RIC WM FWP Task 9: National Energy Water Treatment & Speciation (NEWTS) Database

2022 Resource Sustainability Project Review Meeting

Oct 25, 2022

Task PI: Burt Thomas

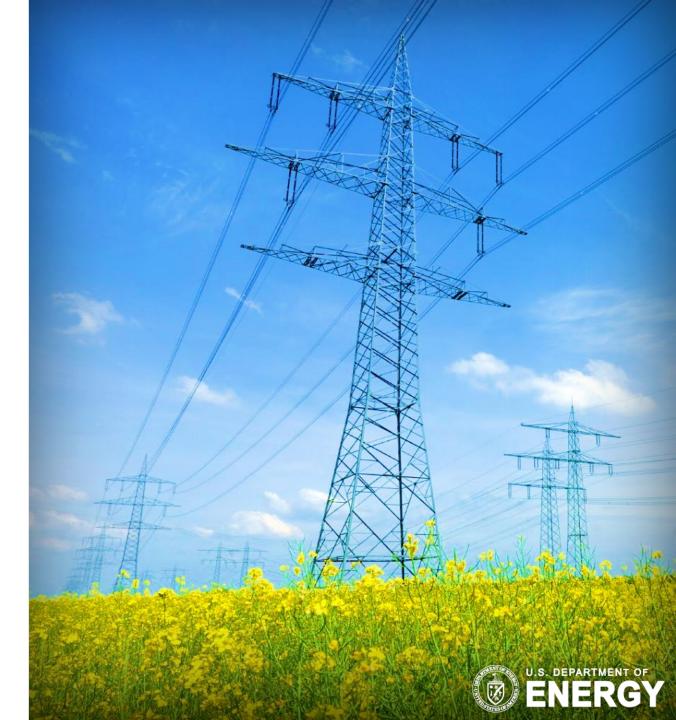
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HQ Program Manager: Hichem Hadjeres

Technology Manager: John Rogers







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Authors and Contact Information



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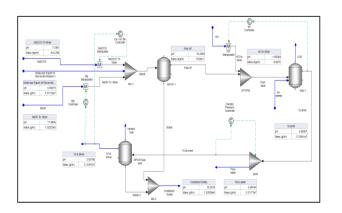
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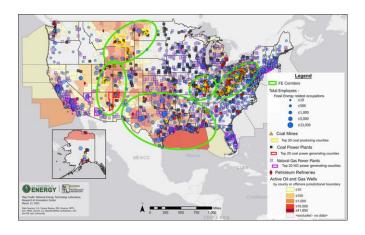


Current Water Data Challenges

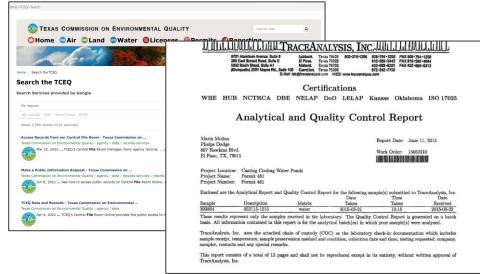
Current state of energy water data

- Energy process wastewater data are disparate, incomplete, and difficult to access
- Stored in unusable formats
- Regulated by different federal and state agencies
- Existing datasets are not comprehensive for energy wastewater data: most data is still stuck behind regulatory agency doors









These data are necessary to design <u>treatment technologies</u> and understand cross-industry wastewater <u>re-use opportunities</u>



NEWTS Project Goals



Develop a **national level dataset** of **energy wastewater compositions** that is relevant, useful, and useable

- > Help industries and the public understand the value of reuse opportunities, and the benefits of water treatment and management.
- > Data must be FAIR (findability, accessibility, interoperability, and reusability)
- > Seamless integration with widely used modeling software





When & Where?









National Energy Water Treatment & Speciation Database



Leveraging NETL R&D Core Capabilities

Solution: Develop a Nationwide Energy Wastewater Data System

- Supplemented with thermodynamic & chemical modeling
- Includes waste streams such as:
- USGS oil & gas produced water
- energy sector effluent (FGD, etc.)
- Acid mine drainage (OSMRE)
- Landfill leachate
- And more
- > Enables design of localized treatment
- Publicly Available Data hosted & displayed through NETL's EDX, and a custom visualization dashboard









Assess localized composition values, scaling potential, osmotic pressure, estimated flow rates, temporal information

Add water quality attributes using thermodynamic and aqueous chemistry modeling, and fill information across spatial and data gaps





Enabling researchers & industry to tailor treatment steps to localized needs



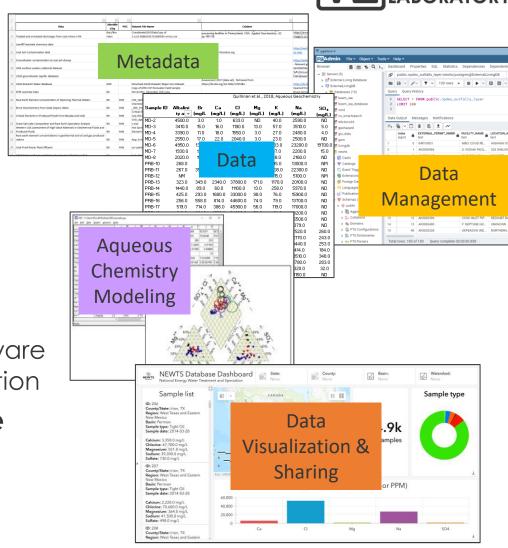
Addressing Water Data Challenges

NEWTS Data Collection & Modeling Methods



Addressing these challenges through:

