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*Long-Term Exposure of $^{238}\text{PuO}_2$
to a Terrestrial Environment*

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Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

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Long-Term Exposure of $^{238}\text{PuO}_2$ to a Terrestrial Environment

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LONG-TERM EXPOSURE OF $^{238}\text{PuO}_2$ TO A TERRESTRIAL ENVIRONMENT

by

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ABSTRACT

Two environmental simulation chambers were used to study the behavior of a $^{238}\text{PuO}_2$ heat source deposited in a humid, temperate environment. Large fragments from an impact-tested source were deposited in the first chamber, and fines from the source were placed in the second. Plutonium released into the soil, the soil drainages, and the condensates from the dehumidifiers were monitored throughout the experiment. The concentration of plutonium released into the soil drainages increased with time, obeying an apparent exponential growth curve over the duration of the experiment (5.7 yr). The bulk of the released plutonium, up to 0.3% of the source, was retained in the soil. A simulated cleanup operation at the conclusion of the experiment, which included removal of the source and the top inch of soil, resulted in an increased rate of plutonium release into the soil drainage and essentially no observable change of release rate into the air. Large chunks of PuO_2 deposited in one of the chambers underwent spontaneous disintegration into smaller pieces; after 2 yr the deposited material could barely be distinguished from the fines deposited in the other chamber.

INTRODUCTION

Radioisotope sources are used to provide heat for electric power generators capable of supplying stable power levels for many years. Because of their longevity and simplicity, these generators are used to provide electric power for instruments and data transmission on many space missions. The isotope used almost exclusively for the space program is ^{238}Pu , usually as PuO_2 . The heat source container is designed with a great safety factor to withstand both reentry from orbit and impact with the earth so that the source will be safely contained until it is recovered. Existing designs have proved to be more than adequately safe; however, to improve the

safety of the heat sources and to provide data for use in risk assessment studies, the Department of Energy continually seeks more information about the potential plutonium release modes and the possible effects of released plutonium. As part of this program the Los Alamos National Laboratory is studying the interactions of $^{238}\text{PuO}_2$ fuel materials with various environmental systems. The results of terrestrial experiments with iridium-clad fuel,¹ a complete fueled sphere assembly with an iridium cladding and a graphite impact shell,² and unclad fragments of $^{238}\text{PuO}_2$ (Ref. 3) have been previously reported. The work discussed here is a continuation of that described in Ref. 3, which concerns studies of unclad, fragmented heat source material

deposited in a terrestrial environmental system with a humid, temperate climate. In terms of a potential plutonium release, it corresponds to a worst-case simulation, in which the containment completely fails and the source itself is broken into fragments that are released into the surrounding environment.

I. OBJECTIVE

The purpose of this experiment was to evaluate the plutonium distribution from a source deposited in a simulated humid, temperate environment. In particular, we sought to determine the total release of plutonium from the source and the amounts released into the soil and groundwater components of the simulated ecosystem. In addition, we hoped to observe any dependencies of the plutonium releases on season, rainfall, time, or any other system variables.

In addition to measuring the plutonium released from the source, we also intended to derive some information on the release mechanisms involved. In a previous experiment³ conducted under similar conditions, we found that a simulated rain on large pieces of pressed $^{238}\text{PuO}_2$ (PPO) caused a temporarily high air concentration of plutonium, probably from thermal spalling.⁴ This was not observed for rains on PPO fines, presumably because these were not thermally hot. To further study this spalling effect, the present experiments were designed with soil in two concentric compartments. The source was deposited on the soil in the innermost compartment. Any plutonium observed in the outer soil compartment could arrive there only by transport through the air over a distance of tens of centimeters. The source material, soil, temperature, humidity, and rainfall cycles were the same as in the previous experiment.³

II. EXPERIMENT DESIGN

A. Equipment

This experiment was conducted with two environmental simulation chambers manufactured by Standard Environmental Systems, Inc., of Totowa, New Jersey, model SLHH/64 (see Fig. 1). Spray heads were included so that rainfalls could be conducted as needed. The soil trays, 0.9 m square by 0.3 m deep, were modified to have

center compartments, 0.45 m in diameter, which were cylindrical to a depth of approximately 21 cm (Fig. 1). Below this they tapered to tubes approximately 1 cm in diameter for the separate collection of water draining from these compartments. Both compartments in each tray were filled with loam soil (Table I) to about 3 cm from the top of the compartment wall.

B. Chamber Operation

The air temperature and humidity were cycled diurnally over ranges of 20 to 40°C and 85 to 97% RH, respectively, in both chambers. This humid summer regime was alternated every 6 months with a humid winter one of 0 to 17°C and 60 to 100% RH. Water from the spray head was distributed evenly over the soil in the trays once weekly, simulating a weekly rainfall in each chamber. The amount of water used in each case was equivalent to a 32-mm (1.3-in.) rainfall.

Chamber 6 suffered several mechanical malfunctions that seriously affected the results of the experiment. A control valve failed on two occasions, each time causing a flood within the chamber. The first flood occurred early in the experiment, after the fifth rain cycle, and resulted in material being carried over from the inside compartment to the outside, thus destroying much of the information that might have been obtained on the deposition of airborne plutonium. The second flood occurred during the third year and also resulted in material being carried over from the inside compartment to the outside. In addition to the valve failures, difficulty with the drain from the inside sample compartment caused some erratic behavior in the inner percolate data from this chamber. The other chamber, chamber 8, functioned in a relatively trouble-free manner throughout the experiment.

C. PuO_2 Sources

The fragmented PPO source from an impact-tested fuel assembly, numbered MHFT-50, was removed from the postimpact containment shell (PICS) and separated into three particle size fractions: particles with diameters less than 10 μm (called airborne), particles with diameters from 10 μm to 2 mm (called fines), and pieces with diameters greater than 2 mm (called chunks). The fines (68 g) and the chunks (186 g) were centrally placed

Fig. 1. An environmental simulation chamber with a compartmentalized soil tray.

TABLE I. Loam Composition^a

Sand (%)	49.5
Silt (%)	37.6
Clay (%)	12.9
Carbon, organic (%)	0.6
Carbonate as CaCO ₃ (%)	trace
H ₂ O at 15 bars (%)	7.6
H ₂ O at saturation (%)	40
pH	8.0
Ca (meq/100 g)	16.3
Mg (meq/100 g)	1.9
Na (meq/100 g)	0.5
K (meq/100 g)	1.0
Cation exchange cap.	13.6
Conductivity (mmho/cm)	0.6
Clay mineral ratio	
Mica	4
Montmorillonite	3
Kaolinite	3

^aSoil analysis was provided by the US Soil Conservation Service Laboratory, Riverside, California.

on the soil in the inner compartments of the soil trays in chambers 6 and 8 respectively. The specific activity of the source material was 13.649 Ci/g.

D. Samples

1. **Aqueous Effluents.** The waters that percolated through the soil in each compartment after each rain were collected and analyzed by liquid scintillation counting to determine their plutonium contents. Condensates from the refrigeration-type dehumidifiers of the chamber climate control systems were collected as needed and also analyzed for plutonium by liquid scintillation counting. The plutonium contents of the soil percolates reveal the groundwater contents, whereas the condensate data indicate trends of the plutonium concentrations in the air but do not quantitatively measure them.

2. **Soil Cores.** Near the end of each summer and winter season, for the first seven seasons, we took two soil cores for plutonium analysis. We obtained the cores, from positions 6 cm apart inside and outside the compartment partition, by pushing sections of 1/2-in.

copper tubing into the soil to the full depth of the soil tray. We filled the resulting holes with melted paraffin wax to prevent channeling of the rainwater through the soil. Each core was divided into from 5 to 14 sections that were individually analyzed to determine the plutonium concentration as a function of depth. Analyses were performed by dissolving the individual sections in nitric and hydrofluoric acids and then mixing the resulting solutions with a scintillation cocktail before counting.

III. RESULTS AND DISCUSSION

A. Aqueous Effluents

Tables II through IX show the results, summarized by seasons, for the aqueous effluents from the chambers. Results are expressed in terms of activity releases per season and as activity release rates over each season. Because the seasons are of variable lengths, the release rate data are more useful for comparisons. Complete listings of the experimental data can be found in Appendices A and B.

One interesting feature of the aqueous effluent results is the large percentage of the plutonium release accounted for by the dehumidifier condensate. In the case of chamber 6, the condensate contains 37% of the aqueous plutonium release; for chamber 8 it contains 82%. The dehumidifier condensate indicates the plutonium released into the air but does not necessarily give a quantitative measure of this release. Because no direct measurements of airborne plutonium were made during this experiment, the condensate is the only evidence available for plutonium released into the air. The condensates from chamber 8 contained larger proportions of the total aqueous releases than did those from chamber 6, especially during the early part of the experiment. Because the major difference between the two chambers was the particle size distribution of the PuO₂ placed in each, the larger particles used in chamber 8 may be more effective in releasing plutonium directly into the air than the smaller ones used in chamber 6. This observation is consistent with the idea that thermal stress or thermal shock mechanisms are important in the ejection of very small particles of PuO₂ directly into the air and inconsistent with mechanisms requiring a direct dependence of airborne release on surface area or mass.

The soil trays were divided into inner and outer compartments to provide information on the airborne transport of plutonium onto soil located some distance

TABLE II. Plutonium Activity Releases for Chamber 6 Summarized by Season

season	elapsed time (days)	inner percolate volume (l)	outer percolate volume (l)	condensate volume (l)	plutonium activity (inner) (uci)	plutonium activity (outer) (uci)	plutonium activity (condensate) (uci)	plutonium activity (total) (uci)
1	winter	79.054	6.300	62.650	141.900	.289	1.469	1.445
2	summer	192.734	38.925	313.600	336.500	.082	3.523	1.060
3	winter	169.972	38.980	219.650	309.600	.305	3.447	.817
4	summer	210.215	53.490	365.100	442.400	.740	5.388	1.853
5	winter	188.019	79.700	282.400	361.500	2.089	9.950	3.058
6	summer	180.780	47.230	281.150	403.400	2.279	7.019	4.788
7	winter	154.987	52.700	157.400	288.100	13.905	3.756	2.728
8	summer	167.025	77.400	145.250	383.800	8.932	2.392	4.614
9	winter	185.008	69.410	195.300	530.500	15.126	4.563	11.748
10	summer	181.040	45.785	152.350	405.700	.752	3.632	6.756
11	winter	181.221	26.580	88.150	549.600	1.441	5.344	9.131
12	summer	182.017	41.886	127.550	593.500	2.016	3.235	11.872
13	winter	7.688	3.500	1.800	35.000	.121	.066	.529
total	2079.760	581.886	2392.350	4781.500	48.077	53.783	60.399	162.259

TABLE III. Plutonium Activity Release Rates for Chamber 6 Summarized by Season

season	elapsed time (days)	inner percolate rate (l/day)	outer percolate rate (l/day)	condensate rate (l/day)	pu release rate (inner) (nci/day)	pu release rate (outer) (nci/day)	pu release rate (condensate) (nci/day)	pu release rate (total) (nci/day)
1	winter	79.054	.080	.792	1.795	3.652	18.583	40.514
2	summer	192.734	.202	1.627	1.746	.427	18.279	24.206
3	winter	169.972	.229	1.292	1.821	1.794	20.277	26.877
4	summer	210.215	.254	1.737	2.105	3.522	25.631	37.968
5	winter	188.019	.424	1.502	1.923	11.113	52.920	80.297
6	summer	180.780	.261	1.555	2.231	12.604	38.826	77.915
7	winter	154.987	.340	1.016	1.859	89.717	24.234	131.550
8	summer	167.025	.463	.870	2.298	53.477	14.319	95.421
9	winter	185.008	.375	1.056	2.867	81.758	24.664	169.922
10	summer	181.040	.253	.842	2.241	4.154	20.062	61.534
11	winter	181.221	.147	.486	3.033	7.951	29.489	87.825
12	summer	182.017	.230	.701	3.261	11.077	17.771	94.073
13	winter	7.688	.455	.234	4.553	15.740	8.585	93.138
net		2079.760	.280	1.150	2.299	23.117	25.250	78.018

TABLE IV. Plutonium Activity Releases for Chamber 8 Summarized by Season

season	elapsed time (days)	inner percolate volume (l)	outer percolate volume (l)	condensate volume (l)	plutonium activity (inner) (uci)	plutonium activity (outer) (uci)	plutonium activity (condensate) (uci)	plutonium activity (total) (uci)
1 winter	79.069	1.295	45.850	163.000	.009	2.712	6.134	8.855
2 summer	192.743	15.000	250.950	545.400	.019	.258	10.342	10.619
3 winter	169.970	15.115	232.050	462.800	.012	1.921	12.203	14.136
4 summer	210.217	7.230	344.750	587.700	.008	1.987	16.387	18.382
5 winter	188.045	31.155	217.590	522.400	.780	3.672	25.447	29.899
6 summer	180.753	27.715	191.900	564.400	3.116	2.377	28.251	33.743
7 winter	154.987	47.350	111.600	427.300	2.710	1.839	18.414	22.963
8 summer	167.024	30.540	161.000	581.900	.994	1.690	41.380	44.065
9 winter	184.960	54.760	216.350	381.100	1.661	3.131	14.675	19.467
10 summer	181.088	25.800	256.800	454.600	1.588	2.740	21.193	25.521
11 winter	181.222	52.180	180.250	291.250	4.249	2.856	11.696	18.801
12 summer	182.014	34.375	178.950	407.100	3.118	5.154	13.573	21.845
13 winter	4.833	2.300	8.000	18.000	.470	.222	.908	1.600
total	2076.927	344.815	2396.040	5406.950	18.734	30.559	220.603	269.897

TABLE V. Plutonium Activity Release Rates for Chamber 8 Summarized by Season

season	elapsed time (days)	inner percolate rate (l/day)	outer percolate rate (l/day)	condensate rate (l/day)	pu release rate (inner) (nci/day)	pu release rate (outer) (nci/day)	pu release rate (condensate) (nci/day)	pu release rate (total) (nci/day)
1 winter	79.069	.016	.580	2.061	.114	34.299	77.577	111.990
2 summer	192.743	.078	1.302	2.830	.096	1.339	53.657	55.092
3 winter	169.970	.089	1.365	2.723	.071	11.301	71.795	83.168
4 summer	210.217	.034	1.640	2.796	.038	9.452	77.953	87.443
5 winter	188.045	.166	1.157	2.778	4.149	19.527	135.324	159.000
6 summer	180.753	.153	1.062	3.122	17.237	13.149	156.296	186.682
7 winter	154.987	.306	.720	2.757	17.483	11.866	118.810	148.160
8 summer	167.024	.183	.964	3.484	5.954	10.121	247.748	263.823
9 winter	184.960	.296	1.170	2.060	8.981	16.928	79.341	105.250
10 summer	181.088	.142	1.418	2.510	8.770	15.131	117.031	140.932
11 winter	181.222	.288	.995	1.607	23.447	15.760	64.540	103.746
12 summer	182.014	.189	.983	2.237	17.133	28.317	74.571	120.021
13 winter	4.833	.476	1.655	3.724	97.241	45.931	187.862	331.034
net	2076.927	.166	1.154	2.603	9.020	14.714	106.216	129.950

TABLE VI. Plutonium Activity Releases After a Simulated Cleanup Operation for Chamber 6
Summarized by Season

season	elapsed time (days)	inner percolate volume (l)	outer percolate volume (l)	condensate volume (l)	plutonium activity (inner) (uci)	plutonium activity (outer) (uci)	plutonium activity (condensate) (uci)	plutonium activity (total) (uci)
1 winter	182.049	70.750	71.950	474.900	187.159	1.712	12.623	201.494
2 summer	186.118	21.505	64.370	449.200	15.070	1.169	9.645	25.884
total	368.167	92.255	136.320	924.100	202.229	2.881	22.268	227.378

TABLE VII. Plutonium Activity Release Rates After a Simulated Cleanup Operation for Chamber 6
Summarized by Season

season	elapsed time (days)	inner percolate rate (l/day)	outer percolate rate (l/day)	condensate rate (l/day)	pu release rate (inner) (nci/day)	pu release rate (outer) (nci/day)	pu release rate (condensate) (nci/day)	pu release rate (total) (nci/day)
1 winter	182.049	.389	.395	2.609	1028.072	9.406	69.339	1106.816
2 summer	186.118	.116	.346	2.414	80.973	6.279	51.822	139.073
net	368.167	.251	.370	2.510	549.288	7.825	60.483	617.596

TABLE VIII. Plutonium Activity Releases After a Simulated Cleanup Operation for Chamber 8
Summarized by Season

season	elapsed time (days)	inner percolate volume (l)	outer percolate volume (l)	condensate volume (l)	plutonium activity (inner) (uci)	plutonium activity (outer) (uci)	plutonium activity (condensate) (uci)	plutonium activity (total) (uci)
1 winter	180.889	125.600	142.700	286.500	22.914	5.654	20.692	49.260
2 summer	172.865	67.850	104.700	599.800	25.223	3.297	36.734	65.254
total	353.753	193.450	247.400	886.300	48.137	8.951	57.426	114.514

TABLE IX. Plutonium Activity Release Rates After a Simulated Cleanup Operation for Chamber 8 Summarized
by Season

season	elapsed time (days)	inner percolate rate (l/day)	outer percolate rate (l/day)	condensate rate (l/day)	pu release rate (inner) (nci/day)	pu release rate (outer) (nci/day)	pu release rate (condensate) (nci/day)	pu release rate (total) (nci/day)
1 winter	180.889	.694	.789	1.584	126.674	31.257	114.391	272.322
2 summer	172.865	.393	.606	3.470	145.912	19.073	212.502	377.486
net	353.753	.547	.699	2.505	136.075	25.303	162.333	323.711

from the source. If most of the released plutonium is simply washed off the source by rain, then one should observe most of the eluted plutonium in the drainage from the inner compartment, and the amount released should be related to the surface area of the deposited source. If much of the released plutonium is ejected from the surface of the source by radioactive recoil mechanisms, the released plutonium should be more uniformly distributed between the inner and outer compartments. In addition, the relative distribution should be independent of particle size, and the total amount of plutonium released should be directly dependent on the surface area of the source. If the released plutonium is ejected from the source by thermal stress or thermal shock mechanisms, then one should observe more plutonium in the outer compartment, compared to the inner compartment, for large-particle sources than for small-particle sources. This is because the larger $^{238}\text{PuO}_2$ particles have much larger thermal gradients at their surfaces and are subject to more thermal stress, especially when they are rapidly cooled, as might happen during a rainfall. If resuspension plays an important part in the production of airborne plutonium, the amount of airborne plutonium should depend on the concentration of PuO_2 fines on the surface of the soil and on the moisture content of the soil. In this case one should observe larger amounts of plutonium in the outer compartment for sources having large amounts of fines. The plutonium eluted from the soil in the outer compartment should relate to the surface area of the source only to the extent that the surface area relates to the amount of fines deposited in the inner compartment. Thus the use of inner and outer compartments in the soil tray allows some inferences to be made on the mechanisms for plutonium release and transport from these sources.

