah, California, Alaska, Missouri. See Attached agenda.

Technical transfer and outreach activities:

March 2005: Society of Petroleum Engineers Meeting. Presentation of paper "Increased Access to Federal Lands Through Data Sharing" (copy attached)

April 20, 2005. Houston, Texas. "GWPC E-projects" Presented to PIDX REGS E-Commerce Group and the POSC eRegulatory Special Interest Group (copy of power point presentation attached).

May 1, 2005: Galveston Texas. RBDMS Annual Training and Technical Transfer

May 15-17: Attended IOGCC meeting in Anchorage and presented RBDMS initiatives

May 2005: Presented CERA initiatives at the International CO2 Sequestration meeting in

Washington D.C.

June 2005: California representatives met in Anchorage with the AOGCC to discuss tech transfer and electronic commerce issues common to large oil and gas producing states.

July 20 2005 : Presented RBDMS and CERA initiative to the NETL staff in the Tulsa Oklahoma office

August 1, 2005: RBDMS Steering Committee meeting held in conjunction with the annual GWPC Board retreat. Presentation made to the GWPC board of directors.

August 2005: Information regarding RBDMS was provided to the British Columbia Oil and Gas Board.

August 2005: The RBDMS Core module was given to the University of Texas. The University of Texas will be using RBDMS to manage over 10,000 production and injection wells in west Texas. The University of Texas would like to use RBDMS as a means of communication with the Texas RRC.

Accomplishments September 1, 2005 – February 28, 2006

September 2005: GWPC Annual Forum, Portland, Oregon. RBDMS technical committee met to develop consensus and draft workplan for e-permitting.

January 2006: GWPC UIC Meeting: RBDMS Steering committee and technical committees met to draft e-permit workplan. The functional design document attached in the appendix is the result of the January meeting.

Accomplishments March 1, 2006 – August 31, 2006

GWPC conducts frequent WebEx meetings to provide technical transfer between states over the internet. Meetings this period include Ohio water quality module, data mining, electronic permitting and introduction to RBDMS.

RBDMS Annual Training: May 7 – 11, 2006 at the Alaska Oil and Gas Conservation Commission. This years training focused on electronic commerce and GIS applications. Id addition we held the RBDMS “101” session for states and personnel new to RBDMS

May, 2006: IOGCC meeting in Billings Montana. Made presentation on the new features of RBDMS to the oil and gas directors.

July 2006: Summer GWPC Board Meeting. Presented RBDMS accomplishments to the entire GWPC/GWPRF boards.

September 2006 Miami Florida: GWPC Annual Forum. Presentation of RBDMS/Water to state ground water and drinking water managers. Meeting was held of the RBDMS

steering and technical committess for technical transfer.

October 2006: Presentations at the IPEC conference San Antonio Texas October

January 2007: San Antonio Texas. Meeting was held of the technical of RBDMS steering and technical review committees. Presentation was made at GWPC Annual UIC meeting on electronic 7520 reporting capabilities of RBDMS.

February 2006: Finalized the training agenda for the May RBDMS training. The training will be held in Sarasota Florida beginning on April 21. The agenda can be viewed in the appendix of this report.

April 2007: The Annual RBDMS training was held in Sarasota Florida (see attached agenda). The training and technical transfer session was attended by 24 state RBDMS administrators.

May 2007: The paper/poster session Tracking Geosequestration Wells Using RBDMS, was presented at the annual Carbon Capture and Sequestration conference in Pittsburgh.

Accomplishments September 1, 2007 – March 31, 2008

September 2007, GWPC Annual Forum san Diego, California., RBDMS states reviewed and approved the workplan for the RBDMS.net admin and entity bbnd modules. Training was provided on the RBDMS data mining application.

January 2008, GWPC UIC Meeting New Orleans, LA. The RBDMS Steering committee met to discuss the progress of the Mississippi .net project and to brief Robert Vagnetti on RBDMS. Additional RBDMS travel was not approved due to budget short falls. No presentations were made at other professional meetings this year due to a lack of budget.

GWPC is participating in the planning committee for the 2009 SPE meeting.

Accomplishments March 1 – September 30, 2008

1. May 2008: RBDMS Annual Training Sarasota Florida (agenda Attached). Attendees: New York, Pennsylvania, Alabama, Mississippi, Louisiana, Oklahoma, Nebraska, North Dakota, Colorado, Utah, Alaska
2. RBDMS Steering Committee meeting: September 2008, Cincinnati (held in conjunction with the GWPC Annual Forum
3. Presentation at the GWPC Annual Forum on RBDMS Electronic Commerce Activities

Accomplishments October 1 2008 – March 30 2009

RBDMS Technical Committee meeting Denver October 23, 24 – 2008, Denver, CO, Colorado Oil and Gas Commission

Reading Materials:
Draft UIC Module Design: Report by ALL
RBDMS .net and UIC recommendations: Summary report on how recommendations for UIC are being incorporated into RBDMS.net
(Mark Layne ALL to participate via conference line)

- Introductions and General RBDMS information: Paul Jehn
- RBDMS.net structure
- Summary of updates to UIC data structure
- myQuery.net
- Mississippi RBDMS.net, timeline for implementation
- Results of the New York ePermit survey
- Demonstration of Oklahoma (epermit) intent to drill

E-permit in Colorado: bring your laptop with a wireless connection

- Project summary, overview and timeline
- Security and Login
- Use of the forms designer and rules editor
- Review of submission through the COGCC INETWorkflow database.
- Explanation of the data validation process
- Data flow for a multiple form submission through the parser.
- The notification module
- A tutorial in .rdlc creation (time permitting)
- Technical committee comments on future e-permit development

Accomplishments April 1, 2009 – September 11, 2009

- May 2009: 20 states attended the annual RBDMS training in Florida

RBDMS Annual Training May 3 – 6, 2009

- Computer set-up and configuration
  NOTE: Microsoft software is available from the Download Center at www.microsoft.com.
  - Microsoft .NET Framework 3.5 Service Pack 1
    http://www.microsoft.com/downloads/details.aspx?FamilyID=AB99342F-5D1A-413D-8319-81DA479AB0D7&displaylang=en
  - SQL Server Express 2005 or 2008 (with advanced services)
    - Microsoft SQL Server 2005 Express Edition with Advanced Services Service Pack 3
      http://www.microsoft.com/downloads/details.aspx?familyid=4C6BA9FD-319A-4887-BC75-3B02B5E48A40&displaylang=en
    - Microsoft SQL Server 2005 Express Edition Toolkit Service Pack 3. The toolkit includes Management Studio, which can be used for query writing, and the Business Intelligence Development Studio,

which we used last year for the SSIS session. http://www.microsoft.com/DownLoads/details.aspx?FamilyID=d434dc36-a24d-44ee-937e-553c382557e3&displaylang=en
        - Visual Studio 2008 **OR** Visual Web Developer 2008 Express http://www.microsoft.com/express/vwd/ with the Report Viewer Add-on http://www.microsoft.com/downloads/details.aspx?FamilyID=b67b9445-c206-4ff7-8716-a8129370fa1d&DisplayLang=en. This software will be needed to design .rdlc report templates.
    - RBDMS WinAdmin.NET (http://RbdmsOnline.org/downloads/MS/RbdmsWinSetup.zip) will be needed to develop report filters.
    - MS RBDMS.NET .bak and client .msi file will be provided upon release.
- 2008- 09 RBDMS Accomplishments
- RBDMS Priorities for 2009 – group discussion
- RBDMS Development Environment–group discussion
    - VS 2008
    - LINQ
    - .NET Framework 3.5.1
    - For the WPF Desktop:
        - SQL Server 2005/ 2008
        - Windows Presentation Foundation
        - Third-party controls
    - For RBDMS eForms:
        - SQL Server 2005/2008
        - Silverlight
        - ASP.NET
        - LINQ
        - Windows Communication Foundation
        - Silverlight Control Toolkit (open source)
    - For RBDMS.NET WinForms (WinAdmin.NET and eReport.NET)
        - SQL Server 2005/2008
        - Windows Communication Foundation
        - Windows forms
        - Third-party controls
- Managing Project Development and Software Testing: The PA eReport.NET Approach
- Discussion and Decisions by Technical Committee
    - 2009 Fall Technical Committee meeting
    - 2010 Training location and schedule
- RBDMS.NET (WPF):
    - Reports from Rick Sims/MS and Bob Griffith/OK: project architecture, constraints, staff feedback
    - Customization of the UI
    - Querying the MS RBDMS.NET database
    - Individual work by module: Test cases

  - State needs for migration from Classic
- RBDMS.NET eReport.NET:
  - Reports from Dave English/PA, Dan Pearson/AR, and Rick Sims/MS on project status and industry feedback
  - Group exercises: Install client, connect to server, perform test cases
- RBDMS eForms:
  - Report from Marc Fine/CO and Thom Kerr/CO on architecture, project constraints, implementation concerns, and Phase 2 planning
  - Connect to server, perform test cases
- .rdlc development
- RBDMS Inspection module: group discussion of new development
- RBDMS Water: group discussion of new development, status of Ohio OSM project
- Hydraulic Fracturing: state needs in RBDMS development
- CO_2 Geosequestration: state needs in RBDMS development

GWPC/RBDMS now maintains two internet web sites for training and file sharing;

1. The RBDMS Sharepoint site (WWW.rbdmsonline.org:81) contains all software and project information. All RBDMS projects are tracked on this site.
2. The RBDMS document management site (www.rbdmsonline.org) is the web site where we now post all documents and training materials. Training materials available for downloading include:
   - Creating RDLC's
   - Creating SSIS packages
   - eForms
   - Data Mining
   - Web GIS XML configuration
   - WinAdmin.net help

   This site also contains state fact sheets, brochures and annual reports.

