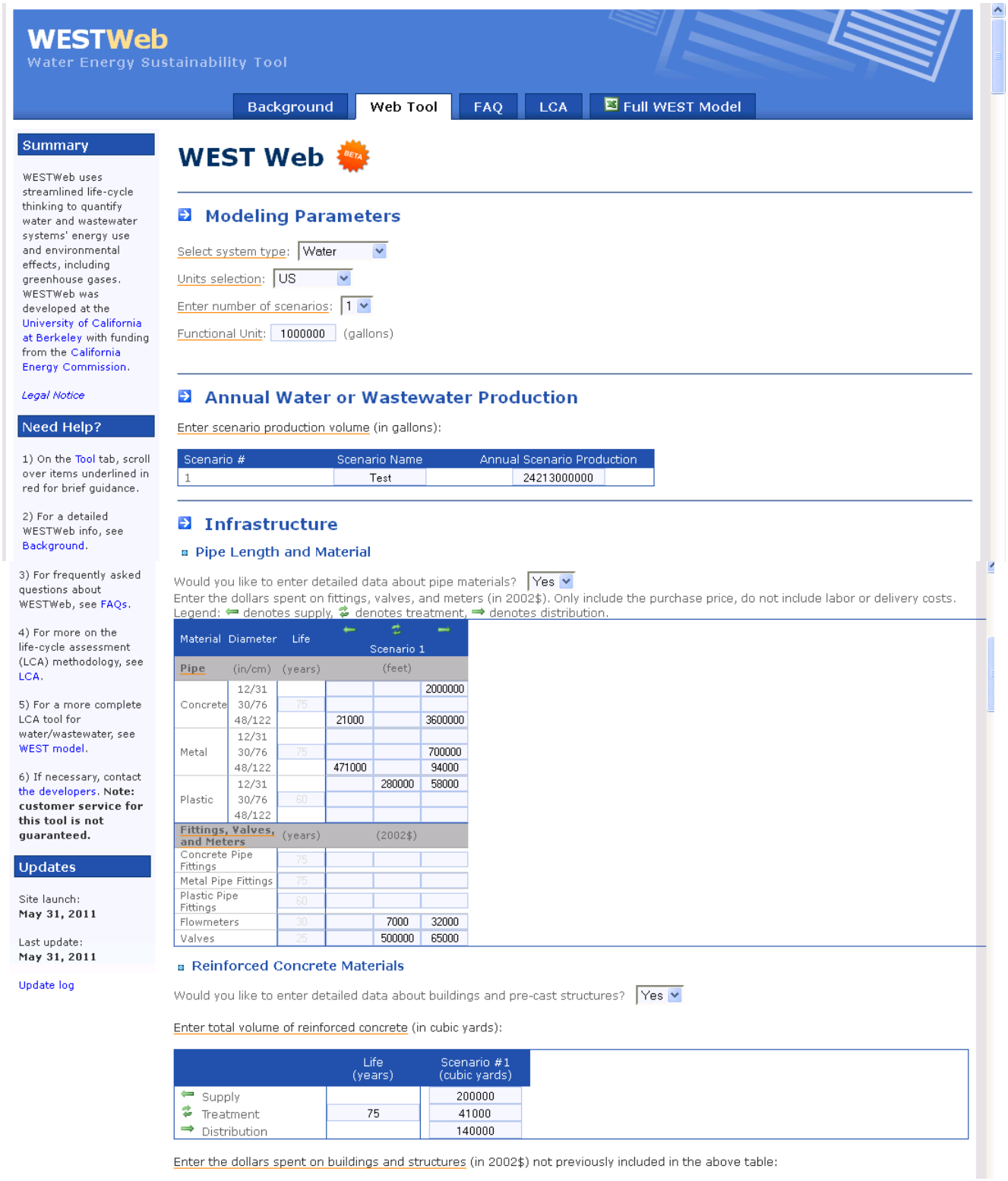
SAMPLE DATA ENTRY for a HYPOTHETICAL SINGLE WATER SYSTEM:

- US units in entry; standard unit notation for results
- Detailed entry selections and results (all results categories and subtotals shown)
- Created: 7/18/2011

Note: Data and results are hypothetical and may not be representative of an actual system



WESTWeb
Water Energy Sustainability Tool

Background | Web Tool | FAQ | LCA | Full WEST Model

Summary

WESTWeb uses streamlined life-cycle thinking to quantify water and wastewater systems' energy use and environmental effects, including greenhouse gases. WESTWeb was developed at the University of California at Berkeley with funding from the California Energy Commission.

Legal Notice

Need Help?