Unfortunately, the value of this experiment was severely compromised by the flood that occurred early in the experiment in chamber 6. By carrying material over the barrier between the inner and outer compartments, the flood made it impossible to determine whether plutonium observed in the effluents from the outer compartment was derived from source particles transported to the outer soil by the flood or from fine particles ejected from source particles in the inner compartment. Only five data points were obtained before this event. These all fall within the range of values observed after the flood, which may mean that the flood did not carry any source particles over the barrier between the two compartments or that ejection of plutonium into the air from small particles or by resuspension processes is a

major factor in the release mechanism. Clearly, this information is not sufficient to answer questions concerning the mechanism of the plutonium release.

One interesting observation is that the ratio of release rates of plutonium for the outer compartment to those for the inner compartment is almost always larger for chamber 8 than for chamber 6. For the entire experiment up to the time the sources were removed from the chambers (5.7 yr), the ratio of release rates for chamber 8 was 1.63 and that for chamber 6 was 1.12. This could be an indication that transport of plutonium over the barrier between the inner and outer compartments is more effective in chamber 8 than in chamber 6. However, the concentration ratios for the two chambers are reversed (0.273 for chamber 6 and 0.235 for chamber 8). That is, the plutonium concentration in the effluent from the outer compartment of chamber 6, when compared to that in the effluent from the inner compartment, is larger than that for chamber 8. The apparent discrepancy between the total release rate data and the concentration data is accounted for by the nearly twofold volume difference for the drainages of the inner compartments for the two chambers. With the information at hand, it is not possible to separate the effects of volume and concentration on the total release rate, and consequently it is not possible, with this information alone, to speculate on release mechanisms.

After 2077 days, both chambers were subjected to simulated cleanup operations. In each case, 1 in. of soil was removed in an effort to remove the source and the most highly contaminated soil. The measurements obtained on the percolates and condensates collected after this operation are shown in Tables VI through IX. Astonishingly, the release rates for the inner percolates actually increased after the cleanup. Release rate changes for the outer percolates and the condensates were not significant except for the outer percolate for chamber 6, which decreased. Note, however, that the volume rate for this effluent decreased from 1.15 L/day before the cleanup to 0.37 L/day afterwards. The only other comparable volume rate change was for the inner percolate of chamber 8, which increased (0.166 L/day before to 0.547 L/day after), and this change was accompanied by a corresponding increase in the release rate. We conclude that the only significant changes resulting from the cleanup operations were the increases in the inner percolate release rates. In the case of chamber 6, these increased rather drastically immediately after the cleanup. This probably reflects a disturbance of the soil column during the cleanup

operation. The release rate increases were more moderate for chamber 8. It is significant that the release rates for the condensates, which one would expect to decrease after removal of the sources, remained essentially constant. Taken together, the evidence suggests that removal of the top layer of soil, while undoubtedly removing the bulk of the deposited PuO_2 , is not particularly effective in controlling the release of plutonium into the surrounding air and groundwater.

The results in Tables II through V are summarized by seasons to reveal any seasonal dependencies in the data. Within the uncertainty in the data, there appear to be no seasonal dependencies except possibly for the inner percolate values for seasons 7, 8, and 9 in chamber 6. Repeated difficulties were encountered with the drainage of this compartment during these seasons, however, and we believe that a large part of the high release rates observed during these seasons was caused by the mechanical problems of the chamber. With this proviso, we conclude that there is no observable dependence of release rate on season in these experiments.

Figures 2 through 7 show the plutonium releases of each effluent plotted as functions of time. These curves, plotted as log concentration versus time, tend to increase linearly with time. (In the case of the inner percolate for chamber 6, it is difficult to say whether the curve is linear or not, but it definitely increases.) This linear behavior for a log-linear curve implies that the plutonium concentration in the chamber effluents obeys an exponential growth law over the duration of the experiment. Table X shows the pre-exponential terms and the growth constants (base e) obtained using visual curve fits for the respective plots. Note that the plutonium concentrations seem to depend on the effluent flow rates, but that the nature of this dependence is known only in a qualitative way.

The growth constants for the inner percolates are substantially larger than those for either the outer percolates or the condensates, which are, in some cases, essentially constant-valued functions of time. The condensate values are interesting in that they do not fall on the linear curve until after the first couple of years. (In fact, we ignored the first 750 days when doing the curve fits.) This could imply that a change in mechanism occurred after the first couple of years or that the linear log concentration versus time curve is not appropriate for this effluent. Because we have no *a priori* reasons to assume an exponential growth curve, we surmise that the latter is probably the case. None of the effluents can obey an exponential growth law indefinitely, since this would ultimately imply a plutonium catastrophe caused by unlimited growth in plutonium concentration. Thus the values shown in Table X can be used only to predict plutonium concentrations over short periods of time.

B. Soil Cores

Fourteen cores were taken from each of the two environmental test chambers. The last two of these from each chamber were sent to LFE Environmental Analysis Laboratories* for particle size analysis. The other 12 cores in each chamber were sectioned, dissolved, and analyzed for plutonium by liquid scintillation counting (Tables XI and XII). The second and third lines of each table show the number of days of exposure to the PuO_2 source and the weather regime (summer or winter), respectively, at the time each core was collected. The position from which each core was taken appears on the

*LFE Environmental Analysis Laboratories, 2030 Wright Avenue, Richmond, CA 94804.

TABLE X. Curve-Fitting Constants for Chamber Effluents

Effluent	Pre-exponential (nCi/L)	Growth Constant (yr ⁻¹)
Chamber 6 inner percolate	2.0	0.71
Chamber 8 inner percolate	0.25	1.11
Chamber 6 outer percolate	20.0	0.00
Chamber 8 outer percolate	6.3	0.20
Chamber 6 condensate	11.2	0.05
Chamber 8 condensate	39.8	0.03

Fig. 2. Plutonium concentration versus time for the rainwater percolates from the inner soil compartment of chamber 6.

Fig. 3. Plutonium concentration versus time for the rainwater percolates from the inner soil compartment of chamber 8.

Fig. 4. Plutonium concentration versus time for the rainwater percolates from the outer soil compartment of chamber 6.

Fig. 5. Plutonium concentration versus time for the rainwater percolates from the outer soil compartment of chamber 8.

Fig. 6. Plutonium concentration versus time for the dehumidifier condensates from chamber 6.

Fig. 7. Plutonium concentration versus time for the dehumidifier condensates from chamber 8.

TABLE XI. Plutonium Contents of Core Sections from Chamber 6^a

Core number	---	1	2	3	4	5	6	7	8	9	10	11	12					
Days exposed	---	76	76	253	253	421	421	652	652	840	840	1010	1010					
Season ^b	---	W	W	S	S	W	W	S	S	W	W	S	S					
Position ^c	---	LI	LO	RI	RO	FI	FO	BI	BO	LFI	LFO	RBI	RBO					
	Depth (cm)													Inner Total	Outer Totals	Winter Totals	Summer Totals	All-Core Totals
Top section	0	26.4μ	2.94μ	127μ	8.58μ	55.7μ	3.83μ	442μ	135μ	20.9μ	2.42μ	298μ	133μ	970μ	286μ	112μ	1.14m	1.26m
Lower sections	2	1.01μ	---	---	---	---	---	2.51m	---	84μ	0	---	---					
	5	9.8	1.3	---	---	350	---	173μ	---	3.20μ	---	3.38μ	---					
	7	23.2	0.6	2.05μ	1.2	97.4	1.6	8.96μ	---	---	58.8	15.3μ	2.2					
	9	9.0	---	---	---	56.1	---	23.4μ	35.8	280	25.0	147	1.0					
	12	15.3	1.4	147	0.7	8.8	---	13.4μ	---	224	---	82.8	---					
	14	7.9	---	---	---	1.4	0.4	6.82μ	---	152	323	1.41μ	0.5					
	16	13.1	0.5	81.1	1.0	0.8	---	8.95μ	5.2	31.5	2.4	1.7	0.7					
	19	5.7	0	---	0	0.4	0	1.30μ	---	---	---	12.2	---					
	21	4.8	---	1.6	---	0.10	---	2.74μ	4.8	2.14μ	0	23.7	0.9					
	23		0		0		0		---		0		---					
	25		0		---		---		4.8		0		1.8					
	27		0		1.6		---		---		374		5.7					
	29		0		9.2		0		1.72μ		0		1.89μ					
Subsurface totals		1.10μ	3.8	2.28μ	13.7	515.0	2.0	2.75m	1.77μ	90μ	783	20.4μ	1.90μ	2.86m	4.47μ	92μ	2.78m	2.87m
Core totals		27.5μ	2.94μ	129μ	8.59μ	56.2μ	3.83μ	3.19m	137μ	111μ	3.20μ	318μ	135μ	3.83m	291μ	204μ	3.92m	4.12m

^aData are in nanocuries (nCi) except where marked μ for microcuries or m for millicuries.

^bW = winter, S = summer.

^cL = left, R = right, F = front, B = back, LF = left front, RB = right back, I = inner, O = outer.

TABLE XII. Plutonium Contents of Core Sections from Chamber 8^a

Core number	---	1	2	3	4	5	6	7	8	9	10	11	12					
Days exposed	---	76	76	253	253	421	421	652	652	840	840	1010	1010					
Season ^b	---	W	W	S	S	W	W	S	S	W	W	S	S					
Position ^c	---	LI	LO	RI	RO	FI	FO	BI	BO	LFI	LFO	RBI	RBO					
	Depth (cm)													Inner Total	Outer Totals	Winter Totals	Summer Totals	All-Core Totals
Top section	0	1.96μ	3.46μ	9.34μ	7.3μ	28.4μ	13.3μ	532μ	92.1μ	8.60μ	32	14.1μ	59.3μ	594μ	175.5μ	55.8μ	714μ	770μ
Lower sections	2	---	---	---	---	---	---	---	---	---	---	195μ	---					
	3	1.5	---	---	---	0.14μ	---	694μ	---	8.61μ	---	3.00μ	---					
	5	---	1.1	---	0	---	0	---	2.2	---	7.2	73.4	5.5					
	6	0.7	---	15.2	---	---	---	363	---	---	---	30.3	---					
	8	0	---	---	---	4.8	2.8	---	---	238	0	7.0	---					
	10	0.7	674	2.7	---	---	---	117	8.3	---	0	2.3	0.5					
	11	0	---	0	0	1.0	---	---	---	---	---	2.0	---					
	13	0	0.7	0	---	0	0	15.8	1.8	53.2	0	2.8	0					
	15	---	---	0	---	0	---	---	---	---	---	0.8	---					
	16	0	519	---	0	0	0	---	---	29.4	0	162	0					
	18	0	---	0	---	0	---	21.8	247	271	---	70	---					
	19	0	---	0	---	0	0.4	---	---	---	0.7	1.3	0					
	21	0	1.0	0.4	0	0	---	90.1	1.6	0.9	0	50.5	---					
	23		0.6		---		0		2.9		4.2		0.9					
	25		0.6		0		--		---		5.2		0					
	27		0.6		--		0		4.0		15.4		0.7					
	29		0.6		0		0		9.7		0		5.0					
Subsurface totals		2.9	1.20μ	18.3	0	0.15μ	3.2	695μ	278	9.20μ	32.7	198μ	12.6	902μ	1.53μ	10.59μ	893μ	904μ
Core totals		1.96μ	4.66μ	9.36μ	7.3μ	28.5μ	13.3μ	1.23m	92.4μ	17.80μ	65	212μ	59.3μ	1.50m	177.0μ	66.3μ	1.61m	1.67m

^aData are in nanocuries (nCi) except where marked μ for microcuries or m for millicuries.^bW = winter, S = summer.^cL = left, R = right, F = front, B = back, LF = left front, RB = right back, I = inner, O = outer.

fourth line. The plutonium data are in nanocuries, except where otherwise noted. For cores divided into fewer than 14 sections in chamber 8, or 10 sections in chamber 6, the subsurface section values were placed on rows with sections of roughly equivalent depths, with dashes on the other lines. The depths, in centimeters, were calculated from the dry weights of the sections on the assumption of uniform density. The cores taken from the inner and outer soil compartments were 21 and 30 cm long, respectively.

The total plutonium in these cores is quite high, considering that less than 0.2% of the soil in the trays was sampled. If we assume that these samples are representative, the soil in chamber 6 would contain 2.3 Ci of plutonium, and the chamber 8 soil would contain 0.9 Ci. For chamber 6 this represents 0.3% of the source originally added, whereas for chamber 8 it represents 0.04% of the original source. The dehumidifier condensates and percolated rainwaters together contained totals of 0.2 mCi and 0.3 mCi for chambers 6 and 8 respectively. The soil clearly is the largest reservoir for the released plutonium. The higher plutonium release rate for the fines probably is related to their greater surface area.

The plutonium contents in the core sections range over 7 orders of magnitude, from 0 (less than 0.4 nCi) to 2.5 mCi, including as much as 6 orders of magnitude within a single core. There is no clear evidence that plutonium increases with time. In both chambers the plutonium content of the cores reached a maximum in the second summer. The plutonium contents of the cores seem to be higher for cores taken in the summer than for those taken in winter, but we have no explanation for this. Except for the first pair of cores from chamber 8, which contained the large source fragments, the outer core of each pair contained less plutonium than the inner one. This is to be expected since plutonium could reach the outer compartment only by spallation, resuspension, or water overflow from the inner compartment. Note that the source in chamber 8 existed as large pieces only during the early part of the experiment (see Sec. III.C).

The distribution of plutonium between surface and subsurface sections should be a function of the sizes of the PuO_2 particles and their possible association with particles of soil. Larger particles would not penetrate the soil. Previous observations suggest that smaller particles may pass rapidly through the soil until they become associated with soil particles, which fix the particles in the soil.³ Most plutonium was found below the surface (deeper than 1 cm) in the cores from the inner soil

compartment, but 99% of it was on the surface in cores from the outer compartments of both chambers. Evidently, most of the material released directly from the sources to the soil was fine enough to penetrate the soil. Similarly, nearly all the PuO_2 transported to the outer compartments must have been in larger particles or associated with soil particles. This is expected in chamber 6, where the transport to the outer compartment probably was by resuspension and water overflow, both of which require that the dense particles of PuO_2 be associated with lighter material to be airborne or carried by water. In chamber 8, which contained the large pieces of PuO_2 , part of the transport may have been by spallation at the beginning of a rain, which is a process that does not require association of the PuO_2 with soil particles. The experimental results suggest that most of these spalled particles, at least those that fall on the tray, are too large to penetrate the soil.