- 1) Systematic data collection
 - Set key words for data search & acquisition
 - Investigating federal & state data sources
 - Literature review
 - Data catalog for metadata capture
- 2) Aqueous chemistry modeling of streams to supplement available data
 - Ensure compatibility with chemistry modeling software
 - Fill in missing data & supplement reported information
- 3) Presenting data through an online interactive data platform
 - Visualization, interaction and access to data





Acquired Data to Date



50 identified data resources

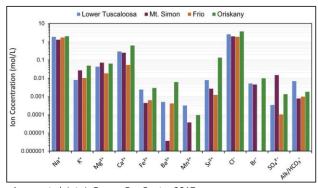
- 35 resources acquired = 8.3 GB of data
- Water types include: acid mine drainage, landfill leachate, coal ash effluent, coal mine surface water and ground water, brackish water, produced water, flue gas desulfurization (FGD) effluent, geothermal brine
- General attributes: major ionic species, pH, total dissolved solids (TDS), location, type of water
- Metadata saved in **Data Catalog** to track resources

Federal/ nation-level data resources:

- EPA
- USGS Produced Waters & Brackish Waters Databases
- National Pollutant Discharge Elimination System (NPDES) data: ~700,000 data points on energy industry streams with over 200 million records.
- PW production averages: ~5,000,000+ spatially anonymized records

States:

- Prioritizing states based on energy activity and previous work + available data
- To date: collected datasets from PA, TX, OK, NM, LA, CA, CO, AZ, WA



Arena, et al. Int. J. Green. Gas Contr., 2017.

Analyte	Procedure	Units	Wght. Avg	Input	Converted Unit	Converted Avg.
Alkalinity, HCO3		mg/L	48.03	HCO3-	mg/L	48.03
Aluminum	Total	ug/L			mg/L	
Ammonia as N	Total	mg/L			mg/L	
Antimony	Total	ug/L			mg/L	
Arsenic	Total	ug/L	190.00	AsO4-3	mg/L	0.35
Beryllium	Total	ug/L			mg/L	
Boron	Total	ug/L	167,106.67	B as B(OH)3	mg/L	167.11
Bromide	Total	mg/L	27.35	Br-	mg/L	0.03
Cadmium	Total	ug/L	0.00	Cd+2	mg/L	0.00
Calcium	Total	ug/L	2,079,500.00	Ca+2	mg/L	2,079.50
Chemical Oxygen Der	Total	mg/L			mg/L	
Chloride	Total	mg/L	2,389.67	CI-	mg/L	2,389.67
Chromium	Total	ug/L	200.07	Cr(OH)3	mg/L	0.40
Cobalt	Total	ug/L		Co+2	mg/L	
Copper	Total	ug/L	158.62	Cu+2	mg/L	0.16
Lithium	Total	mg/L	290.25	Li+	mg/L	0.29
Magnesium	Total	ug/L	1,014,700.00	Mg+2	mg/L	1,014.70
Manganese	Total	ug/L			mg/L	
Mercury	Total	ng/L	89,133.33	Hg+2	mg/L	0.09





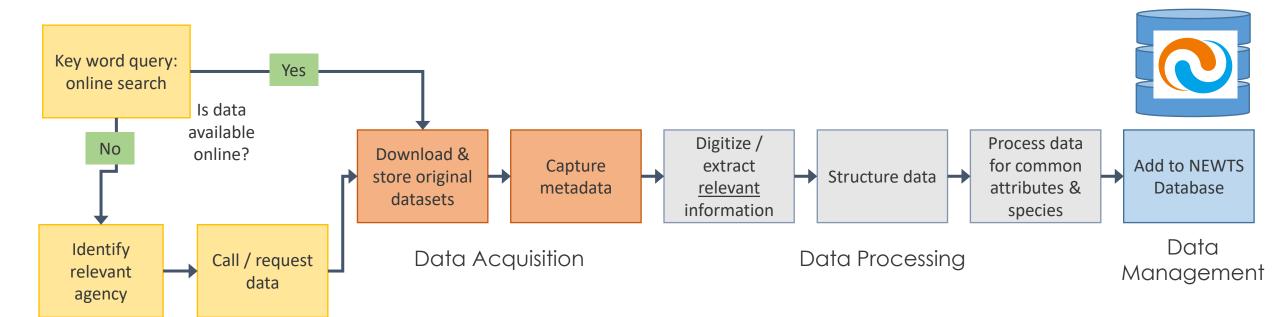




NEWTS Data Gestation



Capturing information from original sources and transforming into usable data



Data Identification

- Specific steps depend on data: size, type, format
- Can be a circular process
- After inclusion in NEWTS Database, data can be further modeled, summarized and visualized



