



THURSTON LABORATORIES, LLC

office@thurstonlabs.com

776 SILVER ST · ELKO, NV 89801

Phone: (775) 738-4611 Fax: (775) 738-4611

IN REPLY REFER TO 9530
TL/RPT
30 SEP 25

From: CEO, Thurston Laboratories
To: Crystal Newton, Great Basin Irrigation

Subj: SUMMARY OF RESULTS OF ADDITIONAL WATER CUBE COMPUTATIONAL MODELING

1. Thurston Laboratories and Anthracene Softworks personnel have completed the computational modeling and data analysis requested on the water cube. Specifically, we have modeled the impact of variation in input water temperature and ambient humidity on the efficiency of the device. As authorship of a full report was not in our agreed upon scope of services, this letter is limited to an overview of model inputs and results. A full report can be authored upon request. Complete raw data from the simulations will also be provided; the data total approximately 8Gb. As this is too large to email or conveniently otherwise upload, data will be provided physically on USB flash media.
2. Overview of methods. 3D models of the water cube were developed from the provided design files. These were then meshed using common first-order meshing algorithms. Water and air within the volume of the cube were similarly modeled and meshed. Material properties were assigned to each of the materials: thermoplastic for the body of the cube, water, and air. Flow rate was assigned a value of 0.1 gallons per minute. Direct sunlight on the south-facing side of the cube and an ambient temperature of 72° F were assumed. Simultaneous solutions were found for the heat diffusion and Navier Stokes equations using the finite element method. Fusion 360 CFD and Elmer Fem software were used in finding steady state solutions.
3. Model inputs. A total of 64 simulations were run sweeping the input parameters of water input temperature and ambient relative humidity. Input water temperature was varied from 70° F to 145° F in steps of 5° F, and relative humidity was varied from 60% to 90% in steps of 10%. Evaporation rates were then calculated from the resultant steady state heat distribution of the water in the water cube.
4. Results. The efficiency of the water cube in desalinating water showed a strong inverse correlation to increasing relative humidity and a moderate correlation to input water temperature, especially at higher temperatures. The tabulated data and heat map visualization are shown below.

Table 1. Water cube output in gal/hr as a function of water input temperature and humidity

		Water Input Temperature °F															
		70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145
Ambient Rel. Humidity	60	0.23	0.23	0.23	0.23	0.23	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.25	0.25	0.25	0.25
	70	0.17	0.17	0.17	0.17	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.19	0.19	0.19	0.19
	80	0.11	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.13	0.13	0.13
	90	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06

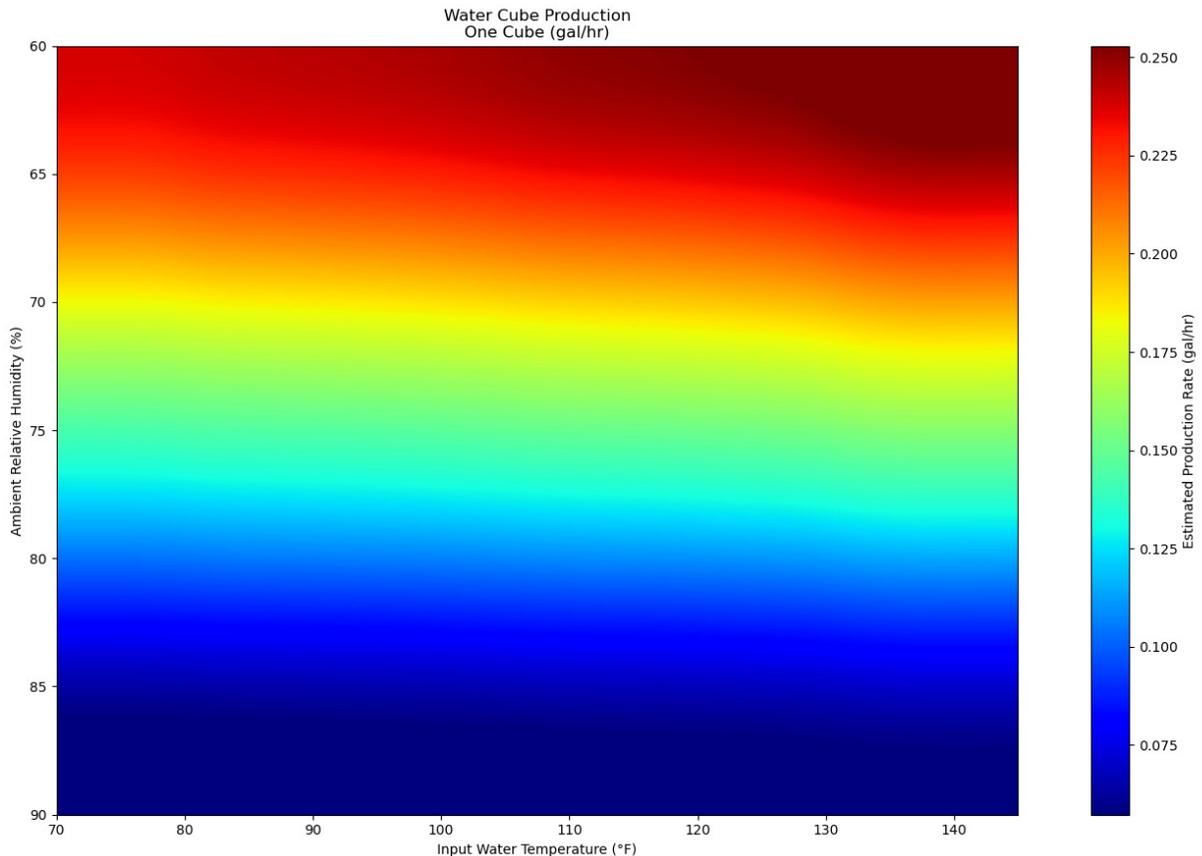


Figure 1. Interpolated heatmap of water cube output.

5. Please let me know if you have any questions or would like any further simulations run. We would also be happy to set up a meeting and go over the results in more detail with you. You can reach me by email at hankt@thurstonlabs.com or by phone at (775) 388-0231.

Respectfully submitted,

/S/
 Hank Thurston, PhD
 CEO, Thurston Laboratories, LLC