Of the cores sent to the LFE Environmental Analysis Laboratory, the odd-numbered sections of the inner cores from each chamber were analyzed for particle size. These cores were collected early in the fourth summer in front and to the right of the sources from positions about 8 cm inside the partitions. Sizes of PuO_2 particles were determined from the density of stars formed by alpha particles in photographic film laid over dispersed soil. Particles smaller than about 25 nm in diameter would not be detected in these analyses because of limitations of the method. The largest particle seen was 0.44 μm in diameter, from the top section of the core from chamber 6. Several 0.3- μm particles were seen in subsurface sections of both cores. The mass median diameters for the particles in the chamber 6 and 8 cores were 0.16 and 0.12 μm , respectively, compared with number median diameters of 71 and 62 nm.

C. Source Behavior

The fraction of MHFT-50 containing the pieces larger than 2 mm in diameter, which was placed in chamber 8, contained 73% of the plutonium from the original sphere, compared with 95% in the same fraction from a similarly treated sphere used in a previous experiment.³ This fraction did not have the sharp edges seen in similar sources in two previous experiments and was described in the impact test post-mortem as "friable....broken up into mostly small pieces with many fines."⁵

The source was observed to be breaking up 2 wk after it had been placed on the surface of the soil, and within a

year it was barely distinguishable on the surface of the soil (Figs. 8 and 9). By the end of the experiment, no identifiable piece of PuO_2 could be seen. In this way the large pieces were converted to fines, with a corresponding increase in surface area, and the distinction between chambers 6 and 8 was blurred. This did not occur for the large fragments in the other two experiments mentioned, which remained essentially unchanged on the surface of soil over several years. These observations are consistent with the experience of Clinard and Rohr, who reported that some impacted fuel material had many microcracks and rapidly decomposed, whereas other material similarly treated was more stable.⁶ The source for chamber 6 was originally deposited as fines and was not physically observable after deposition.

IV. SUMMARY

Fragments from an impact-tested PuO_2 heat source were placed into two environmental test chambers in which humid, temperate climates were simulated. Large fragments from the source were placed in one chamber, chamber 8, and the fines were placed in the other, chamber 6. The soil tray in each chamber was divided into two concentric compartments, with the source fragments located in the inner compartment. Any plutonium found in the outer compartment would be attributed to airborne transport of plutonium from the source to the outer compartment. Thus we hoped to gain information on the airborne release of plutonium as a function of the particle size of the source. A malfunction in chamber 6 very early in the experiment resulted in water overflowing from the inner to the outer compartment of that chamber. Because some PuO_2 fines undoubtedly were transferred along with the water, much of the information that we hoped to gain concerning possible particle size effects was lost. In spite of this disappointment, several important conclusions can be drawn from this experiment.

The plutonium concentrations in the aqueous effluents from the soil trays increased over time and seemed to obey an exponential growth law during the course of the experiment (5.7 yr). The soil drainages from the inner compartments had growth constants (base e) of 0.71 and 1.11 yr^{-1} for chambers 6 and 8 respectively. The growth constants for the effluents from the outer compartments had growth constants less than 0.05 yr^{-1} and were essentially constant-valued functions of time. The concentration of plutonium in the dehumidifier condensates,

which is a crude representation of the plutonium content of the air, increased over the first 2 yr and then remained essentially constant for the remainder of the experiment. This was true for both chambers, although the limiting concentrations were different (see Table X). No seasonal dependencies were noted for the plutonium contents of the aqueous effluents.

After a simulated cleanup operation, which involved removing the sources and the top inch of soil from each chamber, the rate of plutonium release into the aqueous effluents from the inner soil compartments *increased*. The plutonium release rates into the outer soil compartment drainages and the dehumidifier condensates remained essentially the same after the cleanup as before. We conclude that the cleanup operation was not effective in reducing the release of plutonium into the groundwater and air, even though most of the deposited plutonium was removed from the chamber. A more extensive cleanup involving removal of soil to a greater depth might be effective, but there is no evidence from the present study to confirm or deny this possibility.

Data from soil cores taken during the course of the experiment reveal that most of the released plutonium resides in the soil. In chamber 6, which contained the fines, approximately 0.3% of the original source was released into the soil; the corresponding value for chamber 8, which contained the large fragments, was 0.04%. We attribute this difference to the larger relative surface area of the fines deposited in chamber 6.

The large source fragments in chamber 8 spontaneously broke down into smaller pieces during the experiment. By the end of the first 2 yr there was almost no visible difference between the chamber 8 source and the fines that were introduced into chamber 6. Such spontaneous fragmentation has been observed in isolated cases by other experimentalists and probably should be included in any environmental models for these sources.

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Fig. 8 Source fragments in chamber 8 as they appeared at the beginning of the experiment

Fig 9. The source in chamber 8 as it appeared after exposure for 1 yr

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TABLE A-I. Rainwater Percolate Data for Chamber 6

sample	season	date	elapsed time	rain	inner percolate volume (l)	inner percolate activity (ci/l)	outer percolate volume (l)	outer percolate activity (ci/l)
-----	-----	modyyr	(days)	(mm)	-----	-----	-----	-----
6001perc	1.0	041775	7.906	51.000	0.020	0.6000e-08	5.000	0.8200e-09
6002perc	1.0	042275	12.906	38.000	0.050	0.1034e-06	20.700	0.2415e-07
6003perc	1.0	050175	21.906	28.000	1.550	0.2832e-07	4.500	0.2267e-07
6004perc	1.0	050775	27.906	33.000	0.850	0.1494e-07	8.800	0.2955e-07
6005perc	1.0	051475	34.906	33.000	1.800	0.1078e-07	9.400	0.2447e-08
6007perc	1.0	061875	69.906	34.000	0.280	0.3250e-06	8.500	0.3647e-07
6008perc	1.0	062575	76.906	31.000	1.750	0.6651e-07	5.750	0.4696e-07
6009perc	2.0	070275	83.906	34.000	1.400	0.5357e-08	11.000	0.4000e-08
6010perc	2.0	070975	90.906	33.000	2.400	0.4917e-08	11.750	0.1362e-07
0011perc	2.0	071675	97.906	33.000	1.500	0.2533e-08	12.800	0.9922e-08
6012perc	2.0	072475	105.906	33.000	1.200	0.2917e-08	12.500	0.1136e-07
6013perc	2.0	073175	112.906	31.000	1.350	0.1926e-08	11.100	0.1982e-07
6014perc	2.0	080675	118.906	29.000	1.550	0.1813e-08	11.000	0.1455e-07
6015perc	2.0	081375	125.906	33.000	1.550	0.1477e-08	12.900	0.1705e-07
6016perc	2.0	082075	132.906	34.000	2.000	0.1500e-08	14.100	0.7092e-08
6017perc	2.0	082775	139.906	33.000	1.750	0.1331e-08	14.800	0.1284e-07
6018perc	2.0	090375	146.906	31.000	1.400	0.1643e-08	12.800	0.9375e-08
6019perc	2.0	091075	153.906	27.000	1.450	0.1366e-08	9.000	0.1244e-07
6020perc	2.0	091775	160.906	30.000	1.100	0.1636e-08	12.000	0.6667e-08
6021perc	2.0	092475	167.906	31.000	1.100	0.1364e-08	11.800	0.5593e-08
6022perc	2.0	100175	174.906	33.000	2.000	0.1250e-08	12.400	0.4919e-08
6023perc	2.0	100875	181.906	27.000	1.350	0.1430e-08	9.600	0.5833e-08
6024perc	2.0	101575	188.906	27.000	1.350	0.1274e-08	9.850	0.1066e-07
6025perc	2.0	102175	194.906	33.000	1.200	0.1317e-08	11.500	0.1652e-07
6026perc	2.0	102875	201.906	33.000	1.350	0.1756e-08	12.100	0.1901e-07
6027perc	2.0	110475	208.906	33.000	1.375	0.1149e-08	13.600	0.1912e-07
6028perc	2.0	111275	216.906	33.000	1.500	0.1327e-08	11.200	0.1607e-07
6029perc	2.0	111975	223.906	27.000	1.150	0.1078e-08	11.600	0.1293e-07
6030perc	2.0	112675	230.906	27.000	1.400	0.1429e-08	11.500	0.1652e-07
6031perc	2.0	120275	236.906	33.000	2.400	0.1075e-08	12.300	0.9837e-08

(cont)

TABLE A-I. (cont)

6032perc	2.0	121075	244.906	27.000	0.800	0.1500e-07	9.000	0.4889e-08
6033perc	2.0	121575	249.906	27.000	1.500	0.9067e-09	11.750	0.4681e-08
6034perc	2.0	122275	256.906	27.000	0.800	0.1750e-08	10.650	0.6009e-08
6035perc	2.0	122975	263.906	27.000	1.000	0.8000e-09	9.000	0.8444e-08
6036perc	1.0	010776	272.906	35.000	1.300	0.1177e-08	7.000	0.4143e-08
6037perc	1.0	011476	279.906	30.000	2.400	0.1667e-08	6.500	0.7385e-08
6038perc	1.0	012176	286.906	23.000	2.300	0.2261e-08	4.400	0.9432e-08
6039perc	1.0	012776	292.906	27.000	2.750	0.2135e-08	7.000	0.7571e-08
6040perc	1.0	020376	299.906	31.000	1.700	0.2647e-08	10.200	0.1304e-07
6041perc	1.0	020976	305.906	33.000	2.500	0.3000e-08	11.200	0.2321e-07
6042perc	1.0	021776	313.906	27.000	1.200	0.1667e-08	8.200	0.1707e-07
6043perc	1.0	022476	320.906	27.000	1.800	0.2611e-08	9.300	0.1505e-07
6044perc	1.0	030276	327.906	27.000	1.800	0.2889e-08	8.550	0.2222e-07
6045perc	1.0	030876	333.906	27.000	1.750	0.2629e-08	9.300	0.2796e-07
6046perc	1.0	031576	340.906	27.000	1.750	0.2994e-08	9.900	0.2323e-07
6047perc	1.0	032376	348.906	33.000	2.100	0.2667e-08	10.500	0.1810e-07
6048perc	1.0	033176	356.906	30.000	1.650	0.3303e-08	10.500	0.1457e-07
6049perc	1.0	040676	362.906	27.000	2.000	0.4000e-08	9.300	0.1763e-07
6050perc	1.0	041276	368.906	27.000	1.400	0.3286e-08	8.700	0.1966e-07
6051perc	1.0	041976	375.906	29.000	1.750	0.2520e-08	10.500	0.1848e-07
6052perc	1.0	042676	382.906	27.000	1.050	0.2705e-08	9.000	0.1778e-07
6053perc	1.0	050376	389.906	27.000	1.150	0.2209e-08	9.300	0.1495e-07
6054perc	1.0	051076	396.906	29.000	1.000	0.3000e-08	8.400	0.1417e-07
6055perc	1.0	051776	403.906	27.000	1.150	0.3652e-08	9.000	0.1133e-07
6056perc	1.0	052476	410.906	27.000	1.000	0.2610e-08	8.550	0.1135e-07
6057perc	1.0	060176	418.906	27.000	0.680	0.1941e-08	8.250	0.1285e-07
6058perc	1.0	060776	424.906	27.000	1.200	0.1500e-06	9.000	0.1200e-07
6059perc	1.0	061476	431.906	27.000	0.900	0.2889e-07	8.700	0.1368e-07
6060perc	1.0	062176	438.906	27.000	0.700	0.5714e-08	8.400	0.1190e-07
6061perc	2.0	062876	445.906	23.000	0.200	0.3750e-08	8.400	0.1262e-07
6062perc	2.0	070676	453.906	27.000	0.075	0.6400e-08	9.450	0.1153e-07
6063perc	2.0	071276	459.906	34.000	0.700	0.1700e-08	14.000	0.1093e-07
6064perc	2.0	072076	467.906	34.000	2.200	0.2364e-08	12.500	0.1200e-07
6065perc	2.0	072676	473.906	34.000	0.950	0.1463e-08	13.700	0.1029e-07
6066perc	2.0	080276	480.906	34.000	2.000	0.1700e-08	14.000	0.8857e-08
6067perc	2.0	081176	489.906	34.000	0.600	0.2333e-08	13.200	0.1106e-07
6068perc	2.0	081676	494.906	33.000	1.600	0.1563e-08	14.000	0.9714e-08
6069perc	2.0	082376	501.906	33.000	0.800	0.9750e-09	13.600	0.8824e-08
6070perc	2.0	083176	509.906	39.000	0.925	0.8746e-08	14.100	0.1028e-07
6071perc	2.0	090876	517.906	30.000	1.500	0.1787e-08	11.200	0.9018e-08
6072perc	2.0	091576	524.906	30.000	0.600	0.1550e-08	11.600	0.1095e-07
6073perc	2.0	092076	529.906	34.000	1.400	0.8571e-09	15.000	0.9267e-08
6074perc	2.0	092776	536.906	34.000	0.900	0.9667e-09	12.800	0.1031e-07
6075perc	2.0	100476	543.906	34.000	2.000	0.2800e-08	13.000	0.1231e-07
6076perc	2.0	101376	552.906	34.000	1.150	0.6870e-08	13.200	0.1333e-07

(cont)

TABLE A-I. (cont)

6077perc	2.0	101876	557.906	34.000	2.250	0.1867e-08	14.000	0.1571e-07
6078perc	2.0	102676	565.906	31.000	0.700	0.2000e-08	11.000	0.2091e-07
6079perc	2.0	110176	571.906	31.000	2.200	0.2409e-08	11.200	0.1661e-07
6080perc	2.0	110976	579.906	31.000	0.620	0.2419e-08	11.200	0.1696e-07
6081perc	2.0	111576	585.906	31.000	1.350	0.7407e-07	13.200	0.2045e-07
6082perc	2.0	112276	592.906	37.000	2.350	0.1064e-06	15.000	0.1733e-07
6083perc	2.0	112976	599.906	34.000	3.100	0.1000e-07	13.200	0.1705e-07
6084perc	2.0	120676	606.906	34.000	3.600	0.1139e-07	13.000	0.2231e-07
6085perc	2.0	121476	614.906	30.000	1.570	0.1955e-07	10.200	0.2255e-07
6086perc	2.0	122076	620.906	29.000	3.500	0.1003e-07	9.000	0.2133e-07
6087perc	2.0	122776	627.906	34.000	3.700	0.7054e-08	9.600	0.1875e-07
6088perc	2.0	010477	635.906	33.000	4.600	0.1630e-07	9.900	0.2929e-07
6089perc	2.0	011177	642.906	31.000	2.250	0.3191e-07	10.600	0.1887e-07
6090perc	2.0	011777	648.906	34.000	4.100	0.5610e-08	10.250	0.2537e-07
6091perc	1.0	012477	655.906	34.000	6.000	0.1333e-07	6.000	0.2850e-07
6092perc	1.0	013177	662.906	34.000	6.500	0.1031e-07	6.600	0.2727e-07
6093perc	1.0	020777	669.906	33.000	4.500	0.1267e-07	7.200	0.2778e-07
6094perc	1.0	021477	676.906	31.000	3.100	0.1355e-07	9.650	0.2280e-07
6095perc	1.0	022277	684.906	31.000	2.750	0.1240e-07	9.000	0.2889e-07
6096perc	1.0	022877	690.906	34.000	3.100	0.4548e-07	10.400	0.1356e-06
6097perc	1.0	030877	698.906	31.000	1.300	0.2692e-07	10.700	0.7103e-07
6098perc	1.0	031477	704.906	30.000	1.700	0.2706e-07	10.100	0.3663e-07
6099perc	1.0	032177	711.906	34.000	6.900	0.5797e-07	8.400	0.3452e-07
6100perc	1.0	032877	718.906	31.000	6.000	0.4833e-07	6.800	0.2353e-07
6101perc	1.0	040677	727.906	31.000	1.950	0.1595e-07	11.100	0.7838e-07
6102perc	1.0	041177	732.906	34.000	2.350	0.1157e-07	14.000	0.2929e-07
6103perc	1.0	041877	739.906	34.000	2.400	0.1042e-07	12.800	0.2969e-07
6104perc	1.0	042677	747.906	29.000	4.400	0.9955e-07	1.700	0.1624e-06
6105perc	1.0	050277	753.906	34.000	2.800	0.1246e-07	13.200	0.3333e-07
6106perc	1.0	050977	760.906	34.000	2.700	0.1048e-07	12.800	0.2656e-07
6107perc	1.0	051677	767.906	34.000	2.100	0.1014e-07	12.000	0.2917e-07
6108perc	1.0	052377	774.906	34.000	2.150	0.1014e-07	12.400	0.2476e-07
6109perc	1.0	053177	782.906	34.000	1.800	0.1667e-07	12.000	0.2750e-07
6110perc	1.0	060677	788.906	34.000	1.750	0.1080e-07	10.800	0.2796e-07
6111perc	1.0	061377	795.906	34.000	1.900	0.8263e-08	12.000	0.2067e-07
6112perc	1.0	062077	802.906	34.000	2.250	0.9867e-08	11.400	0.2544e-07
6113perc	1.0	062777	809.906	34.000	2.100	0.7476e-08	11.750	0.2060e-07
6114perc	1.0	070677	818.906	33.000	1.300	0.1208e-07	11.000	0.2718e-07
6115perc	1.0	071177	823.906	34.000	2.000	0.5950e-07	13.800	0.1703e-07
6116perc	1.0	071877	830.906	34.000	2.250	0.9467e-08	11.800	0.2627e-07
6117perc	1.0	072577	837.906	34.000	1.650	0.6788e-08	13.000	0.2308e-07
6118perc	2.0	080177	844.906	34.000	2.750	0.1291e-07	11.200	0.2679e-07
6119perc	2.0	080877	851.906	38.000	2.300	0.9739e-08	12.000	0.2583e-07
6120perc	2.0	081577	858.906	34.000	2.500	0.6000e-08	11.000	0.2273e-07
6121perc	2.0	082277	865.906	34.000	2.150	0.5628e-08	11.500	0.3209e-07

