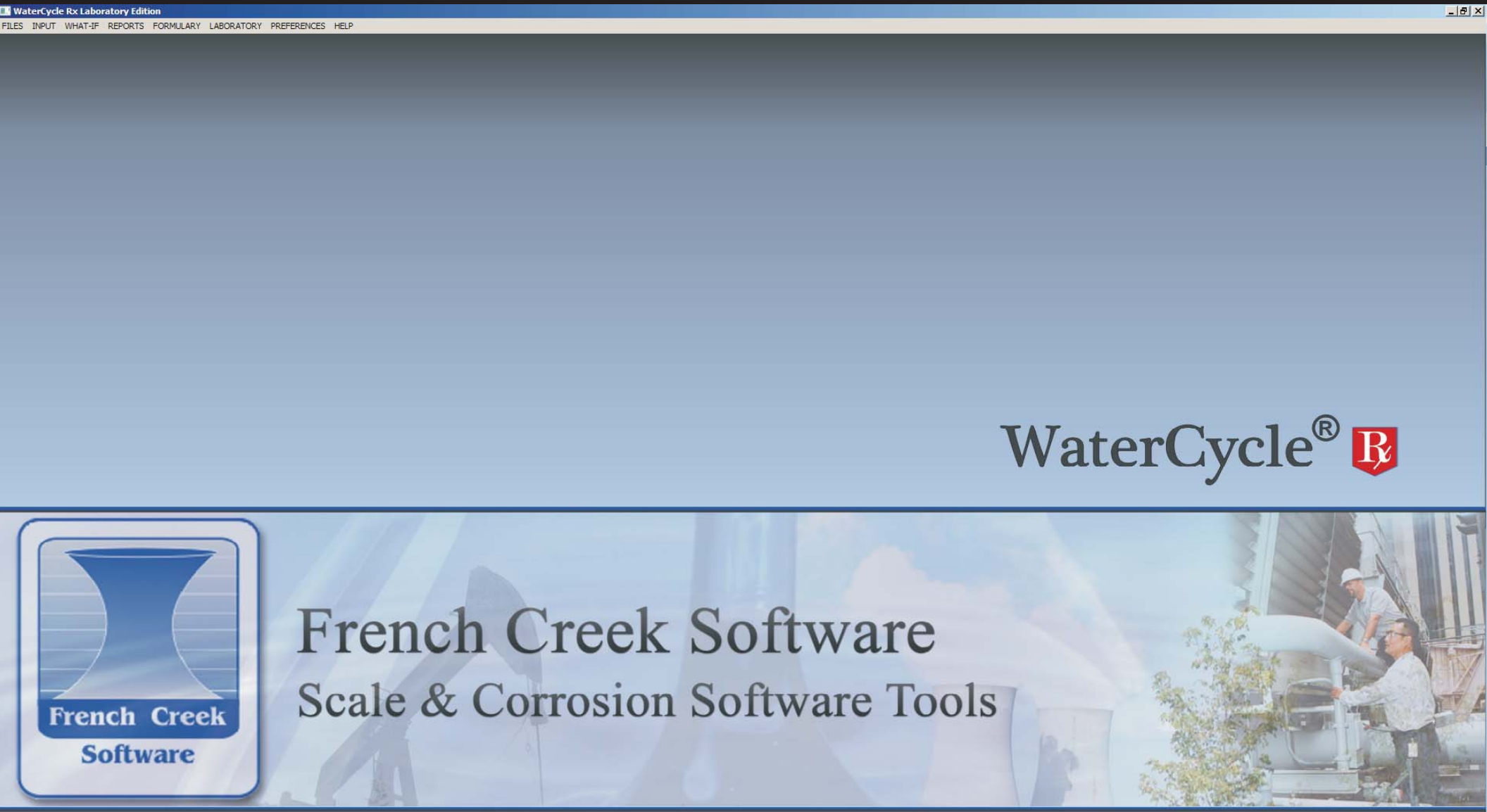
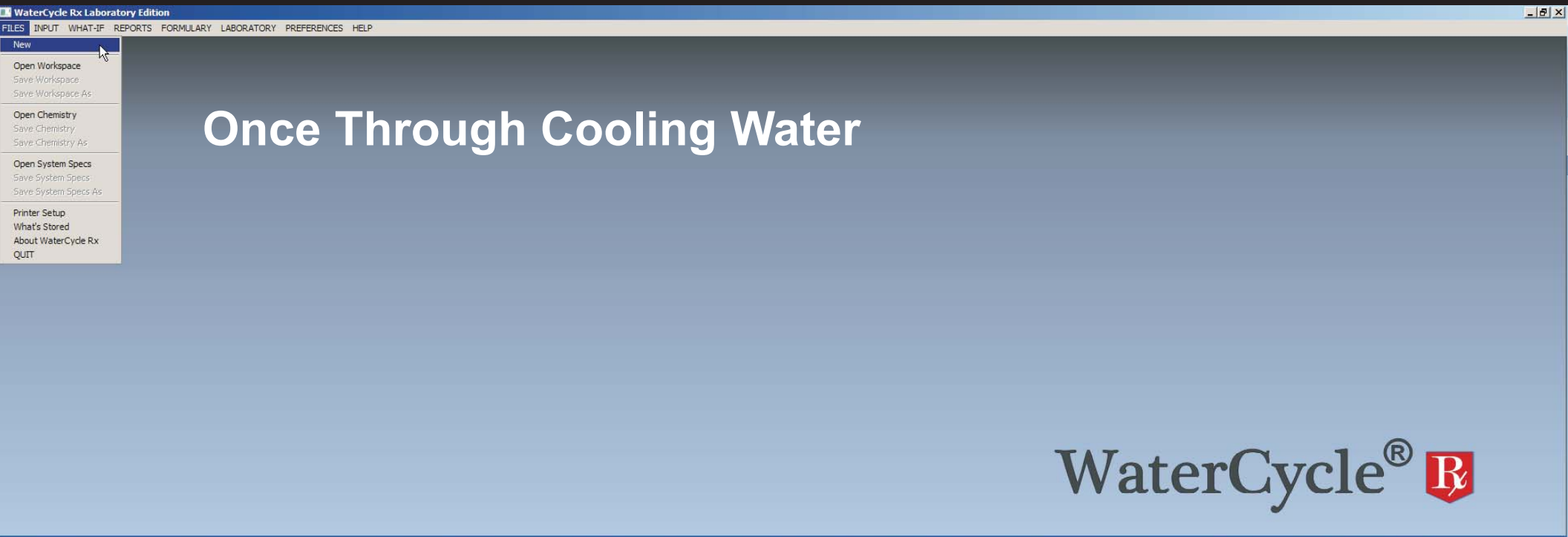
Welcome to the WaterCycle® Walkabout



Cooling Water can be evaluated as Once Through or Open Recirculating



Once Through Cooling Water

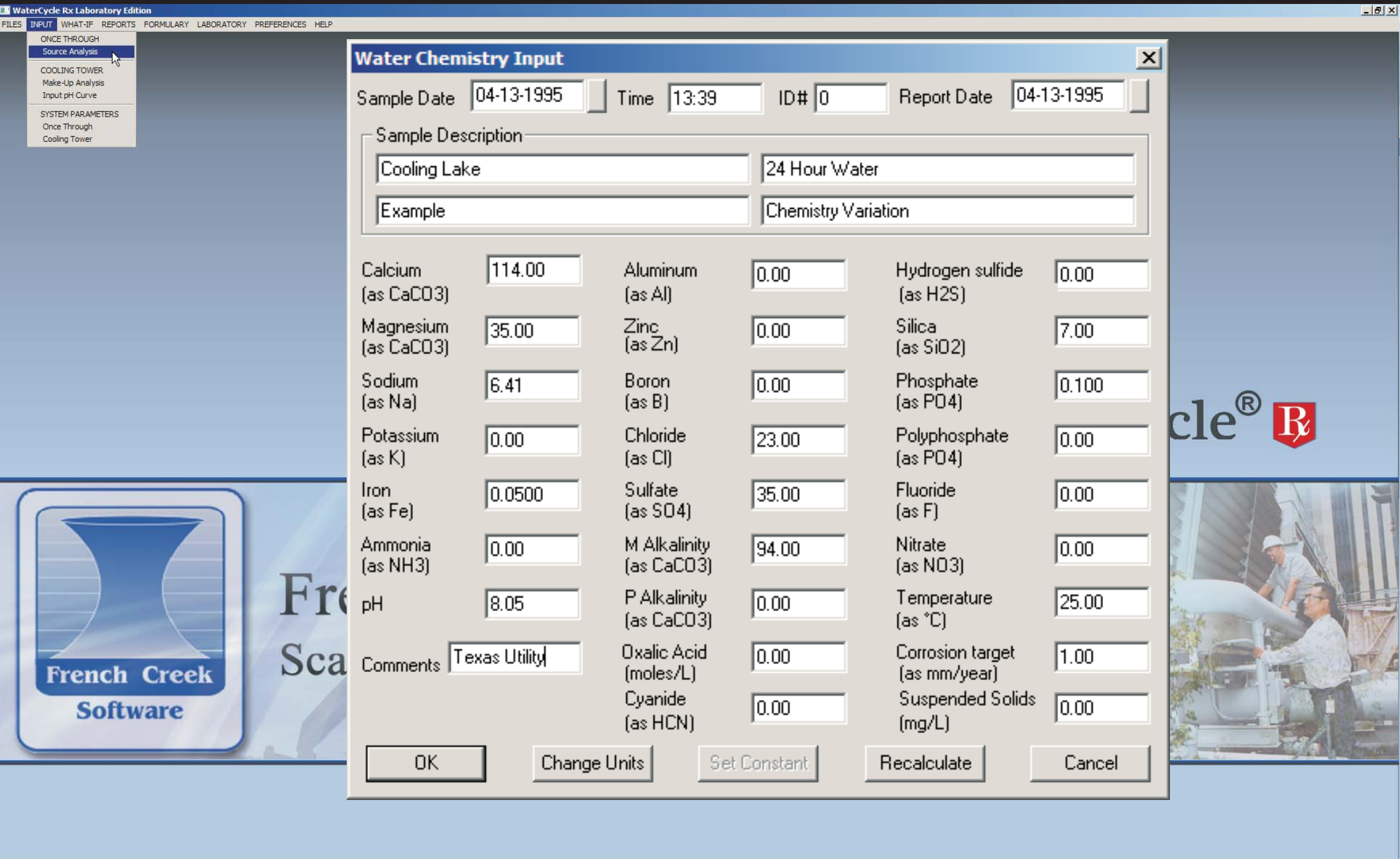
WaterCycle® Rx

French Creek Software

Scale & Corrosion Software Tools

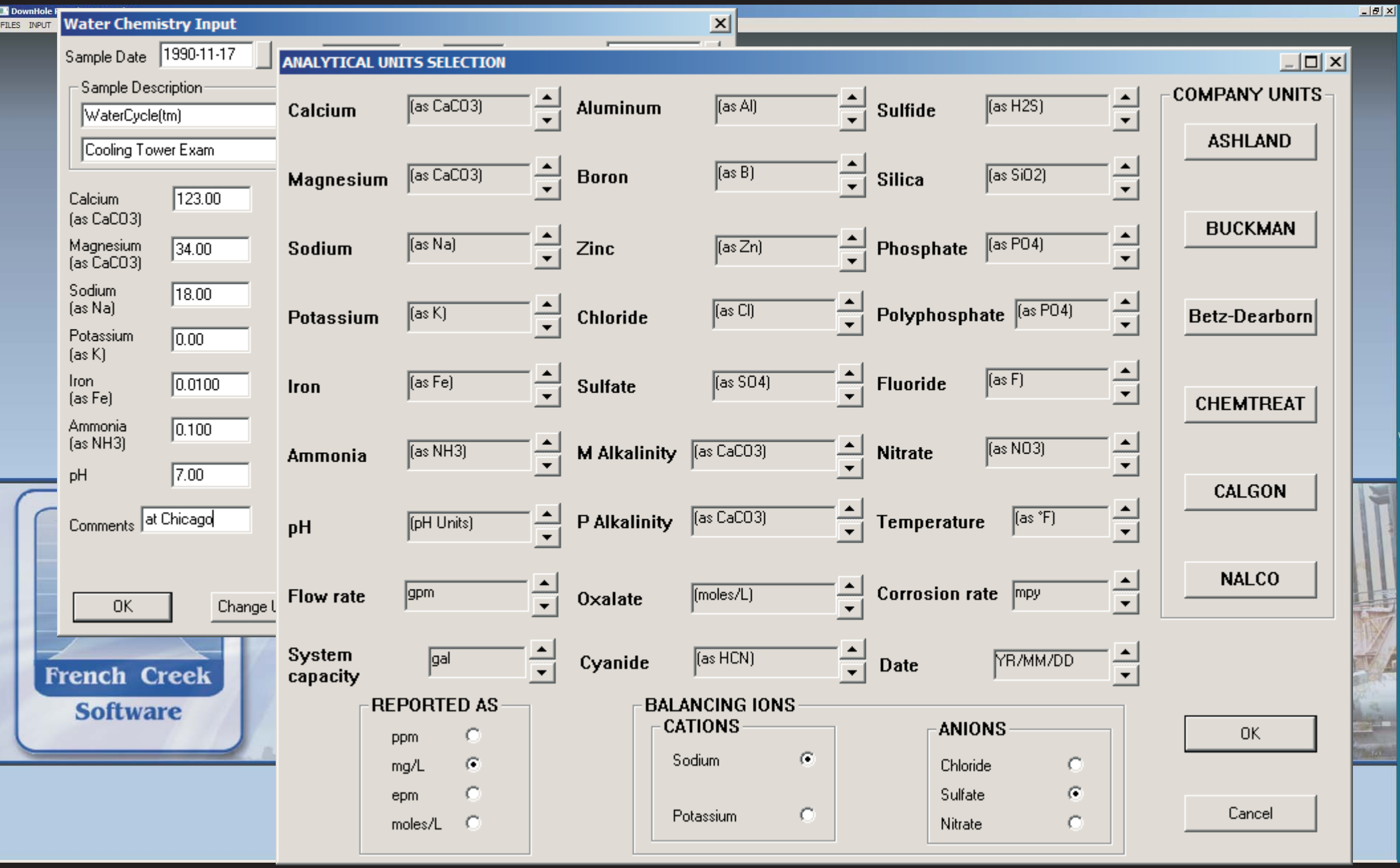
The first step is Source Water Chemistry Input

Always check the Analytical Units
Click on **Change Units** if they aren't just right!

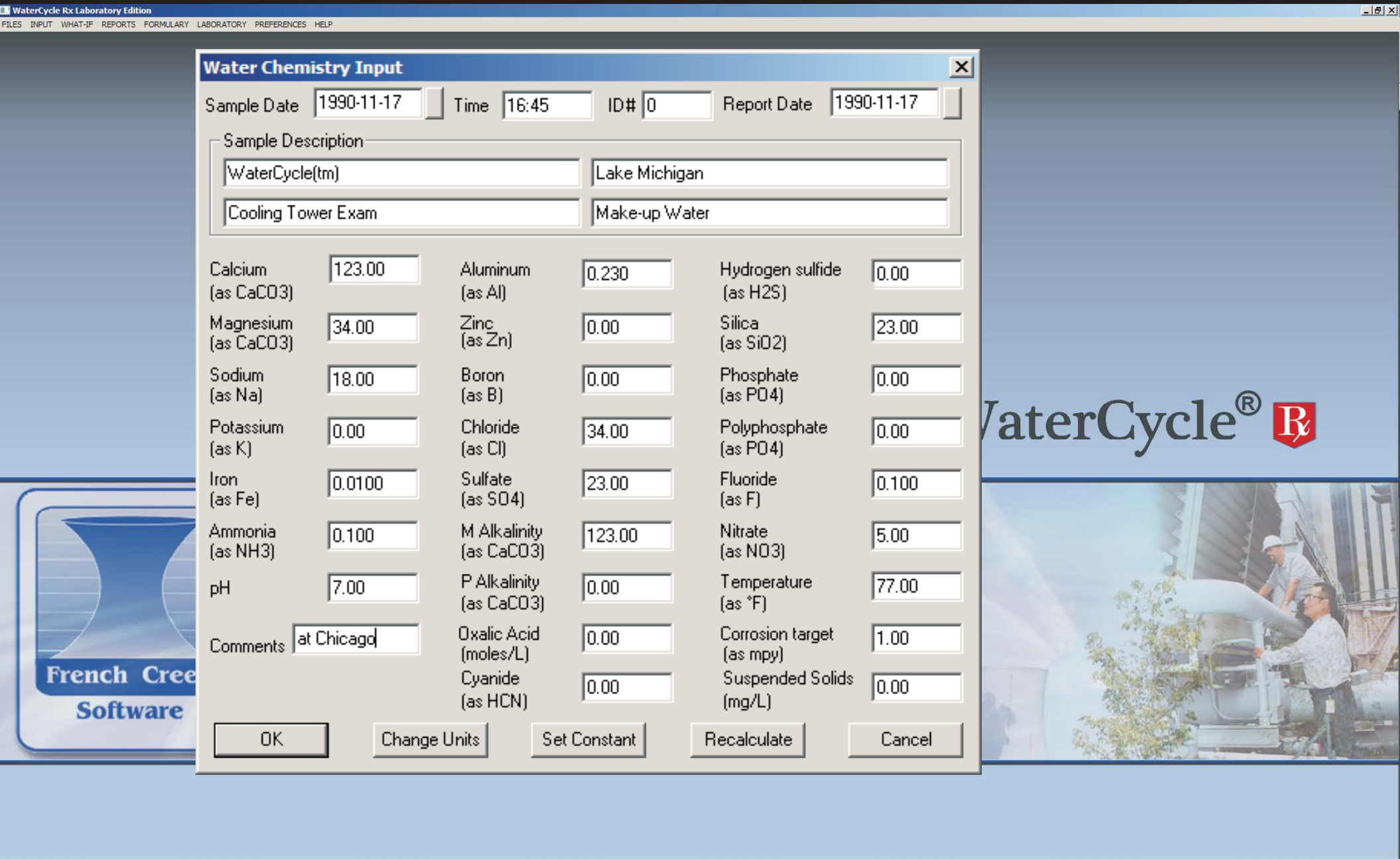


The first step is Water Chemistry Input

Make sure that temperature, pressure, and flows are expressed in your units.
Also check ions, e.g. Ca as Ca? Ca as $CaCO_3$
Click **OK** to save the new units



Press OK and review the water chemistry, scale potential, and corrosivity



Two windows open. The Water Chemistry Input and the Scale and Corrosion Evaluation

SOURCE WATER ANALYSIS

OPTIONS

Sample ID: 0 Report Date: 04-13-1995 Sampled: 04-13-1995 at 1339

CATIONS		ANIONS	
Calcium(as $CaCO_3$)	114.00	Chloride(as Cl)	23.00
Magnesium(as $CaCO_3$)	35.00	Sulfate(as SO_4)	35.00
Sodium(as Na)	6.41	"M" Alkalinity(as $CaCO_3$)	94.00
Potassium(as K)	0.00	"P" Alkalinity(as $CaCO_3$)	0.00
Iron(as Fe)	0.0500	Oxalic acid(moles/L)	0.00
Ammonia(as NH3)	0.00	Silica(as	
Aluminum(as Al)	0.00	Phosphate	
Zinc(as Zn)	0.00	Pyrophosp	
Boron(as B)	0.00	H_2S (as H	
		Cyanide (	
		Fluoride(	
		Nitrate(a	