Data Collection Strategy

NATIONAL ENERGY TECHNOLOGY LABORATORY

- Need to define what we are looking for using key words:
 - Leachate....? Too vague
 - Coal Combustion Residual Leachate...?
 Better results!
 - Produced Brines...? Again, vague
 - Oilfield Production Waste-Water...? Good!
- Tier 1 keywords:
 - Oil and Gas Residual Waste Reporting
 - Produced Fluid
 - Brine
 - Waste Classifications

Tier 2 Keywords:

Description of report

2540-PM-BWM0404 Rev. 5/2016

pennsylvania

DEPARTMENT OF ENVIRONMENTAL

- Water Quality Report
- Analytical
- Test Results, etc.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WASTE MANAGEMENT



NON-COAL MINING, OIL AND GAS, AND OTHER WELL DRILLING WASTES

- Non-oil and Gas Well Drilling Waste includes drilling fluids, residuals, and drill cuttings from monitoring well and drinking water well construction
- Produced Fluid includes flow-back, brine and any other formation fluids recovered from the wellbore. Flow-back is defined as fracturing/stimulation fluids, including fracturing sand, recovered from the wellbore after injection into the wellbore.
- 803 Drilling Fluid Waste oil and gas drilling mud, other drilling fluids other than fracturing fluid and spent lubricant.
- Wastewater Treatment Sludge sludge generated during the processing of any oil and gas-related wastewater including any sediment generated during storage of oil and gas-related wastewater. Mixed loads of wastewater treatment sludge with other waste for disposal purposes, such as filter socks (RWC 812), will be coded as RWC 804.
- 805 Unused Fracturing Fluid Waste oil and gas fracturing/stimulation fluid waste and fracturing sand waste that has not been injected into a wellbore.



Where is the data?



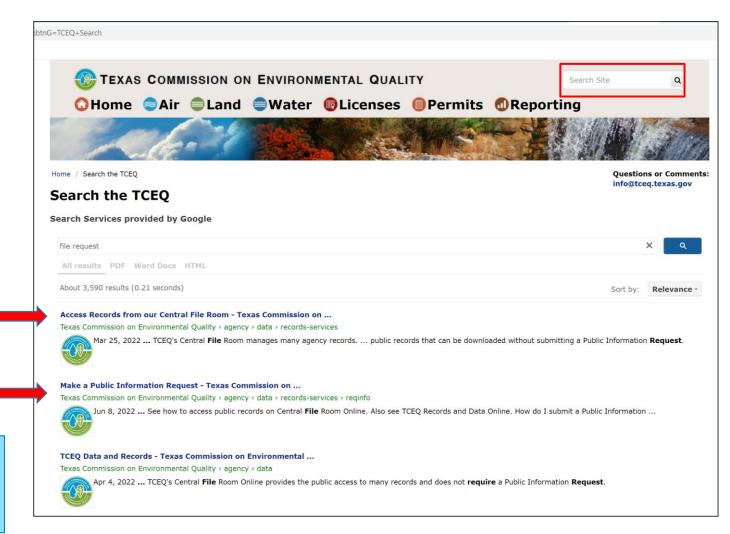
- 1) Identify the permitting agency:
- Oil and Gas? Department of Environmental Protection
- Coal? Bureau of Mines
- Other? Water Regulatory Control Board (CA)
- 2) All data submitted to a regulatory agency accessible by a file review or request
- Contacting agencies directly by <u>phone</u>
 found to be best way to directly obtain data

For Example:

Texas Commission on Environmental Quality:

Searched for "File request"

Ultimately: search by state regulatory agency for relevant energy wastewater quality data





Prioritizing data that can be mined



Report Date: June 11, 2015

Work Order: 15052210



2019 Ninth Avenue PO Box 1925 Altoona, PA 16603 (814) 946-4306 NELAP: PA 07-062, VA 460212

89 Kristi Road Pennsdale, PA 17756 (570) 494-6380 PaDEP: PA 41-04684

FAIRWAY LABORATORIES

State Certifications: MD 275, WV 364

www.fairwaylaboratories.com

Seneca Resources, Brookville

51 Zents Blvd

Brookville PA, 15825

Project Manager: Bill Quinter

BEECHWOOD PAD A Project:

Project Number: [none] Reported:

> Collector: GFS 08/18/15 16:08

Number of Containers: 14

Client Sample ID: BEECHWOOD PAD A **Date/Time Sampled:** 07/17/15 11:00

> Laboratory Sample ID: 5G17108-01 (Water/Grab)

Date / Time Analyte Result MDL RLUnits Analyzed Method Analyst Note

Conventional Chemistry Parameters by SM/EPA Methods

278.0 -10000 mg CaCO3/L 07/27/15 08:39 SM20-2310B Acidity to nH 8.3

MILLILLIAN TRACEANALYSIS, INC. MILLILLIAN MILLILLIAN MILLIAN M

Texas 79424 Teras 79922 200 East Sunset Road, Suite E El Paso. 915-585-3443 FAX 915-585-4944 5002 Basin Street, Suite A1 Midland. Teras 79703 432-689-6301 FAX 432-689-6313 (BioAquatic) 2501 Mayes Rd., Suite 100 Carroldon, Teyas 75006 972-242-7750

Certifications

HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

Maria Molina Phelps Dodge 897 Hawkins Blvd. El Paso, TX, 79915

Project Location: Casting Cooling Water Ponds

Project Name: Permit 461 Project Number: Permit 461

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
393864	052115-1015	water	2015-05-21	10:15	2015-05-22

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

TraceAnalysis, Inc. uses the attached chain of custody (COC) as the laboratory check-in documentation which includes sample receipt, temperature, sample preservation method and condition, collection date and time, testing requested, company, sampler, contacts and any special remarks.