(cont)

TABLE A-I. (cont)

6122perc	2.0	082977	872.906	34.000	2.200	0.5591e-08	11.500	0.2609e-07
6123perc	2.0	090677	880.906	34.000	1.750	0.1257e-07	11.000	0.3364e-07
6124perc	2.0	091277	886.906	34.000	2.400	0.7667e-08	11.000	0.2727e-07
6125perc	2.0	091977	893.906	34.000	2.100	0.7857e-08	11.750	0.2579e-07
6126perc	2.0	092677	900.906	34.000	2.200	0.7182e-08	11.750	0.2128e-07
6127perc	2.0	100377	907.906	34.000	2.400	0.6208e-08	12.000	0.2750e-07
6128perc	2.0	101177	915.906	34.000	1.450	0.1234e-07	10.000	0.3360e-07
6129perc	2.0	101777	921.906	34.000	1.200	0.2167e-07	10.500	0.2819e-07
6130perc	2.0	102577	929.906	33.000	1.400	0.1050e-07	11.100	0.2432e-07
6131perc	2.0	103177	935.906	34.000	2.300	0.1783e-07	11.100	0.2261e-07
6132perc	2.0	110777	942.906	34.000	1.000	0.1000e-07	11.100	0.2559e-07
6133perc	2.0	111577	950.906	41.000	1.750	0.3360e-07	14.000	0.2214e-07
6134perc	2.0	112177	956.906	34.000	1.650	0.7636e-08	11.100	0.2135e-07
6135perc	2.0	112877	963.906	34.000	1.200	0.7500e-08	9.500	0.1926e-07
6136perc	2.0	120577	970.906	34.000	1.000	0.5600e-07	10.500	0.1876e-07
6137perc	2.0	121277	977.906	34.000	1.000	0.2480e-07	10.450	0.2201e-07
6138perc	2.0	121977	984.906	34.000	1.050	0.2600e-07	10.500	0.2095e-07
6139perc	2.0	122777	992.906	34.000	0.880	0.1909e-07	10.500	0.1486e-07
6140perc	2.0	010378	999.906	34.000	0.750	0.2893e-07	10.500	0.1905e-07
6141perc	2.0	010978	1005.906	34.000	1.400	0.3286e-07	10.000	0.1600e-07
6142perc	2.0	011678	1012.906	34.000	2.450	0.2902e-06	8.600	0.3523e-07
6143perc	2.0	012378	1019.906	34.000	4.000	0.2500e-06	7.000	0.4343e-07
6144perc	1.0	013078	1026.906	34.000	2.950	0.2549e-06	7.200	0.3375e-07
6145perc	1.0	020678	1033.906	34.000	3.100	0.1932e-06	10.200	0.2980e-07
6146perc	1.0	021378	1040.906	33.000	2.700	0.2889e-06	9.000	0.3022e-07
6147perc	1.0	022178	1048.906	33.000	2.700	0.3496e-06	9.200	0.2391e-07
6149perc	1.0	030678	1061.906	30.000	6.400	0.1797e-06	7.400	0.3649e-07
6150perc	1.0	031378	1068.906	30.000	2.000	0.4450e-06	8.000	0.2750e-07
6151perc	1.0	032078	1075.906	30.000	2.200	0.3727e-06	9.100	0.2505e-07
6152perc	1.0	032778	1082.906	30.000	1.800	0.3389e-06	8.500	0.2329e-07
6153perc	1.0	040378	1089.906	30.000	1.700	0.2706e-06	7.200	0.2083e-07
6154perc	1.0	041078	1096.906	29.000	1.700	0.2865e-06	7.600	0.2132e-07
6155perc	1.0	041778	1103.906	30.000	3.300	0.1727e-06	5.400	0.2556e-07
6156perc	1.0	042478	1110.906	27.000	5.600	0.1125e-06	3.300	0.3394e-07
6157perc	1.0	050178	1117.906	27.000	1.700	0.3235e-06	7.400	0.2081e-07
6158perc	1.0	050878	1124.906	27.000	1.600	0.3313e-06	7.400	0.1676e-07
6159perc	1.0	051578	1131.906	27.000	1.450	0.3359e-06	7.400	0.1959e-07
6160perc	1.0	052278	1138.906	27.000	1.250	0.3432e-06	6.000	0.1950e-07
6161perc	1.0	053078	1146.906	29.000	1.500	0.4000e-06	7.000	0.1771e-07
6162perc	1.0	060578	1152.906	29.000	2.900	0.3828e-06	8.500	0.1682e-07
6163perc	1.0	061278	1159.906	29.000	1.250	0.3256e-06	8.000	0.1763e-07
6164perc	1.0	061978	1166.906	29.000	2.000	0.2500e-06	6.800	0.2132e-07
6165perc	1.0	062678	1173.906	27.000	2.900	0.2069e-06	6.800	0.2147e-07
6166perc	2.0	070578	1182.906	33.000	4.000	0.1700e-06	8.400	0.2036e-07
6167perc	2.0	071078	1187.906	29.000	2.000	0.2070e-06	8.700	0.1276e-07

(cont)

TABLE A-I. (cont)

6168perc	2.0	071778	1194.906	29.000	2.500	0.1640e-06	7.000	0.1571e-07
6169perc	2.0	072478	1201.906	30.000	3.250	0.1258e-06	6.200	0.1403e-07
6170perc	2.0	073178	1208.906	31.000	4.200	0.1338e-06	8.000	0.1350e-07
6171perc	2.0	080778	1215.906	30.000	4.000	0.9225e-07	5.600	0.1679e-07
6172perc	2.0	081478	1222.906	31.000	2.700	0.1159e-06	6.000	0.1610e-07
6173perc	2.0	082178	1229.906	30.000	2.900	0.1155e-06	5.400	0.1519e-07
6174perc	2.0	082878	1236.906	30.000	2.750	0.1625e-06	5.800	0.1431e-07
6175perc	2.0	090578	1244.906	33.000	1.700	0.3353e-06	8.550	0.1170e-07
6176perc	2.0	091178	1250.906	30.000	3.100	0.1174e-06	6.400	0.1094e-07
6177perc	2.0	091878	1257.906	31.000	3.200	0.1359e-06	6.400	0.2219e-07
6178perc	2.0	092578	1264.906	31.000	3.600	0.1333e-06	6.600	0.2273e-07
6179perc	2.0	100278	1271.906	30.000	3.300	0.9091e-07	5.600	0.1875e-07
6180perc	2.0	101078	1279.906	30.000	2.000	0.1350e-06	5.000	0.1860e-07
6181perc	2.0	101678	1285.906	29.000	3.700	0.7838e-07	5.700	0.1579e-07
6182perc	2.0	102378	1292.906	30.000	3.600	0.8944e-07	5.600	0.1857e-07
6183perc	2.0	103078	1299.906	30.000	2.300	0.1100e-06	5.600	0.1625e-07
6184perc	2.0	110678	1306.906	30.000	3.300	0.7273e-07	4.600	0.1696e-07
6185perc	2.0	111378	1313.906	30.000	3.500	0.8343e-07	4.700	0.1979e-07
6186perc	2.0	112078	1320.906	33.000	4.400	0.7227e-07	4.500	0.1756e-07
6187perc	2.0	112778	1327.906	33.000	3.800	0.6184e-07	4.600	0.1828e-07
6188perc	2.0	120478	1334.906	31.000	3.800	0.7105e-07	4.600	0.2174e-07
6189perc	2.0	121178	1341.906	31.000	3.800	0.9316e-07	5.700	0.1228e-07
6190perc	1.0	121878	1348.906	31.000	3.250	0.2028e-06	5.300	0.1830e-07
6191perc	1.0	122678	1356.906	31.000	3.450	0.2238e-06	4.300	0.2209e-07
6192perc	1.0	010279	1363.906	27.000	3.250	0.2378e-06	3.800	0.2632e-07
6193perc	1.0	010979	1370.906	27.000	5.000	0.1348e-06	3.800	0.2763e-07
6194perc	1.0	011579	1376.906	27.000	2.850	0.1821e-06	3.700	0.3270e-07
6195perc	1.0	012279	1383.906	27.000	1.500	0.4407e-06	6.200	0.2113e-07
6196perc	1.0	012979	1390.906	24.000	1.150	0.8417e-06	5.200	0.5212e-07
6197perc	1.0	020579	1397.906	27.000	1.700	0.4071e-06	8.250	0.2000e-07
6198perc	1.0	021279	1404.906	27.000	1.400	0.4679e-06	11.000	0.1700e-07
6199perc	1.0	022079	1412.906	26.000	1.100	0.3836e-06	11.000	0.1818e-07
6200perc	1.0	022679	1418.906	24.000	1.400	0.7714e-06	11.000	0.1364e-07
6201perc	1.0	030579	1425.906	24.000	5.300	0.1136e-06	6.750	0.2948e-07
6202perc	1.0	031279	1432.906	24.000	3.350	0.1573e-06	8.700	0.2103e-07
6203perc	1.0	031979	1439.906	24.000	4.200	0.9048e-07	7.500	0.2160e-07
6204perc	1.0	032679	1446.906	24.000	5.000	0.7380e-07	6.800	0.2294e-07
6205perc	1.0	040279	1453.906	24.000	4.700	0.7660e-07	6.800	0.2515e-07
6206perc	1.0	040979	1460.906	24.000	1.250	0.4208e-06	10.800	0.2519e-07
6207perc	1.0	041679	1467.906	23.000	0.850	0.3788e-06	8.100	0.2123e-07
6208perc	1.0	042379	1474.906	24.000	1.060	0.4585e-06	9.000	0.2500e-07
6209perc	1.0	043079	1481.906	24.000	2.250	0.1947e-06	8.550	0.2222e-07
6210perc	1.0	050779	1488.906	24.000	2.150	0.3144e-06	8.550	0.2456e-07
6211perc	1.0	051479	1495.906	24.000	2.700	0.2333e-06	8.100	0.2716e-07
6212perc	1.0	052179	1502.906	24.000	3.500	0.2029e-06	7.200	0.2944e-07

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TABLE A-I. (cont)

6213perc	1.0	052979	1510.906	24.000	2.300	0.1609e-06	7.800	0.2231e-07
6214perc	1.0	060479	1516.906	24.000	2.250	0.1778e-06	8.400	0.2381e-07
6215perc	1.0	061179	1523.906	24.000	2.500	0.1820e-06	8.700	0.2241e-07
6216perc	2.0	061879	1530.906	24.000	3.300	0.4939e-07	8.250	0.3503e-07
6217perc	2.0	062579	1537.906	24.000	1.480	0.1088e-07	5.000	0.3200e-07
6218perc	2.0	070279	1544.906	24.000	1.800	0.5278e-08	5.500	0.2345e-07
6219perc	2.0	070979	1551.906	24.000	1.850	0.5243e-08	6.000	0.2800e-07
6220perc	2.0	071679	1558.906	24.000	0.850	0.2706e-08	7.200	0.2000e-07
6221perc	2.0	072379	1565.906	24.000	0.500	0.3800e-08	8.250	0.1661e-07
6222perc	2.0	073079	1572.906	26.000	1.650	0.4485e-08	6.200	0.2113e-07
6223perc	2.0	080679	1579.906	26.000	0.150	0.1473e-07	8.250	0.1794e-07
6224perc	2.0	081379	1586.906	26.000	0.375	0.1760e-07	7.500	0.1720e-07
6225perc	2.0	082079	1593.906	26.000	1.080	0.7500e-08	5.700	0.2000e-07
6226perc	2.0	082779	1600.906	20.000	1.450	0.4414e-08	4.800	0.1646e-07
6227perc	2.0	090479	1608.906	27.000	1.800	0.9389e-08	5.200	0.2404e-07
6228perc	2.0	091079	1614.906	24.000	1.700	0.7294e-08	5.300	0.1642e-07
6229perc	2.0	091779	1621.906	24.000	1.300	0.3385e-08	4.800	0.1708e-07
6230perc	2.0	092479	1628.906	24.000	0.850	0.3647e-08	5.400	0.3704e-07
6231perc	2.0	100179	1635.906	24.000	1.000	0.3000e-08	4.600	0.2391e-07
6232perc	2.0	100979	1643.906	27.000	1.700	0.5235e-08	4.800	0.2396e-07
6233perc	2.0	101579	1649.906	27.000	2.250	0.4533e-07	6.600	0.2561e-07
6234perc	2.0	102279	1656.906	27.000	2.250	0.2133e-07	5.700	0.2386e-07
6235perc	2.0	102979	1663.906	27.000	2.650	0.2536e-07	5.200	0.2096e-07
6236perc	2.0	110579	1670.906	27.000	1.500	0.3593e-07	6.600	0.2606e-07
6237perc	2.0	111379	1678.906	27.000	2.400	0.2250e-07	5.200	0.2558e-07
6238perc	2.0	111979	1684.906	26.000	2.700	0.1763e-07	5.500	0.3200e-07
6239perc	2.0	112679	1691.906	27.000	3.200	0.1250e-07	4.800	0.2854e-07
6240perc	2.0	120379	1698.906	27.000	3.100	0.1065e-07	5.500	0.2000e-07
6241perc	2.0	121079	1705.906	27.000	2.900	0.8414e-08	4.500	0.3178e-07
6242perc	1.0	121779	1712.906	24.000	2.000	0.9200e-08	3.000	0.3267e-07
6243perc	1.0	122679	1721.906	24.000	1.100	0.1364e-07	3.900	0.3256e-07
6244perc	1.0	010280	1728.906	24.000	0.900	0.1622e-07	2.500	0.3240e-07
6245perc	1.0	010780	1733.906	23.000	1.850	0.1038e-07	2.600	0.2885e-07
6246perc	1.0	011480	1740.906	23.000	0.650	0.1323e-07	4.000	0.3425e-07
6247perc	1.0	012180	1747.906	22.000	0.600	0.1550e-07	2.200	0.4318e-07
6248perc	1.0	012880	1754.906	23.000	0.400	0.8225e-07	5.000	0.1740e-06
6249perc	1.0	020480	1761.906	24.000	0.560	0.6750e-07	3.500	0.5429e-07
6250perc	1.0	021180	1768.906	23.000	0.200	0.5600e-07	2.250	0.5067e-07
6251perc	1.0	021980	1776.906	24.000	0.300	0.1967e-07	2.250	0.5111e-07
6252perc	1.0	022580	1782.906	24.000	1.500	0.1800e-06	1.950	0.8308e-07
6253perc	1.0	030380	1789.906	27.000	0.580	0.5672e-07	6.800	0.5882e-07
6254perc	1.0	031080	1796.906	27.000	0.100	0.1900e-05	5.300	0.7057e-07
6255perc	1.0	031780	1803.906	27.000	0.240	0.4958e-06	3.200	0.1125e-06
6256perc	1.0	032480	1810.906	27.000	0.800	0.9413e-07	2.500	0.8400e-07
6257perc	1.0	033180	1817.906	27.000	1.000	0.8700e-07	3.200	0.8156e-07

(cont)

TABLE A-I. (cont)