PARAMETERS		COMMENTS
pH	8.05	Texas Uti
Temperature(Deg C)	25.00	
Calculated T.D.S.	244.81	
Calculated Cond.	320.74	
Suspended Solids(mg/L)	0.00	

SOURCE WATER DEPOSITION POTENTIAL INDICATORS

OPTIONS

Sample ID: 0 Report Date: 04-13-1995 Sampled: 04-13-1995 at 1339

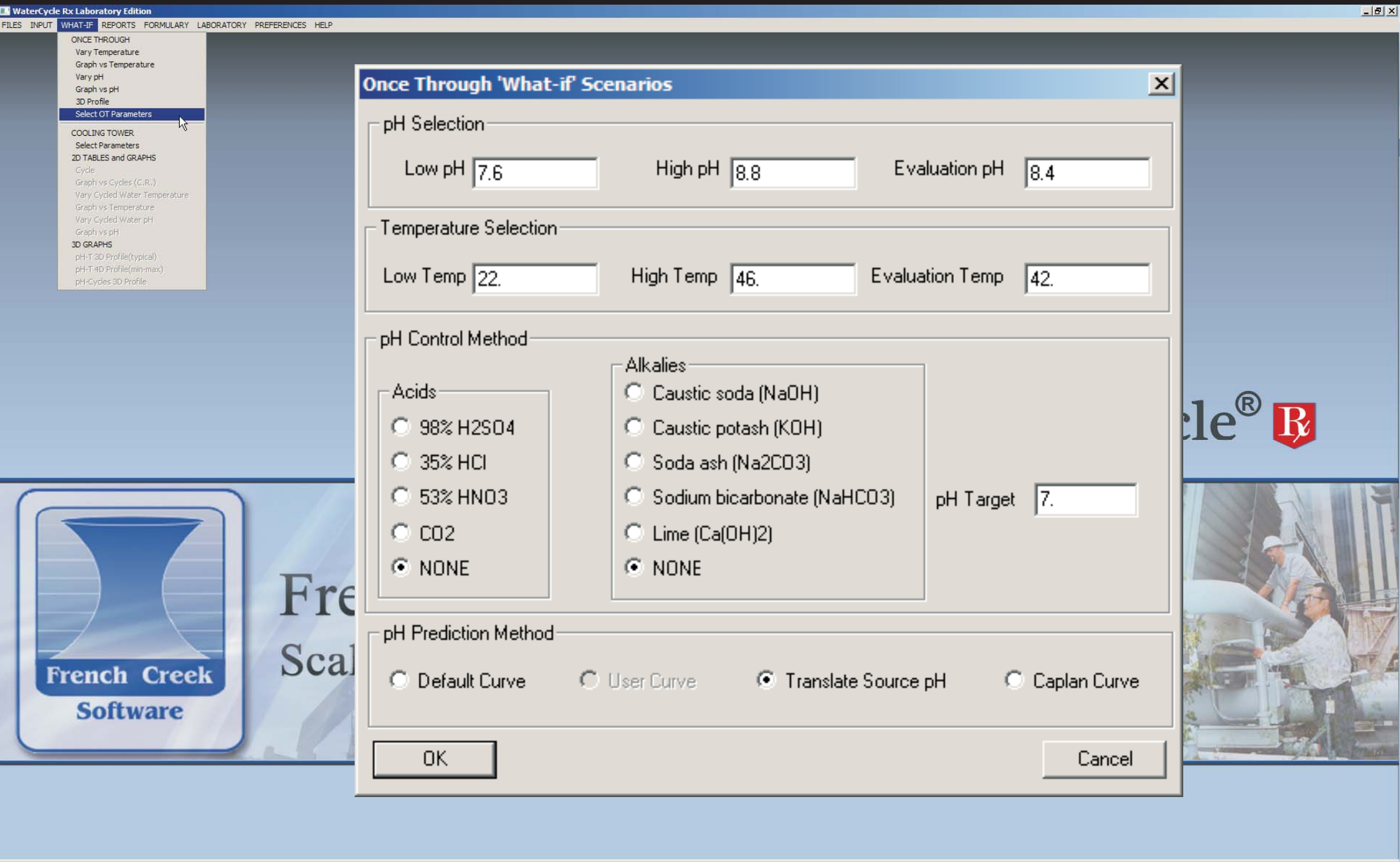
SATURATION LEVEL as IAP/Ksp			BOUND IONS	Total	Free
Calcite:	$CaCO_3$	1.64	Calcium:	45.7	42.6
Aragonite:	$CaCO_3$	1.43	Carbonate:	1.7	0.7
Calcium oxalate:	CaC_2O_4	0.00	Phosphate:	0.1	0.0
Anhydrite:	$CaSO_4$	0.01			
Gypsum:	$CaSO_4*2H_2O$	0.01			
Calcium phosphate:	$Ca_3(PO_4)_2$	0.01			
Hydroxyapatite:	$Ca_5(PO_4)_3(OH)$	0.00			
Ca polyphosphate:	CaP_2O_7	0.00			
Silica:	SiO_2	0.06	FREE ION MOMENTARY EXCESS		
Fluorite:	CaF_2	0.00	Calcite:		0.46
Brucite:	$Mg(OH)_2$	0.00	Aragonite:		0.35
Magnesium silicate:	$MgSiO_3$	0.00	Calcium oxalate:		-0.37
Ferric hydroxide:	$Fe(OH)_3$	141.53	Anhydrite:		-780.39
Siderite:	$FeCO_3$	1.39	Gypsum:		-671.94
Strengite:	$FePO_4*2H_2O$	0.04	Calcium phosphate:		-0.00
Zinc hydroxide:	$Zn(OH)_2$	0.00	Hydroxyapatite:		-383.84
Zinc carbonate:	$ZnCO_3$	0.00	Ca polyphosphate:		-0.00
Zinc phosphate:	$Zn_3(PO_4)_2$	0.00	Silica:		-113.41
Zn polyphosphate:	ZnP_2O_7	0.00	Fluorite:		-37.06
			Brucite:		-4.49
SIMPLE INDICES			Magnesium silicate:		-189.73
Langelier:		0.26	Ferric hydroxide:		0.00
Ryznar:		7.53	Siderite:		0.01
Practical:		8.15	Strengite:		-0.00
Larson-Skold:		0.73	Zinc hydroxide:		-0.00
Zinc solubility:		2.39	Zinc carbonate:		-1.09
Pyro solubility:		3.73	Zinc phosphate:		-0.01
Ortho solubility:		1.84	Zn polyphosphate:		-1.50

OPERATING CONDITIONS

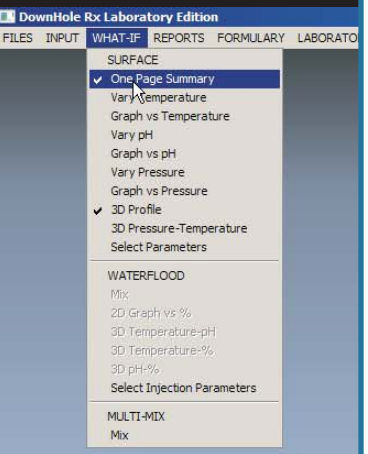
Temperature:	25.0
Time(secs):	5.60

Both Windows can be printed, or saved in Microsoft Word (.rtf) format.

Set-up ‘What-if’ Scenario Options for Profiles



Display the One Page Summary
Coming to WaterCycle Version 7 Fall 2009



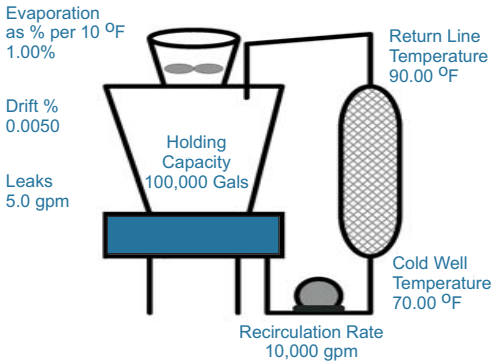
WaterCycle® Cooling System Evaluation

Calculated Using the
French Creek Engine

SYSTEM IDENTIFICATION

WaterCycle(tm) Cooling Tower Exam
Lake Michigan Make-up Water

Date:17-11-1990 Sampled: 17-11-1990
Sample #: 0 at 1645



WATER CHEMISTRY — Concentration Ratio

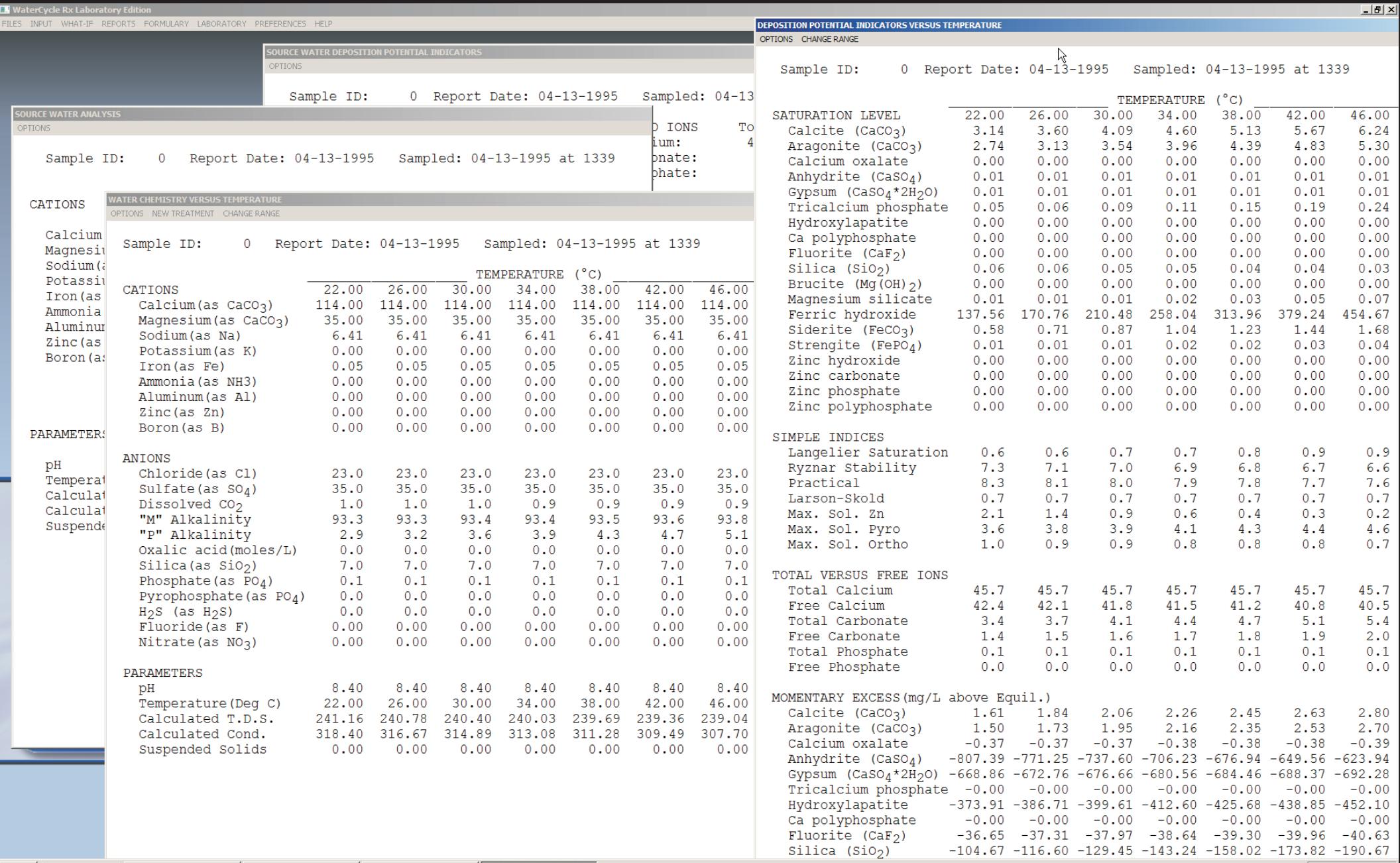
	Makeup	5.00	5.50	6.00
CATIONS				
Calcium (as CaCO3)	123.0	615.00	656.00	738.00
Magnesium (as CaCO3)	23.0	170.00	187.00	204.00
Sodium (as Na)	18.0	90.00	99.00	108.00
Potassium (as K)	0.0	0.00	0.00	0.00
Iron (as Fe)	0.01	0.0500	0.0550	0.0600
Ammonia (as NH3)	0.10	0.500	0.550	0.600
Aluminum (as Al)	0.2	1.15	1.26	1.38
Zinc (as Zn)	0.00	0.00	0.00	0.00
Boron (as B)	0.00	0.00	0.00	0.00
ANIONS				
Chloride (as Cl)	34.0	170.00	187.00	204.00
Sulfate (as SO4)	23.0	115.00	126.50	138.00
Dissolved CO2	0.6	3.0	2.8	2.7
"M" Alkalinity	121.8	609.0	708.6	728.4
"P" Alkalinity	17.1	85.5	112.6	127.2
Oxalate(as C2O4)	0.00	0.00	0.00	0.00
Silica(as SiO2)	23.0	115.00	126.50	138.00
Phosphate(as PO4)	0.00	0.00	0.00	0.00
Pyrophosphate(PO4)	0.00	0.00	0.00	0.00
H2S(as H2S)	0.00	0.00	0.00	0.00
Fluoride(as F)	0.10	0.500	0.550	0.600
Nitrate(as NO3)	5.0	25.00	27.50	30.00
PARAMETERS				
pH	7.00	8.63	8.69	8.74
Temperature (°F)	77.0	110.00	110.00	110.00
Calculated TDS		1517	1652	1786
Calculated Cond.		1412	1506	1596
Suspended Solids	0.00	0.00	0.00	0.00
DOSAGE (mg/L)				
100% PBTC		6.77	7.88	[9.0]

SCALE POTENTIAL — Concentration Ratio

SATURATION LEVEL	5.00	5.50	6.00
Calcite	144.32	179.99	218.62
Aragonite	122.90	153.28	186.18
Calcium oxalate	0.00	0.00	0.00
Anhydrite	0.0709	0.0797	0.0886
Gypsum	0.0775	0.0871	0.0967
Calcium phosphate	0.00	0.00	0.00
Hydroxyapatite	0.00	0.00	0.00
Ca pyrophosphate	0.00	0.00	0.00
Fluorite	0.00104	0.00129	0.00159
Silica	0.561	0.606	0.649
Brucite	0.0239	0.0328	0.0437
Magnesium silicate	6.58	9.78	13.94
Ferric hydroxide	305.12	307.98	308.68
Siderite	3.11	2.84	2.58
Strengite	0.00	0.00	0.00
Struvite	0.00	0.00	0.00
Zinc hydroxide	0.00	0.00	0.00
Zinc carbonate	0.00	0.00	0.00
Zinc phosphate	0.00	0.00	0.00
Zinc pyrophosphate	0.00	0.00	0.00
SIMPLE INDICES			
Langelier	2.50	2.63	2.75
Ryznar	3.63	3.43	3.24
Practical	3.64	3.44	3.25
Larson-Skold	0.594	0.595	0.596
Ca Total	246.31	270.94	295.57
Free	170.63	181.95	192.67
CO3 Total	98.87	122.55	148.06
Free	19.94	24.10	28.49
PO4 Total	0.00	0.00	0.00
Free	0.00	0.00	0.00

Profile versus pH, or temperature

Output as Tables or 2D Graphs



WaterCycle Rx Laboratory Edition

FILES INPUT WHAT-IF REPORTS FORMULARY LABORATORY PREFERENCES HELP

SOURCE WATER DEPOSITION POTENTIAL INDICATORS

OPTIONS

Sample ID: 0 Report Date: 04-13-1995 Sampled: 04-13

SOURCE WATER ANALYSIS

OPTIONS

Sample ID: 0 Report Date: 04-13-1995 Sampled: 04-13-1995 at 1339

CATIONS

Calcium
Magnesiu
Sodium(a
Potassiu
Iron(as
Ammonia
Aluminur
Zinc(as
Boron(as

PARAMETERS

pH
Temperat
Calculat
Calculat
Suspende

WATER CHEMISTRY VERSUS TEMPERATURE

OPTIONS NEW TREATMENT CHANGE RANGE

Sample ID: 0 Report Date: 04-13-1995 Sampled: 04-13-1995 at 1339

	TEMPERATURE (°C)						
CATIONS	22.00	26.00	30.00	34.00	38.00	42.00	46.00
Calcium(as $CaCO_3$)	114.00	114.00	114.00	114.00	114.00	114.00	114.00
Magnesium(as $CaCO_3$)	35.00	35.00	35.00	35.00	35.00	35.00	35.00
Sodium(as Na)	6.41	6.41	6.41	6.41	6.41	6.41	6.41
Potassium(as K)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Iron(as Fe)	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Ammonia(as NH3)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aluminum(as Al)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zinc(as Zn)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Boron(as B)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ANIONS							
Chloride(as Cl)	23.0	23.0	23.0	23.0	23.0	23.0	23.0
Sulfate(as SO_4)	35.0	35.0	35.0	35.0	35.0	35.0	35.0
Dissolved CO_2	1.0	1.0	1.0	0.9	0.9	0.9	0.9
"M" Alkalinity	93.3	93.3	93.4	93.4	93.5	93.6	93.8
"P" Alkalinity	2.9	3.2	3.6	3.9	4.3	4.7	5.1
Oxalic acid(moles/L)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Silica(as SiO_2)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Phosphate(as PO_4)	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Pyrophosphate(as PO_4)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
H_2S (as H_2S)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fluoride(as F)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrate(as NO_3)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PARAMETERS							
pH	8.40	8.40	8.40	8.40	8.40	8.40	8.40
Temperature(Deg C)	22.00	26.00	30.00	34.00	38.00	42.00	46.00
Calculated T.D.S.	241.16	240.78	240.40	240.03	239.69	239.36	239.04
Calculated Cond.	318.40	316.67	314.89	313.08	311.28	309.49	307.70
Suspended Solids	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DEPOSITION POTENTIAL INDICATORS VERSUS TEMPERATURE

