DownHole SAT™

Oilfield Chemistry & Treatment Modeling Software

modeling & prediction

All French Creek modeling applications enable users to model chemistry over a range of parameters including: temperature, pH, pressure, and %mixture.

scale prediction

Simultaneously models 18+ relevant mineral scales. Modules include: single brine, injection well, and mixture of up to 12.

corrosion

All editions include CO_2-H_2S corrosion model. Generate field/well specific models with Laboratory Edition.

inhibitor

Premium Editions enable users to model common raw materials and custom formulations. Modeling includes dosage suggestion and inhibitor limitations.

mixing & water reuse

Users can copy/paste streams to be included in a mixture of up to 12 brines. The final completed mix can be used in an injection well or in another application, such as reverse osmosis or cooling water (in a French Creek Water Reuse Suite).

new in 2015

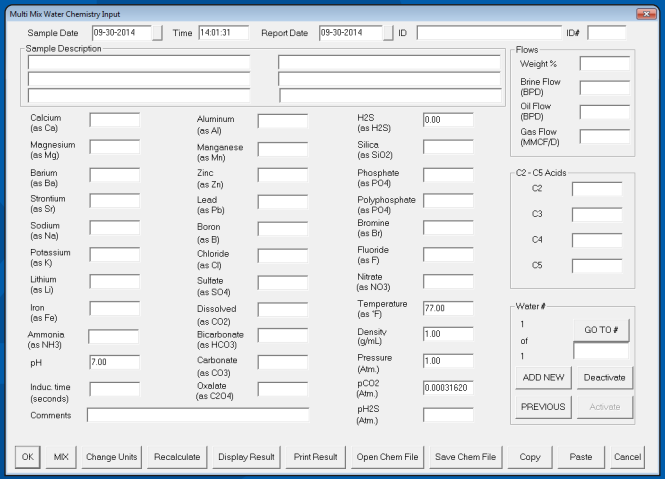
Well Log

pressure temperature profile

The DownHole SAT Well Log module adds the ability to profile scale potential and treatment requirements from bottom hole, to the separator, and after flashing to atmospheric pressure. Results can be viewed in table form or as color coded bar graphs from bottom hole to the surface. Treated and Untreated color coding can be selected to compare the impact of treatment.

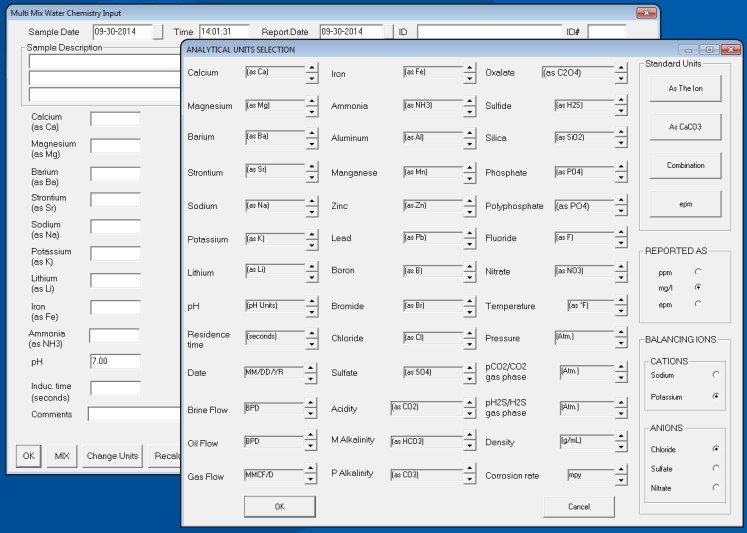
simple input

All French Creek programs are designed to be used on the fly, not requiring hours of tedious model setup/input. Incomplete analysis are balanced via a cation/ion selection of user.