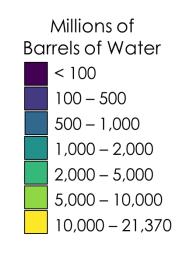
This report consists of a total of 13 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

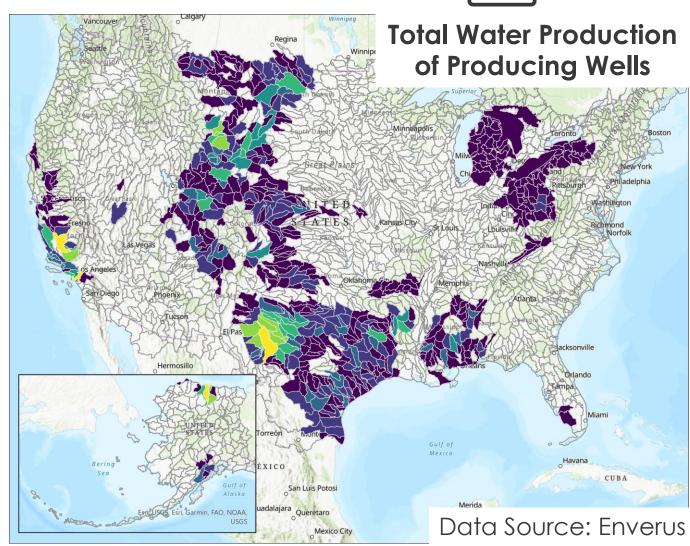


Integrating energy production data



- Acquired 5,096,329 well records (Enverus)
- Spatially aggregated 5,044,327 records to Hydrologic Unit Code 8 (HUC 8) subbasins (grey outlines on map)
- Production data spatially compiled by well status (I.e., active, injecting, abandoned)
 - Well count
 - Cumulative production
 - Water, Oil Gas
 - Vertical depth statistics
 - Supports at-depth composition
 - Temporal trends
 - Producing months statistics







Critical Mineral Speciation in Oil Field Brines

NATIONAL ENERGY TECHNOLOGY LABORATORY

A Literature Review

- US Produces ~2.8 billion gallons of produced water a day¹
- Oilfield produced water could help secure domestic critical mineral supply chains for the clean energy transition
- This is the first state-of knowledge investigation of critical mineral brine resources from US oilfield operations
- Critical mineral concentration data is being compiled from existing manuscripts and datasets
- Prioritizes **DOE's Dynamic Dozen** (Co, Dy, Ga, Ge, C, Ir, Li, Mn, Nd, Ni, Pt, Pr) in the assessment
- Concentration data will be combined with regional production water volumes to assess critical mineral resource potential at HUC 8 levels

Basin specific concentrations of Lithium (green), Manganese (blue) & Magnesium (orange) in conventional hydrocarbon produced water sources (plots show basins with top 10 highest concentrations of each element). This data is adapted from the USGS produced water database ²

^{1.} Veil, John. "US produced water volumes and management practices in 2017." *Groundwater Protection Council* (2020).
2. Blondes, M. S., Gans, K. D., Engle, M. A., Kharaka, Y. K., Reidy, M. E., Saraswathula, V., Thordsen, J. J., Rowan, E. L., & Morrissey, E. A. (2019). U.S. Geological Survey National Produced Waters Geochemical Database v2.3 [Data set]. U.S. Geological Survey. https://doi.org/10.5066/F7J964W8

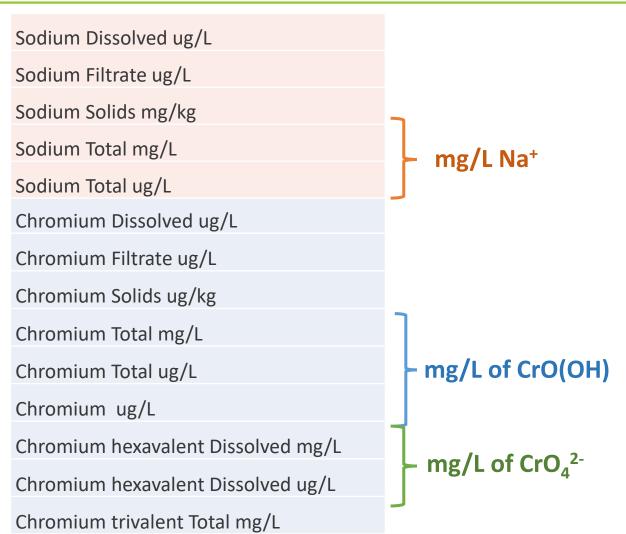


Mn Mg 20

Data Processing: Creating a NEWTS Data Template



- Water quality data is presented using different ions, measurement techniques, and units
- Data points were processed for common units, single measurement for each species based on charge
- Documented assumptions and reasoning for analyte translation / combination