OPTIONS CHANGE RANGE

Sample ID: 0 Report Date: 04-13-1995 Sampled: 04-13-1995 at 1339

	TEMPERATURE (°C)						
SATURATION LEVEL	22.00	26.00	30.00	34.00	38.00	42.00	46.00
Calcite ($CaCO_3$)	3.14	3.60	4.09	4.60	5.13	5.67	6.24
Aragonite ($CaCO_3$)	2.74	3.13	3.54	3.96	4.39	4.83	5.30
Calcium oxalate	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Anhydrite ($CaSO_4$)	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Gypsum ($CaSO_4*2H_2O$)	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Tricalcium phosphate	0.05	0.06	0.09	0.11	0.15	0.19	0.24
Hydroxylapatite	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca polyphosphate	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)	0.06	0.06	0.05	0.05	0.04	0.04	0.03
Brucite ($Mg(OH)_2$)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium silicate	0.01	0.01	0.01	0.02	0.03	0.05	0.07
Ferric hydroxide	137.56	170.76	210.48	258.04	313.96	379.24	454.67
Siderite ($FeCO_3$)	0.58	0.71	0.87	1.04	1.23	1.44	1.68
Strengite ($FePO_4$)	0.01	0.01	0.01	0.02	0.02	0.03	0.04
Zinc hydroxide	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zinc carbonate	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zinc phosphate	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zinc polyphosphate	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SIMPLE INDICES							
Langelier Saturation	0.6	0.6	0.7	0.7	0.8	0.9	0.9
Ryznar Stability	7.3	7.1	7.0	6.9	6.8	6.7	6.6
Practical	8.3	8.1	8.0	7.9	7.8	7.7	7.6
Larson-Skold	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Max. Sol. Zn	2.1	1.4	0.9	0.6	0.4	0.3	0.2
Max. Sol. Pyro	3.6	3.8	3.9	4.1	4.3	4.4	4.6
Max. Sol. Ortho	1.0	0.9	0.9	0.8	0.8	0.8	0.7
TOTAL VERSUS FREE IONS							
Total Calcium	45.7	45.7	45.7	45.7	45.7	45.7	45.7
Free Calcium	42.4	42.1	41.8	41.5	41.2	40.8	40.5
Total Carbonate	3.4	3.7	4.1	4.4	4.7	5.1	5.4
Free Carbonate	1.4	1.5	1.6	1.7	1.8	1.9	2.0
Total Phosphate	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Free Phosphate	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MOMENTARY EXCESS(mg/L above Equil.)							
Calcite ($CaCO_3$)	1.61	1.84	2.06	2.26	2.45	2.63	2.80
Aragonite ($CaCO_3$)	1.50	1.73	1.95	2.16	2.35	2.53	2.70
Calcium oxalate	-0.37	-0.37	-0.37	-0.38	-0.38	-0.38	-0.39
Anhydrite ($CaSO_4$)	-807.39	-771.25	-737.60	-706.23	-676.94	-649.56	-623.94
Gypsum ($CaSO_4*2H_2O$)	-668.86	-672.76	-676.66	-680.56	-684.46	-688.37	-692.28
Tricalcium phosphate	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
Hydroxylapatite	-373.91	-386.71	-399.61	-412.60	-425.68	-438.85	-452.10
Ca polyphosphate	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
Fluorite (CaF_2)	-36.65	-37.31	-37.97	-38.64	-39.30	-39.96	-40.63
Silica (SiO_2)	-104.67	-116.60	-129.45	-143.24	-158.02	-173.82	-190.67

Start | Server Manager | WATLAB32 - Microsoft Vi... | CorelDRAW X4 - [E:\amt... | WaterCycle Rx Labor... | 4:56 PM

Profile versus pH, or temperature

Output as Tables or 2D Graphs

WaterCycle Rx Laboratory Edition

FILES INPUT WHAT-IF REPORTS FORMULARY LABORATORY PREFERENCES HELP

SOURCE WATER DEPOSITION POTENTIAL INDICATORS

OPTIONS

Sample ID: 0 Report Date: 04-13-1995 Sampled: 04-13

SOURCE WATER ANALYSIS

OPTIONS

Sample ID: 0 Report Date: 04-13-1995 Sampled: 04-13-1995 at 1339

CATIONS

Calcium
Magnesiu
Sodium(a
Potassiu
Iron(as
Ammonia
Aluminur
Zinc(as
Boron(as

PARAMETERS

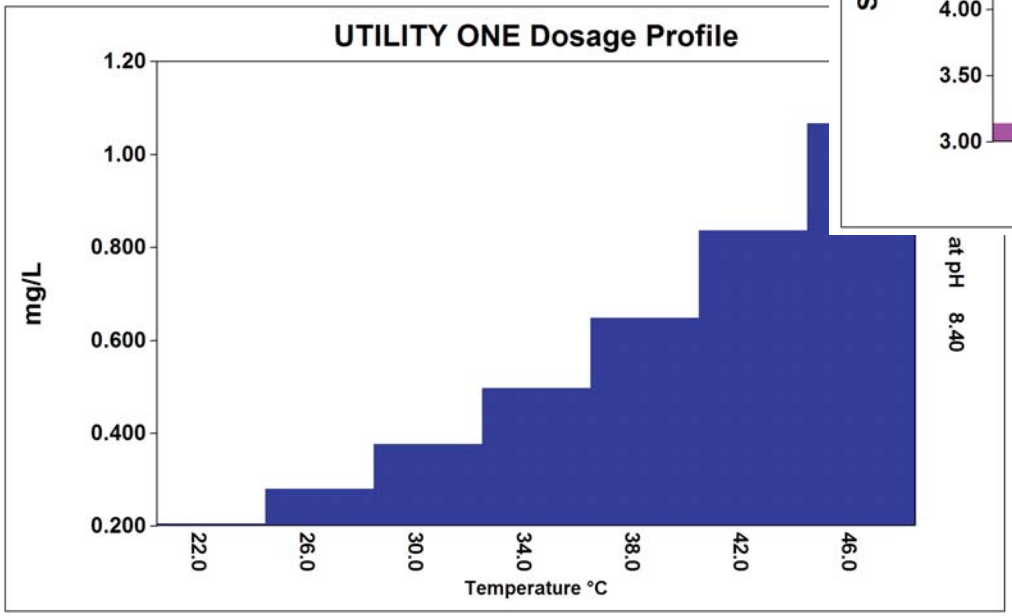
pH
Temperat
Calculat
Calculat
Suspende

WATER CHEMISTRY VERSUS TEMPERATURE

OPTIONS NEW TREATMENT CHANGE RANGE

Sample ID: 0 Report Date: 04-13-1995 Sampled: 04-13-1995 at 133

	TEMPERATURE (°C)					
CATIONS	22.00	26.00	30.00	34.00	38.00	42.00
Calcium(as $CaCO_3$)	114.00	114.00	114.00	114.00	114.00	114.00
Magnesium(as $CaCO_3$)	35.00	35.00	35.00	35.00	35.00	35.00
Sodium(as Na)	6.41	6.41	6.41	6.41	6.41	6.41
Potassium(as K)	0.00	0.00	0.00	0.00	0.00	0.00
Iron(as Fe)	0.05	0.05	0.05	0.05	0.05	0.05
Ammonia(as NH_3)	0.00	0.00	0.00	0.00	0.00	0.00

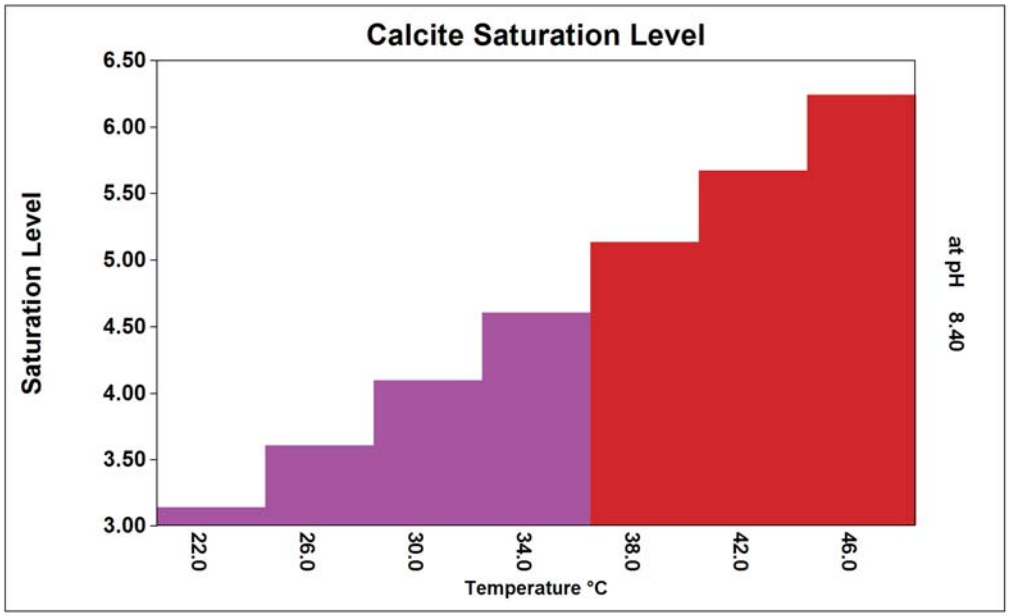


DEPOSITION POTENTIAL INDICATORS VERSUS TEMPERATURE

OPTIONS CHANGE RANGE

Sample ID: 0 Report Date: 04-13-1995 Sampled: 04-13-1995 at 1339

	TEMPERATURE (°C)						
SATURATION LEVEL	22.00	26.00	30.00	34.00	38.00	42.00	46.00
Calcite ($CaCO_3$)	3.14	3.60	4.09	4.60	5.13	5.67	6.24



VERSUS FREE IONS							
l Calcium	45.7	45.7	45.7	45.7	45.7	45.7	45.7
Calcium	42.4	42.1	41.8	41.5	41.2	40.8	40.5
l Carbonate	3.4	3.7	4.1	4.4	4.7	5.1	5.4
Carbonate	1.4	1.5	1.6	1.7	1.8	1.9	2.0
l Phosphate	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Phosphate	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ARY EXCESS(mg/L above Equil.)							
ite ($CaCO_3$)	1.61	1.84	2.06	2.26	2.45	2.63	2.80
onite ($CaCO_3$)	1.50	1.73	1.95	2.16	2.35	2.53	2.70
ium oxalate	-0.37	-0.37	-0.37	-0.38	-0.38	-0.38	-0.39
drite ($CaSO_4$)	-807.39	-771.25	-737.60	-706.23	-676.94	-649.56	-623.94
um ($CaSO_4*2H_2O$)	-668.86	-672.76	-676.66	-680.56	-684.46	-688.37	-692.28
alcium phosphate	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
Hydroxylapatite	-373.91	-386.71	-399.61	-412.60	-425.68	-438.85	-452.10
Ca polyphosphate	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
Fluorite (CaF_2)	-36.65	-37.31	-37.97	-38.64	-39.30	-39.96	-40.63
Silica (SiO_2)	-104.67	-116.60	-129.45	-143.24	-158.02	-173.82	-190.67

Start | Server Manager | WATLAB32 - Microsoft Vi... | CorelDRAW X4 - [E:\amt... | WaterCycle Rx Labor... | 4:56 PM

Profile versus pH, or temperature

Display and Output as Tables or 2D Graphs

DEPOSITION POTENTIAL INDICATORS VERSUS pH

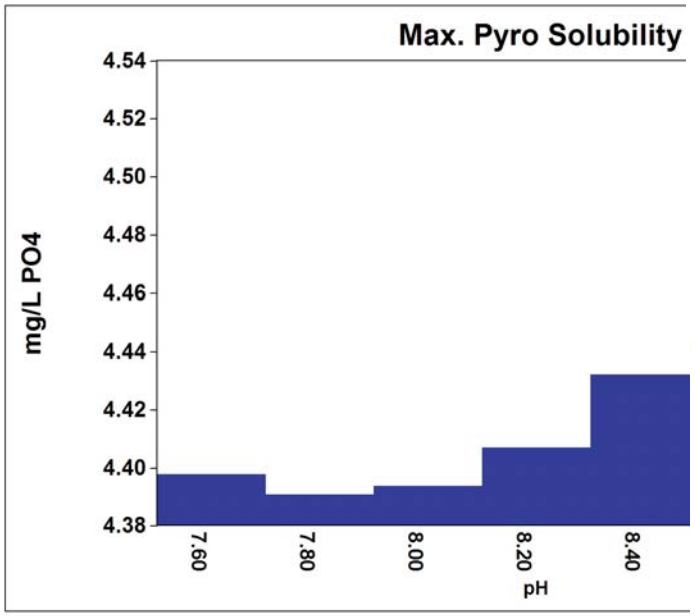
OPTIONS CHANGE RANGE

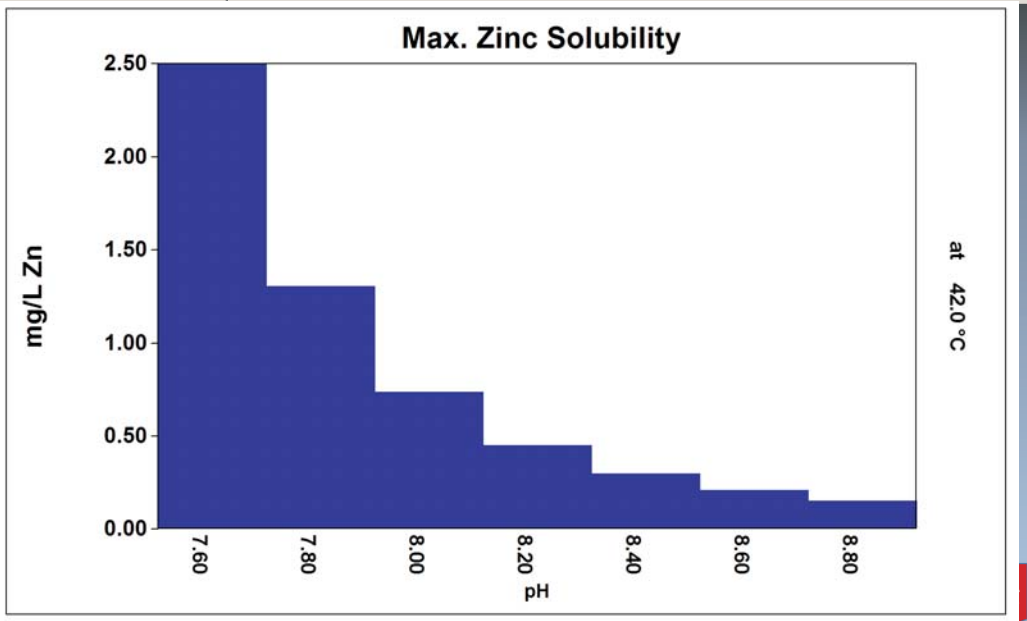
Sample ID: 0 Report Date: 04-13-1995 Sampled: 04-13-

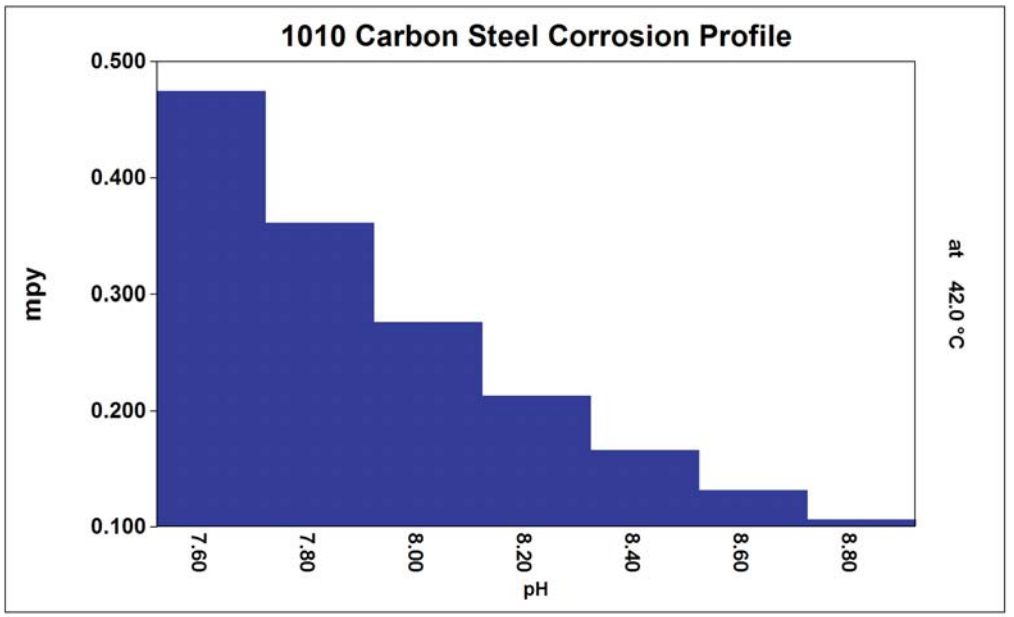
	pH				
SATURATION LEVEL	7.60	7.80	8.00	8.20	8.4
Calcite ($CaCO_3$)	1.00	1.56	2.43	3.74	5.6
Aragonite ($CaCO_3$)	0.85	1.33	2.07	3.19	4.8
Calcium oxalate	0.00	0.00	0.00	0.00	0.0
Anhydrite ($CaSO_4$)	0.01	0.01	0.01	0.01	0.0
Gypsum ($CaSO_4*2H_2O$)	0.01	0.01	0.01	0.01	0.0
Tricalcium phosphate	0.01	0.02	0.04	0.09	0.1
Hydroxylapatite	0.00	0.00	0.00	0.00	0.0
Total Phosphate	0.1	0.1	0.1	0.1	0.1
Free Phosphate	0.0	0.0	0.0	0.0	0.0

FREE ION MOMENTARY EXCESS (ppm)

Calcite ($CaCO_3$)	-0.00	0.31	0.79	1.53	2.63
Aragonite ($CaCO_3$)	-0.10	0.22	0.70	1.43	2.53
Calcium oxalate	-0.38	-0.38	-0.38	-0.38	-0.38
Anhydrite ($CaSO_4$)	-649.79	-649.76	-649.72	-649.67	-649.60
Gypsum ($CaSO_4*2H_2O$)	-688.52	-688.51	-688.48	-688.45	-688.42
Tricalcium phosphate	-0.00	-0.00	-0.00	-0.00	-0.00
Hydroxylapatite	-439.67	-439.57	-439.42	-439.19	-438.87
Ca polyphosphate	-0.00	-0.00	-0.00	-0.00	-0.00
Fluorite (CaF_2)	-39.74	-39.77	-39.81	-39.87	-39.96
Silica (SiO_2)	-173.42	-173.47	-173.54	-173.65	-173.82
Brucite ($Mg(OH)_2$)	-4.70	-4.69	-4.66	-4.62	-4.55