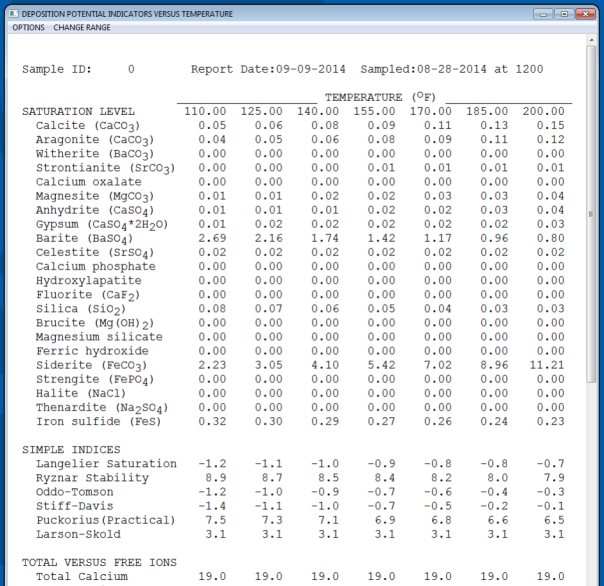
flexible input

Change analytical units and balancing ions on the fly.



output over range

Results displayed over range of parameters: temperature, pressure, %mixture.



DEPOSITION POTENTIAL INDICATORS VERSUS TEMPERATURE

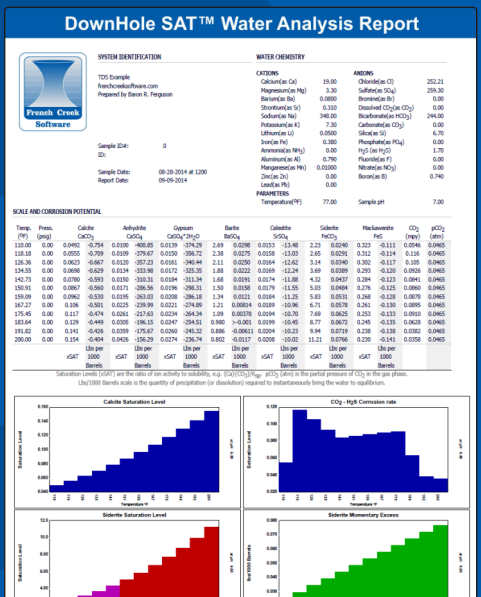
OPTIONS CHANGE RANGE

Sample ID: 0 Report Date:09-09-2014 Sampled:08-28-2014 at 1200

	TEMPERATURE (°F)						
SATURATION LEVEL	110.00	125.00	140.00	155.00	170.00	185.00	200.00
Calcite ($CaCO_3$)	0.05	0.06	0.08	0.09	0.11	0.13	0.15
Aragonite ($CaCO_3$)	0.04	0.05	0.06	0.08	0.09	0.11	0.12
Witherite ($BaCO_3$)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Strontianite ($SrCO_3$)	0.00	0.00	0.00	0.01	0.01	0.01	0.01
Calcium oxalate	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Magnesite ($MgCO_3$)	0.01	0.01	0.02	0.02	0.03	0.03	0.04
Anhydrite ($CaSO_4$)	0.01	0.01	0.01	0.02	0.02	0.03	0.04
Gypsum ($CaSO_4*2H_2O$)	0.01	0.02	0.02	0.02	0.02	0.02	0.03
Barite ($BaSO_4$)	2.69	2.16	1.74	1.42	1.17	0.96	0.80
Celestite ($SrSO_4$)	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Calcium phosphate	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hydroxylapatite	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fluorite (CaF_2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Silica (SiO_2)	0.08	0.07	0.06	0.05	0.04	0.03	0.03
Brucite ($Mg(OH)_2$)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium silicate	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ferric hydroxide	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Siderite ($FeCO_3$)	2.23	3.05	4.10	5.42	7.02	8.96	11.21
Strengite ($FePO_4$)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Halite (NaCl)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Thenardite (Na_2SO_4)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Iron sulfide (FeS)	0.32	0.30	0.29	0.27	0.26	0.24	0.23
SIMPLE INDICES							
Langelier Saturation	-1.2	-1.1	-1.0	-0.9	-0.8	-0.8	-0.7
Ryznar Stability	8.9	8.7	8.5	8.4	8.2	8.0	7.9
Oddo-Tomson	-1.2	-1.0	-0.9	-0.7	-0.6	-0.4	-0.3
Stiff-Davis	-1.4	-1.1	-1.0	-0.7	-0.5	-0.2	-0.1
Puckorius(Practical)	7.5	7.3	7.1	6.9	6.8	6.6	6.5
Larson-Skold	3.1	3.1	3.1	3.1	3.1	3.1	3.1
TOTAL VERSUS FREE IONS							
Total Calcium	19.0	19.0	19.0	19.0	19.0	19.0	19.0

concise summary

All editions feature a brief summary output of chemistry input and scale potential.