6258perc	1.0	040780	1824.906	27.000	0.950	0.7537e-07	3.700	0.7027e-07
6259perc	1.0	041480	1831.906	27.000	1.030	0.3466e-07	3.900	0.5641e-07
6260perc	1.0	042180	1838.906	27.000	1.500	0.3400e-07	4.200	0.5000e-07
6261perc	1.0	042880	1845.906	27.000	1.700	0.3529e-07	3.600	0.5000e-07
6262perc	1.0	050580	1852.906	27.000	1.500	0.3067e-07	4.300	0.4791e-07
6263perc	1.0	051280	1859.906	27.000	1.300	0.3462e-07	3.350	0.5075e-07
6264perc	1.0	051980	1866.906	27.000	1.380	0.3486e-07	2.850	0.4421e-07
6265perc	1.0	052780	1874.906	27.000	1.660	0.3530e-07	2.500	0.3720e-07
6266perc	1.0	060280	1880.906	27.000	1.600	0.3250e-07	2.700	0.4259e-07
6257perc	1.0	060980	1887.906	27.000	1.180	0.2178e-07	2.900	0.3276e-07
6268perc	2.0	061680	1894.906	27.000	1.600	0.2856e-07	2.650	0.4906e-07
6269perc	2.0	062380	1901.906	27.000	2.100	0.2571e-07	2.900	0.4448e-07
6270perc	2.0	063080	1908.906	27.000	2.400	0.2542e-07	3.400	0.4471e-07
6271perc	2.0	070780	1915.906	27.000	2.800	0.2179e-07	2.900	0.3276e-07
6272perc	2.0	071480	1922.906	31.000	3.900	0.2564e-07	3.450	0.4145e-07
6273perc	2.0	072180	1929.906	31.000	4.000	0.2525e-07	4.000	0.3600e-07
6274perc	2.0	072880	1936.906	31.000	0.420	0.2000e-07	7.200	0.2778e-07
6275perc	2.0	080480	1943.906	30.000	0.860	0.2058e-07	7.200	0.2375e-07
6276perc	2.0	081180	1950.906	27.000	0.005	0.1600e-06	6.900	0.2319e-07
6277perc	2.0	081880	1957.906	27.000	0.720	0.1250e-07	4.900	0.2429e-07
6278perc	2.0	082580	1964.906	27.000	0.580	0.1724e-07	4.900	0.2286e-07
6279perc	2.0	090280	1972.906	27.000	2.400	0.1167e-07	2.300	0.2652e-07
6280perc	2.0	090880	1978.906	27.000	0.801	0.4994e-08	5.300	0.2075e-07
6281perc	2.0	091580	1985.906	27.000	0.800	0.7500e-08	5.500	0.2982e-07
6282perc	2.0	092280	1992.906	27.000	0.680	0.5441e-08	5.300	0.2264e-07
6283perc	2.0	092980	1999.906	27.000	0.920	0.5217e-08	5.800	0.2121e-07
6284perc	2.0	100680	2006.906	27.000	0.800	0.4000e-08	7.500	0.1867e-07
6285perc	2.0	101480	2014.906	27.000	1.000	0.6800e-08	6.000	0.1850e-07
6286perc	2.0	102080	2020.906	27.000	1.050	0.4000e-08	7.500	0.1680e-07
6287perc	2.0	102780	2027.906	27.000	1.250	0.4560e-08	6.800	0.1912e-07
6288perc	2.0	110380	2034.906	27.000	1.650	0.4545e-08	7.500	0.1827e-07
6289perc	2.0	111380	2044.906	23.000	1.250	0.8640e-08	0.750	0.5267e-07
6290perc	2.0	111780	2048.906	18.000	3.150	0.7841e-08	2.900	0.3317e-07
6291perc	2.0	112480	2055.906	22.000	2.400	0.4667e-08	4.000	0.2500e-07
6292perc	2.0	120180	2062.906	25.000	1.350	0.9852e-06	6.800	0.1765e-07
6293perc	2.0	120880	2069.906	22.000	3.000	0.3233e-07	3.200	0.3188e-07
6294perc	1.0	121580	2076.906	27.000	3.500	0.3457e-07	1.800	0.3667e-07
6295perc	3.0	122280	2083.906	27.000	2.000	0.3000e-07	3.200	0.3438e-07
6296perc	3.0	122980	2090.906	27.000	2.200	0.3636e-07	3.250	0.1695e-07
6297perc	3.0	010581	2097.906	27.000	2.400	0.1958e-07	2.400	0.2625e-07
6298perc	3.0	011281	2104.906	27.000	2.400	0.2167e-07	1.750	0.2674e-07
6299perc	3.0	011981	2111.906	27.000	3.000	0.1667e-05	1.900	0.3105e-07
6300perc	3.0	012681	2118.906	27.000	6.400	0.1719e-05	1.700	0.3059e-07
6301perc	3.0	020281	2125.906	27.000	4.000	0.1600e-05	1.500	0.2800e-07
6302perc	3.0	020981	2132.906	27.000	2.600	0.9923e-06	1.250	0.3528e-07

(cont)

TABLE A-I. (cont)

6303perc	3.0	021781	2140.906	30.000	3.500	0.1114e-05	1.800	0.3222e-07
6304perc	3.0	022381	2146.906	29.000	3.800	0.7474e-06	0.900	0.3667e-07
6305perc	3.0	030281	2153.906	27.000	5.400	0.1500e-05	1.750	0.2640e-07
6306perc	3.0	030981	2160.906	27.000	2.900	0.1552e-05	2.400	0.2667e-07
6307perc	3.0	031681	2167.906	30.000	3.750	0.3120e-05	2.500	0.3080e-07
6308perc	3.0	032381	2174.906	27.000	1.200	0.5500e-05	3.300	0.1909e-07
6309perc	3.0	033081	2181.906	30.000	1.800	0.5056e-05	4.000	0.2200e-07
6310perc	3.0	040681	2188.906	30.000	3.200	0.5719e-05	4.800	0.1979e-07
6311perc	3.0	041381	2195.906	30.000	2.400	0.5708e-05	4.000	0.1700e-07
6312perc	3.0	042081	2202.906	30.000	1.200	0.5417e-05	4.000	0.1625e-07
6313perc	3.0	042781	2209.906	30.000	2.900	0.5241e-05	5.400	0.2963e-07
6314perc	3.0	050481	2216.906	30.000	2.250	0.5378e-05	4.000	0.1700e-07
6315perc	3.0	051181	2223.906	30.000	2.400	0.4792e-05	3.700	0.1730e-07
6316perc	3.0	051881	2230.906	29.000	2.250	0.5022e-05	3.250	0.2003e-07
6317perc	3.0	052681	2238.906	30.000	2.000	0.4600e-05	3.000	0.1900e-07
6318perc	3.0	060181	2244.906	27.000	1.900	0.4000e-05	1.900	0.2316e-07
6319perc	3.0	060881	2251.906	30.000	1.100	0.3636e-05	2.500	0.1840e-07
6320perc	3.0	061581	2258.906	29.000	1.800	0.3222e-05	1.800	0.4389e-07
6321perc	4.0	062281	2265.906	27.000	2.300	0.2826e-05	1.800	0.2500e-07
6322perc	4.0	062981	2272.906	27.000	0.750	0.1427e-05	1.700	0.2000e-07
6323perc	4.0	070681	2279.906	30.000	0.500	0.8160e-06	1.650	0.1473e-07
6324perc	4.0	071381	2286.906	33.000	1.000	0.3000e-06	2.000	0.1350e-07
6325perc	4.0	072081	2293.906	33.000	1.900	0.2368e-06	0.750	0.2867e-07
6326perc	4.0	072781	2300.906	27.000	2.400	0.2875e-06	1.250	0.3280e-07
6327perc	4.0	080381	2307.906	39.000	1.600	0.9875e-06	1.000	0.3500e-07
6328perc	4.0	081081	2314.906	38.000	0.075	0.4227e-06	0.900	0.2622e-07
6329perc	4.0	081781	2321.906	38.000	0.040	0.2550e-06	0.750	0.2400e-07
6330perc	4.0	082481	2328.906	24.000	0.110	0.1055e-06	0.200	0.3400e-07
6331perc	4.0	083181	2335.906	35.000	0.200	0.5350e-07	0.200	0.3050e-07
6332perc	4.0	090881	2343.906	37.000	0.015	0.1667e-06	0.270	0.2296e-07
6333perc	4.0	091481	2349.906	30.000	0.088	0.6743e-07	1.950	0.1318e-07
6334perc	4.0	092181	2356.906	18.000	0.088	0.6743e-07	1.950	0.1318e-07
6335perc	4.0	100281	2367.906	27.000	0.020	0.9000e-07	6.500	0.5846e-08
6336perc	4.0	101381	2378.906	22.000	0.020	0.6850e-07	6.000	0.5333e-08
6337perc	4.0	102181	2386.906	20.000	2.600	0.1462e-05	4.000	0.1100e-06
6338perc	4.0	102981	2394.906	20.000	1.200	0.3917e-07	5.000	0.1500e-07
6339perc	4.0	110981	2405.906	27.000	0.800	0.1038e-06	8.000	0.1000e-07
6340perc	4.0	111881	2414.906	20.000	3.500	0.7914e-08	3.500	0.1134e-07
6341perc	4.0	113081	2426.906	23.000	1.000	0.2300e-07	7.000	0.1100e-07
6342perc	4.0	120781	2433.906	23.000	1.300	0.7769e-08	8.000	0.5875e-08

TABLE A-II. Rainwater Percolate Data for Chamber 8

sample	season	date	elapsed time	rain	inner percolate volume (l)	inner percolate activity (ci/l)	outer percolate volume (l)	outer percolate activity (ci/l)
		modyyr	(days)	(mm)				
8001perc	1.0	041775	7.927	37.000	0.050	0.3680e-07	3.600	0.2667e-07
8002perc	1.0	042275	12.927	31.000	0.130	0.1538e-08	7.000	0.3286e-08
8003perc	1.0	050175	21.927	37.000	0.050	0.5560e-07	6.000	0.4167e-06
8004perc	1.0	050775	27.927	33.000	0.040	0.5500e-07	5.800	0.2069e-08
8005perc	1.0	051475	34.927	35.000	0.400	0.2000e-08	6.750	0.7407e-08
8006perc	1.0	052175	41.927	29.000	0.050	0.6000e-09	5.600	0.1607e-08
8007perc	1.0	061875	69.927	34.000	0.525	0.9333e-10	5.900	0.1695e-08
8008perc	1.0	062575	76.927	31.000	0.050	0.2200e-07	5.200	0.2308e-08
8009perc	2.0	070275	83.927	35.000	0.325	0.5538e-09	11.000	0.1000e-08
8010perc	2.0	070975	90.927	34.000	0.100	0.1200e-08	9.500	0.3158e-09
8011perc	2.0	071675	97.927	33.000	0.170	0.1765e-09	9.900	0.2929e-09
8012perc	2.0	072475	105.927	38.000	0.450	0.5778e-09	11.250	0.4444e-09
8013perc	2.0	073175	112.927	35.000	0.150	0.2667e-09	9.750	0.5128e-09
8014perc	2.0	080675	118.927	31.000	1.250	0.2720e-09	10.200	0.4902e-09
8015perc	2.0	081375	125.927	34.000	0.800	0.3625e-09	10.350	0.3865e-09
8016perc	2.0	082075	132.927	33.000	0.450	0.1778e-09	8.000	0.1250e-08
8017perc	2.0	082775	139.927	33.000	0.680	0.1618e-09	8.250	0.9697e-09
8018perc	2.0	090375	146.927	35.000	0.650	0.1154e-08	10.650	0.1127e-08
8019perc	2.0	091075	153.927	33.000	2.550	0.1110e-08	10.000	0.5000e-09
8020perc	2.0	091775	160.927	33.000	0.350	0.7714e-09	9.000	0.5556e-09
8021perc	2.0	092475	167.927	34.000	0.950	0.5789e-09	8.400	0.8333e-09
8022perc	2.0	100175	174.927	45.000	0.575	0.2087e-09	13.400	0.5224e-09
8023perc	2.0	100875	181.927	34.000	0.850	0.5765e-09	12.400	0.8871e-09
8024perc	2.0	101575	188.927	34.000	0.675	0.1481e-09	10.200	0.7843e-09
8025perc	2.0	102275	195.927	34.000	0.300	0.2333e-09	9.300	0.1505e-08
8026perc	2.0	102875	201.927	33.000	0.450	0.2667e-09	7.000	0.1429e-08
8027perc	2.0	110475	208.927	33.000	0.180	0.3333e-09	9.600	0.1250e-08
8028perc	2.0	111275	216.927	33.000	0.125	0.5600e-09	7.800	0.1282e-08
8029perc	2.0	111975	223.927	45.000	0.330	0.2121e-09	14.000	0.7143e-09
8030perc	2.0	112675	230.927	37.000	0.225	0.4444e-09	11.600	0.6897e-09

(cont)

TABLE A-II. (cont)

8031perc	2.0	120275	236.927	33.000	0.340	0.6029e-08	9.900	0.2020e-08
8032perc	2.0	121075	244.927	33.000	0.075	0.4933e-08	11.000	0.5091e-08
8033perc	2.0	121675	250.927	27.000	1.100	0.7909e-08	5.300	0.9434e-09
8034perc	2.0	122975	263.927	27.000	0.900	0.3778e-09	3.200	0.1313e-08
8035perc	1.0	010776	272.927	35.000	0.580	0.3448e-09	0.700	0.8429e-08
8036perc	1.0	011476	279.927	34.000	1.000	0.3000e-09	5.000	0.1400e-08
8037perc	1.0	012176	286.927	34.000	0.500	0.7000e-09	6.000	0.4167e-08
8038perc	1.0	012776	292.927	33.000	0.850	0.2235e-09	9.000	0.4222e-08
8039perc	1.0	020376	299.927	34.000	0.400	0.3500e-09	9.300	0.6559e-08
8040perc	1.0	020976	305.927	34.000	0.580	0.3276e-09	10.800	0.7407e-08
8041perc	1.0	021776	313.927	34.000	0.300	0.3667e-09	7.400	0.9459e-08
8042perc	1.0	022476	320.927	34.000	0.550	0.6364e-09	9.500	0.1684e-07
8043perc	1.0	030376	328.927	34.000	0.400	0.8750e-09	9.600	0.1219e-07
8044perc	1.0	030876	333.927	34.000	0.430	0.6279e-09	10.500	0.7714e-08
8045perc	1.0	031576	340.927	34.000	0.800	0.6625e-09	9.600	0.9479e-08
8046perc	1.0	032376	348.927	50.000	0.500	0.1140e-08	16.000	0.6875e-08
8047perc	1.0	033176	356.927	37.000	1.300	0.4308e-09	10.200	0.1216e-07
8048perc	1.0	040676	362.927	34.000	0.700	0.9000e-09	10.950	0.1151e-07
8049perc	1.0	041276	368.927	34.000	1.000	0.1000e-08	11.400	0.1123e-07
8050perc	1.0	041976	375.927	34.000	0.750	0.5600e-09	9.750	0.6974e-08
8051perc	1.0	042676	382.927	81.000	0.450	0.5111e-09	10.200	0.4902e-08
8052perc	1.0	050376	389.927	34.000	0.650	0.1554e-08	9.300	0.8495e-08
8053perc	1.0	051076	396.927	34.000	0.350	0.1000e-08	9.450	0.6772e-08
8054perc	1.0	051776	403.927	34.000	0.525	0.1200e-08	9.600	0.8438e-08
8055perc	1.0	052476	410.927	34.000	0.900	0.1556e-08	9.300	0.7204e-08
8056perc	1.0	060176	418.927	34.000	0.450	0.1178e-08	8.250	0.7152e-08
8057perc	1.0	060776	424.927	34.000	0.190	0.2016e-08	10.500	0.6857e-08
8058perc	1.0	061476	431.927	34.000	0.600	0.1833e-08	9.900	0.9697e-08
8059perc	1.0	062176	438.927	34.000	0.360	0.9722e-09	9.850	0.6193e-08
8060perc	2.0	062876	445.927	34.000	0.360	0.7222e-09	11.600	0.8621e-08
8061perc	2.0	070676	453.927	34.000	0.360	0.1472e-08	10.500	0.6952e-08
8062perc	2.0	071276	459.927	34.000	0.340	0.1294e-08	12.300	0.5528e-08
8063perc	2.0	071976	466.927	34.000	0.325	0.9231e-09	10.800	0.6204e-08
8064perc	2.0	072676	473.927	34.000	0.315	0.1683e-08	10.050	0.6070e-08
8065perc	2.0	080276	480.927	34.000	0.200	0.4000e-09	9.750	0.4205e-08
8066perc	2.0	081176	489.927	35.000	0.350	0.3514e-09	8.400	0.4881e-08
8067perc	2.0	081676	494.927	34.000	0.550	0.1418e-08	12.000	0.4667e-08
8068perc	2.0	082376	501.927	34.000	0.450	0.2222e-09	11.800	0.4407e-08
8069perc	2.0	083176	509.927	49.000	0.750	0.9600e-09	16.300	0.3742e-08
8070perc	2.0	090876	517.927	42.000	0.625	0.9120e-09	15.000	0.2800e-08
8071perc	2.0	091576	524.927	39.000	0.125	0.4000e-09	13.200	0.2348e-08
8072perc	2.0	092076	529.927	34.000	0.150	0.1200e-08	12.400	0.4435e-08
8073perc	2.0	092776	536.927	34.000	0.150	0.1000e-08	10.650	0.4977e-08
8074perc	2.0	100476	543.927	34.000	0.060	0.6667e-09	9.750	0.5128e-08
8075perc	2.0	101376	552.927	34.000	0.130	0.8462e-09	7.800	0.4487e-08