FINAL Period Task 3 – Water-Energy Sustainability

As the recognition of water and energy interdependency has emerged, the relationship between the availability of water and the development and use of energy point to the need for better strategies to assure that both resources will remain available even as demand for them grows substantially in the coming years. The implementation of resource management processes and programs will be critical tools in assuring the continued viability of water and energy resources.

Subtask 3.1 Water Quality Data

Meeting current and future water and energy consumption rates means juggling the inter-related and often conflicting demands of balancing ground water supply allocations and quality guarantees with encouraging the development of sustainable sources of affordable

energy. Agencies have reported the need for an effective data management system to store and analyze the laboratory data provided by operators to comply with requirements for characterization of background hydrologic conditions, quarterly monitoring reporting (QMR), and National Pollutant Discharge Elimination System (NPDES) reporting. In response, the Recipient developed a module for RBDMS that tracks water quality parameters and source water quantity measurements for use in the regulatory oversight of fossil energy extraction activities.

RBDMS for Water is a .NET Windows application that features an online GIS paired with a SQL Server database. Pilot tested in Ohio, the application is being used to manage surface water, ground water, and waste stream quality (e.g., produced water, oil field brine, associated waste and acid mine drainage) data to evaluate permit applications and application revisions. The Ohio Department of Natural Resources (ODNR) Department of Mineral Resources Management (DMRM) has deemed RBDMS for Water a mission-critical tool. The application is significantly improving the ability of the agency and its watershed partners to access and analyze water quality data. The Ohio implementation of RBDMS for Water offers field sampling program planning from chain-of-custody setup through automated reporting of laboratory analysis results provided by oil and gas and mining operators to comply with permit requirements. ODNR's ability to focus on using information in RBDMS for Water rather than searching for it, in turn, improves the confidence and speed with which program managers develop regulatory decisions.

In Nebraska, the GIS component of RBDMS for Water is being used to combine coverage of wellhead protection areas with oil, gas, and UIC well locations from its oil and gas database. The resulting maps allow NOGCC to manage its field inspection activities to target wells located in high-risk, environmentally sensitive areas for quarterly inspections.

Today, there exists a sufficient critical mass of water quality (and quantity) data to allow an order of magnitude jump with regard to modeling alternatives for water management. Through existing and enhanced RBDMS analytical capabilities, the Recipient shall develop a web-based GIS model to assess water management options. The model will utilize location, chemical composition, volumetric data, potential end uses for the water, and any applicable regulatory requirements. The modeling system will require coordination of RBDMS with state data management and GIS applications (such as the NEIL "WebMapper" application currently deployed by the Montana Board of Oil & Gas Conservation) and a compilation of other data sets. For instance, the United States Geological Survey (USGS) maintains a produced water quality database that could serve to provide spatial produced water quality data to be merged with other data sets, such as soil types from NRCS, land use from the USDA, water quantity data from the Bureau of Reclamation, and water permit and monitoring data from state environmental agencies.

FY09 Milestones:

Phase 2, Web Enabled Laboratory Reports - Development to allow operators' laboratories to submit reports for mineral extraction oversight activities over the

Web in an EPA XML protocol; continued enhancement of Phase 1 application

- develop and test Phase 2 application in Ohio; ***Completed currently being tested in Ohio***

Water Quality Data Compilation - Compile ground water monitoring data into a single location and format for use in RBDMS Data Mining Applications and water management options analysis.

- rollouts for agencies implementing RBDMS for Water, Data Mining, and other GIS applications ***Completed: currently being testing in Ohio. This will form the basis of the RBDMS HF module.***

Subtask 3.2 Water-Energy Sustainability Symposium and Report

In order to develop improved strategies for sustainable water and energy management, the Recipient, through a separate DOE/NETL grant, intends to hold a Water-Energy Sustainability Symposium in September, 2009. The symposium will be held over a 2 day period in conjunction with the GWPC Annual Forum to enhance participation by state regulatory agencies that will ultimately be responsible for implementing many of the strategies to be discussed, and to provide for the most efficient management of time and resources for holding a major conference of this type. A major goal of the symposium will be to acquire information for the development of a Water-Energy Sustainability Report, which is also being developed under the same, yet separate DOE/ NETL grant.

Activities associated with this subtask support the Symposium and the Water-Energy Sustainability Report such that the interests of the DOE Office of Fossil Energy and NETL/SCNGO are fully considered. Specifically, under this subtask the Recipient shall consider FE/SCNGO interests in three areas: (1) planning and development of the Symposium agenda, and the selection of session chairs and speakers; (2) participation and co-sponsorship of the Symposium; and (3) development of the Water-Energy Sustainability Report including, but not limited to, report outline, review and approval of state surveys, and review and concurrence of the final comprehensive report.

FY09 Milestones:

- develop agenda and acquire speakers/session chairs for the symposium
- develop, distribute and compile the results of the initial assessment and state survey
- prepare a draft report summarizing the findings of the assessment to stakeholders for review
- hold a symposium on Water/Energy Sustainability
- prepare final comprehensive report and submit to DOE for review

- On September 13-16, 2009, in Salt Lake City, the Ground Water Protection Council, US Department of Energy and National Energy Laboratories were joined by 26 water, power, and energy organizations as "sustainability partners" for a 4-day Symposium dedicated to understanding the water-energy inter-relationships and the science, technology, and policy needs identified by the participants as steps towards integrated

water-energy planning and sustainability. This article series summarizes the findings of that Symposium. While these findings do not constitute recommendations by the sponsors and partners, they are intended to support a more informed dialogue on these important issues.

Water-Energy Sustainability Partners:

www.NGWA.org www.ASDWA.org www.NRWA.org www.PTTC.org www.westgov.org/wswc

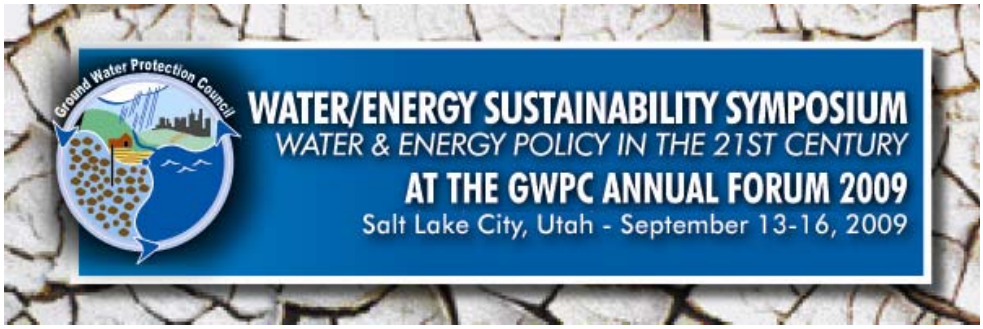
www.AllianceForWaterEfficiency.org www.IOGCC.org www.strongerinc.org www.oilshaleassoc.org www.NESC.wvu.edu

www.Groundwater.org www.WCEE.org www.Geosociety.org www.GMDAUSA.org www.RiverNetwork.org www.WESTCAS.org

www.NACWA.org www.WERF.org www.PurposeFocusED.org www.WaterResearchFoundation.org www.WestGov.org

www.edf.org www.WIPP.org www.AWWA.org www.ACWA.com www.EWRInstitute.org

The official title of the event was Water/Energy Sustainability Symposium: Water & Energy Policy in the 21st Century



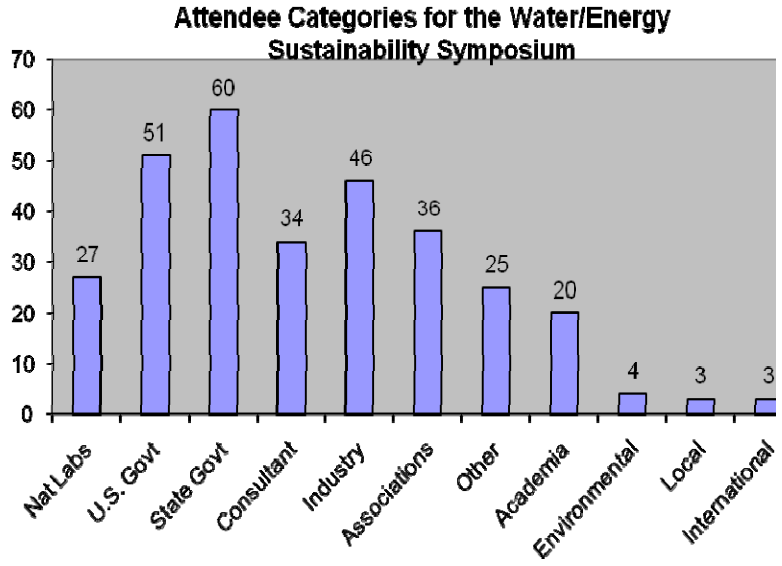
The event contained the following sessions…

- Water needs for energy development
- Water needs for power generation
- Energy and power needs for water supply and wastewater treatment
- Treatment and reuse applications of energy water for other water uses
- Water needs for unconventional oil & gas
- Water needs for renewable energy supplies
- Water, energy and agriculture

- Global water-energy issues and food security
- Water and energy underground part 1 (geothermal)
- Water and energy underground part 2 (carbon sequestration and hydraulic fracturing)
- Water-energy policies, agency programs, and legislative initiatives
- The DOE roadmapping process, regional issues, and integrated water-energy planning approaches

- The following is a breakdown of participants.

