

Title: Characterization of Produced Water In New Mexico
PI: Martha Cather
Institution: Petroleum Recovery Research Center/New Mexico Tech

Project Description:

The Petroleum Recovery Research Center (PRRC), a division of the New Mexico Institute of Mining and Technology, compiled data on quality and quantity of produced water (water produced as a byproduct of oil and gas production) into the NM WAIDS database. This database encompassed information on water quality/quantity in various producing regions of the state. Purposes of the original database included assessments of the amount and quality of produced water to support the design of water treatment systems to promote the use of produced water. Work on the database ceased about 10 years ago. The database is now out of date, and online access to the database is currently not available. The proposed project would update the NM WAIDS database, bring the database online, provide GIS user-friendly functionality and analysis tools, and identify and attempt to fill in data gaps in newly active plays in the San Juan and Permian basins.

The NMWAIDS database was taken offline in 2013 due to concerns about the security of the web pages and queries that accessed the database. In the ten years that have elapsed since the database was first put online, cyber security has become an increasingly important consideration and the old interface was becoming highly vulnerable. In addition, there is a need to obtain more data. Several oil and gas plays have come to the foreground since the bulk of the data was collected, including new horizontal plays in both southeast and northwest New Mexico.

Methodology:

The project objectives are:

- 1) Reactivate access to the current water quality/quantity database by recoding the web interface using current best practices,
- 2) Examine the existing produced water database to identify data gaps and make efforts to fill in those gaps,
- 3) Provide data access via online search queries, both text-based and through an online GIS based system if possible. Sufficient location information will be provided to enable users to map data in their own systems via a common format such as GIS shapefiles.

Results:

The revised design layout for the entire Go-Tech website, which hosts the water quality database access pages (NM WAIDS), is complete at this point. Internal beta testing is complete, and the revised web site, including the water quality database access pages, is planned to be in operation by 10/15/2015, with the transition taking place over a weekend to avoid downtime during normal working hours.

Major efforts during the previous quarter were primarily trouble-shooting small problems with the new web site and making sure that it was ready for publication. Additional data collection has also begun, and the recent effort to digitize previously unpublished data that was

collected by the USGS from wells in southeast New Mexico has been completed. This data adds about 130 samples to the NM WAIDS database. This data is primarily produced water samples from wells that were sampled in the mid-1950's to 1960's.

Figures 1-3, below show the basic interface to the web site, the results page, and a sample of a downloadable .csv file that users can create based on their query results.

Efforts have also been underway to begin redeployment of the online GIS mapping service to both oil and gas production wells and produced water sample data. Initial work using one particular software solution did not work well on the large production well dataset so we are now focusing on using Google Maps as a programming interface. A beta product is now available but will require some modification before it can be useful to a general audience.

Remaining Work:

Server configuration is complete, and the website is to be deployed over the weekend of October 3rd. At that time, the original NM WAIDS produced/groundwater quality database should be online. Additional produced water sample data has been collected and will be added into the database on an as-found basis, and cleaning of the database will proceed during this time. Task 2, analysis of data to identify gaps, will be started during the second quarter of the new project year. The online GIS maps, Task 3, will require a significant amount of attention and may not be completed by the end of the year; however the data can be made available as GIS shapefiles for user download.

Student Participants:

Graduate Students:

Dongyi Chen – PhD, computer science

Cris Gallegos – Master's, computer science

Matt Bradley – Undergraduate, Technical Communication

Powerpoint: attached to email.

The screenshot shows the NM WAIDS website interface. At the top, there is a navigation menu with seven items: Production Data, Well Data, NM Priceshheet, NM WAIDS, State Land Office Data, Software, and Help. Below the menu, the page title is "Produced Water :: Samples Query". The main content area is titled "Water Sample Search" and contains a search form with the following fields: API Number (text input), County (dropdown menu with "Cibola" selected), Township (dropdown menu with "Any" selected), Range (dropdown menu with "Any" selected), Section (dropdown menu with "Any" selected), Formation (dropdown menu with "Any" selected), Well Name (text input), and Field (text input). At the bottom of the form are two buttons: "Search" and "Reset Form".

Produced Water :: Sample Search Results

You searched for... County: Lea << Back to Search Page Download Selected

Showing 1 to 20 of 3,011 entries Search:

Sample ID	API	Well Name	Section	Town	Range	Field	Formation	Collected
66		GRAHAM STATE NCT A 002	24	185	03E	Hobbs Grayb-SAD		1932-08-18
68		CHILDERS FEDERAL 001	11	095	03E	ALLISON		1957-10-22
71		F W KUTTER NCT B 003	28	195	03E	Monument GrayB-SAD	GBG	1900-01-01
83		LEARCY MCBUFFINGTON 012	13	255	03E	452BLBR	ELBG	1900-01-01
87		B C DICKINSON B 004	12	155	03E	DENTON	WOLF	1959-03-19
109		B C DICKINSON B 004	12	155	03E	DENTON	WOLF	1953-03-04
163		D F WILLHOIT 001	18	175	03E	300DVNN	DEV	1900-01-01
263		B C DICKINSON B 005	12	155	03E	DENTON	WOLF	1953-05-27
271		F W KUTTER NCT B 003	28	195	03E	Monument GrayB-SAD	GBG	1900-01-01
725		B C DICKINSON B 004	12	155	03E	DENTON	WOLF	1956-07-03

CSV Viewer - C:\Users\Cris\Downloads\produced_water.csv

1	2	3	4	5	6	7	8	9	10	
1	SampleID	API	Well Name	County	Township	Range	Section	Formation	Field	Well ID
2	7393		GRAHAM STATE NCT A	Lea	185	03E	24		Hobbs Grayb-SAD	002
3	6063		CHILDERS FEDERAL	Lea	095	03E	11		ALLISON	001

Figures 1-3. Screen shots of NM WAIDS website, which will be available via <http://gotech.nmt.edu/gotech>.