DownHole SAT™ Water Analysis Report

French Creek Software

SYSTEM IDENTIFICATION

TDS Example
frenchcreeksoftware.com
Prepared by Baron R. Ferguson

Sample ID#: 0
ID:

Sample Date: 08-28-2014 at 1200
Report Date: 09-09-2014

WATER CHEMISTRY

CATIONS		ANIONS	
Calcium(as Ca)	19.00	Chloride(as Cl)	252.21
Magnesium(as Mg)	3.30	Sulfate(as SO_4)	259.30
Barium(as Ba)	0.0000	Bromine(as Br)	0.00
Strontium(as Sr)	0.310	Dissolved CO_2(as CO_2)	0.00
Sodium(as Na)	348.00	Bicarbonate(as HCO_3)	244.00
Potassium(as K)	7.30	Carbonate(as CO_3)	0.00
Lithium(as Li)	0.0500	Silica(as Si)	6.70
Iron(as Fe)	0.380	Phosphate(as PO_4)	0.00
Ammonia(as NH_3)	0.00	H_2S (as H_2S)	1.70
Aluminum(as Al)	0.790	Fluoride(as F)	0.00
Manganese(as Mn)	0.01000	Nitrate(as NO_3)	0.00
Zinc(as Zn)	0.00	Boron(as B)	0.740
Lead(as Pb)	0.00		