Total Number -310
Presenters-124
Partner Organizations-26



You will find the full agenda, the abstracts as well as the majority of the power point presentations at the GWPC web site at www.gwpc.org/meetings/proceedings.htm

Comprehensive Report Task 4: Oil and Gas Regulatory Project

GWPC will produce a written report that details the systems at the state level related to the protection of water through oil and gas regulatory programs. This will include a history of oil and gas regulatory development, discussion of specific elements of regulatory programs designed to proactively protect water, an analysis of the current state of water protection regulation at the state level and a discussion of specific topics such as formation treatment, stimulation and hydraulic fracturing. The report is designed to build a national picture of the efficacy of state regulations to protect water from the potential effects of oilfield exploration and production practices. The report will paint a national picture of state regulations in 12 topical areas:

1. Regulatory Authority
2. Permitting
3. Formation Treatment, Stimulation and Hydraulic Fracturing
4. Well Construction
5. Temporary Abandonment
6. Plugging
7. Tanks
8. Pits
9. Exempt Waste Handling
10. Spills
11. Data Management
12. General Program

Deliverables

A written report in both printed and electronic formats that is web enabled for posting on the internet and can be used as an information source and regulatory reference document of state programs designed to protect water relative to oilfield operations. The report is scheduled to be submitted in two parts:

Part 1 will be a preliminary findings document and executive summary that details the findings of the study and contains an statistical analysis of the elements of oil and gas regulations designed to protect water resources as researched by GWPC staff and reviewed by the states.

Part 2 will be a final report with graphical content that contains a chapter/ section for each of the topical areas shown above with an analysis of the effect of each topical area and an analysis of the combined effect of the topical areas relative to water protection. It will also contain a historical review of the regulatory development process, the technologies in use by regulatory agencies to prevent water impacts, an accounting of orphan well programs, and a discussion of the existing State Review process.

Accomplishments October 1, 2008- March 31, 2009

- Incorporated responses from state agencies into crosswalk chart statistics

- Compiled numbers from crosswalk charts and developed graphs to display data
- Developed first draft of the report text and submitted it to peer review team
- Began to incorporate comments from peer review team and gather graphics for use in the report
- Developed preliminary draft based on comments and prepared it for review by DOE

Coupling Economic Benefits for the Energy Production Sector with Enhanced Ground Water Protection and Conservation

Energy and the Environment-Economic Benefits and Initiatives: Implementation of environmental regulation is a cost of doing business. In the energy sector such costs are directly related to the implementation methodologies associated with the regulations being applied by regulatory agencies. In the case of exploration and production of oil and gas, one of the most heavily regulated areas relates to the management of produced water. In this arena, implementation of the Underground Injection Control (UIC) Program by states and USEPA results in a cost to industry that can be lowered through the use of properly applied regulatory approaches. Additionally, produced water has beneficial uses when regulatory barriers are removed. This CERA initiative can also lead to lowered costs and increased production. GWPC proposes to review several specific areas of UIC program implementation and evaluate changes that will result in cost reductions for the oil and gas industry; while also enhancing the protection of ground water and the environment. The following is a list of the initiatives that will be undertaken by GWPC.

Accomplishments September 1, 2007 - March 31, 2008

Meetings held

GWPC Annul UIC Meeting: January 2008 – New Orleans, Louisiana

Cost Effective Regulatory Relief for Produced Water Management:
Step 1: GWPC plans to conduct an initial review of the Safe Drinking Water Act and Environmental Protection Agency policy related to state primacy of UIC programs. Step 2: GWPC will develop and evaluate a model Memorandum of Agreement (MOA) document related to primacy and develop a Class V UIC MOA for the State of Montana providing regulatory relief for greater flexibility for the state regulatory agency and improved environmental options for the management of produced water. Step 3: Upon the completion of steps 1 and 2, GWPC will conduct an evaluation of the primacy delegation and if feasible, develop an application for state primacy of a single class or subclass of UIC wells related to produced water. This effort is tentatively slated to be conducted for the State of Alaska.

Accomplishments September 1, 2005 – February 28, 2006

- GWPC obtained an analysis of the SDWA; which found that there was no bar to the

USEPA granting primacy over any combination of well types.

- GWPC prepared a Memorandum of Agreement on behalf of the State of Montana requesting that EPA delegate a portion of the UIC program for Class V wells to the Montana Board of Oil and Gas Conservation and presented the MOA to EPA Region 8 officials on January 11, 2006.
- GWPC received a response from EPA Region 8 on March 29, 2006 in which the Region stated it was not opposed to the concept of a partial delegation to Montana but did not see the current need for implementing an MOA due to a lack of pending applications.

Accomplishments September 1, 2007 – March 31, 2008

- GWPC worked with stakeholders to provide input to USEPA regarding regulatory management of CO2 geosequestration including those related to primacy issues.
- GWPC provided support for oil and gas environmental state reviews regarding E&P waste management. This process provides a means for state oil and gas programs to obtain an evaluation of the effectiveness of their programs.

Literature investigation of Oil Shale Development Effects on Ground Water
GWPC will commission Argonne National Laboratories to conduct a search of the literature relating to the usage and effects on water from oil shale development in anticipation of a more intensive effort to develop this resource.

Accomplishments September 1, 2005 – August 31, 2006

GWPC commissioned the study and provided ongoing direction to the study team to ensure the development of a comprehensive search of the literature related to oil shale development and its affects on ground water. A draft report was completed and reviewed and the final report is scheduled for release during the next quarter.

Drinking Water Desalination Concentrate Disposal:
GWPC will initiate a project to assess quality of the concentrate from a desalination pilot project. This effort will be done jointly by the Ground Water Protection Research Foundation (GWPRF), Texas A&M and Argonne National Laboratory and begin in the summer 2005. The project will develop data on the chemical constituents contained in brackish/saline water concentrate and compile the information into a database. This information can be used by regulatory agencies to determine the appropriate requirements for managing concentrate by underground injection, including Class II as one possibility. The project is intended to be flexible to accommodate new opportunities to collect and compile data from additional water sources.

Accomplishments September 1, 2005 – August 31, 2006

- An update of the analytical data that had been completed through 2005 was presented at the 2006 GWPC Annual UIC Meeting. The Texas Commission on Environmental Quality has been working with other state agencies to streamline regulations for the permitting process for disposal in deep-underground injection wells of brine produced by desalination operations. Applicants for permits to

dispose of brine from desalination in injection wells must meet the current requirements for disposing of hazardous waste in Class I injection wells, including brine from desalination if it is classified as a waste material from "either industrial or municipal facilities". Since injection wells have been used for disposal of salt water associated with oil and gas operations for almost a century, (as Class 2 wells), it is hoped that new cooperative efforts in desalination will allow deep injection wells into oil and gas fields for brine byproduct use in enhanced oil recovery operations. Recent private meetings between TCEQ and the TRC may have removed the roadblock.

- Results of field analysis of oilfield brines from test sites that were collected and analyzed as part of a Texas A&M University study were presented to the GWPRF

UIC Program Awareness (MIT/ ZEI Studies):
The current reporting of mechanical integrity tests (MIT's) is confused by the fact that each state defines test failure in a different manner. Once a National UIC database is implemented, states may be reporting raw data rather than compiled data. This may result in improper utilization of the data due to the differences in state definitions of test failure. Additionally, the utilization of a Zone of Endangering Influence (ZEI) calculation in the Area of Review considerations for UIC wells proposed by the EPA National Technical Workgroup would result in additional costs to industry and states, and could lead to lower domestic oil and gas production. The GWPC will conduct studies to evaluate the need for a consistent definition of MIT failure among the states, and the need, feasibility and cost of implementing ZEI in reviews of UIC wells.

Accomplishments September 1, 2005 – August 3, 2006

- GWPC conducted a study to determine the nationwide consistency of the MIT inspections and subsequent 7520 reports and information provided in the PART review. This report was finalized in September 2006.. The report shows the variability of MIT failure criteria and the concerns that states have in developing a national report based on these data.