1) On the Tool tab, scroll over items underlined in red for brief guidance.

2) For a detailed WESTWeb info, see Background.

3) For frequently asked questions about WESTWeb, see FAQs.

4) For more on the life-cycle assessment (LCA) methodology, see LCA.

5) For a more complete LCA tool for water/wastewater, see WEST model.

6) If necessary, contact the developers. **Note: customer service for this tool is not guaranteed.**

Updates

Site launch:
May 31, 2011

Last update:
May 31, 2011

Update log

WEST Web BETA

Modeling Parameters

Select system type: Water
Units selection: US
Enter number of scenarios: 1
Functional Unit: 1000000 (gallons)

Annual Water or Wastewater Production

Enter scenario production volume (in gallons):

Scenario #	Scenario Name	Annual Scenario Production
1	Test	24213000000

Infrastructure

Pipe Length and Material

Would you like to enter detailed data about pipe materials? Yes
Enter the dollars spent on fittings, valves, and meters (in 2002$). Only include the purchase price, do not include labor or delivery costs.
Legend: ⇐ denotes supply, ⇄ denotes treatment, ⇒ denotes distribution.

Material	Diameter (in/cm)	Life (years)	Scenario 1 ⇐ (feet)	Scenario 1 ⇄ (feet)	Scenario 1 ⇒ (feet)
Pipe					
Concrete	12/31				2000000
	30/76	75			
	48/122		21000		3600000
Metal	12/31				
	30/76	75			700000
	48/122		471000		94000
Plastic	12/31			280000	58000
	30/76	60			
	48/122				
Fittings, Valves, and Meters		(years)		(2002$)	
Concrete Pipe Fittings		75			
Metal Pipe Fittings		75			
Plastic Pipe Fittings		60			
Flowmeters		30		7000	32000
Valves		25		500000	65000

Reinforced Concrete Materials

Would you like to enter detailed data about buildings and pre-cast structures? Yes

Enter total volume of reinforced concrete (in cubic yards):

	Life (years)	Scenario #1 (cubic yards)
⇐ Supply		200000
⇄ Treatment	75	41000
⇒ Distribution		140000

Enter the dollars spent on buildings and structures (in 2002$) not previously included in the above table:

Only include the purchase price; do not include labor or delivery costs.
Legend: ⇐ denotes supply, ⇄ denotes treatment, ⇒ denotes distribution.

Component	Life (years)	⇐	⇄	⇒
		Scenario 1 (2002$)		
Buildings	50	1000000	3000000	
Pre-cast Concrete	75			100000

Process Equipment

Would you like to enter detailed data about process equipment? Yes

Enter the dollars spent (in 2002$) on process equipment. Only include the purchase price; do not include labor or delivery costs.
Legend: ⇐ denotes supply, ⇄ denotes treatment, ⇒ denotes distribution.

Component	Life (years)	⇐	⇄	⇒
		Scenario 1 (2002$)		
Filtration				
Filter Media (Sand or Gravel)	15		600000	
Filter Media (Anthracite or Other Coal Product)	15		970000	
Membranes	7			
General				
Pumps	15	40000	30000	70000
Fans / Blowers	10			
Motors and Generators	15			
Turbines	30			
Metal Tanks	30		210000	
UV Lamps / Lights	3			
Other Industrial Equipment	15		8000000	
Electrical	15		1000000	
Controls	10		1000000	

Operation

Electricity Mix

Electricity Mix Location: CA (SCE)

Enter percentages for each scenario's electricity primary fuel/energy source:

	CA (SCE) Mix
Coal	12%
Oil	-%
Natural Gas	46%
Nuclear	19%
Hydro	9%
Biomass	1%
Wind	3%
Solar	1%
Geothermal	9%
Total	100%

Energy Use

Enter quantities of energy consumed for each scenario:

Annual Consumption of:	⇐	⇄	⇒
	Scenario 1		
Electricity (MWh)	11000	4200	20000
Natural Gas (MMBTU)	9500	6100	6800
Gasoline (gallons)	1000	1000	1000
Diesel (gallons)	27000	27000	27000

Treatment Chemical Consumption

Enter quantities of chemicals used in each scenario:

	Units	Scenario #1
pH Adjustment		
Hydrochloric Acid	lb/yr	
Sulphuric Acid	lb/yr	
Lime	lb/yr	
Coagulants & Flocculants		
Aluminum Sulfate	lb/yr	
Aluminum Hydroxide	lb/yr	1300000
Caustic Soda	lb/yr	1200000
Ferric Chloride	lb/yr	
Polymers	lb/yr	300000
Disinfectants		
Chlorine	lb/yr	
Calcium Hypochlorite	lb/yr	
Ozone	lb/yr	
Aqueous Ammonia	lb/yr	610000
Others		
Fluorosilicic Acid	lb/yr	900000
Other Chemicals	$/yr	700000