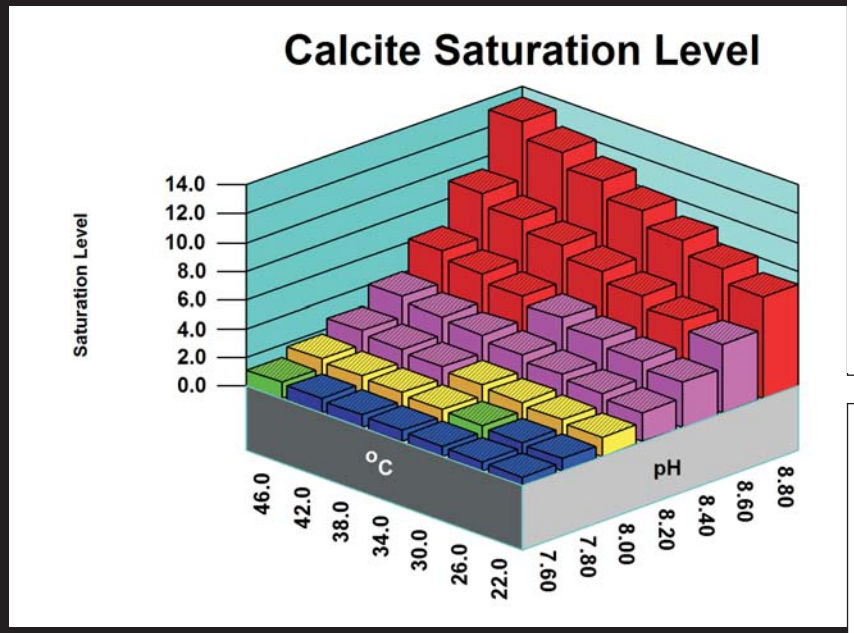


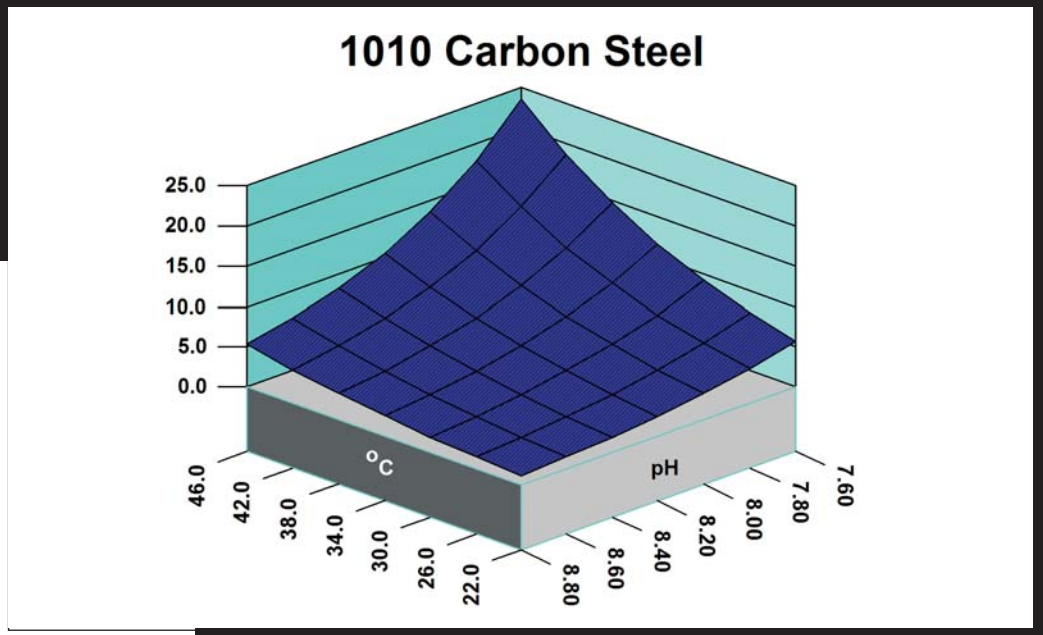




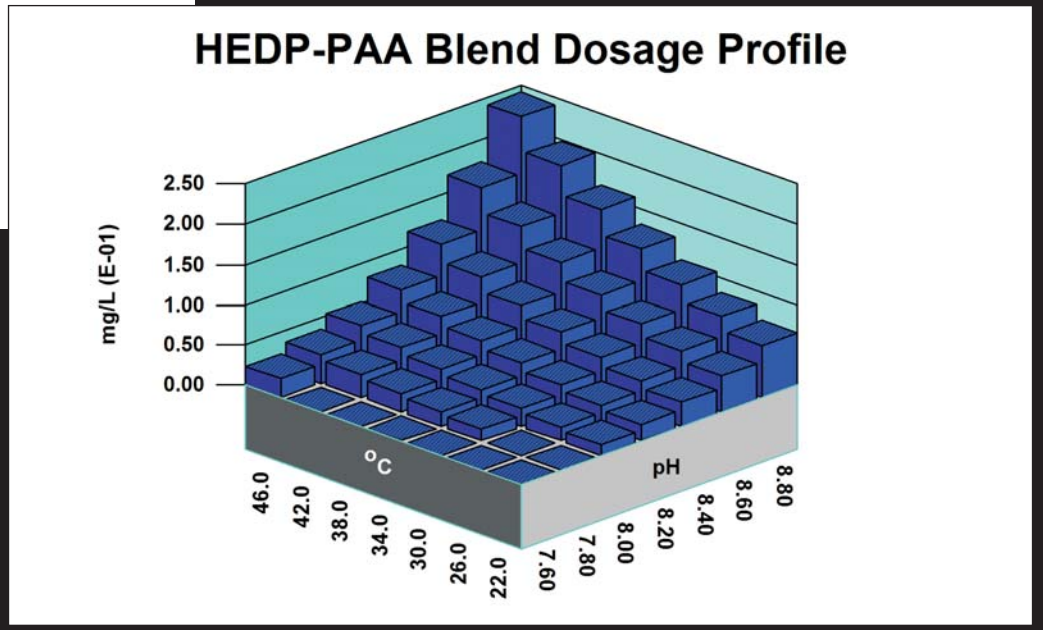
Profile versus pH & Temperature
plot indices, predicted corrosion rates, dosage

Display and Output as
3D Contour or Bar Graphs

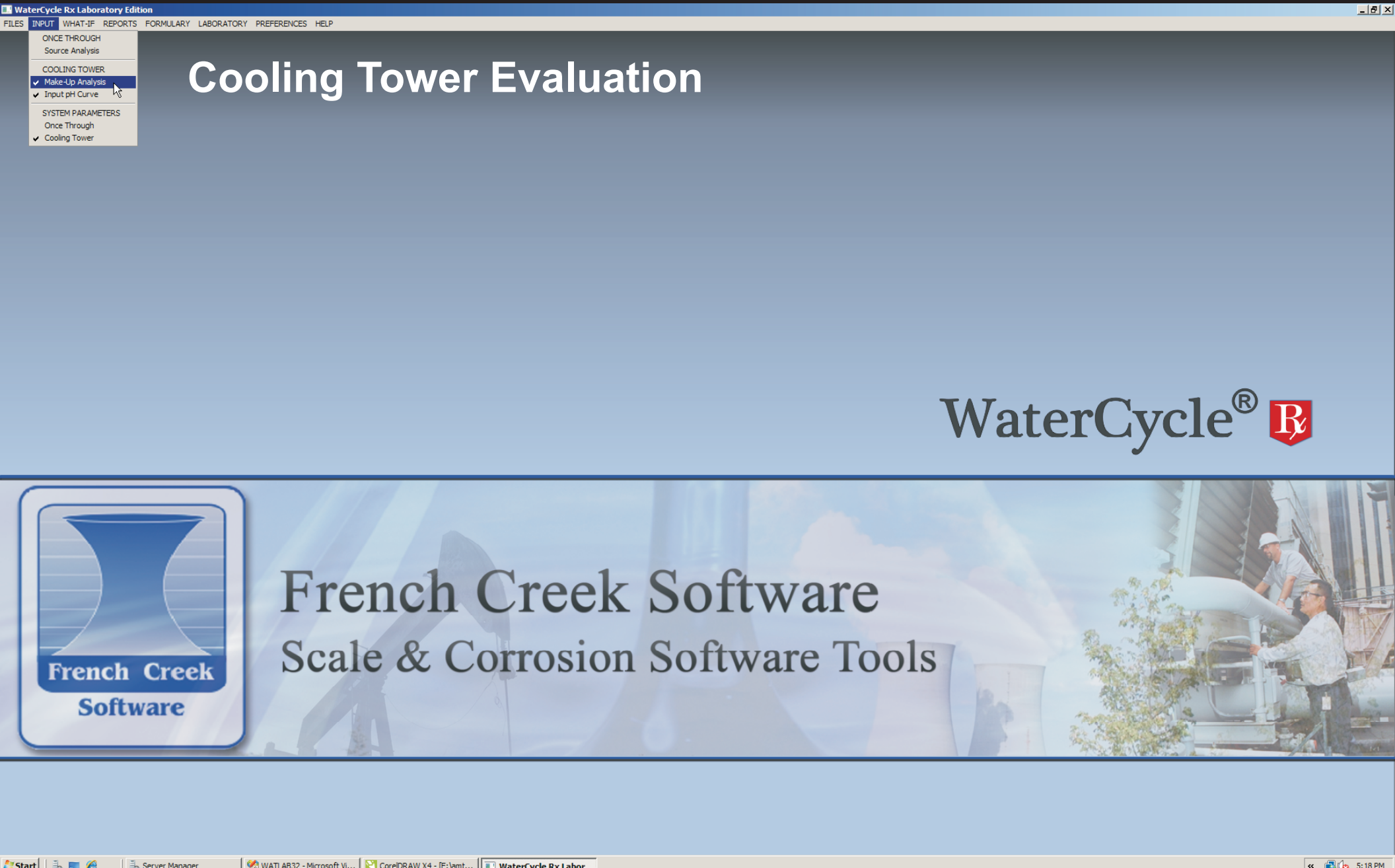




Select a Treatment
for Dosage Profiles

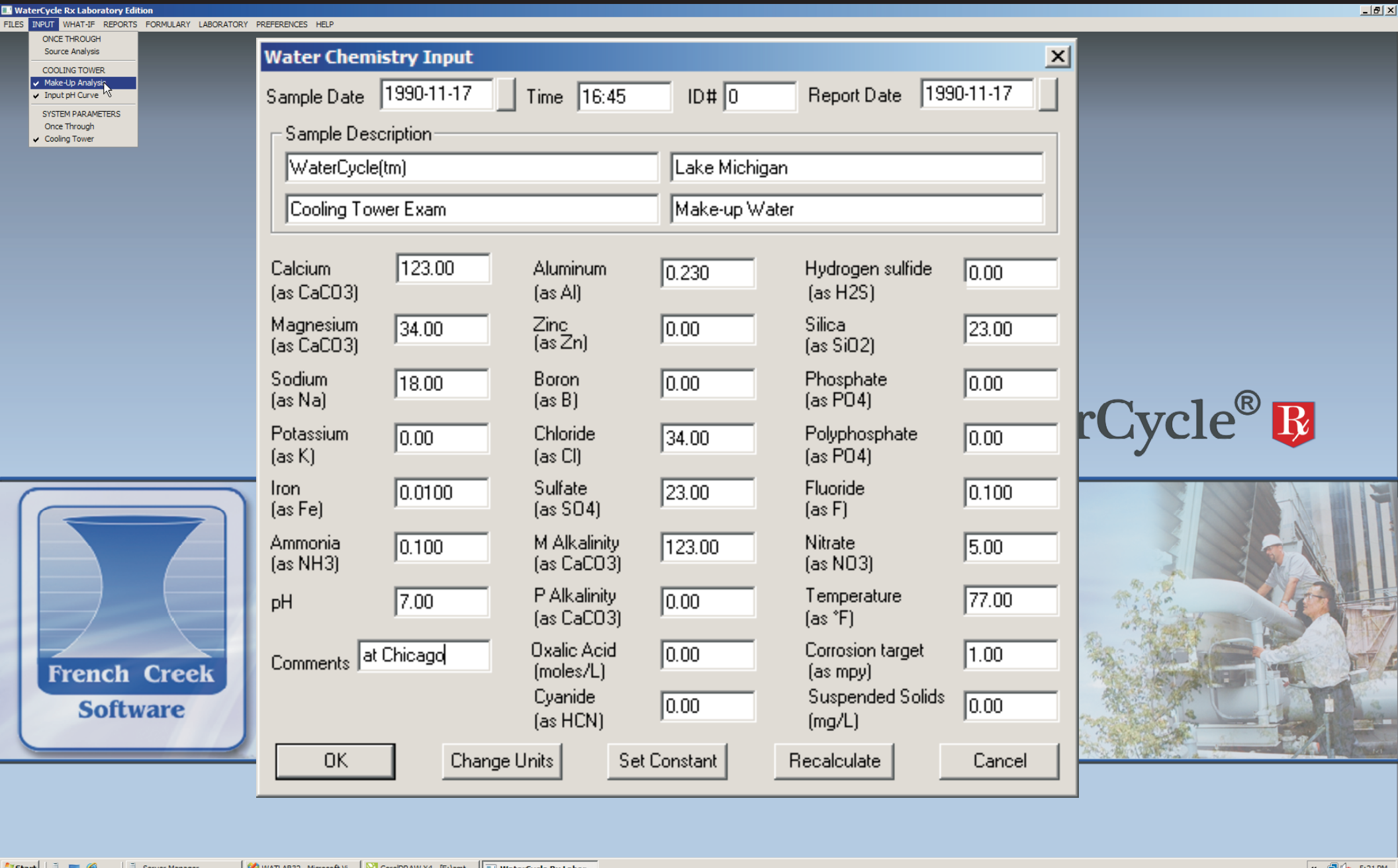


Profile Cooling Water Over a Broad Range of COC with and without pH control compare treatment dosages and limits



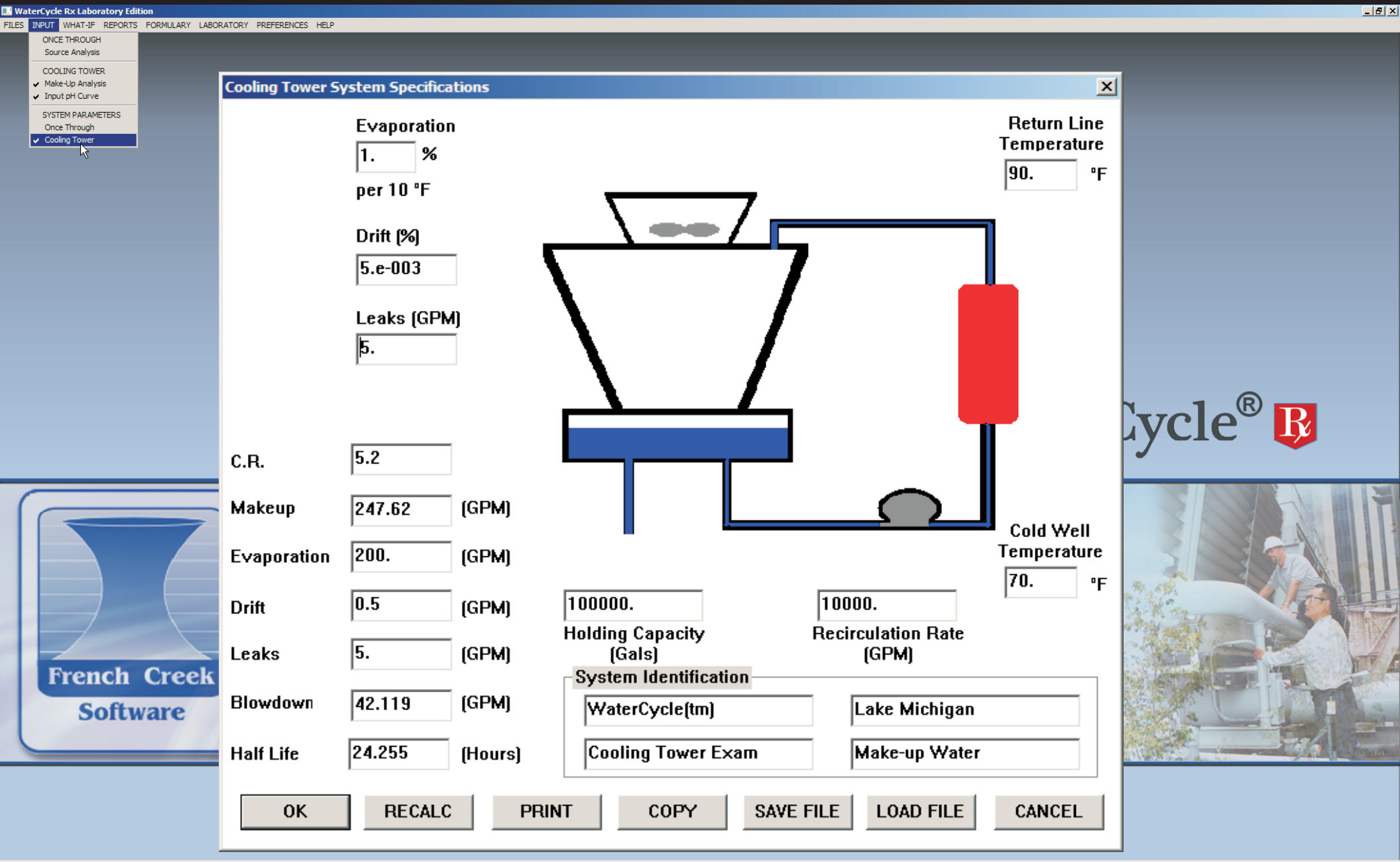
The first step is the Make-up Water Chemistry Input

Always check the Analytical Units
Click on **Change Units** if they aren't just right!