- The GWPRF reviewed the work product of the UIC National Technical Workgroup (NTW) related to Area of Review/ Zone of Endangering Influence (AOR/ZEI) and submitted a letter to EPA requesting an interpretation of the intent of the work groups statements regarding use of the ZEI calculation to determine whether or not further technical evaluation of the AOR/ ZEI issue under the CERA umbrella was warranted. We expect a response from the NTW to be made within the next quarter.

Accomplishments September 1, 2007 – February 29, 2008

- GWPC received an interpretation of the AOR/ ZEI issue from USEPA that supported the concept that AOR/ ZEI should be considered only on a case by case basis and not as a routine process during AOR evaluations.

Data Application for Tracking Water Quality and other Environmental Effects of Mining Operations: The GWPC is developing a comprehensive source water quality data tracking application for agencies that oversee mining operations.

The RBDMS Mines data application extends the RBDMS™ family of software programs into source water quality protection and laboratory information management. The application will be used to manage surface water, ground water, and waste stream quality (e.g., oilfield brine, associated waste and acid mine drainage) data associated with mining operations to evaluate permit applications and application revisions. Ultimately, however, oil and gas and mine owners and their laboratory consultants will be able to refer to the database through a Web-enabled e-commerce interface to track compliance with water information reporting requirements. The application is being built with .NET and XML technologies and will offer the following operational benefits:

- Performance beyond mere compliance tracking

-Comprehensive source water quality data tracking with direct links to RBDMS oil and gas and MineInfo databases and two-way data exchange between agencies and laboratories

-A data structure proven in sophisticated laboratories to handle many diverse sampling and analysis techniques

-Simplified data entry and tracking through user-assigned groupings of samples and analyses

Accomplishments September 1, 2005 – February 28, 2006

A GIS interface is being added to this module. A current beta version can be viewed at http://rbdmsonline.org/gis/oh/gisconfig.aspx

Accomplishments March 1, 2006 – August 31, 2006

This project is near completion of Phase I and should be deployed in early 2007. Monitoring data from Ohio, USGS and EPA has been added to the application. The GIS layers also include locations of public water supply wells, coal mines, oil and gas productions wells, Class II injection wells, source water protection areas and other hydrologic features. This application allows regulators to view monitoring data from compliance reports, run statistical analysis and use a GIS format for watershed management. Monitoring data is electronically downloaded from the laboratory directly into RBDMS for Water. In Phase II, this application will be web enabled to allow for industry use.

Please call Paul Jehn (GWPC) at 208 892-1400 for an on-line demonstration of this system.

A video files describing this application can be downloaded from http://www.rbdmsonline.org/OHMines/Video/RBDMSW_OHMinesavi.exe (47 MB)

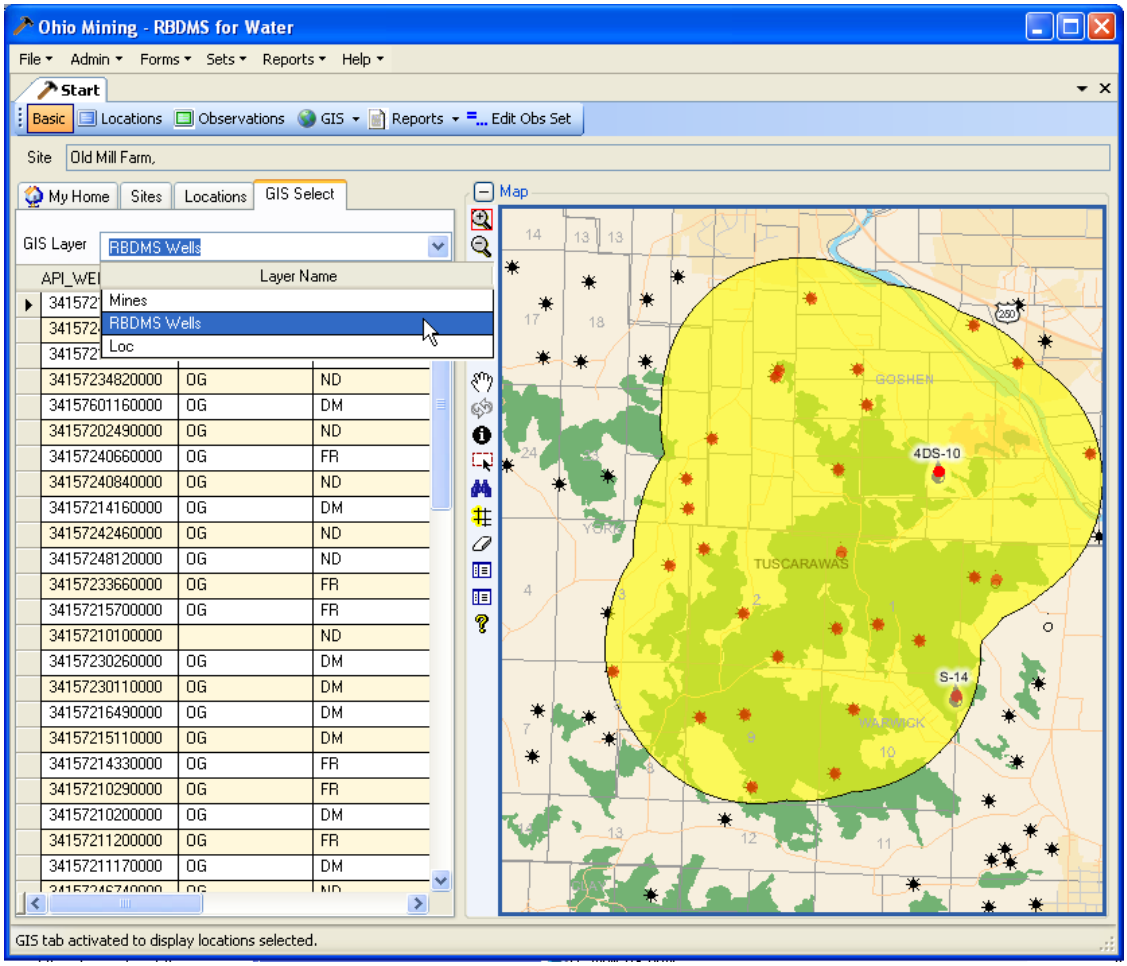
For complete descriptions and accomplishments of this task and projects please see the 2006 RBDMS Annual Report (attached) or download from: http://www.gwpc.org/UIC/Data%20Management/uic_data_management_main.htm

Accomplishments September 1 2006 – February 28, 2007

RBDMS/water has been completed for Ohio and will be installed in the Spring of 2007. The following diagram shows how this program can track water quality monitoring data and it relates to UIC wells and coal mines.

Accomplishments September 1 2007- March 31, 2008

The Ohio RBDMS Water quality module is being installed in the Nebraska Data Mining Application. RBDMS Class II and Oil and Gas GIS data are being combined with state (NE DNR) and Federal (USGS, EPA) water quality data. This will enable the NOGCC to complete more accurate AOR's, target inspections, follow up on compliance issues and achieve better resource protection. Phase one, listing of the wells on the map is now complete. Phase 2 which is under way will allow water quality and quantity data to be view in an interactive GIS format.



Accomplishments March 1 – September 30 2008

Additional water quality data has been added to the Nebraska NOGCC web site with full text searching capability and retrieval of water quality analysis. See

http://coordinatesolutions.com/RBDMSWebWQ/ for more details

Accomplishments March 1 2009 – September 11, 2009

RBDMS for Water extends the RBDMS family of software programs into water quality, laboratory information management, produced water management, and water quantity assessment. The application is being used to manage surface water, ground water, and waste stream quality (e.g., oil field brine, associated waste and acid mine drainage) data associated with mining operations to evaluate permit applications and application revisions. Phase 2, now underway, will allow oil and gas and mine owners and their laboratory consultants to refer to the database through a Silverlight Web application to track compliance with water information reporting requirements. In Phase 3, the GWPC will extend this work to track the effects of hydrofracturing in New York and Pennsylvania.

For a complete description See attached fact sheet RBDMSWater

FINAL Period Task 4: Oil and Gas Regulatory Project

The Recipient shall produce a written report that details the systems at the state level related to the protection of water through oil and gas regulatory programs. This will include a history of oil and gas regulatory development, discussion of specific elements of regulatory programs designed to proactively protect water, an analysis of the current state of water protection regulation at the state level and a discussion of specific topics such as formation treatment, stimulation and hydraulic fracturing. The report is designed to build a national picture of the efficacy of state regulations to protect water from the potential effects of oilfield exploration and production practices. The report will paint a national picture of state regulations in 12 topical areas:

- Regulatory Authority
- Permitting
- Formation Treatment, Stimulation and Hydraulic Fracturing
- Well Construction
- Temporary Abandonment
- Plugging
- Tanks
- Pits
- Exempt Waste Handling
- Spills
- Data Management
- General Program

The Recipient shall develop this report in a Web enabled format with hyperlinks to information sources, regulatory agency websites, relevant studies and reports and other supporting materials. Additionally, as part of this effort, the Recipient shall consult with individual states to identify potential opportunities for tailoring the deliverables to be useful to states that chose to disseminate information on the study results within their states. As a component of the overall project for which the findings will be included in

the final report, the Recipient will develop a focused topic report on the emerging shale gas production that includes the 12 State regulatory program areas, as well as a comprehensive review of field practices and other requirements that exist. These regulatory requirements will also be discussed in the Federal regulatory context.