Run Analysis

Results include: greenhouse gases (in CO_2 equivalents), energy, carcinogens (chloroethylene [C_2H_3Cl] equivalents), non-carcinogens (C_2H_3Cl equivalents), respiratory inorganics ($PM_{2.5}$ equivalents), ozone depletion (CFC-11 equivalents), respiratory organics (ethylene [C_2H_4] equivalents), aquatic ecotoxicity (triethylene glycol [TEG] water), terrestrial ecotoxicity (TEG soil), aquatic acidification (SO_2 equivalents), and aquatic eutrophication (PO_4^{3-} in a P-limited environment). For more info on the impact categories listed here, see the Glossary.

Run Analysis for Energy and Greenhouse Gas Emissions

Run Analysis for Energy, Greenhouse Gas Emissions, and Human/Environmental Impact Potentials

Display detailed calculations: Show Analysis output notation: Standard

Analysis Output

Scenario 1 Results
↳ Test

			GHG	EN	Car	NCar	ReIn	OzDe	ReOr	AqEc	TeEc	TeAN	AqAc	AqEu
			g CO2e	MJ	g C2H3Cl eq	g C2H3Cl eq	mg PM2.5 eq	mg CFC11 eq	mg C2H4 eq	kg TEG water	kg TEG soil	mg SO2 eq	mg SO2 eq	mg PO4 P-lim
		⇐	46977	580	32738	345274	49	7	483	89428	78468	6099	3786	0
	Pipe	⇄	3483	57	676	6966	16	13	762	1889	1531	1988	801	0
		⇒	360268	3535	67072	704207	350	43	5793	166494	151112	43026	77784	3
		⇐	-	-	-	-	-	-	-	-	-	-	-	-
	↳ Concrete S	⇄	-	-	-	-	-	-	-	-	-	-	-	-
		⇒	21370	202	2515	26313	20	2	350	5742	5378	2500	5000	0
		⇐	-	-	-	-	-	-	-	-	-	-	-	-
	↳ Concrete M	⇄	-	-	-	-	-	-	-	-	-	-	-	-
		⇒	-	-	-	-	-	-	-	-	-	-	-	-
		⇐	1733	16	204	2134	1	0	28	465	436	202	405	0
	↳ Concrete L	⇄	-	-	-	-	-	-	-	-	-	-	-	-
		⇒	297241	2810	34981	365991	283	31	4873	79871	74816	34779	69558	2
		⇐	-	-	-	-	-	-	-	-	-	-	-	-
	↳ Metal S	⇄	-	-	-	-	-	-	-	-	-	-	-	-
		⇒	-	-	-	-	-	-	-	-	-	-	-	-
		⇐	-	-	-	-	-	-	-	-	-	-	-	-
	↳ Metal M	⇄	-	-	-	-	-	-	-	-	-	-	-	-
		⇒	31905	397	22943	241977	33	4	320	62734	55027	4158	2383	0
		⇐	45243	564	32534	343139	48	6	454	88962	78032	5896	3380	0
	↳ Metal L	⇄	-	-	-	-	-	-	-	-	-	-	-	-
		⇒	9029	112	6493	68482	9	1	90	17754	15573	1176	674	0
		⇐	-	-	-	-	-	-	-	-	-	-	-	-
	↳ Plastic S	⇄	3483	57	676	6966	16	13	762	1889	1531	1988	801	0
		⇒	721	11	140	1443	3	2	157	391	317	411	166	0
		⇐	-	-	-	-	-	-	-	-	-	-	-	-
Piping	↳ Plastic M	⇄	-	-	-	-	-	-	-	-	-	-	-	-
		⇒	-	-	-	-	-	-	-	-	-	-	-	-
		⇐	-	-	-	-	-	-	-	-	-	-	-	-
	↳ Plastic L	⇄	-	-	-	-	-	-	-	-	-	-	-	-
		⇒	-	-	-	-	-	-	-	-	-	-	-	-