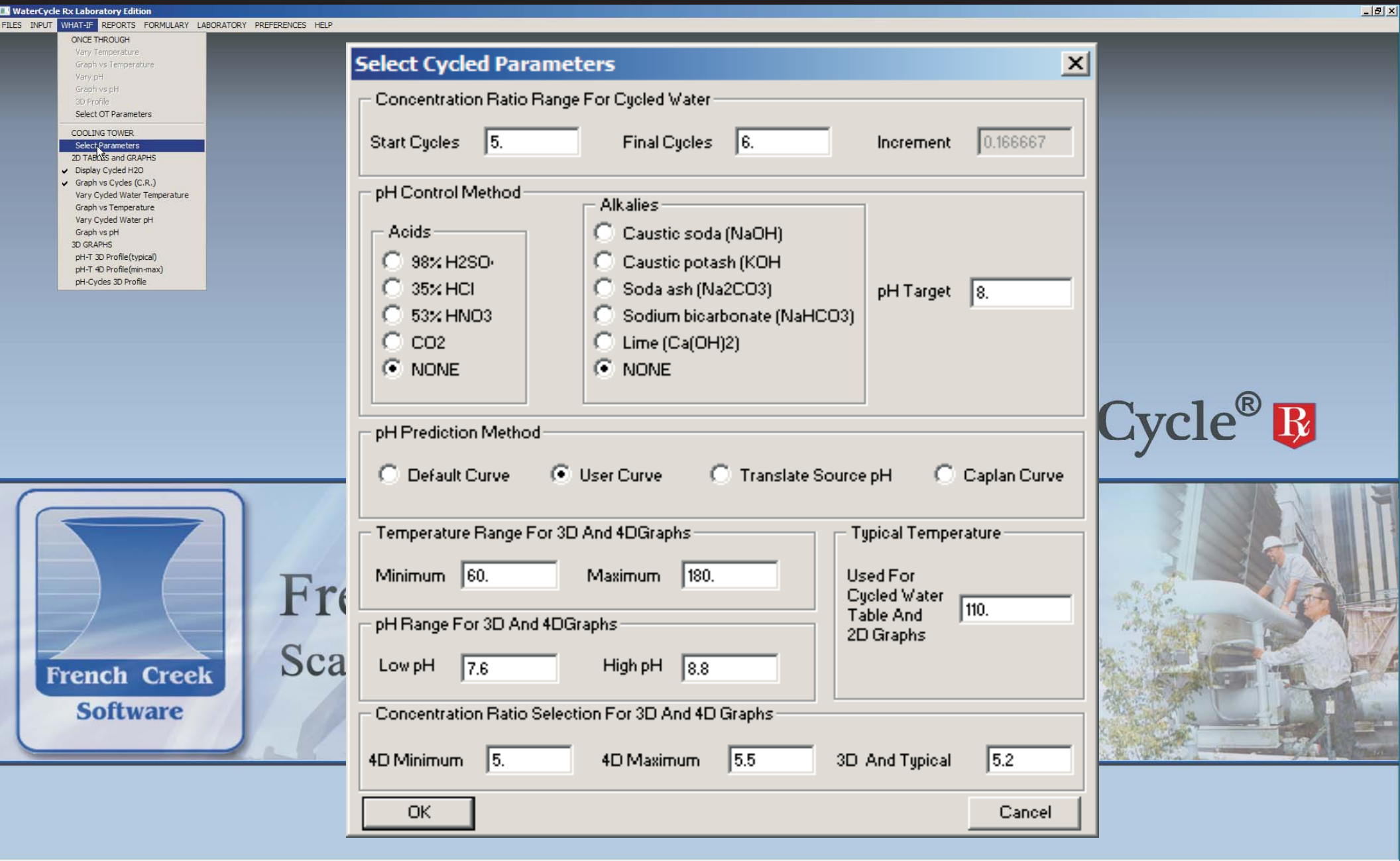


The second step: System Specifications

Always check the Units for flows, volumes
Go to PREFERENCES and UNITS to change

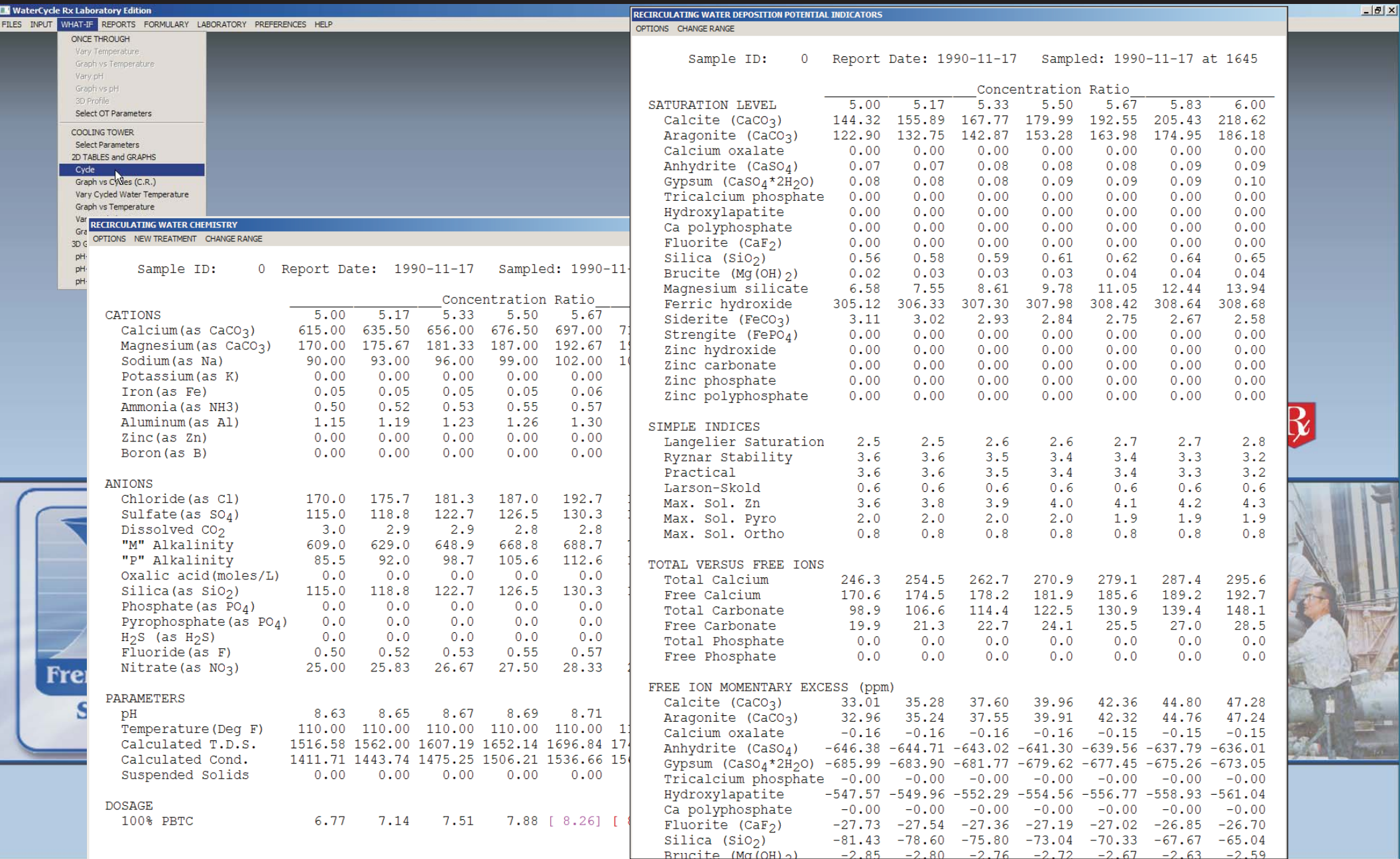


Set-up the Cycles of Concentration range and other Parameters for 'What-if' Scenarios



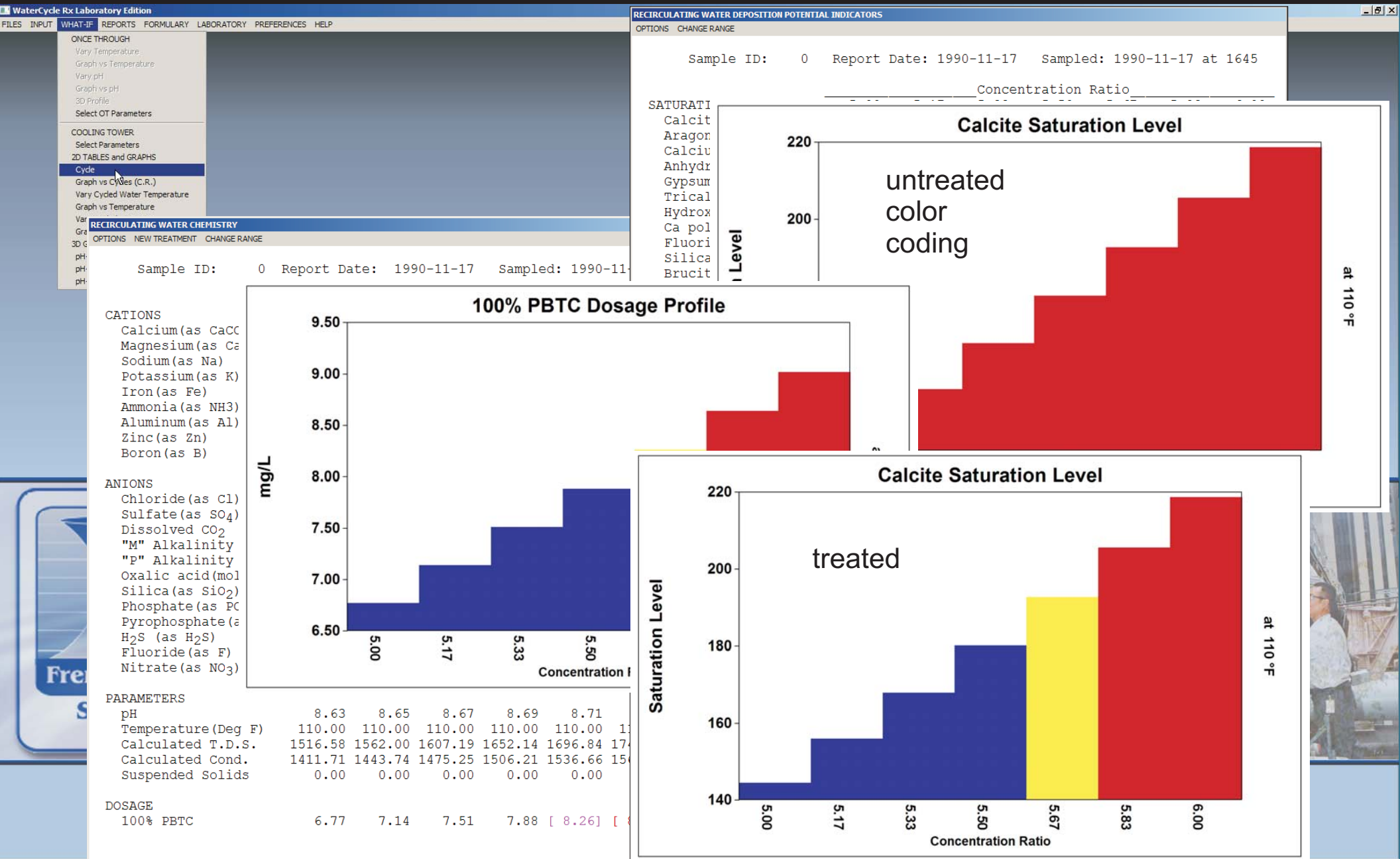
Cycle

Output & Display as Tables or 2D Graphs



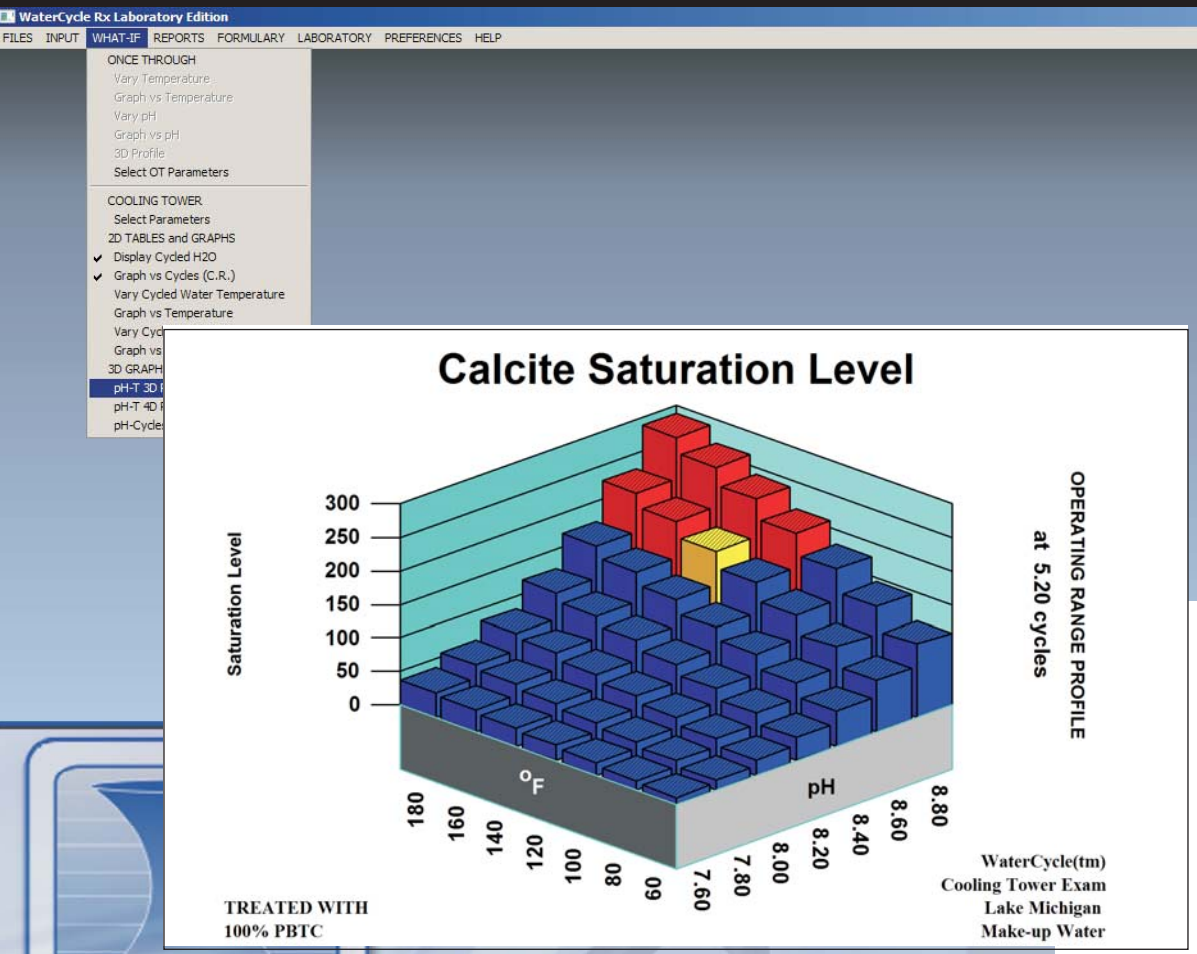
Cycle

Output & Display as Tables or 2D Graphs

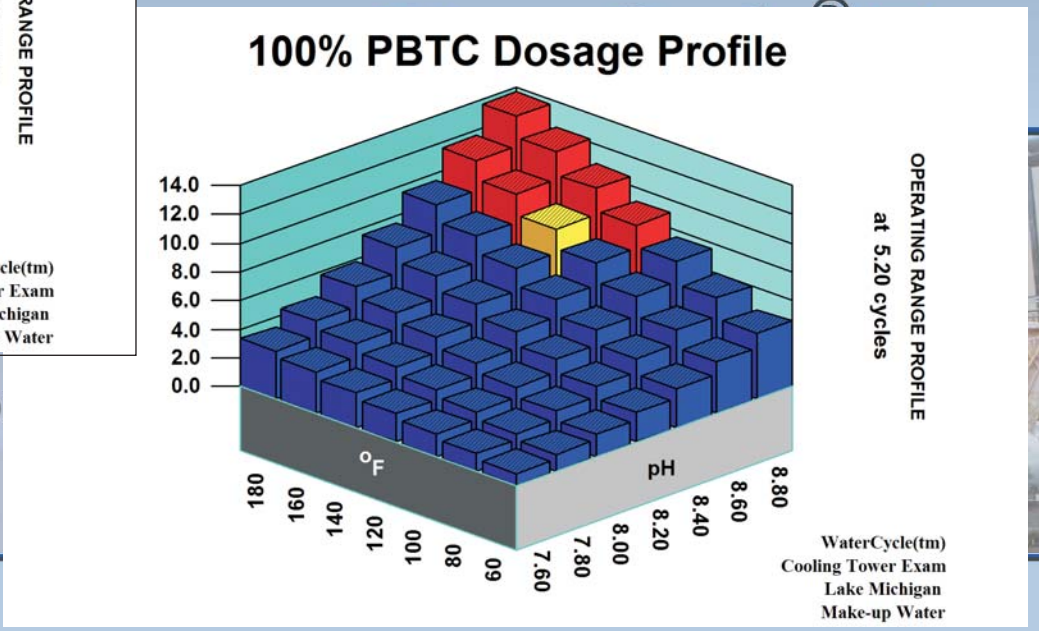


Profile Operating Range

Profile versus Temperature & pH at Target COC (3D)
or versus pH & Temperature at the Min and Max COC (4D)
or versus pH & Cycles



Plot any Indices, Dosages, or Corrosion Rates calculated by the program

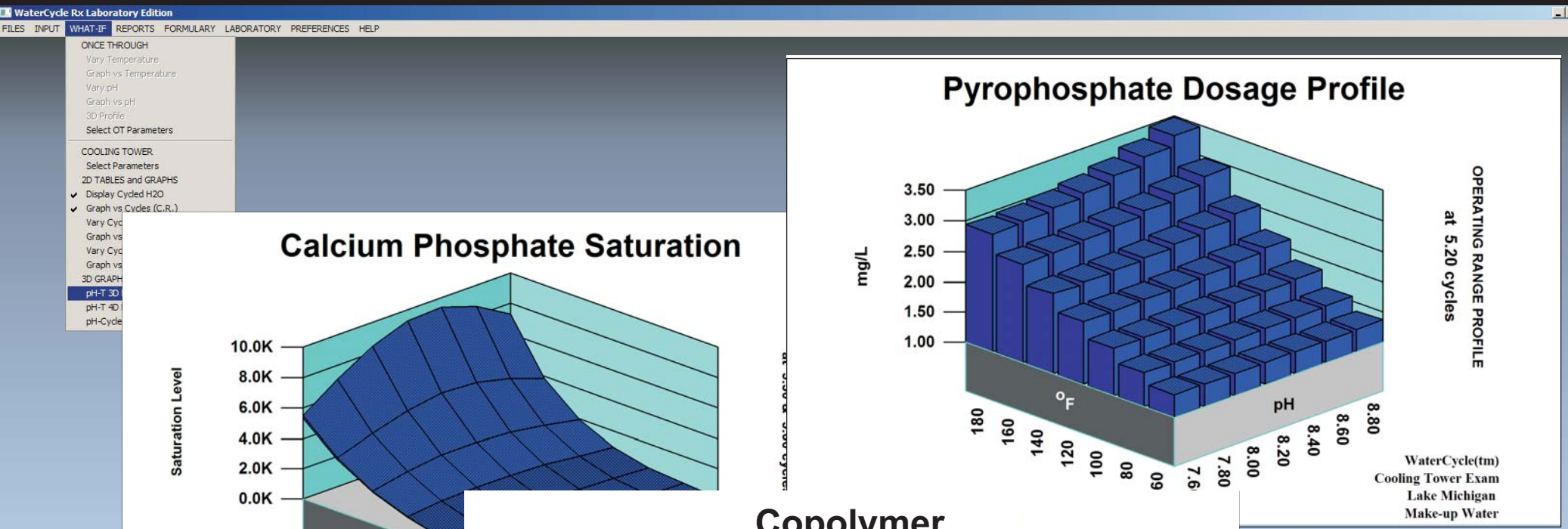


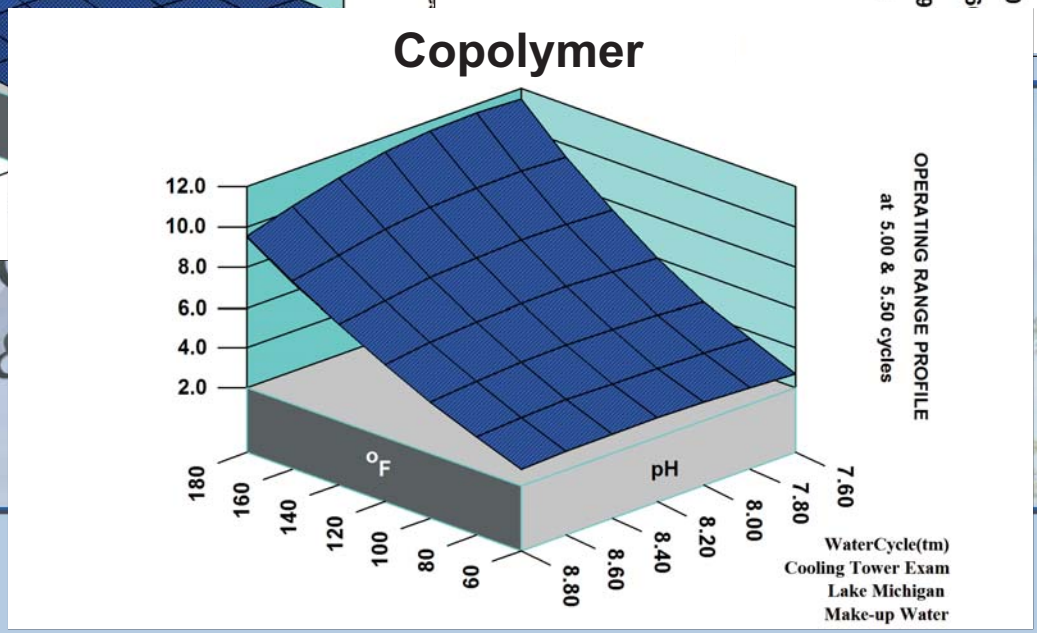
French Creek Software

Scale & Corrosion So

Profile Operating Range

Profile versus Temperature & pH at Target COC (3D)
or versus pH & Temperature at the Min and Max COC (4D)
or versus pH & Temperature