The report will contain a chapter/ section for each of the topical areas shown above with an analysis of the effect of each topical area and an analysis of the combined effect of the topical areas relative to water protection. It will also contain a historical review of the regulatory development process, the technologies in use by regulatory agencies to prevent water impacts, an accounting of orphan well programs, and a discussion of the existing State Review process.

FY09 Milestones:

- interim analysis of state regulatory programs
- focused shale gas report
- final report

GWPC produced a written report that details the regulations at the state level related to the protection of water relative to oil and gas regulatory programs. This includes a history of oil and gas regulatory development, discussion of specific elements of regulatory programs designed to proactively protect water, an analysis of the current state of water protection regulation at the state level and a discussion of specific topics such as formation treatment, stimulation and hydraulic fracturing. The report is designed to build a national picture of the efficacy of state regulations to protect water from the potential effects of oilfield exploration and production practices. The report paints this national picture of state regulations in 8 specific topical areas:

- ***Permitting***
- ***Well Construction***
- ***Hydraulic Fracturing***
- ***Temporary Abandonment***
- ***Well Plugging***
- ***Tanks***
- ***Pits***
- ***Waste handling and Spills***

Deliverables

A written report in both printed and electronic formats that is web enabled for posting on the internet was completed. This report can be used as an information source and regulatory reference document of state programs designed to protect water relative to oilfield operations. The report was completed in two parts:

Part 1 was a preliminary findings document and executive summary that details the findings of the study and contains an statistical analysis of the elements of oil and gas regulations designed to protect water resources as researched by GWPC staff and reviewed by the states.

Part 2 was a final report with graphical content that contains a chapter/ section for each of the topical areas shown above with an analysis of the effect of each topical area and an analysis of the combined effect of the topical areas relative to water protection. The report also contains a Regulatory Reference Document that includes specific regulatory language from each state oil and gas program that can be used to review specific state regulations in the 8 topical areas of the report. Additionally, the written report contains a set of Key Messages and Suggested Actions that focus on specific conditions and actions that could be taken to improve regulatory management of oil and gas activities relative to the proactive protection of water resources.

As a component of the overall project for which the findings were included, GWPC develop a focused topic report on the emerging shale gas production that included a comprehensive review of field practices and other requirements that exist. This companion report entitled Modern Shale Gas Development in the United States: A Primer, can be viewed in the e-library of the GWPC website at: www.gwpc.org/e-library/documents/general/Shale%20Gas%20Primer%202009.pdf

The FINAL report is available in the e-library of the GWPC website at http://www.gwpc.org/e-library/e_library_list.htm ***and is entitled State Regulations Reference Document- State Oil and Natural Gas Regulations Designed to Protect Water Resources, USDOE/ NETL, GWPC, May 2009***

Accomplishments October 1, 2008- September 30, 2009

- ***Incorporated responses from state agencies into crosswalk chart statistics***
- ***Compiled numbers from crosswalk charts and developed graphs to display data***
- ***Developed a Regulatory Reference document***
- ***Developed first draft of the report text and submitted it to peer review team***
- ***Began to incorporate comments from peer review team and gather graphics for use in the report***
- ***Developed preliminary draft based on comments and prepared it for review by DOE and the peer review team***
- ***Developed the final written report and posted it on the GWPC website***

Developed a hyperlinked version of the report and posted it on the GWPC website

Comprehensive Report Task 5 Reporting

GWPC/GWPRF will produce an annual report which details accomplishments with topical reports that discuss specific work areas as required.

Accomplishments September 1 2004 – April 30 – 2005

Accomplishments September 1, 2005 – February 28, 2006
The 2006 RBDMS is underdevelopment and will be published in May 2006

Accomplishments March 1- August 31 2006: The RBMDS 2006 Annual Report can be downloaded from:
http://www.gwpc.org/UIC/Data%20Management/uic_data_management_main.htm

The GWPC produced the Ground Water Report – A Call to Action. September 2007

Accomplishments March 2006 – September 2009

Attached are fact sheets of the major RBDMS Accomplishments. These are available for downloading at www.rbdmsonline.org

- RBDMSWater
- Data Mining
- eForms
- Inspection
- Intro to RBDMS

Available for downloading are the following training materials

- Creating RDLCs Training
- Creating SSIS Packages
- eForms Training
- RBDMS Data Mining Configuration
- RBDMS Web GIS XML Configuration
- WinAdmin.NET Help

Publications available for downloading include:

- RBDMS Annual Report 2006
- RBDMS eCommerce Initiative Progress Report 2008-2009
- RBDMS Efficiency Summary
- Using Risk-Based Analysis to Identify Inspection Priorities

FINAL Period Task 5: Reporting and Technical Transfer

Reporting and technology transfer is an integral part of this overall effort and will be incorporated into every task. Technology transfer activities include training events, technical presentations, peer-to-peer support networks, presentations to the U.S. Department of Energy and other Federal Agencies, professional meetings and other annual meetings such as the GWPC Annual Forum where RBDMS and CERA projects will be presented. The Recipient will conduct specific technology transfer activities as listed under milestones below.

FY09 Milestones:

- semi-annual progress reports submitted to the U.S. DOE. Completed
- RBDMS annual report. ***Completed. 2009 report under development***
- Fall (2008) meeting of technical and steering committees to evaluate and make recommendations on RBDMS.net activities Completed
- Spring (2009) annual RBDMS training ***Completed***
- RBDMS.net and electronic commerce upgrades posted on the GWPC/RBDMS web site along with documentation and user manuals. ***Completed all updates posted on the RBDMS sharepoint site http://www.rbdmsonline.org:81 contact Paul Jehn (pauljehn@gmail.com) if you need access to this site. GWPC also maintains a RBDMS library at www.rbdmsonline.org. This site is not password protected.***
- electronic commerce applications developed for use by all state oil and gas regulatory agencies (including non-RBDMS states). Completed
- meeting notes, summaries, and presenter abstracts published on the GWPC web site ***Completed***
- topical reports as required, including:
  - results of state peer reviews detailed in a written summary
  - emerging issues discussed in special papers and reports

EXPERIMENTAL

This research project does not involve the use of experimental methodology.

GRAPHICAL MATERIALS LIST(S)

None at this time

REFERENCES/BIBLIOGRAPHY

RBDMS 2005 Annual Report

S.D. Belieu, SPE, Nebraska Oil and Gas Conservation Commission, P.J. Jehn, Ground Water Protection Council, M.F. Bohrer, North Dakota Industrial Commission Society of Petroleum Engineers March 2005: SPE Paper Number 94371, Increased Access to Federal Lands Through Data Sharing

S.D. Belieu, SPE, Nebraska Oil and Gas Conservation Commission, P.J. Jehn, Ground Water Protection Council: NOGCC's eReport Module. Presented at the IPEC meeting November 2005

Paul Jehn November 2006: State Electronic Commerce Initiatives: Presented at IPEC.

RBDMS 2006 Annual Report

Evaluation of State and Regional Resource Needs to Manage Carbon Sequestration through Injection, John Veil, Argonne National Laboratory, June 2007

Video file describing the RBDMS for Water system: available at http://www.rbdmsonline.org/OHMines/Video/RBDMSW_OHMinesavi.exe (47 MB)

Source Water Protection and the Energy-Water Nexus
Scott Kell, Ohio Department of Natural Resources, Division of Mineral Resource Management
Stan Belieu, Nebraska Oil and Gas Conservation Commission
*Paul Jehn, Ground Water Protection Council (GWPC), Oklahoma City, OK
Tom Gillespie, Virtual Engineering Solutions, Inc.
David Lowther, Coordinate Solutions, Inc.

Scott Kell, Tom Richmond, Stan Belieu, Mark Bohrer and Paul Jehn: Tracking CO2 Geosequestration Wells with Risk Based Data Management System. Present at the Carbon Capture and Sequestration Conference in Pittsburgh, May 2007

LIST OF ACRONYMS AND ABBREVIATIONS

API – American Petroleum Institute
GWPC- Ground Water Protection Council
GWPRF – Ground Water Protection Research Foundation
EIMS – Environmental Information Management Suite
RBDMS – Risk Based Data Management System
DOE – Department of Energy
EPA – Environmental Protection Agency
BLM – Bureau of Land Management
MMS – Minerals Management Service
XML – Extensible Markup Language
CERA – Cost Effective Regulatory Approach.
AOGCC – Alaska Oil and Gas Conservation Commission
UDOGM – Utah Department of Oil and Gas and Minerals
MBOGC – Montana Board of Oil and Gas Conservation
NOGCC – Nebraska Oil and Gas Conservation Commission
PPM – parts per million

POSC- Petrochemical open Software Corporation
E-commerce – electronic commerce
E-permit – electronic permit
E-report – electronic report
UIC – Underground Injection Control

APPENDIX

Accomplishments September 1, 2005 – February 28, 2006
Attached files and links to on-line files

The following desktop video files are in zip-to-exe archives that include the .avi (each about 5 minutes long) and video codec. The help files are in Windows .hlp format.