INFRASTRUCTURE		**Fittings**	←	-	-	-	-	-	-	-	-	-	-	-	-
			⇄	-	-	-	-	-	-	-	-	-	-	-	-
			→	-	-	-	-	-	-	-	-	-	-	-	-
		↳ Concrete Pipe Fittings	←	-	-	-	-	-	-	-	-	-	-	-	-
			⇄	-	-	-	-	-	-	-	-	-	-	-	-
			→	-	-	-	-	-	-	-	-	-	-	-	-
		↳ Metal Pipe Fittings	←	-	-	-	-	-	-	-	-	-	-	-	-
			⇄	-	-	-	-	-	-	-	-	-	-	-	-
			→	-	-	-	-	-	-	-	-	-	-	-	-
		↳ Plastic Pipe Fittings	←	-	-	-	-	-	-	-	-	-	-	-	-
			⇄	-	-	-	-	-	-	-	-	-	-	-	-
			→	-	-	-	-	-	-	-	-	-	-	-	-
		Valves & Meters	←	-	-	-	-	-	-	-	-	-	-	-	-
			⇄	451	6	439	4698	0	0	12	3392	2249	86	56	0
			→	78	1	77	826	0	0	2	506	342	15	9	0
		↳ Flowmeters	←	-	-	-	-	-	-	-	-	-	-	-	-
			⇄	4	0	4	48	0	0	0	14	11	1	0	0
			→	20	0	21	222	0	0	0	66	51	4	2	0
		↳ Valves	←	-	-	-	-	-	-	-	-	-	-	-	-
			⇄	446	6	435	4650	0	0	11	3378	2238	85	55	0
			→	58	0	56	604	0	0	1	439	291	11	7	0
	Concrete and Buildings	**Concrete and Buildings**	←	38399	402	6699	70375	32	4	364	16707	17971	4063	2431	0
			⇄	9284	101	1650	17358	8	1	98	4560	4540	1068	617	0
			→	26588	277	4631	48647	22	3	250	11438	12391	2792	1677	0
		↳ Reinforced & Precast Concrete	←	37894	395	6600	69326	32	4	355	16300	17665	3978	2388	0
			⇄	7768	81	1353	14211	6	0	72	3341	3621	815	489	0
			→	26588	277	4631	48647	22	3	250	11438	12391	2792	1677	0
		↳ Buildings	←	505	6	99	1049	0	0	8	406	306	84	42	0
			⇄	1516	20	297	3147	2	0	25	1219	919	252	127	0
			→	-	-	-	-	-	-	-	-	-	-	-	-
	Equipment	**Pumps**	←	58	0	35	367	0	0	2	106	84	12	7	0
			⇄	58	0	35	367	0	0	2	106	84	12	7	0
			→	102	1	61	643	0	0	4	186	147	22	12	0
		Filtration	←	-	-	-	-	-	-	-	-	-	-	-	-
			⇄	10659	74	505	5389	5	0	30	2271	1952	640	339	0
			→	-	-	-	-	-	-	-	-	-	-	-	-
		↳ Filter Media (Sand or Gravel)	←	-	-	-	-	-	-	-	-	-	-	-	-
			⇄	2246	31	168	1784	1	0	11	733	584	130	99	0
			→	-	-	-	-	-	-	-	-	-	-	-	-
		↳ Filter Media (Anthracite or Other Coal Product	←	-	-	-	-	-	-	-	-	-	-	-	-
			⇄	8412	42	336	3605	4	0	18	1538	1367	510	239	0
			→	-	-	-	-	-	-	-	-	-	-	-	-
		↳ Membranes	←	-	-	-	-	-	-	-	-	-	-	-	-
			⇄	-	-	-	-	-	-	-	-	-	-	-	-
			→	-	-	-	-	-	-	-	-	-	-	-	-
		General	←	-	-	-	-	-	-	-	-	-	-	-	-
			⇄	15128	218	17334	181879	22	10	421	35293	29472	2768	1739	0
			→	-	-	-	-	-	-	-	-	-	-	-	-
		↳ Fans / Blowers	←	-	-	-	-	-	-	-	-	-	-	-	-
			⇄	-	-	-	-	-	-	-	-	-	-	-	-
			→	-	-	-	-	-	-	-	-	-	-	-	-
		↳ Motors and Generators	←	-	-	-	-	-	-	-	-	-	-	-	-
			⇄	-	-	-	-	-	-	-	-	-	-	-	-
			→	-	-	-	-	-	-	-	-	-	-	-	-
		↳ Turbines	←	-	-	-	-	-	-	-	-	-	-	-	-
			⇄	-	-	-	-	-	-	-	-	-	-	-	-
			→	-	-	-	-	-	-	-	-	-	-	-	-
		↳ Metal Tanks	←	-	-	-	-	-	-	-	-	-	-	-	-
			⇄	273	3	103	1081	0	0	9	303	270	35	22	0
			→	-	-	-	-	-	-	-	-	-	-	-	-
		↳ UV Lamps / Lights	←	-	-	-	-	-	-	-	-	-	-	-	-
			⇄	-	-	-	-	-	-	-	-	-	-	-	-
			→	-	-	-	-	-	-	-	-	-	-	-	-
		↳ Other Industrial Equipment	←	-	-	-	-	-	-	-	-	-	-	-	-
			⇄	12577	179	6916	72688	17	8	343	19735	16453	2202	1409	0
			→	-	-	-	-	-	-	-	-	-	-	-	-