Example Processed Data



EPA FGD Effluent Dataset

G	Н	I	J	K	L	М	N	0
Oate Collecte 🔻	Lab Na 🔻	Analyte 🔻	CAS_NO	Method 🔻	Proced ▼	Units 💌	Non-D∈ ▼	Amount 🔻.
8/24/2010	TA	Nickel	7440-02-0	200.8	Total	ug/L	D	580
8/25/2010	TA	Nickel	7440-02-0	200.8	Total	ug/L	D	450
8/26/2010	TA	Nickel	7440-02-0	200.8	Total	ug/L	D	570
9/29/2010	TA	Nickel	7440-02-0	200.8	Total	ug/L	D	600
12/8/2010	TA	Nickel	7440-02-0	200.8	Total	ug/L	D	560
1/12/2011	TA	Nickel	7440-02-0	200.8	Total	ug/L	D	510
8/23/2010	TA	Nitrate Nitrite as N	STL00217	353.2	Total	mg/L	D	67
8/24/2010	TA	Nitrate Nitrite as N	STL00217	353.2	Total	mg/L	D	67
8/25/2010	TA	Nitrate Nitrite as N	STL00217	353.2	Total	mg/L	D	47
8/26/2010	TA	Nitrate Nitrite as N	STL00217	353.2	Total	mg/L	D	62
9/29/2010	TA	Nitrate Nitrite as N	STL00217	353.2	Total	mg/L	D	83
12/8/2010	TA	Nitrate Nitrite as N	STL00217	353.2	Total	mg/L	D	94
1/12/2011	TA	Nitrate Nitrite as N	STL00217	353.2	Total	mg/L	D	94
8/23/2010	TA	Nitrogen, Kjeldahl	STL00296	351.2	Total	mg/L	D	130
8/24/2010	TA	Nitrogen, Kjeldahl	STL00296	351.2	Total	mg/L	D	23
8/25/2010	TA	Nitrogen, Kjeldahl	STL00296	351.2	Total	mg/L	D	12
8/26/2010	TA	Nitrogen, Kjeldahl	STL00296	351.2	Total	mg/L	D	21
9/29/2010	TA	Nitrogen, Kjeldahl	STL00296	351.2	Total	mg/L	D	23
12/8/2010	TA	Nitrogen, Kjeldahl	STL00296	351.2	Total	mg/L	D	17
1/12/2011	TA	Nitrogen, Kjeldahl	STL00296	351.2	Total	mg/L	D	15
8/23/2010	TA	Phosphorus, Total	7723-14-0	365.1	Total	mg/L	D	3.7
8/24/2010	TA	Phosphorus, Total	7723-14-0	365.1	Total	mg/L	ND	0
8/25/2010	TA	Phosphorus, Total	7723-14-0	365.1	Total	mg/L	D	3.2
8/26/2010	TA	Phosphorus, Total	7723-14-0	365.1	Total	mg/L	D	4.3
9/29/2010	TA	Phosphorus, Total	7723-14-0	365.1	Total	mg/L	D	1.9
12/8/2010	TA	Phosphorus, Total	7723-14-0	365.1	Total	mg/L	D	1.2
1/12/2011	TA	Phosphorus, Total	7723-14-0	365.1	Total	mg/L	D	2.5
0/22/2010	TA	Calanium	7792 40 2	200.0	Diccoluge	lua/I	D	150