- Desktop video introduction to RBDMS:
  http://www.rbdmsonline.org/Downloads/EIMSrbdms01AVI_CP.exe

- User and admin help files for generic RBDMS, including well schematic utility and multilateral construction:
  http://www.rbdmsonline.org/Downloads/RBDMS_WSU_MLhelp020805.zip

- Basic Training Video 1:
  http://www.rbdmsonline.org/Downloads/Sort_FilterRBDMS01_CP.exe

- Basic Training Video 2:
  http://www.rbdmsonline.org/Downloads/IntroWellMaster01Avi_CP.exe

- Basic Training Video 3:
  http://www.rbdmsonline.org/Downloads/MITavi01_CP.exe

The generic Access front end included a menu pick that auto-generated a data dictionary. Many of the RBDMS state agency SQL Server installations were customized, so one data dictionary doesn't exist. However, from part of a recent analysis I did for a project, here is a data dictionary I ran for New York RBDMS: http://www.rbdmsonline.org/IN_DataMapRBDMS/NY_DD.htm and here is another I generated for Arkansas RBDMS: http://www.rbdmsonline.org/IN_DataMapRBDMS/AR_DD.htm.

ATTACHMENTS

Attached are fact sheets of the major RBDMS Accomplishments

GROUNDWATER PROTECTION COUNCIL

Member-Agency Case Study

RBDMS.NET: A Past and Future Success Story

OIL AND GAS REGULATORY CONFIDENCE

Overview

States: 22 oil and gas producing state agencies

Business Situation

RBDMS is a client/server application originally designed to help agencies manage oil and gas injection well data and evaluate the risk injection wells pose to USDWs.

Solution

Attributes of today's RBDMS include its continued usefulness in assessing and reducing risk to USDWs, its use of non-proprietary software, and its adaptability to serve variations in state regulatory programs. RBDMS integrates oil and gas resource data and state source water protection planning. RBDMS also provides data well locations, permitting, and production to the public and industry owners through its Web interfaces.

Benefits

States using RBDMS have collectively saved millions of dollars and have greater confidence in regulatory decisions.

The GWPC's approach to increasing data availability through the Risk Based Data Management System (RBDMS) application and its Web interfaces focuses on partnering with federal and state agencies, industry groups, and citizens. Developing and sustaining a family of RBDMS e-commerce applications that have specific purposes for water resources protection and oil and gas regulation depends on such partnerships. In many ways, the success of the RBDMS initiative reflects the dedication and contributions of the agency project managers to build consensus among the stakeholders, and the willingness of industry to be an active partner in these endeavors.

Situation

Since the program's inception in 1992, the development of the award-winning RBDMS software has been underwritten through grants from the Department of Energy. Matching funding has been provided by state agencies in the forms of both donated, in-kind services and direct funding. Originally developed in Access version 1.1, RBDMS has evolved to the latest .NET technologies and has been adopted as a national standard.

RBDMS.NET combines the best aspects of the e-commerce initiative's Web interfaces: full-text searching, integrated GIS, automated notifications, and highly granular security. The same application is used both within agency offices and for field inspection. The result provides immediate access to data for purposes of area trend analyses, well and mine history tracking (ownership, bonding, permitting, location, construction, inspection, production, and plugging/ restoration), compliance monitoring, and complaint adjudication. The GWPC is now overseeing rollouts in Mississippi and Oklahoma, and other agencies are planning to upgrade as well.

RBDMS.NET Web interfaces have been installed in many agencies, greatly leveraging efficiency in mission-critical tasks such as reporting UIC data directly to EPA from RBDMS, automating the collection of production and disposition data from operators, and offering electronic permitting of oil and gas wells.

EXPERTISE IN DATA EXCHANGE

"RBDMS focuses on ways that information technology can be used to protect the environment while encouraging exploration and responsible development of domestic oil and gas."

Michel Paque, GWPC Executive Director

Solution

The GWPC and its member-state agencies have identified three priorities for ongoing information exchange for the through the RBDMS e-commerce initiative:

1. Providing the baseline reference data needed to make informed decisions about environmental protection and ground water resource management.
2. Reducing the cost of information exchange between the petroleum and mining industries and regulatory agencies to encourage more domestic fossil fuel production and to increase state revenues.
3. Providing technology transfer opportunities for industry and agency stakeholders and developing an educational outreach program for the public.

RBDMS development has historically been and continues to be directed by RBDMS states. Ongoing RBDMS development, legacy data conversion and migration, and system setup efforts in multiple states are overseen by both the GWPC and the RBDMS Technical Committee, a users' group whose participation is drawn from multiple states.

In addition to telephone and remote [Terminal Services and/or Virtual Private Network (VPN)] help desk support, GWPC provides user support, code sharing, and development updates through peer-to-peer networking, bi-annual training meetings, open-attendance weekly conference calls, and a Microsoft SharePoint Services site for registered users at https://www.rbdmsonline.org/Projects.

Server Requirements

- Microsoft .NET Framework 3.5.1
- SQL Server 2005 or 2008 with advanced services
- IIS 6.0 or higher
- Microsoft Terminal Server and/or VPN
- Internet Explorer 6.0 or Firefox 2.0 or higher

Administrator Tools

- Visual Studio 2008 or Visual Developer 2008 Express to develop report templates
- RBDMS WinAdmin.NET to manage security, menus, filters, and rules

Client Requirements

- Microsoft .NET Framework 3.5.1
- Internet Explorer 6.0 or Firefox 2.0 or higher
- Approximately 80 MB free disk space for RBDMS
- XGA (1024 x 768) monitor or better
- MS-compatible LAN with SQL Server

Member-Agency Case Study

eReport.NET: An Easier Way to Report Production and Injection Activity

MAKING REGULATORY REPORTING SIMPLER

Overview

States: PA, AR, MS, NY, NE, UT, MT, AK

Business Situation

eReport is the GWPC's highly successful Web application that oil and gas operators use to report oil and gas production and UIC data directly to agency databases. eReport has completely replaced manual and flat-ASCII file submission of monthly and annual reports in some states.

Solution

eReport demonstrated the efficacy of using database-neutral XML for such data transfers. The eReport schema, now in version 3.6, is a recommended standard of the API.

Benefits

- Elimination of drawn-out correction cycles
- Data grooming through regular review with industry
- Automated, multi-level data validations with precise error messages
- Immediate feedback on report status

eReport is the GWPC's highly successful Web application that oil and gas owners and operators use to report oil and gas production and UIC data directly to state agency databases. eReport demonstrated the efficacy of using database-neutral XML for such information transfers. The eReport schema, now in version 3.6, is a recommended standard of the API.

Situation

Data transactions that involve manual data entry and error checking are expensive for both industry and regulating agencies, and the cost can be measured in terms of the associated delays in critical decisions affecting other aspects of oil field operation and development processes.

To help, the GWPC developed eReport, a multi-tiered, Internet-based solution for regulatory reporting. Although user interfaces and required data differ among the agencies as a result of statutory differences, these solutions are based on the same unifying format, an eXtensible Markup Language (XML) schema document (XSD) called eReport.

eReport eliminates rework loops for both the operator and the agency stemming from incomplete or incorrectly formatted submittals. eReport applications have built-in multi-level data validations, so formatting and other errors are flagged as operators complete the forms. The application also checks to make sure that required fields are filled in and that valid codes are used. This streamlined reporting process thus reduces the cost and time for regulatory compliance and helps states to capture revenues due from oil and gas activity.

Solution

eReport.NET is a down-loadable Windows desktop application paired with a web service that provides spreadsheet-like data entry forms with built-in data formatting checks. Reports produced in eReport.NET are automatically formatted as schema-compliant files for upload to the agency's web service. Operators find out the moment they file whether their reports pass the agency's automated data validation checks through clear status messages and error reporting.

Operators also can use eReport.NET as a local data repository for both regulatory reports and internal well tracking. Prerequisites for installing eReport.NET include the .NET Framework 3.5, which is available from Microsoft free of charge, and an Internet connection.

DATA TRANSFER AT REDUCED COST

"eReport has removed numerous re-work loops from our production reporting system by automating data quality checks. Our operators really like it."

Ted Loukides, NYSDEC Mineral Resources Specialist

eReport is database-neutral, so when operators download well information from the agency Web server to eReport Remote.NET, they also have the option of joining the data structure to their own in-house ADO.NET-compatible databases (SQL Server, Oracle, MySQL, MS Access, and any others with OLEDB and/or ODBC drivers). The creation of schema-compliant production and injection reports can then be completely automated.

To help automate the deployment of future updates, eReport.NET uses ClickOnce technology. ClickOnce, part of the .NET Framework, allows Windows smart client applications to be deployed to a desktop by a link. When the user clicks the link on a Web page or in an e-mail, the application files are downloaded to the user's machine. The program then executes in a secure sandbox provided by .NET code access security. Later, when a new version of the application is deployed to the server, it can be automatically detected by connected clients, and the update can be downloaded and applied in a variety of ways that can be controlled through optional deployment settings.

