Math 105—Project 2
A bit more Caustic Rain...

by Gavin LaRose (glarose@NebrWesleyan.edu), Nebraska Wesleyan University, August 1998

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the Lonlinc Building
South 9th Avenue
Lonlinc, SK 08685

28 September 1998

Independent Mathematical Contractors, Inc.
Suite 2, Strawmarket Business Plaza
Lonlinc, SK 04685

Dear IMC:

Our great thanks for your prompt and useful work on the matter of the acid rain that we are hoping not to suffer from in Lonlinc. We have forwarded your report to the various agencies of import to which we inevitably report, and have received numerous accolades therefrom as a result of its comprehensive assessment of the problem. As a result of this report, however, we have received a reply from the transportation division of the Lonlinc bureaucracy. It appears that they are in the process of installing some high-gain solar panels to power a number of traffic direction devices about the city, the surfaces of which will eventually become pitted and therefore less clear as they are exposed to the acidity of the precipitation. According to their estimates, it would take exposure to an amount of Nitric Acid (NO_3) equal to 800 grams for this to have a significant impact on the solar panels' electrical yield.

We therefore need to know, based on the data for monthly precipitation and NO_3 concentration reproduced in tables 1 and 2 below, at what point the total acidic exposure to which a solar panel will have been subjected will equal or exceed 800 g of NO_3.

It is with great pleasure that we anticipate your final report of 3–6 pages on this matter, which we need to receive by the 2nd of November. Owing to the success of the secondary consulting arrangment implemented with your previous project work, we have again made our scientific expert, Dr. Gavin LaRose, available to answer any questions that you might have in the course of your investigation. *Again, he will unfortunately be unavailable to assist on this project over the weekend of 31 October–1 November.* You should with your project team also plan on meeting with him sometime in the week of the 19th of September.

Sincerely,

Jack C. Ousteaux
Director, Lonlinc CPE

jco:glr

Table 1: Average monthly precipitation (mm)

month	1	2	3	4	5	6	7	8	9	10	11	12
avg. precipitation	173	206	600	705	1098	1140	999	987	1016	623	351	260
month	13	14	15	16	17	18	19	20	21	22	23	24
avg. precipitation	177	218	596	750	1109	1088	1004	1028	965	593	369	255
month	25	26	27	28	29	30	31	32	33	34	35	36
avg. precipitation	173	209	567	134	1089	1055	928	1033	983	609	539	251

Table 2: Average NO_3 concentration in precipitation (g/ml)

month	1	2	3	4	5	6	7	8	9
NO_3 conc.	0.4003	0.4033	0.4060	0.4078	0.4100	0.4124	0.4136	0.4171	0.4184
month	10	11	12	13	14	15	16	17	18
NO_3 conc.	0.4214	0.4248	0.4255	0.4282	0.4307	0.4331	0.4356	0.4380	0.4409
month	19	20	21	22	23	24	25	26	27
NO_3 conc.	0.4440	0.4454	0.4490	0.4513	0.4532	0.4567	0.4587	0.4603	0.4638
month	28	29	30	31	32	33	34	35	36
NO_3 conc.	0.4658	0.4700	0.4715	0.4743	0.4772	0.4805	0.4834	0.4852	0.4879