Raw data: one row per <u>measurement</u>

EPA FGD Effluent data in NEWTS Template

Unique_ID	Analyte	Proced	ure Unit	485	486	487	488	489	490
Date Collected	-	-	-	10/27/2008			10/27/2008		10/27/2008 ##
Sample Point	-	-	-	Influ after set basin	Influ prior set bas		Outfall010	_	Primary Clarifi Re
Type of Wastewater	-	-	-	Settling Pond Effluent	Settling Pond Infl				
Sample Description	-	-	-	Effluent from Settling Po					
Wastewater Classificat	tion -	-	-	FGD Pond Effluent		_		_	CP Primary Cla FO
Plant Name	-	7	•	Roxboro	Roxboro	Roxboro	Roxboro	Roxboro	Pleasant Prairi Pl
Plant ID Total Dissolved Solids 1	- 	- - T-+-1	mg/L	9391	9391	9391	9391	9391	6283
pH	Total Total Dis	si Iotai	mg/L						
Alkalinity mg/L	Alkalinity	Blank 8	& T mg/L as CaCO₃						
Silica	Silica		mg/L of SiO ₂						
В(ОН)3	Boron Hy	droxide	mg/L of B(OH) ₃	450.743872	381.5306632	44.15917121	441.019702	4.15279253	
Ag+	Silver		mg/L of Ag ⁺	0.0002	0.02	0.0002	0.0002	0.0002	
K+	Potassiur	n	mg/L of K ⁺						
Li+	Lithium		mg/L of Li [*]						
Na+	Sodium		mg/L of Na ⁺						
NH4+	Ammoniu	ım	mg/L of NH ₄ ⁺						
Ba+2	Barium		mg/L of Ba ²⁺	0.31	0.579	0.201	0.169	0.045	
Ca+2	Calcium		mg/L of Ca ²⁺						
Co+2	Cobalt		mg/L of Co ²⁺	0.011	0.032	0.011	0.011	0.011	
Cu+2	Copper		mg/L of Cu ²⁺	0.016	0.074	0.016	0.016	0.016	
Hg+2	Mercury		mg/L of Hg ²⁺	0.00052	0.028	0.00011	0.00012	0.00011	0.0043
Mg+2	Magnesiu	ım	mg/L of Mg ²⁺						
Mn+2	Mangane	se	mg/L of Mn ²⁺	0.846	3.5	0.245	0.592	0.154	
Ni+2	Nickel		mg/L of Ni ²⁺	0.096	0.158	0.018	0.018	0.018	
Pb+2	Lead		mg/L of Pb ²⁺	0.019	0.032	0.019	0.019	0.019	
Sr+2	Strontiun	n	mg/L of Sr2+						
Zn+2	Zinc		mg/L of Zn ²⁺	0.049	0.259	0.038	0.038	0.038	

Processed data:

- One column per stream
- Easy input into modeling software
- Easy charge balance calculation; data comparison; gap analysis



<u>Data Processing for Standardized Format</u>

Creating a template for input into aqueous chemistry modeling software



Neutrals	Input	
Silica	SiO ₂	
Boron	B(OH) ₃	
Chromium	CrO(OH)	
Titanium	TiO ₂	
Antimony	Sb(OH) ₅	
Aluminum	Al(OH) ₃	
Beryllium	Be(OH) ₂	

•	Organized by
	analyte charge

All mg/L measurements

Cations	Input	Cations	Input
Silver	Ag ⁺	Copper	Cu ²⁺
Potassium	K ⁺	Mercury	Hg ²⁺
Lithium	Li ⁺	Magnesium	Mg ²⁺
Sodium	Na ⁺	Manganese	Mn ²⁺
Ammonia	NH ₄ ⁺	Nickel	Ni ²⁺
Thallium	TI+	Lead	Pb ²⁺
Vanadium	VO ₂ ⁺	Zinc	Zn ²⁺
Barium	Ba ²⁺	Iron	Fe ³⁺
Calcium	Ca ²⁺	Molybdenum	Mo ³⁺
Cadmium	Cd ²⁺	Tin	Sn ⁴⁺
Cobalt	Co ²⁺		

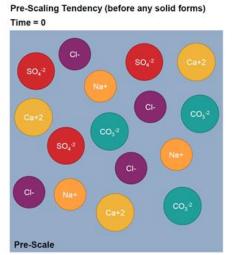
Anions	Input
Bromide	Br-
Chloride	Cl ⁻
Fluoride	F-
Cyanide	CN ⁻
Nitrate	NO ₃
Chromium Hexavalent	CrO ₄ ²⁻
Sulfate	SO ₄ ²⁻
Sulfite	SO ₃ ²⁻
Selenate	SeO ₄ ²⁻
Selenite	SeO ₃ ²⁻
Phosphate	PO ₄ ²⁻
Arsenic	AsO ₄ ³⁻

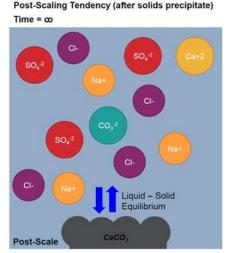
Importance of Modeling Results

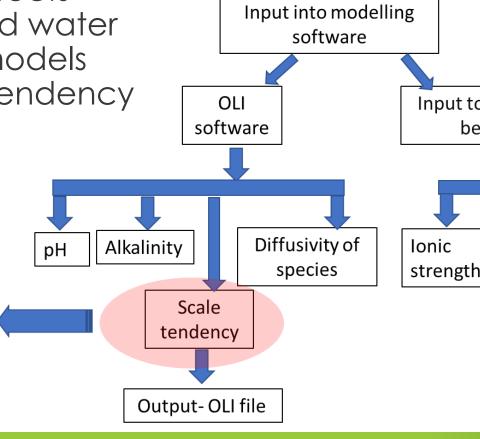


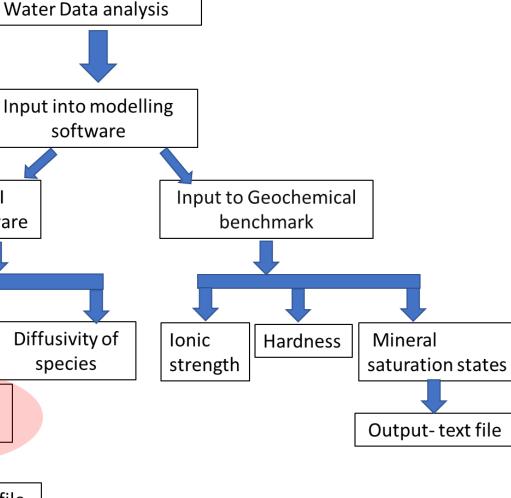
Chemistry matters

Formation of mineral scales affects water treatment processes and water quality. The thermodynamic models accurately identify the scale tendency of wastewater