The New York State Department of Environmental Conservation (NYSDEC) has used the eReport.NET application for several years to capture annual production data. An industry representative reported to the agency that eReport.NET is a user-friendly application and that the experience of working with it was "enjoyable."

The Nebraska Oil and Gas Conservation Commission, which was the first agency to use the technology, has indicated that 70 percent of its operators are filing monthly production and injection reports with eReport. This resulted in staffing efficiencies that allowed the agency to reassign production staff to other pressing work.

The Utah Division of Oil, Gas, and Mining has indicated that several of its largest industry operators report injection and production data for as many as 550 well records at one time each month with immediate feedback and a high level of satisfaction with the process.

The Arkansas Oil and Gas Commission recently became the newest user of eReport.NET, and the Pennsylvania Department of Conservation of Natural Resources is planning to release an upgrade from its original eReport installation to eReport.NET in time to capture data from the 2009 annual production cycle.

Why eReport data transfers are better than ASCII flat file transfers.

Feature	eReport	ASCII
Automated, multi-level validations	Yes	No
Required field checks	Yes	No
Valid code checks	Yes	No
Edit checks	Yes	No
Precise error messages	Yes	No
Immediate feedback on report status	Yes	No

GROUNDWATER PROTECTION COUNCIL

Member-Agency Case Study

RBDMS.NET Inspection: Providing Complete Access to Well and Mine Data in the Field

SAFEGUARDING THE ENVIRONMENT

Overview

States: MS, OK, NY, AR, UT, MT, AK, ND, NM

Business Situation

The clear preference of agencies for using laptops over PDA devices led the GWPC to re-factor the eInspect application into an integrated Inspection module within RBDMS.NET.

Solution

The Inspection module is fully integrated with RBDMS.NET and uses SQL Server Mobile Express. It handles merge replication with SQL Server with synchronization via network or wireless Internet connection.

Benefits

- Immediate access to data in the field
- Complete GIS integration, available via wireless Internet connection
- Elimination of iterative data entry tasks
- Reduced deployment costs by using the same application in both field and office

The ability to take database information into the field makes critical information about each well immediately accessible to inspection teams. The RBDMS.NET Inspection module tracks many well field inspection concerns, such as plugging and abandonment, mechanical integrity testing, blowout prevention, environmental inspection, logbook, and well construction information. The GWPC developed the Inspection module with the specific goals of eliminating iterative data entry tasks and transcription errors for more accurate and timely data management and to capture data necessary for environmental reporting to the U.S. Environmental Protection Agency and for other state purposes.

Recent improvements to the base application have made the Inspection module of RBDMS.NET portable to inspectors' laptops. Merge replication with the production database can be done anywhere and at any time an Internet connection is available. The Inspection module of RBDMS.NET now features the ability to store images associated with inspection and enforcement site visits.

Situation

The goals for field inspection programs are generally to improve the number and quality of the inspections conducted, to provide immediate access to information about previous inspections, and to eliminate duplicated effort such as handwriting in the field and data entry in the office.

The appeal of using a pocket-sized personal digital assistant (PDA) that could overcome the drawbacks of using laptops led the GWPC to first introduce a personal digital assistant (PDA) version of eInspect several years ago. Although the hardware was inexpensive, the platform lacked sufficient memory to be more than minimally useful. In addition, the data was difficult to translate from the PDA to SQL Server, and the devices were frequently lost.

With widespread acceptance of using laptops in the field, the GWPC fully integrated the Inspection and RBDMSGIS modules within RBDMS.NET. It is now being rolled out to interested agencies nationwide. Agencies in Mississippi and Oklahoma are scheduled to release their Inspection modules in the 2009-2010 timeframe.

MANAGING FIELD DATA

"Having a field inspection application makes inspections easier and more uniform. Being able to merge the results into the production database frequently makes data available for analysis faster."

Don Drazan, NYSDEC
Project Coordinator

Solution

The Inspection module of RBDMS.NET tracks such inspection activities as drilling and plugging activities, environmental concerns, abandoned wells, enforcement and compliance issues, well mechanical integrity testing, mining operations, and reclaimed lands information.

The GWPC can customize the Inspection module for state agencies to meet differing oil and gas field inspection requirements. These agency-specific requirements can be made without sacrificing base application compatibility, and the application can accept program updates without loss of those agency-specific modifications.

The Inspection module uses SQL Server Express and merge replication with SQL Server 2000, 2005, and 2008. With an Internet connection, a Virtual Private Network connection to the agency network, and the ability to run the Windows Synchronization Manager, an inspector can synchronize field data any time and any place. The base Inspection module includes the following components:

- The same well selection and navigation features available to in-office users of RBDMS.NET
- A generic inspection form, which includes the elements common to inspections nationwide, such as Inspector, Inspection Date, Inspection Type, etc.
- Access to multilateral well construction information.
- Global positioning system (GPS) capabilities.
- The ability to store photos and other images associated with inspected facilities.
- Merge replication and data validation with the RBDMS SQL Server database.

The Inspection module of RBDMS.NET stores data and images associated with inspection and enforcement site visits.

GROUNDWATER PROTECTION COUNCIL

Member-Agency Case Study

RBDMS.NET eForm: Filing Regulatory Permit Applications on the Web

PERMIT PROCESSING EFFICIENCY

Overview

States: CO, MS, NE, AL, KY

Business Situation

State agencies are issuing record numbers of permits for new oil and gas wells as operators try to meet demand with innovative producing techniques to compensate for steady decline curves from older wells. The GWPC and the COGCC partnered to launch a Web-based ePermit application now being rolled out nationally.

Solution

RBDMS eForm is a Silverlight Web program with a web service middle tier that can be programmed to meet any state agency's business rules.

Benefits

- Secure sign-on
- Online forms completion and attachment upload tied to a document management application
- Data-sharing with multiple agencies
- Public comment page
- Data validation checks
- Automated workflow/ approval processing

With many agencies reporting record levels of permit applications and industry operators requesting expedited decision-making for their own business purposes, the need for an electronic permitting system has long been clear.

Situation

The GWPC is pleased to announce that the RBDMS.NET eForm application, which is programmable to adapt to any state agency's business rules, is now available. The Silverlight Web application is now live in Colorado, in use for processing industry permit applications, data-sharing with sister state and Federal agencies, and providing opportunity for public comment. eForm is now being rolled out to other states nationwide.

Solution

eForm allows industry operators to submit regulatory forms over the Internet, thereby eliminating paper forms that must be mailed to the various state offices and manually re-keyed. These electronic submissions help reduce processing time within the agencies and allow for improved data to be available to the staff members who are making regulatory decisions. Within some state agencies, a significant reduction in time to issue a permit to drill may be achieved.

In the face of stringent new rules for oil and gas well siting and permitting, the Colorado Oil and Gas Conservation Commission (COGCC) led the design of the eForm project as a partner with the GWPC. To eliminate duplication of data entry and storage of permit forms, the eForm project was developed in a way that industry operators provide the permit information online only once and then three sister agencies (the COGCC, the Department of Public Health and Environment and the Department of Wildlife) share access to the data. eForm tracks permit application status through a workflow processing system that is governed by specific agency review time clocks.

The application architecture consists of an integrated set of server tools that are based on Silverlight Web clients (one external and one internal), a Windows Communication Foundation middle tier, and a SQL Server 2008 intermediary database in a DMZ that is replicated to the production database behind a firewall.

TRANSPARENCY IN PERMIT REVIEW

"eForm is achieving significant efficiencies in permit management. Our permit review process is now 100 percent paperless and provides unprecedented levels of data sharing with other agencies and transparency to the public."