(cont)

TABLE A-II. (cont)

8076perc	2.0	101876	557.927	34.000	0.180	0.1444e-08	10.800	0.4259e-08
8077perc	2.0	102676	565.927	35.000	0.300	0.3000e-08	9.000	0.7333e-08
8078perc	2.0	110176	571.927	34.000	0.150	0.9333e-09	10.800	0.5556e-08
8079perc	2.0	110976	579.927	35.000	0.060	0.1167e-08	10.500	0.5429e-08
8080perc	2.0	111576	585.927	34.000	0.110	0.1273e-08	11.150	0.7175e-08
8081perc	2.0	112276	592.927	41.000	0.125	0.5600e-09	12.500	0.7440e-08
8082perc	2.0	112976	599.927	34.000	0.450	0.1933e-08	10.500	0.6000e-08
8083perc	2.0	120676	606.927	34.000	0.075	0.6667e-09	9.750	0.1026e-07
8084perc	2.0	121476	614.927	35.000	0.150	0.1800e-08	7.950	0.8805e-08
8085perc	2.0	122076	620.927	34.000	0.060	0.8333e-09	9.900	0.6061e-08
8086perc	2.0	122776	627.927	41.000	0.090	0.1111e-08	12.800	0.7031e-08
8087perc	2.0	010477	635.927	50.000	0.080	0.6250e-09	17.000	0.7059e-08
8088perc	2.0	011177	642.927	48.000	0.050	0.8000e-09	17.000	0.6824e-08
8089perc	2.0	011777	648.927	35.000	0.110	0.1091e-08	12.800	0.6250e-08
8090perc	1.0	012477	655.927	34.000	0.050	0.1400e-08	8.500	0.5765e-08
8091perc	1.0	013177	662.927	34.000	0.040	0.1000e-08	8.100	0.5926e-08
8092perc	1.0	020777	669.927	34.000	0.040	0.7500e-09	8.500	0.8471e-08
8093perc	1.0	021477	676.927	34.000	0.120	0.1833e-08	8.700	0.9885e-08
8094perc	1.0	022277	684.927	34.000	3.400	0.2215e-07	8.250	0.1006e-07
8095perc	1.0	022877	690.927	34.000	3.100	0.6419e-07	9.600	0.8438e-08
8096perc	1.0	030877	698.927	34.000	2.600	0.5615e-07	7.250	0.1448e-07
8097perc	1.0	031477	704.927	34.000	1.500	0.3667e-07	8.400	0.1083e-07
8098perc	1.0	032177	711.927	34.000	2.750	0.3091e-07	7.000	0.1129e-07
8099perc	1.0	032877	718.927	34.000	1.500	0.1733e-07	7.800	0.1449e-07
8100perc	1.0	040677	727.927	34.000	0.860	0.2058e-07	6.000	0.3167e-07
8101perc	1.0	041177	732.927	34.000	2.100	0.1157e-07	9.000	0.1667e-07
8102perc	1.0	041877	739.927	34.000	1.600	0.1188e-07	8.400	0.1821e-07
8103perc	1.0	042677	747.927	34.000	0.650	0.2338e-07	7.500	0.1600e-07
8104perc	1.0	050277	753.927	36.000	0.825	0.8485e-08	10.800	0.2130e-07
8105perc	1.0	050977	760.927	27.000	1.000	0.8600e-08	9.600	0.1448e-07
8106perc	1.0	051677	767.927	28.000	0.760	0.6579e-08	7.340	0.1907e-07
8107perc	1.0	052377	774.927	27.000	0.150	0.4467e-08	7.650	0.1869e-07
8108perc	1.0	053177	782.927	32.000	1.050	0.1162e-07	8.400	0.1952e-07
8109perc	1.0	060677	788.927	27.000	1.700	0.1347e-07	12.000	0.1917e-07
8110perc	1.0	061377	795.927	27.000	1.100	0.9909e-08	7.000	0.2229e-07
8111perc	1.0	062077	802.927	29.000	0.840	0.1202e-07	7.300	0.2452e-07
8112perc	1.0	062777	809.927	29.000	1.060	0.1198e-07	6.800	0.2191e-07
8113perc	1.0	070677	818.927	44.000	0.220	0.1532e-07	8.000	0.2875e-07
8114perc	1.0	071177	823.927	27.000	1.160	0.8966e-08	6.600	0.1985e-07
8115perc	1.0	071877	830.927	27.000	0.280	0.1100e-07	6.900	0.2812e-07
8116perc	1.0	072577	837.927	27.000	0.700	0.1486e-07	6.200	0.2694e-07
8117perc	2.0	080177	844.927	27.000	0.700	0.7429e-08	7.000	0.2857e-07
8118perc	2.0	080877	851.927	29.000	1.200	0.8417e-08	6.100	0.2164e-07
8119perc	2.0	081577	858.927	32.000	0.680	0.3676e-08	8.000	0.1625e-07
8120perc	2.0	082277	865.927	29.000	0.900	0.5111e-08	6.400	0.1391e-07

(cont)

TABLE A-II. (cont)

8121perc	2.0	082977	872.927	30.000	0.520	0.3654e-08	7.000	0.1600e-07
8122perc	2.0	090677	880.927	32.000	0.720	0.3194e-08	6.500	0.1369e-07
8123perc	2.0	091277	886.927	32.000	1.000	0.4200e-08	8.000	0.1550e-07
8124perc	2.0	091977	893.927	32.000	0.760	0.3289e-08	7.200	0.1289e-07
8125perc	2.0	092677	900.927	32.000	0.650	0.1692e-08	7.750	0.1161e-07
8126perc	2.0	100377	907.927	32.000	1.100	0.3000e-08	9.000	0.1222e-07
8127perc	2.0	101177	915.927	32.000	0.460	0.3826e-08	6.000	0.1195e-07
8128perc	2.0	101977	923.927	48.000	0.800	0.4750e-08	7.000	0.1243e-07
8129perc	2.0	102577	929.927	48.000	0.125	0.1120e-08	13.000	0.1069e-07
8130perc	2.0	103177	935.927	48.000	0.120	0.9250e-08	9.750	0.1046e-07
8131perc	2.0	110777	942.927	32.000	0.100	0.1200e-07	8.000	0.1048e-07
8132perc	2.0	111577	950.927	48.000	0.950	0.3053e-08	7.200	0.1125e-07
8133perc	2.0	112177	956.927	32.000	0.700	0.2071e-08	10.000	0.1010e-07
8134perc	2.0	112877	963.927	32.000	1.080	0.3259e-08	7.400	0.1486e-07
8135perc	2.0	120577	970.927	34.000	0.850	0.1765e-06	4.400	0.1295e-07
8136perc	2.0	121277	977.927	34.000	1.900	0.4368e-06	6.000	0.1167e-07
8137perc	2.0	121977	984.927	41.000	3.200	0.3088e-06	9.000	0.7889e-08
8138perc	2.0	122777	992.927	38.000	1.600	0.1994e-06	6.500	0.8231e-08
8139perc	2.0	010278	998.927	37.000	2.200	0.1305e-06	7.200	0.7639e-08
8140perc	2.0	010978	1005.927	34.000	1.800	0.1294e-06	7.500	0.7333e-08
8141perc	2.0	011678	1012.927	34.000	1.800	0.6889e-07	5.000	0.7600e-08
8142perc	2.0	012378	1019.927	34.000	1.800	0.7278e-07	5.000	0.6600e-08
8143perc	1.0	013078	1026.927	34.000	3.850	0.6597e-07	2.800	0.2036e-07
8144perc	1.0	020678	1033.927	34.000	2.800	0.5036e-07	4.000	0.1168e-07
8145perc	1.0	021378	1040.927	34.000	3.600	0.6667e-07	4.000	0.1045e-07
8146perc	1.0	022178	1048.927	34.000	3.400	0.6029e-07	3.000	0.1270e-07
8147perc	1.0	022878	1055.927	34.000	3.000	0.6467e-07	6.000	0.1167e-07
8148perc	1.0	030678	1061.927	34.000	3.300	0.6545e-07	3.800	0.1395e-07
8149perc	1.0	031378	1068.927	33.000	2.300	0.6348e-07	3.600	0.1236e-07
8150perc	1.0	032078	1075.927	33.000	3.400	0.6029e-07	4.000	0.1850e-07
8151perc	1.0	032778	1082.927	34.000	3.550	0.7831e-07	4.000	0.1475e-07
8152perc	1.0	040378	1089.927	34.000	2.500	0.8400e-07	4.400	0.1545e-07
8153perc	1.0	041078	1096.927	33.000	1.900	0.6947e-07	5.000	0.1500e-07
8154perc	1.0	041778	1103.927	34.000	2.200	0.6909e-07	5.000	0.1580e-07
8155perc	1.0	042478	1110.927	33.000	2.800	0.8679e-07	4.600	0.1609e-07
8156perc	1.0	050178	1117.927	29.000	1.200	0.1308e-07	6.800	0.1559e-07
8157perc	1.0	050878	1124.927	27.000	0.300	0.9667e-08	6.400	0.2188e-07
8158perc	1.0	051578	1131.927	29.000	0.600	0.1500e-07	4.400	0.2477e-07
8159perc	1.0	052278	1138.927	34.000	0.800	0.1063e-07	7.500	0.2053e-07
8160perc	1.0	053078	1146.927	34.000	1.500	0.1213e-07	7.400	0.1986e-07
8161perc	1.0	060578	1152.927	32.000	0.850	0.7412e-08	8.000	0.1200e-07
8162perc	1.0	061278	1159.927	32.000	1.000	0.9400e-08	5.800	0.2069e-07
8163perc	1.0	061978	1166.927	34.000	0.800	0.1013e-07	5.700	0.1719e-07
8164perc	1.0	062678	1173.927	34.000	1.700	0.9176e-08	5.400	0.1648e-07
8165perc	2.0	070578	1182.927	41.000	0.800	0.5500e-08	5.800	0.1241e-07

(cont)

TABLE A-II. (cont)

8166perc	2.0	071078	1187.927	35.000	1.000	0.3800e-08	7.950	0.1031e-07
8167perc	2.0	071778	1194.927	34.000	2.100	0.5857e-08	2.500	0.1140e-07
8168perc	2.0	072478	1201.927	38.000	0.890	0.4944e-08	6.000	0.1115e-07
8169perc	2.0	073178	1208.927	38.000	1.100	0.4455e-08	6.800	0.8382e-08
8170perc	2.0	080778	1215.927	39.000	1.000	0.1500e-07	7.200	0.1111e-07
8171perc	2.0	081478	1222.927	34.000	1.450	0.4690e-08	6.200	0.1129e-07
8172perc	2.0	082178	1229.927	34.000	1.750	0.4857e-08	4.500	0.1098e-07
8173perc	2.0	082878	1236.927	41.000	1.000	0.3500e-08	5.300	0.9906e-08
8174perc	2.0	090578	1244.927	36.000	0.250	0.2360e-08	6.000	0.9833e-08
8175perc	2.0	091178	1250.927	34.000	1.700	0.5647e-08	7.000	0.8229e-08
8176perc	2.0	091878	1257.927	36.000	0.450	0.1222e-07	6.800	0.9529e-08
8177perc	2.0	092578	1264.927	36.000	0.750	0.3200e-07	7.000	0.1443e-07
8178perc	2.0	100278	1271.927	36.000	1.100	0.6455e-08	6.400	0.9172e-08
8179perc	2.0	101078	1279.927	40.000	1.000	0.9400e-08	6.000	0.1000e-07
8180perc	2.0	101678	1285.927	40.000	2.800	0.4714e-07	8.400	0.1298e-07
8181perc	2.0	102378	1292.927	40.000	1.800	0.6833e-07	9.600	0.9792e-08
8182perc	2.0	103078	1299.927	40.000	1.850	0.1470e-07	6.750	0.1096e-07
8183perc	2.0	110678	1306.927	40.000	1.800	0.1806e-07	7.500	0.1080e-07
8184perc	2.0	111378	1313.927	40.000	1.500	0.5507e-07	3.600	0.1139e-07
8185perc	2.0	112078	1320.927	40.000	0.800	0.6950e-07	6.500	0.1108e-07
8186perc	2.0	112778	1327.927	40.000	1.250	0.4936e-07	7.500	0.9333e-08
8187perc	2.0	120478	1334.927	40.000	1.000	0.1400e-06	8.700	0.1149e-07
8188perc	2.0	121178	1341.927	40.000	1.400	0.1571e-06	11.000	0.8182e-08
8189perc	1.0	121878	1348.927	40.000	1.600	0.1213e-06	6.800	0.9265e-08
8190perc	1.0	122678	1356.927	38.000	3.600	0.3389e-07	5.400	0.9074e-08
8191perc	1.0	010279	1363.927	40.000	2.500	0.7760e-07	8.250	0.1103e-07
8192perc	1.0	010879	1369.927	40.000	4.500	0.6733e-07	12.000	0.1583e-07
8193perc	1.0	011579	1376.927	34.000	0.800	0.6125e-07	12.000	0.1000e-07
8194perc	1.0	012279	1383.927	34.000	4.200	0.3190e-07	9.900	0.9899e-08
8195perc	1.0	012979	1390.927	28.000	2.400	0.2292e-07	7.950	0.2415e-07
8196perc	1.0	020579	1397.927	28.000	2.800	0.7893e-08	5.600	0.1321e-07
8197perc	1.0	021279	1404.927	28.000	1.200	0.7083e-08	8.550	0.1123e-07
8198perc	1.0	022079	1412.927	28.000	1.750	0.7943e-08	6.600	0.1455e-07
8199perc	1.0	022679	1418.927	28.000	2.100	0.5476e-08	8.400	0.9881e-08
8200perc	1.0	030579	1425.927	28.000	2.500	0.9880e-08	7.950	0.1396e-07
8201perc	1.0	031279	1432.927	28.000	2.250	0.7111e-08	7.200	0.1208e-07
8202perc	1.0	031979	1439.927	28.000	0.700	0.5971e-07	8.700	0.1299e-07
8203perc	1.0	032679	1446.927	28.000	1.500	0.2600e-07	8.250	0.1358e-07
8204perc	1.0	040279	1453.927	28.000	1.360	0.7574e-08	7.950	0.1195e-07
8205perc	1.0	040979	1460.927	28.000	1.550	0.7419e-08	9.000	0.1322e-07
8206perc	1.0	041679	1467.927	40.000	3.500	0.8229e-07	11.200	0.3598e-07
8207perc	1.0	042379	1474.927	28.000	2.150	0.1000e-07	7.500	0.1520e-07
8208perc	1.0	043079	1481.927	28.000	2.150	0.9628e-08	7.950	0.1585e-07
8209perc	1.0	050779	1488.927	28.000	0.700	0.6429e-08	9.450	0.1354e-07
8210perc	1.0	051479	1495.927	28.000	1.200	0.6417e-08	9.000	0.1333e-07

(cont)

TABLE A-II. (cont)