Aqueous Chemistry Modeling: Case Studies



Using OLI Studio to evaluate scale tendency of FGD effluent from Roxboro plant

Input into OLI Studio

mpu		OLI .	siudio
Unique_ID	Analyte Procedu	re U nit	270
Date Collected		-	7/28/2008
Sample Point		-	Influ after set basin
Type of Wastewater			Settling Pond Effluent
Sample Description		-	Effluent from Settling Pond
Wastewater Classification		-	FGD Pond Effluent
Plant Name			Roxboro
Plant ID		-	9391
Total Dissolved Solids Tota	In Total Diss (Total	mg/L	
pH #REF!	#REF! Blank &	T mg/L as CaCO ₃	
Silica	Silica Silica	mg/L of SiO ₂	
B(OH)3	Boron Hydroxide	mg/L of B(OH) ₂	441.0197022
TiO2			41.0157022
	Titanium dioxide	mg/L of TiO ₂	
Sb(OH)5	Antimony hydroxid		0.095772536
AI(OH)3	Aluminum	mg/L of AI(OH)₃	1.487777778
Be(OH)2	Bery Iliu m	mg/L of Be(OH) ₂	0.003963918
CrO(OH)	Chromium	mg/L of CrO(OH)	0.016346154
Ag+1	Silver	mg/L of Ag [†]	0.0002
K+1	Potassiu m	mg/L of K [†]	
Li+1	Lith ium	mg/L of Li [†]	
Na+1	Sodium	mg/L of Na [†]	
NH 4+1	Ammonium	mg/L of NH ₄ ⁺	
TH1	Thallium	mg/L of TI ⁺¹	0.00241
VO2+1	Vanadium	mg/L of VO ₂ *	
			0.02279466
Ba+2 Ca+2	Barium	mg/L of Ba ²⁺ mg/L of Ca ²⁺	0.408
	Calcium		
Cd+2	Cad miu m	mg/L of Cd ²⁺	0.00277
Co+2	Cobalt	mg/L of Co ²⁺	0.022
Cu+2	Copper	mg/L of Cu ²⁺	0.016
Hg+2	Mercury	mg/L of Hg ²⁺	0.00116
Mg+2	Magnesium	mg/L of Mg ²⁺	
Mn+2	Manganese	mg/L of Mn ²⁺	1.88
Ni+2	Nickel	mg/L of Ni ²⁺	0.126
Pb+2	Lead	mg/L of Pb ²⁺	0.019
Sr+2	Strontium	mg/L of Sr2+	
Zn+2	Zinc	mg/L of Zn ²⁺	0.038
Fe+3	Iron	mg/L of Fe ³⁺	1.04
Mo+3	Molybd enu m	mg/L of Mo ³⁺	0.0449
Sn+4	Tin	mg/L of Sn ⁴⁺	
Br-1	Bromide	mg/L of Br	
CI-1	Chloride	mg/L of Cl	4300
F-1	Fluoride	mg/L of F	9.4
CN-1	Cyanide	mg/L of CN	
NO3-1	Nitrate	mg/L of NOs	
CrO4-2	Chromate	mg/L of CrO ₄ ²⁻	
SO4-2	Sulfate	mg/L of SO ₄ ²⁻	1200
SO 3-2	Sulfite	mg/L of SO2	1200
SeO4-2	Selenate	mg/L of SeO ₄	
SeO 4-2 SeO 3-2	Selenate	mg/L of SeO ₂	
AsO 4-3	Arsenic(V) Tetraoxi		
PO4-3	Phospate	mg/L of PO ₄ ³⁻	



Scaling Tendencies

Row Filter Applied: Values > 1.0e-4

Solids	Post-Scale
Fe(OH)3 (Bernalite)	1.00000
BaSO4 (Barite)	1.00000
PbSO4 (Anglesite)	0.0195029
B(OH)3	0.0101386
AgCI	1.96141e-3
AI(OH)3 (Gibbsite)	1.47368e-4



Sept 30 Data Release and NEWTS Group on EDX



First set of data publicly released 9/30/2022:

- Three large datasets including U.S. EPA Flue Gas
 Desulfurization (FGD) power plant effluent, USGS
 Brackish Waters, and USGS Produced Waters data
- Data processed into a template format for easy to entry into commercial aqueous chemistry modeling software
 - OLI Studio, Geochemist's Workbench, and others

Water compositions from:

- >4,000 FGD power plant effluent streams
- >15,000 of the most complete and highest salinity brackish waters
- >15,000 of the most complete and high salinity produced water compositions



Crucial for the development of water treatment process and resource recovery from fossil effluent streams