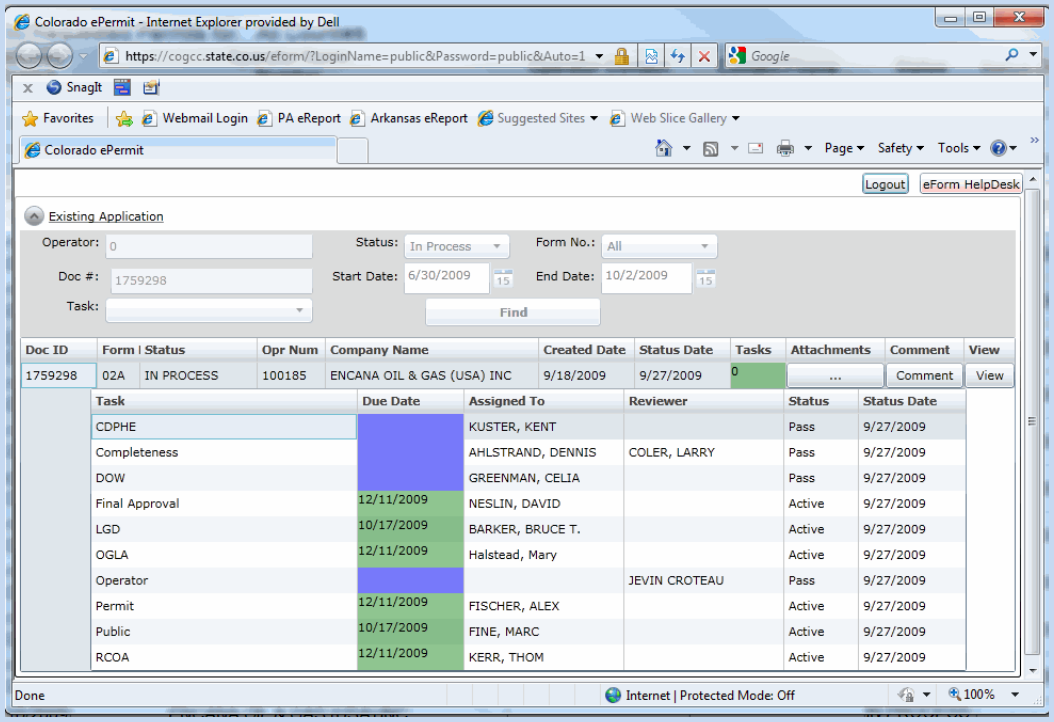
Marc Fine, COGCC
Project Manager

With its decoupled rules engine, forms designer, and security components, state agency database administrators can manage the expansion of their eForm installations without outside help from consultants.

The eForm dashboard provides navigation through the different form pages and allows users to edit and save forms at different stages of completion. Permit application status is viewable through a menu system, and status changes are tied to the time clock rules of the Notification module.

The dashboard is filterable and customizable by state and can track submittals by proposed location, document ID, well name, and other attributes. An agency interface controls workflows for step-wise review and approval with accountability reporting to the external Web interface.

eForm currently supports single-form processing. Multiple-form processing is now in development.



Industry operators and members of the public can log into the COGCC's Web site to view the status of permit applications that are in the review process and, if desired, comment on them. The review tasks are shown with elapsed time clock status in color-coding (red = "due") and the responsible agency staff member's name.

Member-Agency Case Study

RBDMS.NET for Water: Assessing the Effects of Fossil Fuel Extraction on Watersheds

PROTECTING AND RESTORING WATERSHEDS

Overview

States: OH, PA, NY

Business Situation

The GWPC is partnering with the ODNR to create a data management system to store and analyze the laboratory data provided by coal operators to comply with requirements for pre-mining characterization of background hydrologic conditions, and quarterly monitoring and NPDES reporting.

Solution

Phase 1 of RBDMS for Water is a .NET/SQL Server application with an integrated GIS. Phase 2, now in development, will Web-enable the application for automated reporting from third-party laboratories. Phase 3 work in NY and PA will extend the program to track the effects of hydrofracturing.

Benefits

- E-transfer of lab data
- 3-click report creation
- Improved decision-making
- Transparency to the public through Web reporting

RBDMS for Water extends the RBDMS family of software programs into water quality, laboratory information management, produced water management, and water quantity assessment. The application is being used to manage surface water, ground water, and waste stream quality (e.g., oil field brine, associated waste and acid mine drainage) data associated with mining operations to evaluate permit applications and application revisions. Phase 2, now underway, will allow oil and gas and mine owners and their laboratory consultants to refer to the database through a Silverlight Web application to track compliance with water information reporting requirements. In Phase 3, the GWPC will extend this work to track the effects of hydrofracturing in New York and Pennsylvania.

Situation

The Ohio Department of Natural Resources views RBDMS for Water as a mission-critical tool that will significantly improve the ability of the agency and its watershed partners to access and analyze water quality data and the confidence and speed with which program decisions are developed.

The ODNR processes and files over 76,000 water parameter tests provided by coal operators to comply with requirements for pre-mining characterization of background hydrologic conditions, QMR, and NPDES reporting. The agency also manages significant volumes of hydrologic data associated with its Coal Regulatory and AML programs. Each year, the ODNR laboratory conducts over 25,000 parameter tests that are used for the following purposes:

- Assessing hydrologic consequences of mining operations.
- Responding to citizen complaints near mining operations.
- Developing strategies to prevent and/or treat acid mine drainage (AMD).
- Developing AMD abatement and treatment plans to remediate mining-impaired waters.
- Monitoring long-term success of AMD treatment systems.

Solution

The internal agency portion of the RBDMS for Water application is a .NET WinForm application that encompasses the laboratory information management system, water quality, source water assessment components, and links to the other databases. This application features an integrated

PROTECTING WATER QUALITY

"Being able to overlay sampling locations with laboratory results within the boundaries of watershed project or source water protection area helps all stakeholders protect water resources."

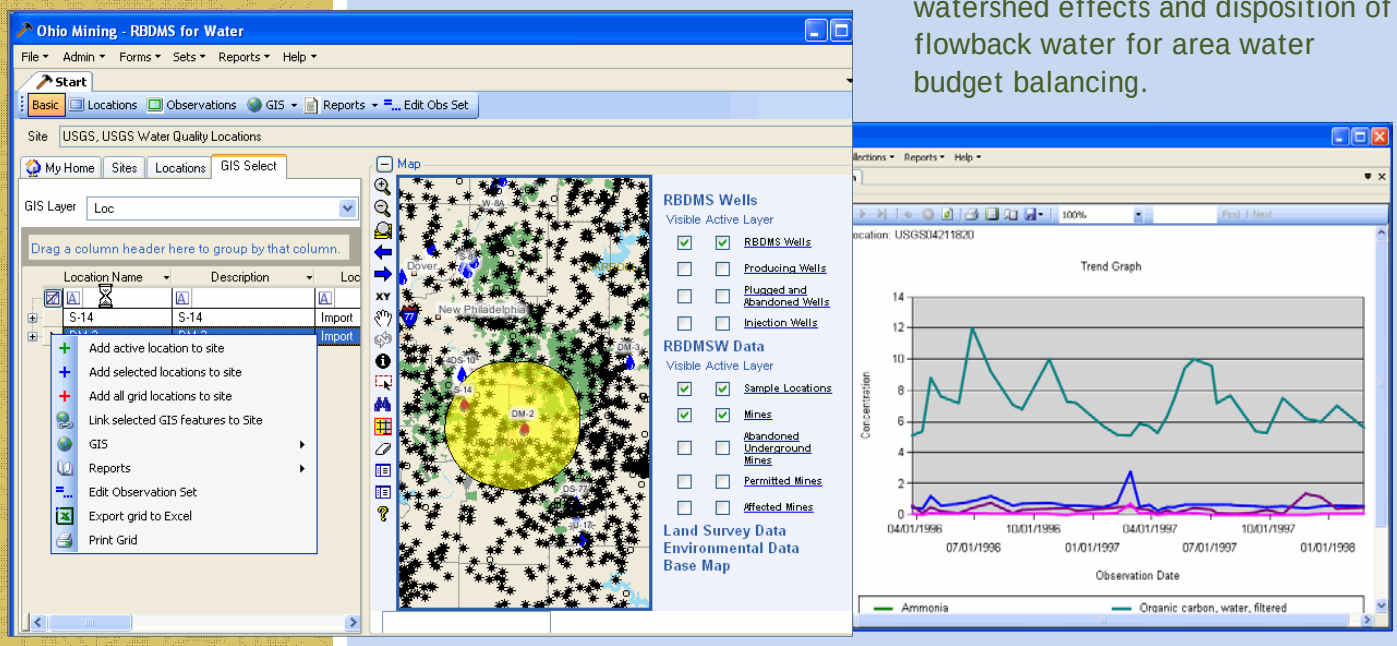
Scott Kell, ODNR Deputy Chief

GIS and statistical and graphical reporting system. Historical data import, compliance tracking, and sample collection and analysis are also included in the Phase 1 application.

In Phase 2, which is underway now, the electronic data deliverable will be developed to be compatible with the EPA's schemas for water quality, as appropriate for data exchange with laboratories and other state and federal agencies (Example: http://www.epa.gov/storet/wqx.html). The R BDMS for Water application will be Web-enabled with a Silverlight/ASP.NET interface, and a Web service will be created and installed to work with the Windows client application to receive data from third-party laboratories.

The application will track organic, inorganic, and physical water quality parameters and water source data such as well and spring construction details, water well test data, surface sample source details, surface water flow measurements, waste stream source details, and abandoned and active mine source details such as seeps, impoundments, sediment ponds, and underground mine intercepts. Aquifer, watershed, usage categories for ground and surface water, and geographic information also will be tracked, as will laboratory and field test methods and observations. Sophisticated workflow and automated notifications to flag the occurrences of regulatory deadlines, permit violations, and analytical parameter exceedances.

Phase 3 enhancements of RBDMS for Water will help agencies address specific concerns about the impacts of hyrdofracturing. Among these will be the chemicals used in fracturing fluids, background water quality measurements, points of withdrawal, and amounts withdrawn, along with post-fracture monitoring for watershed effects and disposition of flowback water for area water budget balancing.



Innovative means of grouping locations, analysis parameters, and observation results also allows users to create and display varied formats of reports with as few as three clicks.