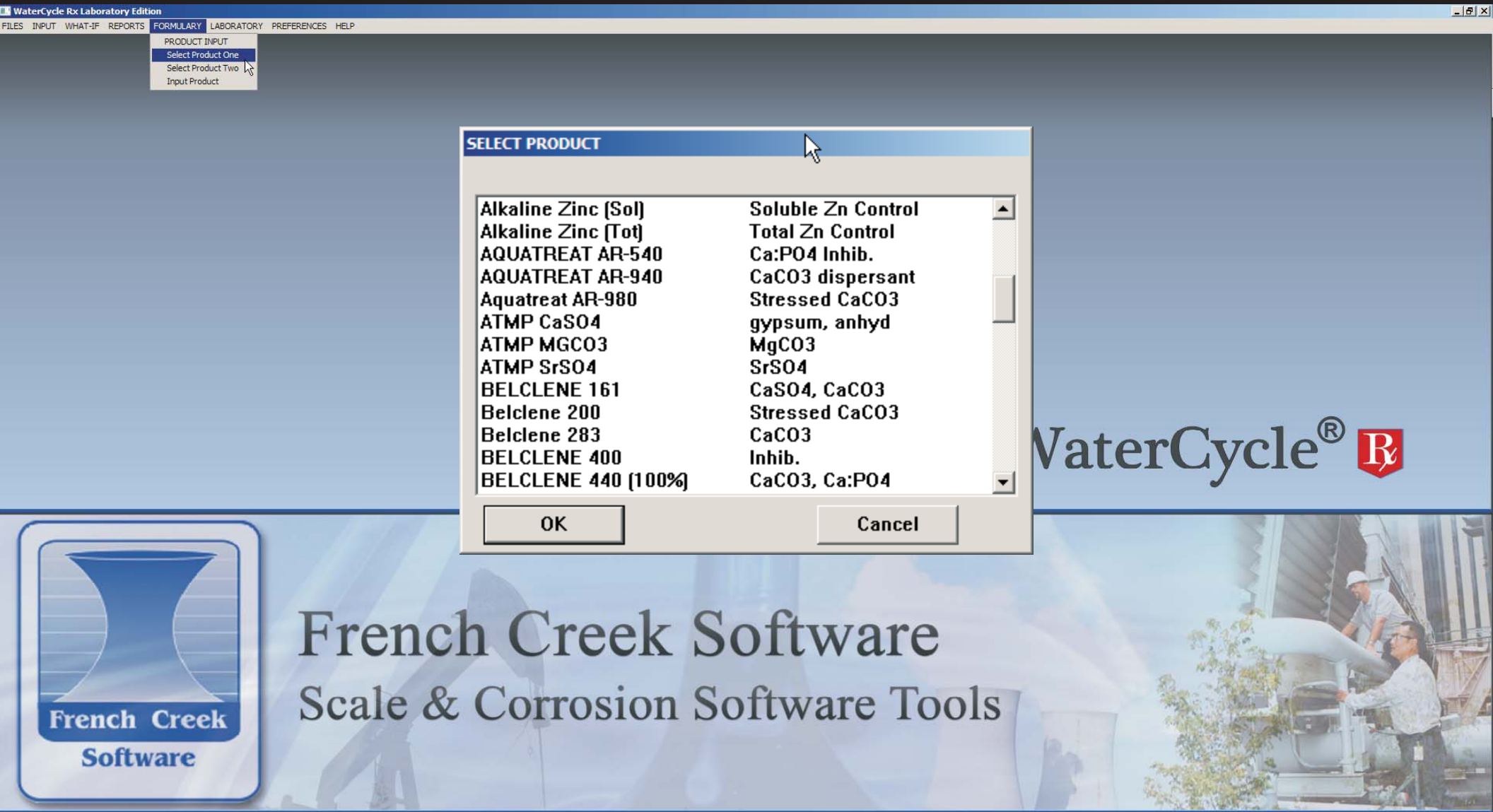




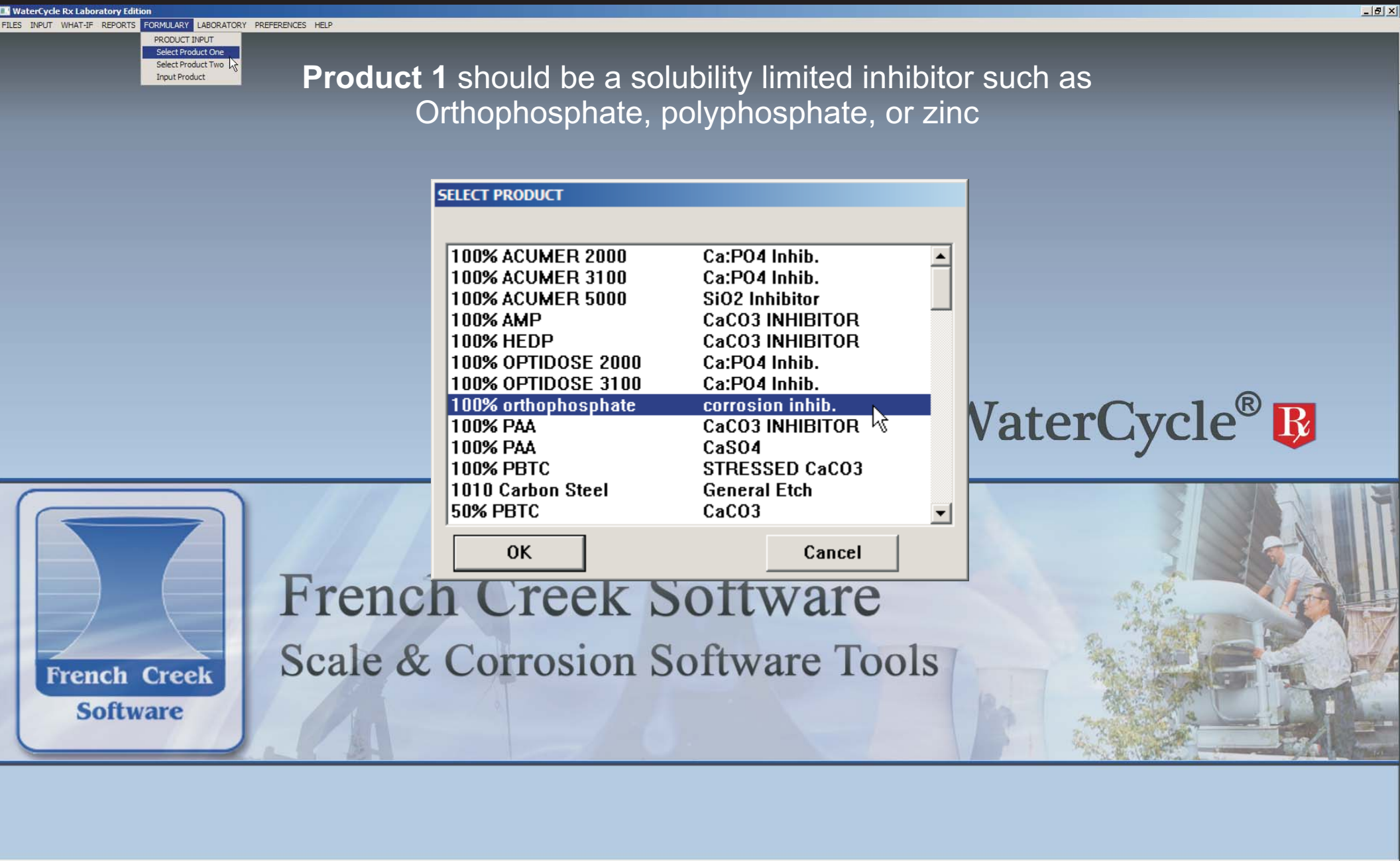
some say Cycles,
others COC (cycles of concentration)
and others CR (concentration ratio)

Antiscalant & Corrosion Inhibitor Selection

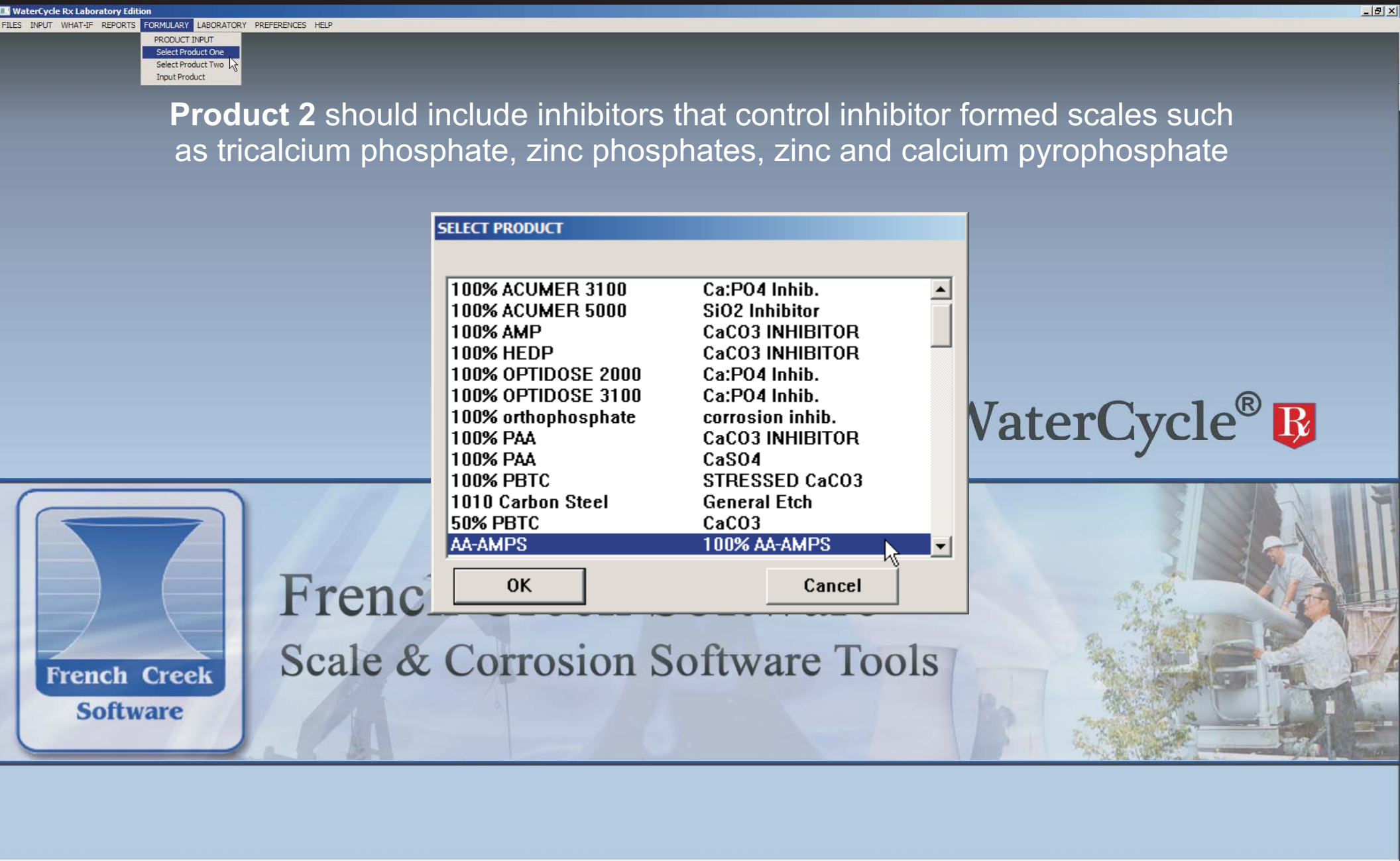
Products can be selected in several convenient locations in the program.
Under FORMULARY in the Main Menu system –
At the top of graphs by clicking NEW TREATMENT
At the top of tables by clicking NEW TREATMENT



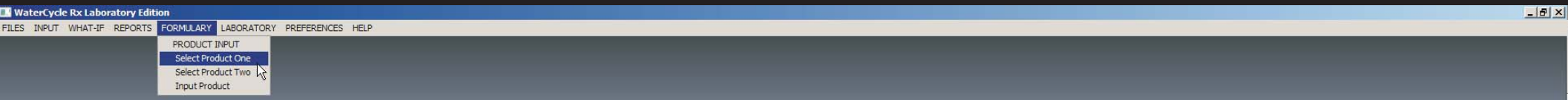
Select Two Products for Sequential Processing



Select Two Products for Sequential Processing



Sequential Processing?



Step One: The program concentrates the water, calculates all indices, and then determines the solubility limited inhibitor requirements.

Step Two: The program doses the water with the solubility limited inhibitors, recalculates all indices, and then determines the requirements for zinc stabilizers, calcium phosphate control agents, etc..

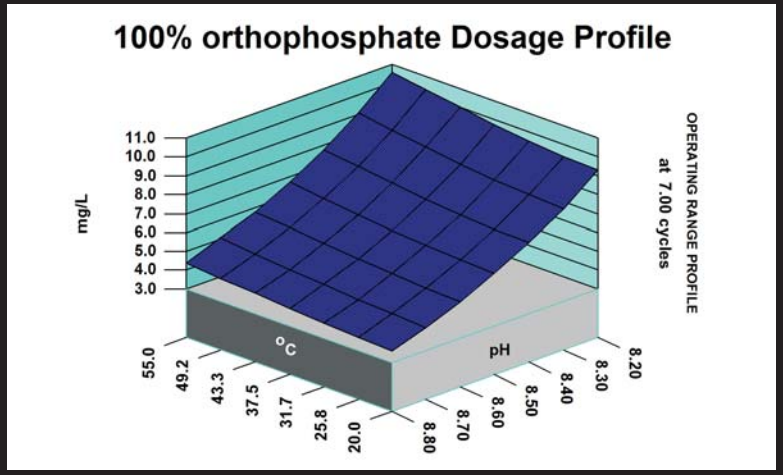
WaterCycle® Rx

French Creek Software

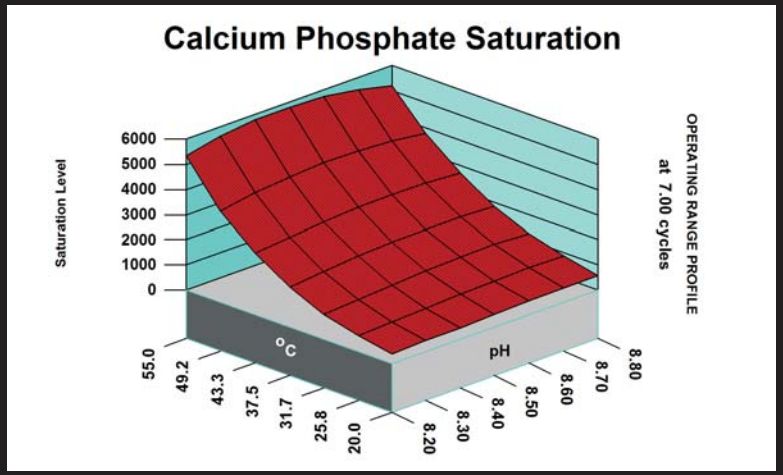
Scale & Corrosion Software Tools

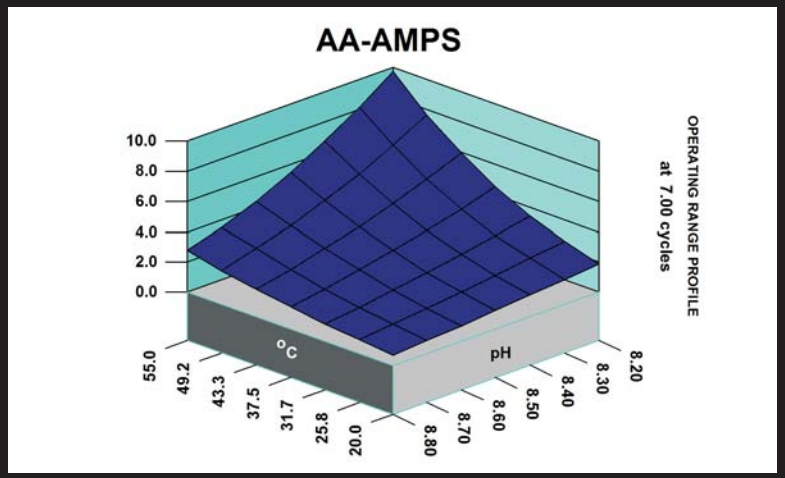
Sequential Processing?

Step One: The program concentrates the water, calculates all indices, and then determines the solubility limited inhibitor requirements.



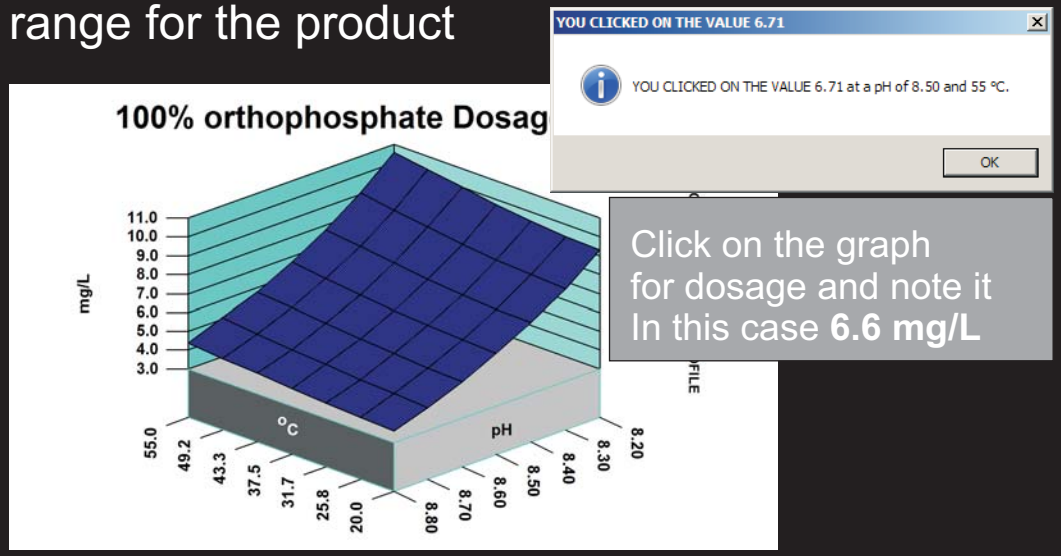
Step Two: The program doses the water with the solubility limited inhibitors, recalculates all indices, and then determines the requirements for zinc stabilizers, calcium phosphate control agents, etc..