8211perc	1.0	052179	1502.927	28.000	1.950	0.8205e-08	7.950	0.1371e-07
8212perc	1.0	052879	1509.927	28.000	1.900	0.8895e-08	7.350	0.1565e-07
8213perc	1.0	060479	1516.927	28.000	2.000	0.8200e-08	8.400	0.1405e-07
8214perc	1.0	061179	1523.927	28.000	1.900	0.1005e-07	7.050	0.1546e-07
8215perc	2.0	061879	1530.927	28.000	2.400	0.1104e-07	5.400	0.2593e-07
8216perc	2.0	062579	1537.927	28.000	0.600	0.5167e-08	6.000	0.2100e-07
8217perc	2.0	070279	1544.927	34.000	0.900	0.4000e-08	7.200	0.1667e-07
8281perc	2.0	070979	1551.927	34.000	1.250	0.3920e-08	9.600	0.1208e-07
8219perc	2.0	071679	1558.927	34.000	1.300	0.9308e-07	9.450	0.1101e-07
8220perc	2.0	072379	1565.927	34.000	0.800	0.3125e-08	10.500	0.1143e-07
8221perc	2.0	073079	1572.927	34.000	0.400	0.4500e-08	10.600	0.1075e-07
8222perc	2.0	080679	1579.927	34.000	0.250	0.2520e-08	10.000	0.1100e-07
8223perc	2.0	081379	1586.927	34.000	0.150	0.2667e-08	10.500	0.8571e-08
8224perc	2.0	082079	1593.927	34.000	0.200	0.1500e-08	11.800	0.5763e-08
8225perc	2.0	082779	1600.927	34.000	0.225	0.1733e-08	12.800	0.7109e-08
8226perc	2.0	090479	1608.927	34.000	0.550	0.1782e-07	10.400	0.9615e-08
8227perc	2.0	091079	1614.927	34.000	1.800	0.1944e-07	9.000	0.8333e-08
8228perc	2.0	091779	1621.927	34.000	1.250	0.8640e-07	9.450	0.9524e-08
8229perc	2.0	092479	1628.927	34.000	0.200	0.7000e-08	11.000	0.7273e-08
8230perc	2.0	100179	1635.927	34.000	1.150	0.2957e-07	10.800	0.8426e-08
8231perc	2.0	100979	1643.927	34.000	0.500	0.2200e-07	9.400	0.1074e-07
8232perc	2.0	101579	1649.927	34.000	1.450	0.2814e-06	10.800	0.8241e-08
8233perc	2.0	102279	1656.927	34.000	1.650	0.1182e-07	9.000	0.1044e-07
8234perc	2.0	102979	1663.927	34.000	1.600	0.1094e-06	9.750	0.1231e-07
8235perc	2.0	110579	1670.927	34.000	0.600	0.6117e-07	9.900	0.9899e-08
8236perc	2.0	111379	1678.927	34.000	0.650	0.2308e-06	8.850	0.1107e-07
8237perc	2.0	111979	1684.927	34.000	2.250	0.6889e-07	10.000	0.1200e-07
8238perc	2.0	112679	1691.927	34.000	1.650	0.1036e-06	11.000	0.1091e-07
8239perc	2.0	120379	1698.927	34.000	1.100	0.7745e-07	11.000	0.1136e-07
8240perc	2.0	121079	1705.927	34.000	0.925	0.2530e-07	12.600	0.1111e-07
8241perc	1.0	121779	1712.927	34.000	1.400	0.5000e-07	11.800	0.1169e-07
8242perc	1.0	122679	1721.927	34.000	1.400	0.1357e-07	13.200	0.7576e-08
8243perc	1.0	010280	1728.927	34.000	1.400	0.6357e-07	14.500	0.7655e-08
8244perc	1.0	010780	1733.927	23.000	1.750	0.9543e-07	8.250	0.4412e-07
8245perc	1.0	011480	1740.927	34.000	3.200	0.4906e-07	14.500	0.1186e-07
8246perc	1.0	012180	1747.927	23.000	2.000	0.5550e-08	6.000	0.1083e-07
8247perc	1.0	012880	1754.927	23.000	1.750	0.6343e-08	4.600	0.1326e-07
8248perc	1.0	020580	1762.927	23.000	2.200	0.5545e-08	5.300	0.1113e-07
8249perc	1.0	021180	1768.927	23.000	2.000	0.2150e-07	5.700	0.1404e-07
8250perc	1.0	021980	1776.927	23.000	2.000	0.3800e-07	4.500	0.1533e-07
8251perc	1.0	022580	1782.927	23.000	2.550	0.7569e-07	4.200	0.1595e-07
8252perc	1.0	030380	1789.927	28.000	2.600	0.2538e-06	7.500	0.9333e-08
8253perc	1.0	031080	1796.927	28.000	3.400	0.2853e-06	6.600	0.1758e-07
8254perc	1.0	031780	1803.927	23.000	1.150	0.5478e-07	6.000	0.1500e-07
8255perc	1.0	032480	1810.927	20.000	2.250	0.6711e-07	5.800	0.1569e-07

(cont)

TABLE A-II. (cont)

8256perc	1.0	033180	1817.927	23.000	2.650	0.6679e-07	5.700	0.2456e-07
8257perc	1.0	040780	1824.927	23.000	2.700	0.2196e-07	5.300	0.1604e-07
8258perc	1.0	041480	1831.927	23.000	2.000	0.5150e-07	5.800	0.1741e-07
8259perc	1.0	042180	1838.927	23.000	3.150	0.1368e-06	5.400	0.1926e-07
8260perc	1.0	042880	1845.927	23.000	1.400	0.1643e-06	5.900	0.1814e-07
8261perc	1.0	050580	1852.927	23.000	2.500	0.3400e-07	5.000	0.1880e-07
8262perc	1.0	051280	1859.927	23.000	1.750	0.1217e-06	5.400	0.1926e-07
8263perc	1.0	051980	1866.927	23.000	1.650	0.2000e-07	5.500	0.1855e-07
8264perc	1.0	052780	1874.927	23.000	0.300	0.7400e-07	6.600	0.1939e-07
8265perc	1.0	060280	1880.927	23.000	1.950	0.3344e-07	5.500	0.2073e-07
8266perc	1.0	060980	1887.927	23.000	1.080	0.1278e-06	5.700	0.2175e-07
8267perc	2.0	061680	1894.927	23.000	2.000	0.1915e-07	5.200	0.3846e-07
8268perc	2.0	062380	1901.927	23.000	1.650	0.2770e-07	5.400	0.2815e-07
8269perc	2.0	063080	1908.927	23.000	1.650	0.2636e-07	4.800	0.3542e-07
8270perc	2.0	070780	1915.927	23.000	0.800	0.2938e-07	5.500	0.2909e-07
8271perc	2.0	071480	1922.927	28.000	0.500	0.3560e-07	7.950	0.2516e-07
8272perc	2.0	072180	1929.927	28.000	0.800	0.4200e-07	7.800	0.2551e-07
8273perc	2.0	072880	1936.927	28.000	1.020	0.3588e-07	7.500	0.2280e-07
8274perc	2.0	080480	1943.927	28.000	1.100	0.5818e-07	8.000	0.2138e-07
8275perc	2.0	081180	1950.927	28.000	0.800	0.8238e-07	8.400	0.2226e-07
8276perc	2.0	081880	1957.927	28.000	0.700	0.8257e-07	8.400	0.2143e-07
8277perc	2.0	082580	1964.927	28.000	1.040	0.6827e-07	6.750	0.2222e-07
8278perc	2.0	090280	1972.927	28.000	1.260	0.1524e-06	6.900	0.2464e-07
8279perc	2.0	090880	1978.927	28.000	1.300	0.7154e-07	7.350	0.2381e-07
8280perc	2.0	091580	1985.927	28.000	1.300	0.5708e-07	6.750	0.2519e-07
8281perc	2.0	092280	1992.927	28.000	1.900	0.6579e-07	7.000	0.1000e-06
8282perc	2.0	092980	1999.927	28.000	1.400	0.7286e-07	7.500	0.2467e-07
8283perc	2.0	100680	2006.927	28.000	0.830	0.1325e-06	7.800	0.2295e-07
8284perc	2.0	101480	2014.927	28.000	1.850	0.6811e-07	5.900	0.2559e-07
8285perc	2.0	102080	2020.927	28.000	0.680	0.1132e-06	7.800	0.2282e-07
8286perc	2.0	102780	2027.927	28.000	1.370	0.3650e-07	7.200	0.2528e-07
8287perc	2.0	110380	2034.927	28.000	0.725	0.4966e-07	9.000	0.2344e-07
8288perc	2.0	111380	2044.927	24.000	1.500	0.6160e-06	2.250	0.5333e-07
8289perc	2.0	111780	2048.927	23.000	2.000	0.2445e-06	5.700	0.2772e-07
8290perc	2.0	112480	2055.927	28.000	1.700	0.2912e-07	7.800	0.2551e-07
8291perc	2.0	120180	2062.927	28.000	2.000	0.3650e-07	7.500	0.2613e-07
8292perc	2.0	120880	2069.927	28.000	2.500	0.4000e-07	6.800	0.3529e-07
8293perc	1.0	121580	2076.927	28.000	2.300	0.2043e-06	8.000	0.2775e-07
8294perc	3.0	122280	2083.927	24.000	3.000	0.2367e-06	6.000	0.9667e-07
8295perc	3.0	122980	2090.927	27.000	5.000	0.3120e-06	6.800	0.4912e-07
8296perc	3.0	010581	2097.927	27.000	5.000	0.1920e-06	5.600	0.3571e-07
8297perc	3.0	011281	2104.927	27.000	5.600	0.1696e-06	6.000	0.4183e-07
8298perc	3.0	011981	2111.927	27.000	2.500	0.3640e-06	10.000	0.3480e-07
8299perc	3.0	012681	2118.927	27.000	3.400	0.2176e-06	8.000	0.3775e-07
8300perc	3.0	020281	2125.927	27.000	3.400	0.2471e-06	9.000	0.3567e-07

(cont)

TABLE A-II. (cont)

8301perc	3.0	020981	2132.927	27.000	4.000	0.1825e-06	8.000	0.3750e-07
8302perc	3.0	021781	2140.927	27.000	3.400	0.1865e-06	8.000	0.3250e-07
8303perc	3.0	022381	2146.927	27.000	5.400	0.1241e-06	6.500	0.2785e-07
8304perc	3.0	030281	2153.927	27.000	5.000	0.1480e-06	8.000	0.2625e-07
8305perc	3.0	030981	2160.927	27.000	5.200	0.1269e-06	6.600	0.3091e-07
8306perc	3.0	031681	2167.927	27.000	4.800	0.1417e-06	6.000	0.3400e-07
8307perc	3.0	032381	2174.927	27.000	5.600	0.1268e-06	5.800	0.2897e-07
8308perc	3.0	033081	2181.927	27.000	6.000	0.1150e-06	5.400	0.2870e-07
8309perc	3.0	040681	2188.927	27.000	6.400	0.9688e-07	5.600	0.2679e-07
8310perc	3.0	041381	2195.927	27.000	4.500	0.3067e-06	4.500	0.6378e-07
8311perc	3.0	042081	2202.927	23.000	5.800	0.1862e-06	1.900	0.6684e-07
8312perc	3.0	042781	2209.927	23.000	5.800	0.1776e-06	2.250	0.5556e-07
8313perc	3.0	050481	2216.927	23.000	5.400	0.1870e-06	2.750	0.4982e-07
8314perc	3.0	051181	2223.927	23.000	4.800	0.1979e-06	3.200	0.4438e-07
8315perc	3.0	051881	2230.927	23.000	5.700	0.1807e-06	3.150	0.3778e-07
8316perc	3.0	052681	2238.927	23.000	4.500	0.1978e-06	3.650	0.4301e-07
8317perc	3.0	060181	2244.927	23.000	5.200	0.1769e-06	2.800	0.4393e-07
8318perc	3.0	060881	2251.927	23.000	4.200	0.1833e-06	4.000	0.3725e-07
8319perc	3.0	061581	2258.927	23.000	6.000	0.1750e-06	3.200	0.3750e-07
8320perc	4.0	062281	2265.927	23.000	3.500	0.5114e-06	5.000	0.5320e-07
8321perc	4.0	062981	2272.927	23.000	3.800	0.2789e-06	4.600	0.4696e-07
8322perc	4.0	070681	2279.927	23.000	3.100	0.1429e-06	4.000	0.4275e-07
8323perc	4.0	071381	2286.927	28.000	2.250	0.1067e-06	4.250	0.3294e-07
8324perc	4.0	072081	2293.927	23.000	1.600	0.1625e-06	4.250	0.5318e-07
8325perc	4.0	072781	2300.927	27.000	1.700	0.2824e-06	4.000	0.4775e-07
8326perc	4.0	080381	2307.927	25.000	1.500	0.3733e-06	5.000	0.4580e-07
8327perc	4.0	081081	2314.927	23.000	1.700	0.4412e-06	4.000	0.3025e-07
8328perc	4.0	081781	2321.927	23.000	2.200	0.4000e-06	3.600	0.3611e-07
8329perc	4.0	082481	2328.927	23.000	2.300	0.5130e-06	2.400	0.4958e-07
8330perc	4.0	083181	2335.927	22.000	2.500	0.5560e-06	2.700	0.3704e-07
8331perc	4.0	090881	2343.927	23.000	2.300	0.5522e-06	2.800	0.3536e-07
8332perc	4.0	091481	2349.927	28.000	2.500	0.5080e-06	3.300	0.2879e-07
8333perc	4.0	092181	2356.927	23.000	2.500	0.4840e-06	3.800	0.2605e-07
8334perc	4.0	092881	2363.927	28.000	2.600	0.4885e-06	5.200	0.2192e-07
8335perc	4.0	100581	2370.927	23.000	3.000	0.4267e-06	4.000	0.2250e-07
8336perc	4.0	101381	2378.927	23.000	2.400	0.3917e-06	3.800	0.1842e-07
8337perc	4.0	102081	2385.927	23.000	2.900	0.4483e-06	3.800	0.1474e-07
8338perc	4.0	102681	2391.927	23.000	4.400	0.4409e-06	3.000	0.2200e-07
8339perc	4.0	110281	2398.927	25.000	3.800	0.3500e-06	5.000	0.1740e-07
8340perc	4.0	110981	2405.927	23.000	3.400	0.2029e-06	4.200	0.1762e-07
8341perc	4.0	111681	2412.927	26.000	3.300	0.2758e-06	5.000	0.1680e-07
8342perc	4.0	112381	2419.927	26.000	2.400	0.4083e-06	6.000	0.2033e-07
8343perc	4.0	113081	2426.927	26.000	2.700	0.3185e-06	6.000	0.1850e-07
8344perc	4.0	120781	2433.927	26.000	3.500	0.2686e-06	5.000	0.4420e-07

APPENDIX B
DEHUMIDIFIER CONDENSATE DATA

TABLE B-I. Dehumidifier Condensate Data for Chamber 6

sample	season	date modyyr	time (days)	volume (l)	activity (ci/l)
-----	-----	-----	-----	-----	-----
6001cond	1.0	041875	8.906	12.000	0.1500e-08
6002cond	1.0	042175	11.906	19.000	0.1579e-08
6003cond	1.0	043075	20.906	20.700	0.1401e-07
6004cond	1.0	050575	25.906	18.000	0.9833e-08
6005cond	1.0	051275	32.906	17.200	0.3017e-07
6006cond	1.0	051975	39.906	18.000	0.2278e-08
6007cond	1.0	061975	70.906	18.000	0.1500e-07
6008cond	1.0	062775	78.906	19.000	0.5263e-08
6009cond	2.0	070375	84.906	18.000	0.5000e-08
6010cond	2.0	071375	94.906	18.000	0.5167e-08
6011cond	2.0	072475	105.906	18.000	0.4389e-08
6012cond	2.0	080175	113.906	16.500	0.3818e-08
6013cond	2.0	080875	120.906	14.000	0.3500e-08
6014cond	2.0	081875	130.906	18.000	0.2667e-08
6015cond	2.0	082975	141.906	18.000	0.2111e-08
6016cond	2.0	091075	153.906	18.000	0.2778e-08
6017cond	2.0	092275	165.906	20.000	0.2750e-08
6018cond	2.0	100275	175.906	17.500	0.2400e-08
6019cond	2.0	101075	183.906	13.500	0.2148e-08
6020cond	2.0	102175	194.906	18.000	0.2056e-08
6021cond	2.0	102975	202.906	18.000	0.2444e-08
6022cond	2.0	110775	211.906	18.000	0.3556e-08
6023cond	2.0	111475	218.906	16.000	0.5313e-08
6024cond	2.0	112675	230.906	18.000	0.2444e-08
6025cond	2.0	120875	242.906	19.000	0.2368e-08
6026cond	2.0	121875	252.906	18.000	0.2444e-08
6027cond	2.0	122475	258.906	10.000	0.3000e-08
6028cond	2.0	123175	265.906	12.000	0.2583e-08
6029cond	1.0	011276	277.906	19.000	0.1842e-08
6030cond	1.0	012276	287.906	18.000	0.1667e-08
6031cond	1.0	013076	295.906	17.000	0.2412e-08
6032cond	1.0	020976	305.906	18.000	0.2722e-08
6033cond	1.0	022076	316.906	18.000	0.2111e-08
6034cond	1.0	030276	327.906	19.000	0.2000e-08
6035cond	1.0	031276	337.906	19.200	0.1406e-08
6036cond	1.0	032376	348.906	19.000	0.1000e-07
6037cond	1.0	040276	358.906	17.600	0.1534e-08
6038cond	1.0	041276	368.906	18.000	0.1944e-08
6039cond	1.0	042276	378.906	18.100	0.2873e-08
6040cond	1.0	050376	389.906	18.500	0.2811e-08
6041cond	1.0	051276	398.906	18.000	0.2889e-08
6042cond	1.0	052176	407.906	18.400	0.2065e-08
6043cond	1.0	060176	418.906	18.500	0.2162e-08
6044cond	1.0	061076	427.906	18.300	0.2077e-08
6045cond	1.0	061876	435.906	17.000	0.2059e-08
6046cond	2.0	062876	445.906	18.500	0.3730e-08
6047cond	2.0	070876	455.906	19.000	0.3368e-08
6048cond	2.0	071676	463.906	18.000	0.1722e-07
6049cond	2.0	072376	470.906	16.000	0.5875e-08
6050cond	2.0	080276	480.906	19.000	0.3368e-08
6051cond	2.0	081176	489.906	18.500	0.3838e-08
6052cond	2.0	082076	498.906	18.500	0.4108e-08
6053cond	2.0	082776	505.906	18.000	0.3611e-08
6054cond	2.0	083076	508.906	18.300	0.3279e-08
6055cond	2.0	090976	518.906	19.200	0.3281e-08