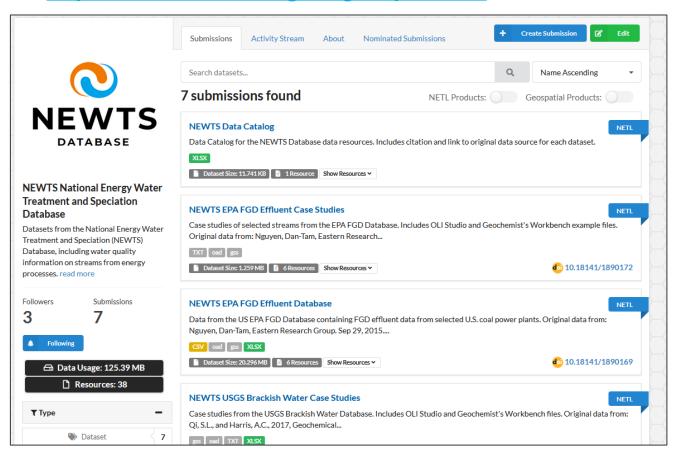
https://edx.netl.doe.gov/group/newts



NEWTS Public Group on EDX



https://edx.netl.doe.gov/group/newts





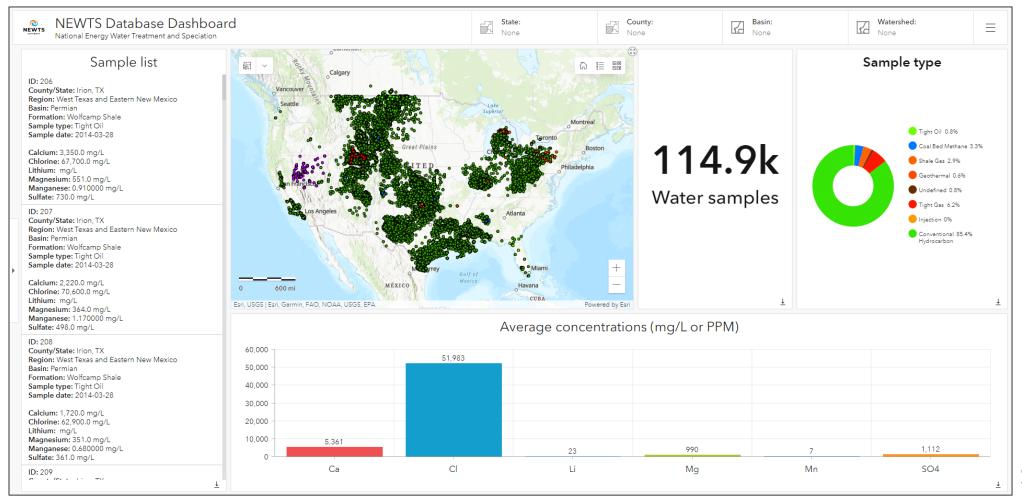
- NEWTS Data Catalog
- > EPA FGD database + case studies
- USGS Brackish Waters database + case studies
- USGS Produced Waters database + case studies
- Templates for each dataset for input into OLI, GeoChemist's Workbench



NEWTS Dashboard (Beta version)

Currently displaying USGS Produced Waters data





Enables data visualization, exploration, and download

Blondes, M. S., et al. (2019). U.S. Geological Survey National Produced Waters Geochemical Database v2.3 [Data set]. U.S. Geological Survey. https://doi.org/10.5066/F7J964W8



NETL Water Brief Update and Data Exchange Website



Objective

Update the NETL 2018 Water Brief for Fossil Energy Applications Portfolio

Make all data used to develop the maps and charts, such as shapefiles, available to the public and stakeholders through a data Exchange website

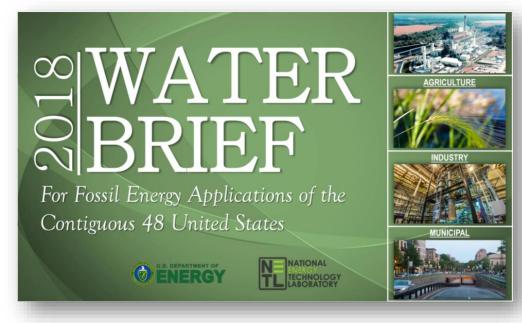
Approach

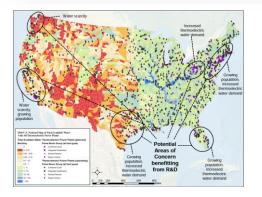
Update existing maps with current and relevant data Add other NETL analyses

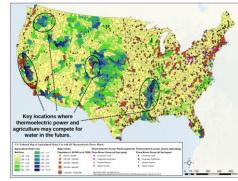
Select appropriate platform for data exchange website and house data and shapefiles

Outcome

- Data and file pull (October 2022)
- Updated Water Brief Portfolio (March 2023)
- Data published on data exchange website (March 2023)









Next Steps



- Continue to **aggregate data** from state and federal resources on energy-related wastewater information
- Develop workflow for data extraction & management
 - Digitization of relevant attributes
 - Automate data processing steps
- Continue modeling streams using aqueous chemistry software
- Develop NEWTS Dashboard to include additional resources
- Planned release of **NEWTS Database Version 1**: March 2023









NETL RESOURCES

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