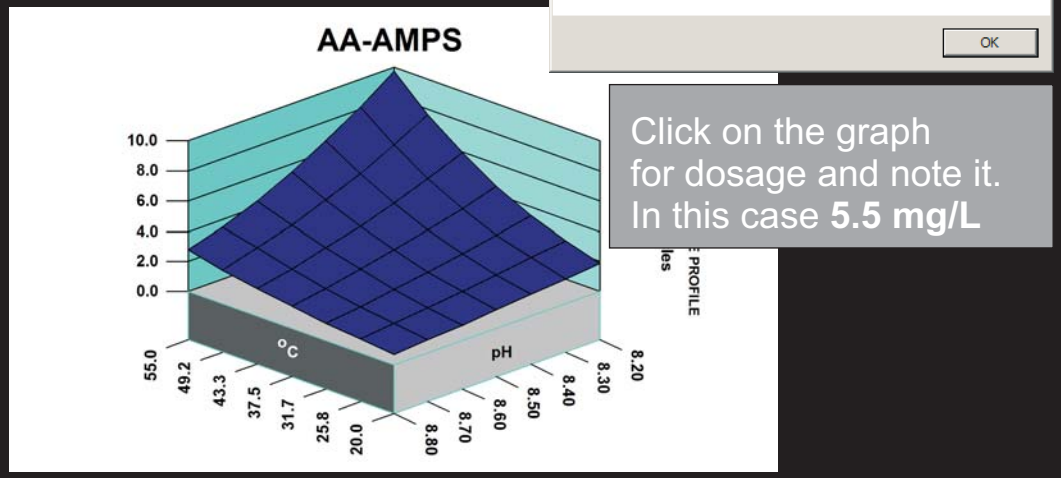
Optimize Inhibitor Ratios Using Sequential Processing

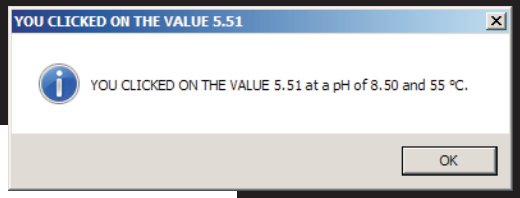
Step One: Select the solubility limited corrosion inhibitor as Product 1.. Enter your make-up water, cycle to the target range for the product



Click on the graph for dosage and note it In this case **6.6 mg/L**

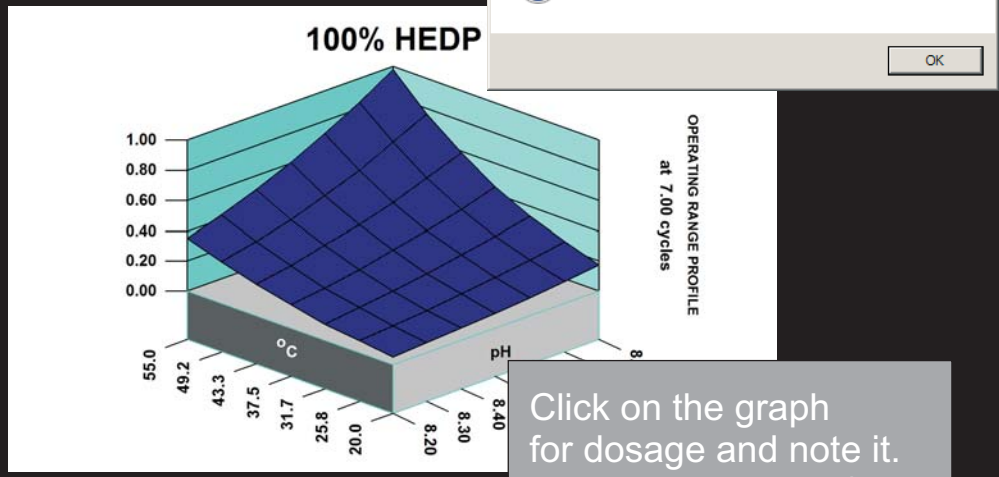
Step Two: Select the stabilizer for inhibitor based scales as Product 2.

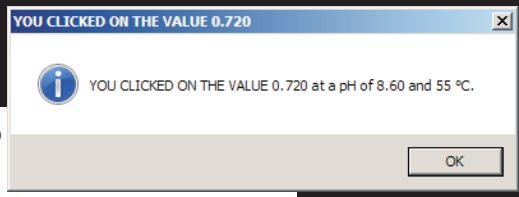




Click on the graph for dosage and note it. In this case **5.5 mg/L**

Step Three: Select the desired calcium carbonate inhibitor as Product 2.



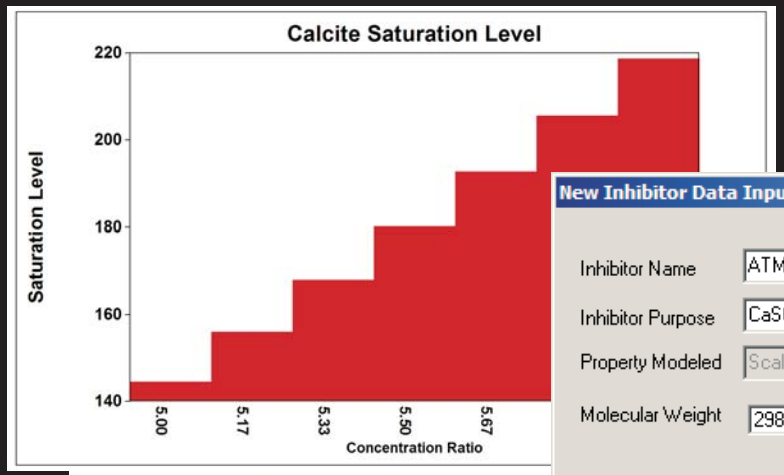


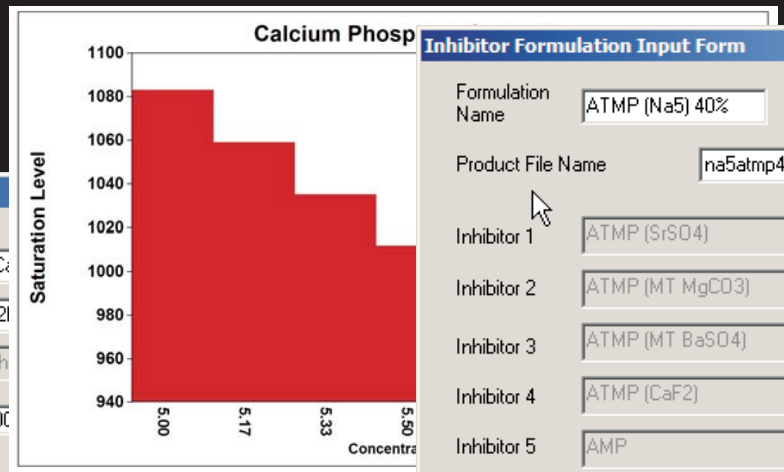
Click on the graph for dosage and note it. In this case 0.7 mg/L

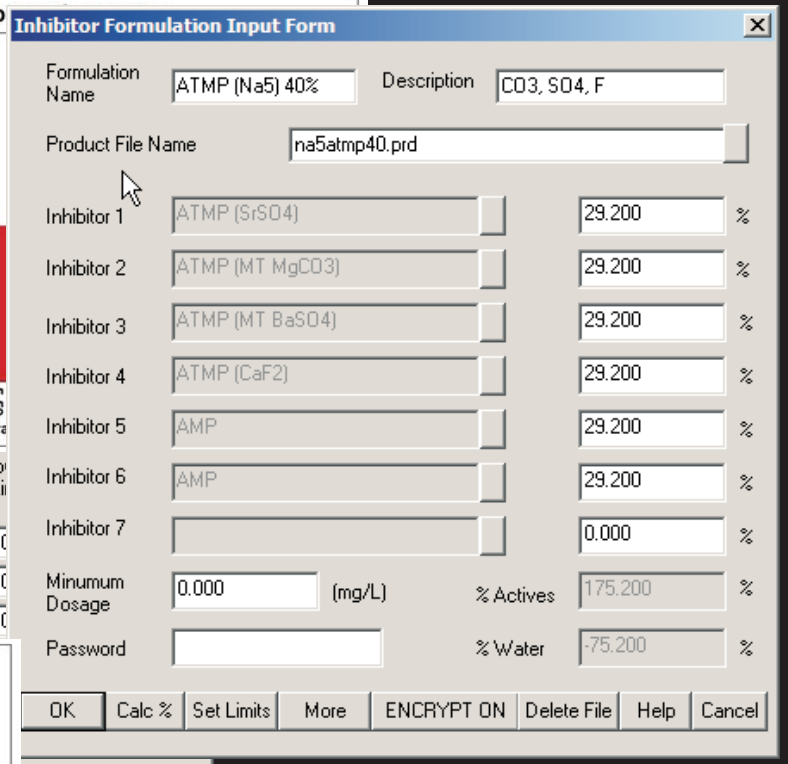
Result: Formulation for Dosage of 100 mg/L at Target pH, CR

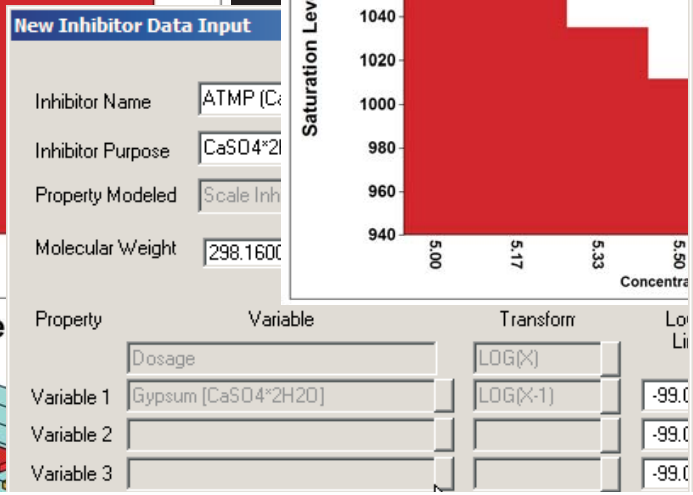
Raw Material	Active % to achieve 100 mg/L dosage
Orthophosphate active PO_4	6.7
AA-AMPS active Polymer	5.5
HEDP active Phosphonate	0.7

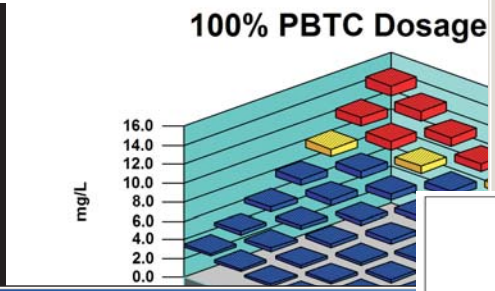
Premium Editions Add Profiling Capabilites, Modeling Capabilites

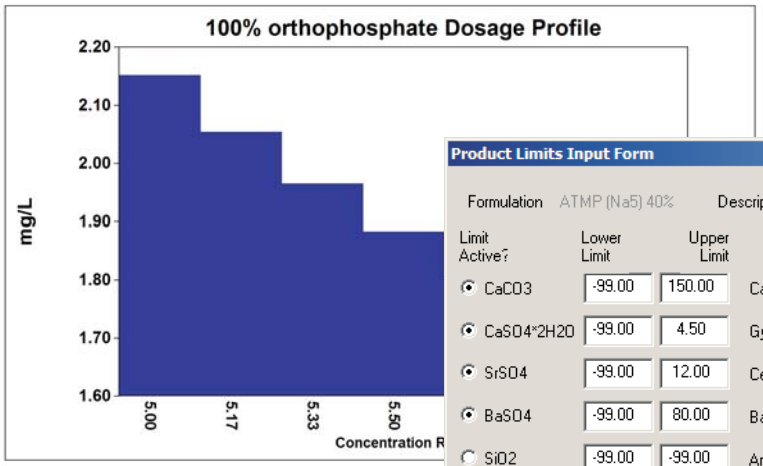










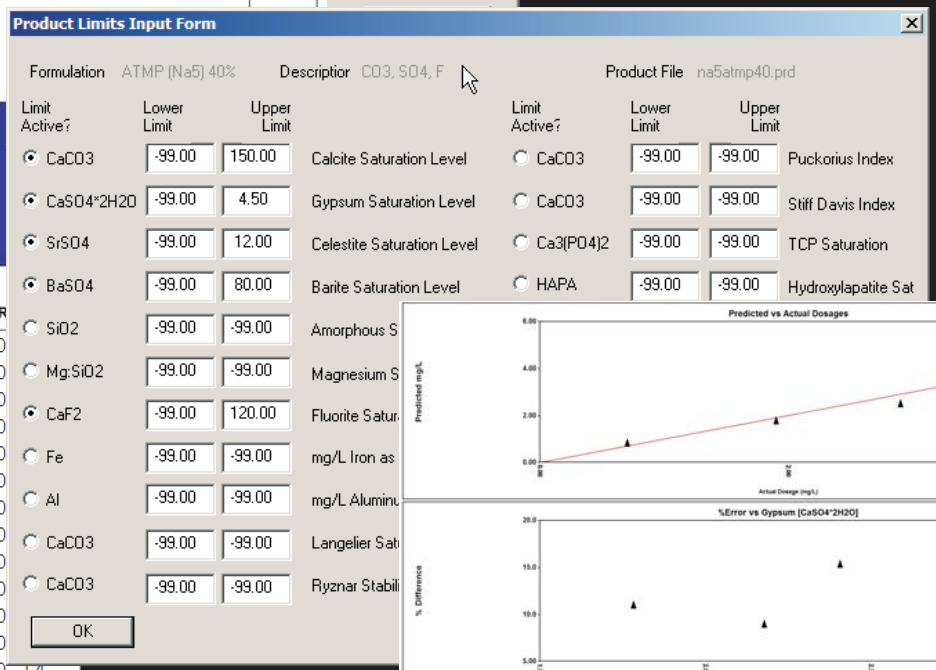


MIXED WATER DEPOSITION POTENTIAL INDICATORS

OPTIONS CHANGE RANGE

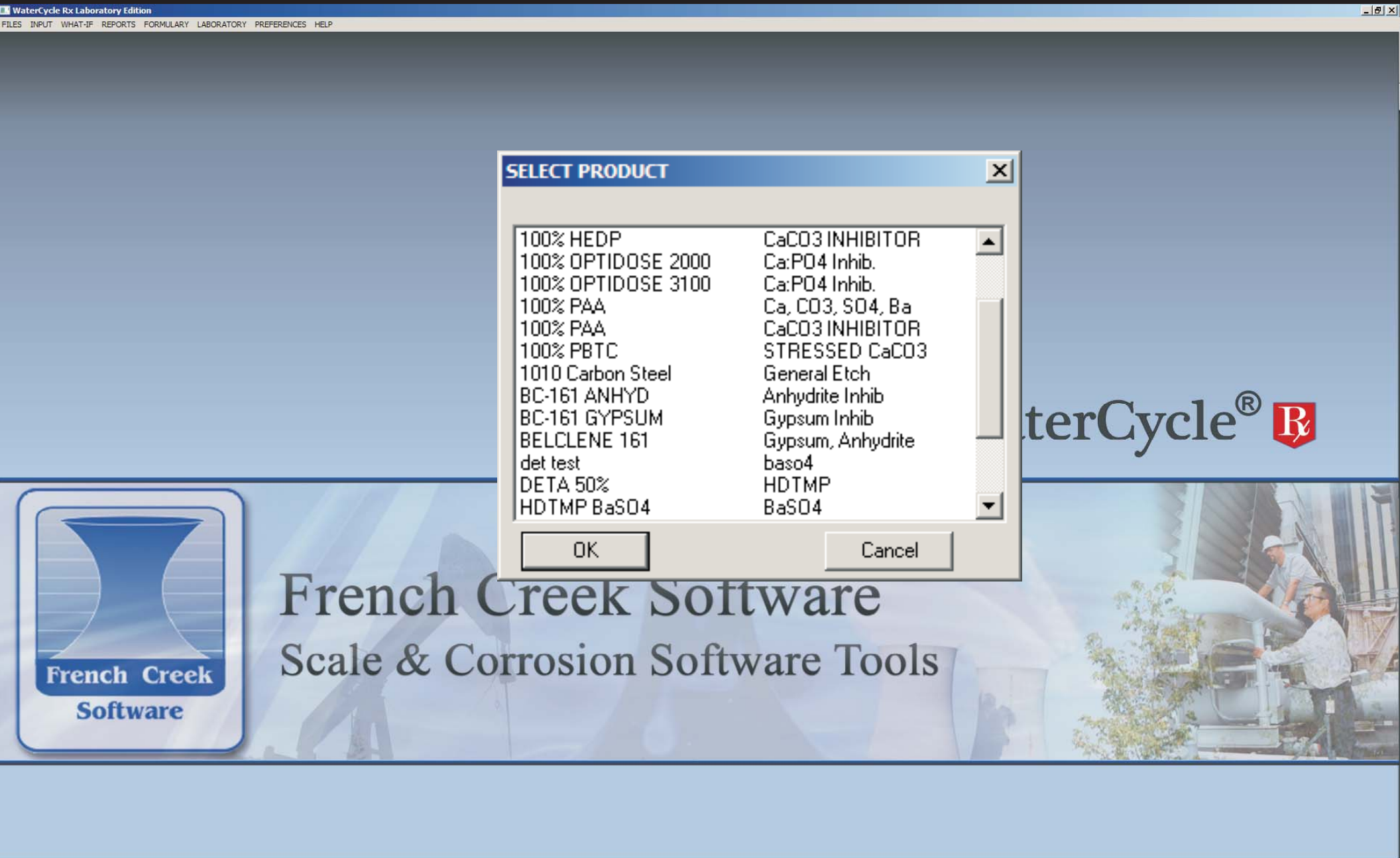
Sample ID: 2 Report Date:08-

		%					
	0.00	16.67					
SATURATION LEVEL	100.00	83.33					
Calcite ($CaCO_3$)	4.07	1.65					
Aragonite ($CaCO_3$)	3.50	1.42					
Witherite ($BaCO_3$)	0.00	0.00					
Strontianite ($SrCO_3$)	0.00	0.00					
Magnesite ($MgCO_3$)	0.66	0.27					
Anhydrite ($CaSO_4$)	0.02	0.03					
Gypsum ($CaSO_4*2H_2O$)	0.02	0.03	0.04	0.05	0.06	0.07	0
Barite ($BaSO_4$)	0.01	0.01	0.02	0.03	0.03	0.04	0
Celestite ($SrSO_4$)	0.00	0.00	0.00	0.00	0.00	0.00	0
Tricalcium phosphate	0.00	0.00	0.00	0.00	0.00	0.00	0
Hydroxylapatite	0.00	0.00	0.00	0.00	0.00	0.00	0
Fluorite (CaF_2)	0.00	0.00	0.00	0.00	0.00	0.00	0
Silica (SiO_2)	0.00	0.00	0.00	0.00	0.00	0.00	0
Brucite ($Mg(OH)_2$)	0.00	0.00	0.00	0.00	0.00	0.00	0
Magnesium silicate	0.00	0.00	0.00	0.00	0.00	0.00	0
Ferric hydroxide	132.82	0.00	0.00	0.00	0.00	0.00	0
Siderite ($FeCO_3$)	10.83	4.27	1.68	0.55	0.09	0.00	0
Strengite ($FePO_4$)	0.00	0.00	0.00	0.00	0.00	0.00	0
Halite ($NaCl$)	0.24	0.22	0.20	0.18	0.17	0.15	0.14
Thenardite (Na_2SO_4)	0.00	0.00	0.00	0.00	0.00	0.00	0.00