			-	-	-	-	-	-	-	-	-	-	-	-	-
		Electrical	1018	15	7048	73789	2	0	33	6415	6139	267	153	0
			-	-	-	-	-	-	-	-	-	-	-	-
			-	-	-	-	-	-	-	-	-	-	-	-
		Controls	1259	19	3266	34320	2	0	36	8838	6608	263	154	0
			-	-	-	-	-	-	-	-	-	-	-	-
OPERATION	Energy Use		200591	3449	-	-	411212	-	116502	-	-	1427695	-	-
		Electricity	76589	1317	-	-	157008	-	44482	-	-	545120	-	-
			364712	6272	-	-	747658	-	211822	-	-	2595809	-	-
			24373	415	-	-	5304	-	3100	-	-	167082	-	-
		Natural Gas	15650	266	-	-	3406	-	1990	-	-	107284	-	-
			17446	297	-	-	3797	-	2218	-	-	119595	-	-
			14610	29	-	-	1817	-	780	-	-	39540	-	-
		Equipment Fuels	14610	29	-	-	1817	-	780	-	-	39540	-	-
			14610	29	-	-	1817	-	780	-	-	39540	-	-
			467	1	-	-	69	-	83	-	-	1441	-	-
		Gasoline	467	1	-	-	69	-	83	-	-	1441	-	-
			467	1	-	-	69	-	83	-	-	1441	-	-
			14142	27	-	-	1747	-	697	-	-	38098	-	-
		Diesel	14142	27	-	-	1747	-	697	-	-	38098	-	-
			14142	27	-	-	1747	-	697	-	-	38098	-	-
	Chemicals	**pH Adjustment**	-	-	-	-	-	-	-	-	-	-	-	-
		Hydrochlor...	-	-	-	-	-	-	-	-	-	-	-	-
		Sulphuric ...	-	-	-	-	-	-	-	-	-	-	-	-
		Lime	-	-	-	-	-	-	-	-	-	-	-	-
		Flocculants / Coagulants	57968	1817	35	131	28053	4	26781	9627	16	898948	232063	761
		Aluminum S...	-	-	-	-	-	-	-	-	-	-	-	-
		Aluminum H...	1781	49	1	10	2260	0	340	29	0	67048	19852	2
		Caustic So...	25777	905	19	93	17343	4	20077	9340	13	529142	149726	283
		Ferric Chl...	-	-	-	-	-	-	-	-	-	-	-	-
		Polymers	30409	863	14	27	8449	0	6363	257	2	302757	62484	475
		Disinfectants	31314	615	4	9	2319	0	1796	151	1	72489	19842	66
		Chlorine	-	-	-	-	-	-	-	-	-	-	-	-
		Calcium Hy...	-	-	-	-	-	-	-	-	-	-	-	-
		Ozone	-	-	-	-	-	-	-	-	-	-	-	-
		Aqueous Am...	31314	615	4	9	2319	0	1796	151	1	72489	19842	66
		Other	91380	2248	200732	2133745	33954	429	7493	1047564	650487	715187	393374	415
		Fluorosili...	31826	1363	96	181	33552	1	6299	209172	10	665751	374438	412
		Other Chem...	59554	884	200636	2133564	401	427	1193	838392	650477	49436	18936	2
Σ	Infrastructure		85494	984	39508	416385	82	11	852	106348	96609	10188	6232	0
			39007	458	20607	216293	53	25	1325	47408	39746	6552	3555	0
			387037	3815	71843	754325	373	46	6049	178625	163993	45858	79484	3
	Operation		239575	3894	-	-	418334	-	120382	-	-	1634318	-	-
			287514	6294	200771	2133886	226558	434	83324	1057343	650506	2378570	645280	1243
			396769	6599	-	-	753273	-	214821	-	-	2754946	-	-
	End-of-Life		-	-	-	-	-	-	-	-	-	-	-	-
	Scenario 1 Grand Total		1435398	22046	332730	3520891	1398675	518	426756	1389725	950856	6830434	734552	1247