PARAMETERS

Temperature(°F) 77.00 Sample pH 7.00

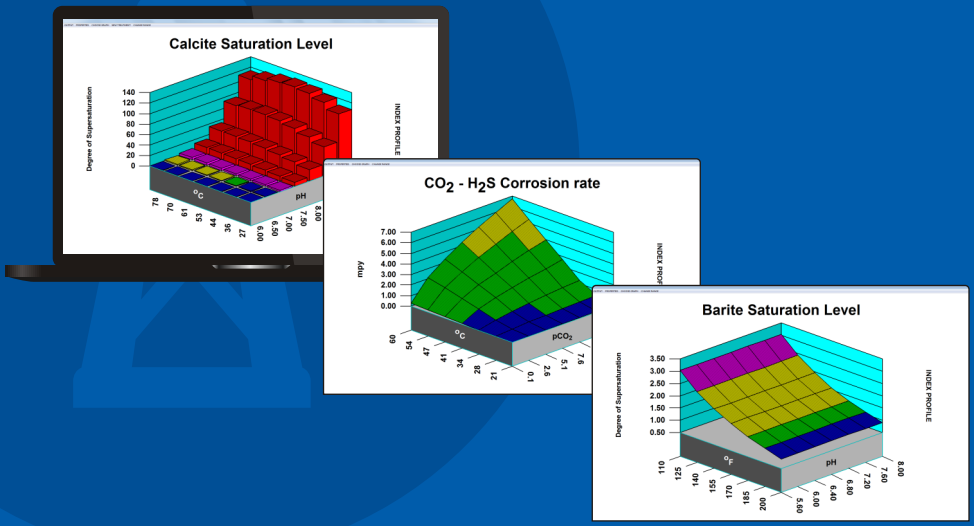
SCALE AND CORROSION POTENTIAL

Temp. (°F)	Press. (psig)	Calcite $CaCO_3$		Anhydrite $CaSO_4$		Gypsum $CaSO_4*2H_2O$		Barite $BaSO_4$		Celestite $SrSO_4$		Siderite $FeCO_3$		Mackawinite FeS		CO_2 (mpy)	pCO_2 (atm)
110.00	0.00	0.0492	-0.754	0.0100	-400.85	0.0139	-374.29	2.69	0.0298	0.0153	-13.48	2.23	0.0240	0.323	-0.111	0.0546	0.0465
118.18	0.00	0.0555	-0.709	0.0109	-379.67	0.0150	-356.72	2.38	0.0275	0.0158	-13.03	2.65	0.0291	0.312	-0.114	0.116	0.0465
126.36	0.00	0.0623	-0.667	0.0120	-357.23	0.0161	-340.44	2.11	0.0250	0.0164	-12.62	3.14	0.0340	0.302	-0.117	0.105	0.0465
134.55	0.00	0.0698	-0.629	0.0134	-333.98	0.0172	-325.35	1.88	0.0222	0.0169	-12.24	3.69	0.0389	0.293	-0.120	0.0916	0.0465
142.73	0.00	0.0780	-0.593	0.0150	-310.31	0.0184	-311.34	1.68	0.0191	0.0174	-11.88	4.32	0.0437	0.284	-0.123	0.0841	0.0465
150.91	0.00	0.0867	-0.560	0.0171	-286.56	0.0196	-298.31	1.50	0.0158	0.0179	-11.55	5.03	0.0484	0.276	-0.125	0.0860	0.0465
159.09	0.00	0.0962	-0.530	0.0195	-263.03	0.0208	-286.18	1.34	0.0121	0.0184	-11.25	5.83	0.0531	0.268	-0.128	0.0878	0.0465
167.27	0.00	0.106	-0.501	0.0225	-239.99	0.0221	-274.89	1.21	0.00814	0.0189	-10.96	6.71	0.0578	0.261	-0.130	0.0895	0.0465
175.45	0.00	0.117	-0.474	0.0261	-217.63	0.0234	-264.34	1.09	0.00378	0.0194	-10.70	7.69	0.0625	0.253	-0.133	0.0910	0.0465
183.64	0.00	0.129	-0.449	0.0305	-196.15	0.0247	-254.51	0.980	-0.001	0.0199	-10.45	8.77	0.0672	0.245	-0.135	0.0628	0.0465
191.82	0.00	0.141	-0.426	0.0359	-175.67	0.0260	-245.32	0.886	-0.00611	0.0204	-10.23	9.94	0.0719	0.238	-0.138	0.0382	0.0465
200.00	0.00	0.154	-0.404	0.0426	-156.29	0.0274	-236.74	0.802	-0.0117	0.0208	-10.02	11.21	0.0766	0.230	-0.141	0.0358	0.0465
			Lbs per		Lbs per		Lbs per		Lbs per		Lbs per		Lbs per		Lbs per		
		xSAT	1000 Barrels	xSAT	1000 Barrels	xSAT	1000 Barrels	xSAT	1000 Barrels	xSAT	1000 Barrels	xSAT	1000 Barrels	xSAT	1000 Barrels		

Saturation Levels (xSAT) are the ratio of ion activity to solubility, e.g. $(Ca)(CO_3)/K_{SP}$. pCO_2 (atm) is the partial pressure of CO_2 in the gas phase.
Lbs/1000 Barrels scale is the quantity of precipitation (or dissolution) required to instantaneously bring the water to equilibrium.

visual aids

2D & 3D color coded visual aids: Red Bad - Blue Good.



DownHole SAT™

Oilfield Chemistry & Treatment Modeling Software

	BASIC EDITION	FIELD ENGINEER	FORMULATOR EDITION	LABORATORY EDITION
Calculate Saturation Levels	X	X	X	X
CO_2-H_2S Corrosion Rate Module	X	X	X	X
2D & 3D Graphs	X	X	X	X
Single Brine Modeling	X	X	X	X
Injection Well Modeling	X	X	X	X
Multi-Mix Modeling	X	X	X	X
Select Product File & Model Treatment		X	X	X
Generate Product File / Input Formulation			X	X
Create Custom Inhibitor Models Via Lab Data				X
Develop Corrosion Rate Models				X
Batch Processing	Available	Available	Available	Available

DownHole SAT™

Oilfield Chemistry & Treatment Modeling Software

Basic Edition	$2,495.00 License Fee + $495.00 Annual Maintenance
Field Engineer Edition	$3,295.00 License Fee + $599.00 Annual Maintenance
Formulator Edition	$4,995.00 License Fee + $749.00 Annual Maintenance
Laboratory Edition	$7,495.00 License Fee + $1,124.00 Annual Maintenance
Batch Processing / Customization	$5,000 Fee