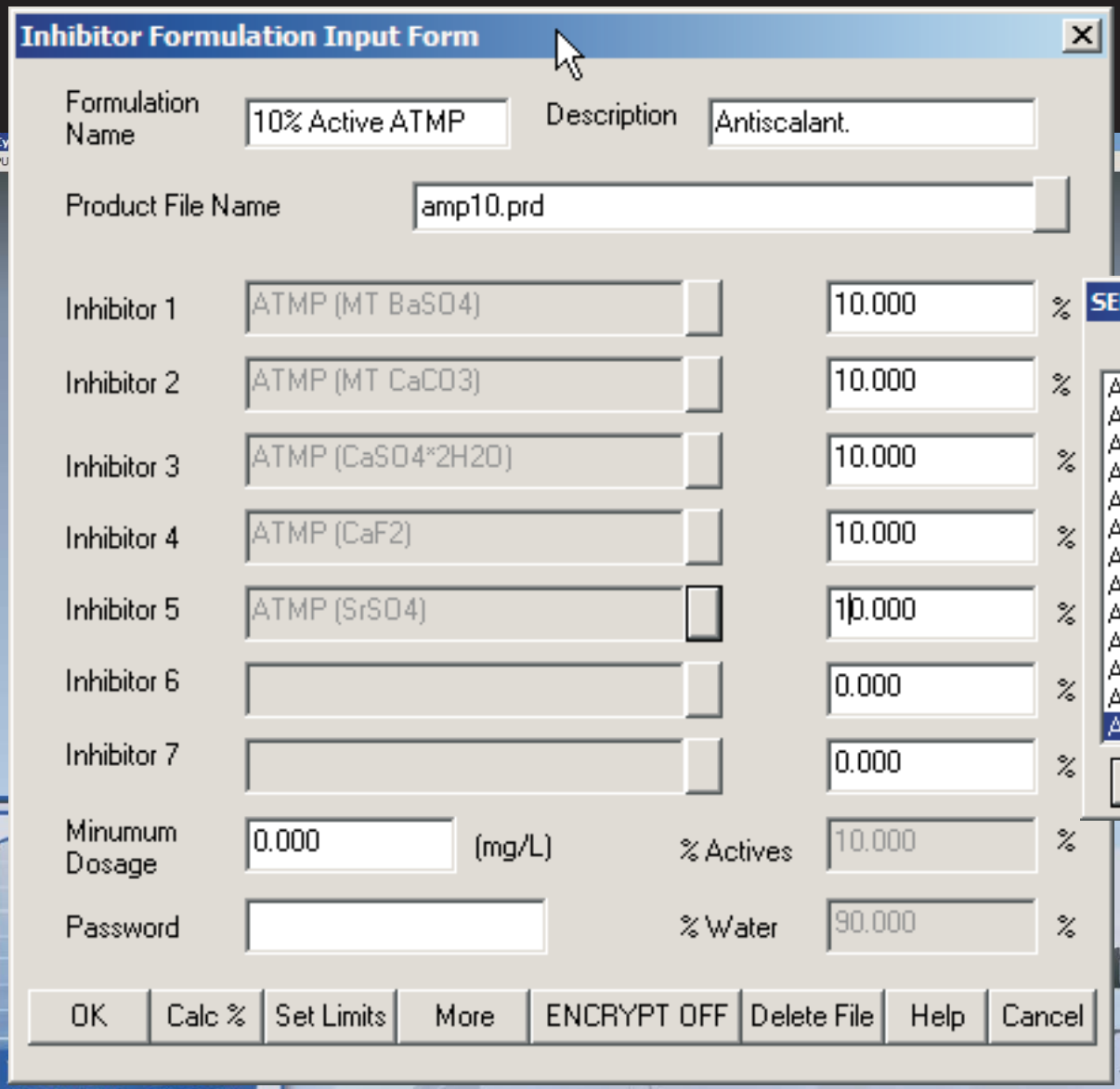
The Salesman's Edition adds the ability to optimize treatments

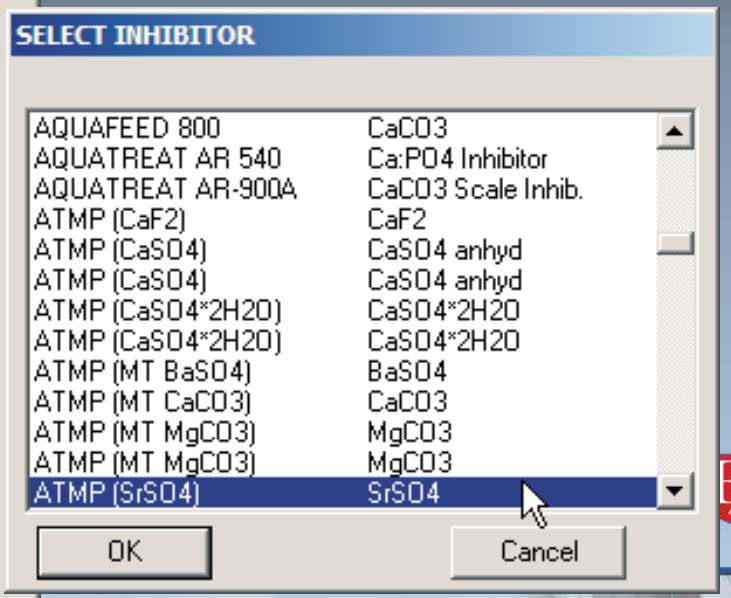
Antiscalants can be selected in several convenient locations in the program.
Under FORMULARY in the Main Menu system –
At the top of graphs by clicking NEW TREATMENT
At the top of tables by clicking NEW TREATMENT



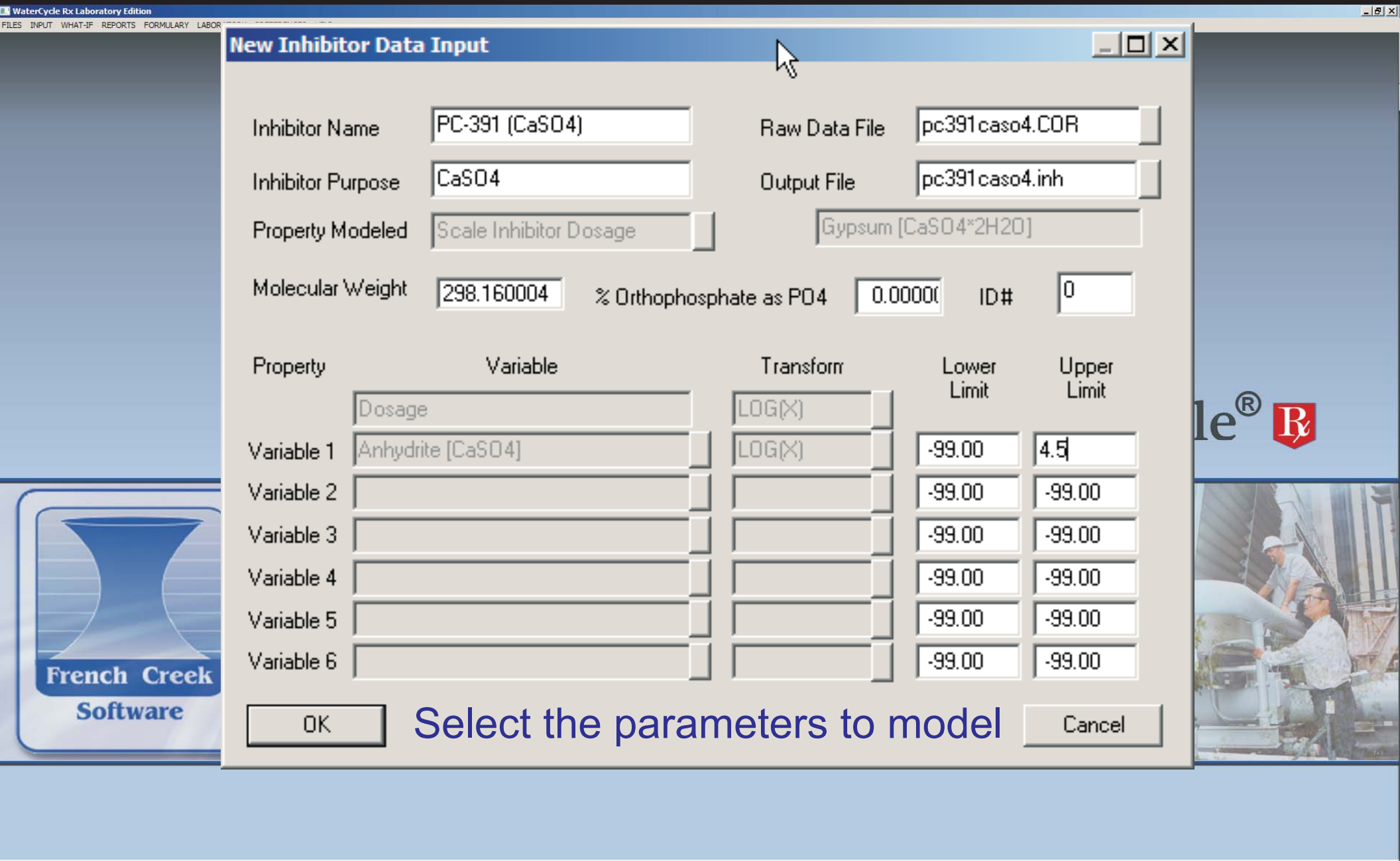
The Product Manager Edition adds the ability to input products

French Creek provides models for most inhibitors and scales





The Laboratory Edition adds the ability to develop your own inhibitor models from laboratory data, field data, or existing curves.

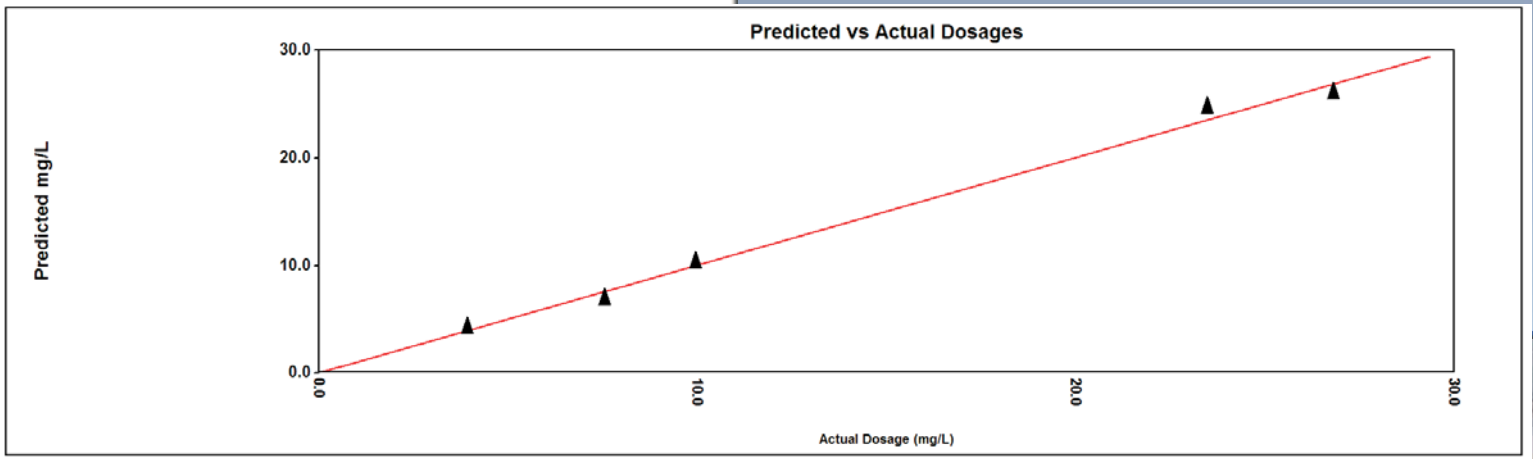


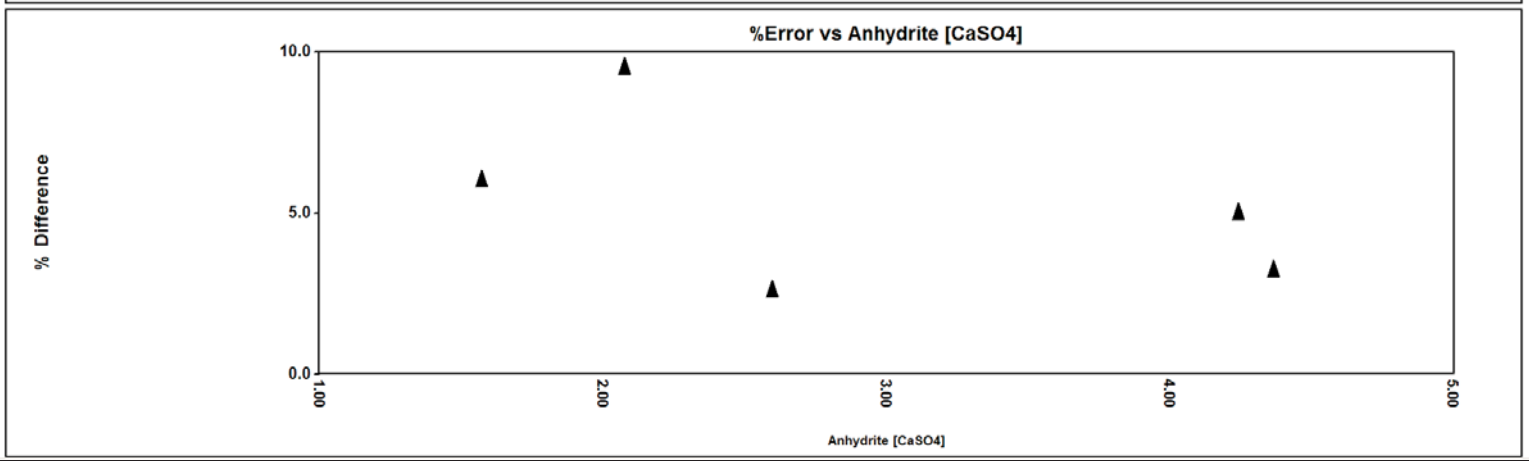
CORRELATION

PRINT GRAPH CLOSE CHANGE MODEL

```
Inhibitor Modelled:      PC-391 (CaSO4)
Inhibitor Purpose:       CaSO4
Raw Data File:           E:\HYDRO\COR\pc391caso4.COR
Output File:             E:\HYDRO\INHIB\pc391caso4.inh

                                    X CaSO4
                          Intercept   LOG(X)
               Coef.        -12.00     1.80
               Std.Error      0.09     0.09
               Sig.Level <   0.001  <  0.001

R-SQRD  0.993    Correlation Problems?  NO

ANAL.#   OBSERVED   PREDICTED DIFFERENCE    % ERROR

     0    3.91000     4.14406     0.2340    5.98619
     1    7.54000     6.82634    -0.7136   -9.46497
     2    9.95000    10.20483     0.2548    2.56118
     3   23.45999    24.62213     1.1621    4.95370
     4   26.79000    25.93737    -0.8526   -3.18262
```

The Laboratory Edition then provides the model coefficients, statistics, and a graph of goodness of fit.





Learn to Fully Harness the Power of the French Creek Engine

The French Creek Seminar Series

Session One: "Learning the French Creek Standard"

Last Offered: August 4 & 5, 2009

Explore the uses and nuances of using French Creek Software products with chemist and program author Rob Ferguson. This popular - two day session - covers the basic and more advanced use of all French Creek products; perfect for both the novice and seasoned user. Bring your own water analyses for class evaluation.
Learn to truly harness the power of the French Creek engine.

Session Two: "Inhibitor Modeling, Product Formulation, and Developing your own models"

Last Offered: August 6, 2009

Session two expands on Session One. Explore French Creek's inhibitor, corrosion rate, and product modeling. Gain a fuller understanding of formulating products and creating your own inhibitor and corrosion rate models

An absolute must for any French Creek users with Product Manager/ Formulator or Laboratory editions!

Favorite Quotes

"I see the use of WaterCycle becoming a status symbol among water treatment consultants .... "
Software Reviewer Marvin Silbert, Industrial Water Treatment 1992

"Despite all the chemistry and our best intentions, water treatment still remains more of an art than science. We understand the limitations of Langelier and Ryznar yet continue to use them because of their simplicity and speed of use in the field.

We also understand the tremendous 'What-if' and other benefits of WaterCycle® software, yet the cost and complexities of use can often overwhelm us."
Colin Frayne, AWT Analyst, 2009

"You mean anyone can get French Creek? I thought only <major service company> had it. "
former <major service company> sales representative at AWT 2008

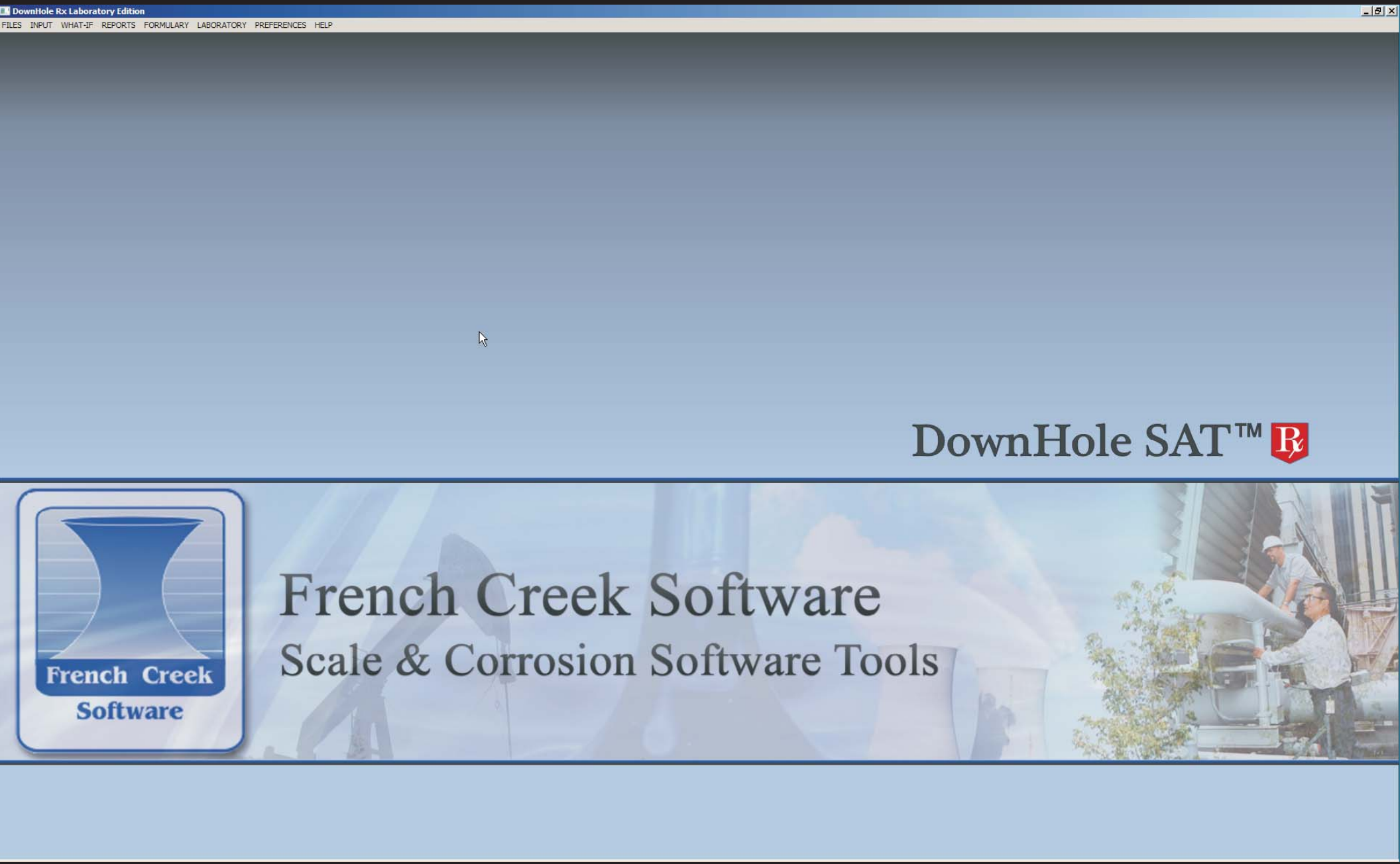
French Creek Software

Scale & Corrosion Software Tools


French Creek
Software
French Creek Software
Scale & Corrosion Software Tools


French Creek
Software
French Creek Software
Scale & Corrosion Software Tools

Thank you for joining us for a WaterCycle walk-about



Visit us on the Web

http://www.frenchcreeksoftware.com

Click on the Online Library for relevant technical papers

Click on the Online Store to order