(cont)

TABLE B-I. (cont)

6056cond	2.0	092076	529.906	20.000	0.3300e-08
6057cond	2.0	092976	538.906	19.000	0.2947e-08
6058cond	2.0	100876	547.906	18.000	0.2333e-08
6059cond	2.0	101876	557.906	18.000	0.2500e-08
6060cond	2.0	102776	566.906	18.000	0.2944e-08
6061cond	2.0	110576	575.906	18.000	0.3111e-08
6062cond	2.0	111576	585.906	19.000	0.2789e-08
6063cond	2.0	112476	594.906	19.500	0.3846e-08
6064cond	2.0	120376	603.906	17.500	0.4457e-08
6065cond	2.0	121376	613.906	19.000	0.3895e-08
6066cond	2.0	122276	622.906	19.000	0.4895e-08
6067cond	2.0	123076	630.906	16.200	0.3519e-08
6068cond	2.0	011077	641.906	19.200	0.3958e-08
6069cond	2.0	011977	650.906	19.000	0.4895e-08
6070cond	1.0	012777	658.906	18.000	0.7278e-08
6071cond	1.0	020477	666.906	18.000	0.5333e-08
6072cond	1.0	021477	676.906	19.000	0.4000e-08
6073cond	1.0	022377	685.906	18.000	0.4167e-08
6074cond	1.0	030477	694.906	18.000	0.7111e-08
6075cond	1.0	031477	704.906	18.000	0.6167e-08
6076cond	1.0	032377	713.906	18.000	0.4333e-08
6077cond	1.0	040177	722.906	17.000	0.3588e-08
6078cond	1.0	041177	732.906	19.000	0.2232e-07
6079cond	1.0	041877	739.906	18.000	0.2300e-07
6080cond	1.0	042977	750.906	18.500	0.9730e-08
6081cond	1.0	050677	757.906	16.000	0.8688e-08
6082cond	1.0	051677	767.906	18.000	0.4444e-08
6083cond	1.0	052677	777.906	18.000	0.4556e-08
6084cond	1.0	060677	788.906	19.000	0.5263e-08
6085cond	1.0	061677	798.906	18.500	0.8649e-08
6086cond	1.0	062777	809.906	19.000	0.6947e-08
6087cond	1.0	070777	819.906	18.500	0.1189e-07
6088cond	1.0	071577	827.906	16.500	0.1182e-07
6089cond	1.0	072577	837.906	18.500	0.9514e-08
6090cond	2.0	080577	848.906	17.000	0.1324e-07
6091cond	2.0	081577	858.906	19.000	0.9789e-08
6092cond	2.0	082477	867.906	17.000	0.1424e-07
6093cond	2.0	090277	876.906	18.000	0.1406e-07
6094cond	2.0	091277	886.906	19.000	0.1126e-07
6095cond	2.0	091977	893.906	19.000	0.1611e-07
6096cond	2.0	092777	901.906	18.000	0.1100e-07
6097cond	2.0	100777	911.906	19.500	0.1415e-07
6098cond	2.0	101377	917.906	18.000	0.1311e-07
6099cond	2.0	102177	925.906	17.600	0.1188e-07
6100cond	2.0	103177	935.906	19.000	0.1316e-07
6101cond	2.0	110777	942.906	18.000	0.1228e-07
6102cond	2.0	111577	950.906	18.600	0.1489e-07
6103cond	2.0	112277	957.906	18.000	0.1200e-07
6104cond	2.0	113077	965.906	19.000	0.1063e-07
6105cond	2.0	120777	972.906	18.000	0.1344e-07
6106cond	2.0	121577	980.906	18.900	0.1164e-07
6107cond	2.0	122377	988.906	18.800	0.1021e-07
6108cond	2.0	123077	995.906	18.000	0.8278e-08
6109cond	2.0	010678	1002.906	17.000	0.9000e-08
6110cond	2.0	011378	1009.906	18.000	0.8667e-08
6111cond	2.0	012278	1018.906	20.000	0.8250e-08
6112cond	1.0	013078	1026.906	18.000	0.9389e-08
6113cond	1.0	020878	1035.906	18.000	0.8778e-08
6114cond	1.0	021778	1044.906	18.000	0.7722e-08
6115cond	1.0	022778	1054.906	18.000	0.7111e-08
6116cond	1.0	031078	1065.906	18.000	0.1683e-07
6117cond	1.0	032078	1075.906	18.000	0.1183e-07
6118cond	1.0	032978	1084.906	18.000	0.1128e-07
6119cond	1.0	040778	1093.906	16.500	0.1164e-07
6120cond	1.0	041778	1103.906	18.100	0.1033e-07

(cont)

TABLE B-I. (cont)

6122cond	1.0	042578	1111.906	18.000	0.8667e-08
6123cond	1.0	050478	1120.906	18.000	0.7889e-08
6124cond	1.0	051578	1131.906	19.000	0.7632e-08
6125cond	1.0	052378	1139.906	18.000	0.9611e-08
6126cond	1.0	060278	1149.906	18.000	0.3311e-08
6127cond	1.0	061278	1159.906	18.500	0.1011e-07
6128cond	1.0	062178	1168.906	18.000	0.9611e-08
6129cond	2.0	063078	1177.906	18.000	0.1411e-07
6130cond	2.0	071078	1187.906	19.000	0.1611e-07
6131cond	2.0	071578	1192.906	17.000	0.1676e-07
6132cond	2.0	072578	1202.906	17.500	0.1223e-07
6133cond	2.0	080178	1209.906	16.000	0.1375e-07
6134cond	2.0	080978	1217.906	20.000	0.1285e-07
6135cond	2.0	081878	1226.906	17.800	0.1197e-07
6136cond	2.0	082578	1233.906	16.000	0.1144e-07
6137cond	2.0	090178	1240.906	16.000	0.1081e-07
6138cond	2.0	090878	1247.906	15.500	0.1187e-07
6139cond	2.0	091478	1253.906	14.200	0.1085e-07
6140cond	2.0	092078	1259.906	16.000	0.8063e-08
6141cond	2.0	092878	1267.906	17.800	0.9888e-08
6142cond	2.0	100678	1275.906	18.500	0.9946e-08
6143cond	2.0	101678	1285.906	18.500	0.1249e-07
6144cond	2.0	102478	1293.906	19.000	0.1574e-07
6145cond	2.0	103178	1300.906	17.000	0.1129e-07
6146cond	2.0	110778	1307.906	17.500	0.1097e-07
6147cond	2.0	111578	1315.906	19.000	0.1089e-07
6148cond	2.0	112278	1322.906	17.000	0.1041e-07
6149cond	2.0	113078	1330.906	18.500	0.1027e-07
6150cond	2.0	120678	1336.906	18.000	0.1078e-07
6151cond	1.0	121578	1345.906	17.500	0.1023e-07
6152cond	1.0	122278	1352.906	15.000	0.1193e-07
6153cond	1.0	122978	1359.906	14.500	0.1110e-07
6154cond	1.0	010879	1369.906	19.000	0.1037e-07
6155cond	1.0	011679	1377.906	18.000	0.1061e-07
6156cond	1.0	012579	1386.906	18.500	0.9135e-08
6157cond	1.0	020279	1394.906	17.000	0.1053e-07
6158cond	1.0	020679	1398.906	18.000	0.4694e-07
6159cond	1.0	021279	1404.906	28.000	0.3418e-07
6160cond	1.0	021679	1408.906	16.000	0.3394e-07
6161cond	1.0	022079	1412.906	18.000	0.1200e-07
6162cond	1.0	022679	1418.906	24.000	0.5046e-07
6163cond	1.0	030279	1422.906	18.000	0.5444e-07
6164cond	1.0	030679	1426.906	18.000	0.1700e-07
6165cond	1.0	031279	1432.906	22.000	0.2195e-07
6166cond	1.0	031679	1436.906	18.000	0.1894e-07
6167cond	1.0	032179	1441.906	20.000	0.1495e-07
6168cond	1.0	032779	1447.906	19.000	0.1211e-07
6169cond	1.0	040279	1453.906	18.000	0.9722e-08
6170cond	1.0	040679	1457.906	21.000	0.1452e-07
6171cond	1.0	040979	1460.906	19.000	0.1658e-07
6172cond	1.0	041879	1469.906	18.000	0.1656e-07
6173cond	1.0	042379	1474.906	24.000	0.6375e-07
6174cond	1.0	050279	1483.906	19.000	0.2684e-07
6175cond	1.0	051179	1492.906	17.500	0.1406e-07
6176cond	1.0	052179	1502.906	18.000	0.1394e-07
6177cond	1.0	053179	1512.906	18.000	0.1217e-07
6178cond	1.0	061179	1523.906	19.500	0.1195e-07
6179cond	2.0	061879	1530.906	42.000	0.3524e-07
6180cond	2.0	062279	1534.906	15.000	0.3053e-07
6181cond	2.0	070279	1544.906	18.000	0.1372e-07
6182cond	2.0	071379	1555.906	19.000	0.1437e-07
6183cond	2.0	072479	1566.906	18.500	0.1416e-07
6184cond	2.0	080279	1575.906	18.000	0.1444e-07
6185cond	2.0	080979	1582.906	18.500	0.1405e-07
6186cond	2.0	082079	1593.906	24.000	0.1292e-07

(cont)

TABLE B-I. (cont)

6187cond	2.0	082879	1601.906	18.200	0.1407e-07
6188cond	2.0	090679	1610.906	18.500	0.1270e-07
6189cond	2.0	091479	1618.906	17.000	0.1188e-07
6190cond	2.0	092479	1628.906	20.000	0.1025e-07
6191cond	2.0	100279	1636.906	18.500	0.1086e-07
6192cond	2.0	101179	1645.906	19.000	0.1058e-07
6193cond	2.0	101979	1653.906	17.500	0.1114e-07
6194cond	2.0	102979	1663.906	19.000	0.1068e-07
6195cond	2.0	110679	1671.906	18.500	0.1119e-07
6196cond	2.0	111579	1680.906	18.500	0.1000e-07
6197cond	2.0	112179	1686.906	13.500	0.1007e-07
6198cond	2.0	112979	1694.906	17.000	0.4788e-07
6199cond	2.0	120779	1702.906	17.500	0.9486e-08
6200cond	1.0	121479	1709.906	17.000	0.1012e-07
6201cond	1.0	122179	1716.906	16.000	0.1063e-07
6202cond	1.0	122779	1722.906	17.000	0.9294e-08
6203cond	1.0	010280	1728.906	18.500	0.8973e-08
6204cond	1.0	010980	1735.906	18.000	0.9722e-08
6205cond	1.0	011680	1742.906	18.500	0.8649e-08
6206cond	1.0	012380	1749.906	19.000	0.8000e-08
6207cond	1.0	012880	1754.906	19.000	0.8789e-08
6208cond	1.0	013080	1756.906	62.000	0.4839e-07
6209cond	1.0	020580	1762.906	19.000	0.5526e-07
6210cond	1.0	021280	1769.906	18.000	0.2272e-07
6211cond	1.0	021980	1776.906	20.000	0.1645e-07
6212cond	1.0	022680	1783.906	18.000	0.1567e-07
6213cond	1.0	030380	1789.906	17.000	0.1494e-07
6214cond	1.0	031080	1796.906	18.500	0.1168e-07
6215cond	1.0	031780	1803.906	18.000	0.1139e-07
6216cond	1.0	032480	1810.906	18.500	0.1097e-07
6217cond	1.0	033180	1817.906	18.500	0.1032e-07
6218cond	1.0	040780	1824.906	18.000	0.1011e-07
6219cond	1.0	041480	1831.906	18.000	0.9556e-08
6220cond	1.0	042180	1838.906	18.300	0.1038e-07
6221cond	1.0	042880	1845.906	18.200	0.9780e-08
6222cond	1.0	050580	1852.906	18.200	0.9505e-08
6223cond	1.0	051280	1859.906	19.100	0.9738e-08
6224cond	1.0	051980	1866.906	18.800	0.8138e-08
6225cond	1.0	052380	1870.906	12.500	0.9120e-08
6226cond	1.0	053080	1877.906	19.000	0.8316e-08
6227cond	1.0	060680	1884.906	19.000	0.8737e-08
6228cond	2.0	061380	1891.906	19.000	0.8737e-08
6229cond	2.0	061980	1897.906	19.000	0.1095e-07
6130cond	2.0	062780	1905.906	18.000	0.1022e-07
6231cond	2.0	070380	1911.906	14.500	0.1021e-07
6232cond	2.0	071180	1919.906	19.000	0.9158e-08
6233cond	2.0	071880	1926.906	17.700	0.9266e-08
6234cond	2.0	072580	1933.906	18.000	0.8944e-08
6235cond	2.0	080180	1940.906	18.000	0.8944e-08
6236cond	2.0	080780	1946.906	16.500	0.9030e-08
6237cond	2.0	081480	1953.906	18.300	0.9617e-08
6238cond	2.0	082280	1961.906	20.000	0.9300e-08
6239cond	2.0	082980	1968.906	18.000	0.8778e-08
6240cond	2.0	090480	1974.906	17.500	0.8629e-08
6241cond	2.0	091280	1982.906	17.500	0.9143e-08
6242cond	2.0	091980	1989.906	17.000	0.8412e-08
6243cond	2.0	092680	1996.906	17.500	0.1086e-07
6244cond	2.0	092980	1999.906	82.000	0.6927e-07
6245cond	2.0	093080	2000.906	29.000	0.3586e-07
6246cond	2.0	100180	2001.906	18.500	0.8757e-08
6247cond	2.0	100380	2003.906	31.000	0.9871e-08
6248cond	2.0	100880	2008.906	18.000	0.1794e-07
6249cond	2.0	101480	2014.906	18.000	0.1078e-07
6250cond	2.0	102080	2020.906	18.000	0.1106e-07
6251cond	2.0	102880	2028.906	18.000	0.1389e-07

(cont)

TABLE B-I. (cont)

6253cond	2.0	110680	2037.906	19.000	0.1468e-07
6253cond	2.0	111780	2048.906	19.500	0.1246e-07
6254cond	2.0	112680	2057.906	19.000	0.1368e-07
6255cond	2.0	120380	2064.906	18.000	0.1428e-07
6256cond	1.0	121180	2072.906	18.000	0.1394e-07
6257cond	1.0	121880	2079.906	17.000	0.1635e-07
6258cond	3.0	121880	2079.906	2.400	0.1458e-07
6259cond	3.0	122480	2085.906	13.000	0.1662e-07
6260cond	3.0	123180	2092.906	18.500	0.1519e-07
6261cond	3.0	010781	2099.906	19.000	0.1342e-07
6262cond	3.0	011481	2106.906	18.000	0.1350e-07
6263cond	3.0	012181	2113.906	18.500	0.1578e-07
6264cond	3.0	012781	2119.906	17.000	0.1229e-07
6265cond	3.0	020381	2126.906	18.000	0.1367e-07
6266cond	3.0	021081	2133.906	18.500	0.1232e-07
6267cond	3.0	021881	2141.906	19.000	0.1279e-07
6268cond	3.0	022481	2147.906	17.500	0.1223e-07
6269cond	3.0	030381	2154.906	18.500	0.1259e-07
6270cond	3.0	031081	2161.906	18.500	0.1108e-07
6271cond	3.0	031781	2168.906	19.000	0.1221e-07
6272cond	3.0	032481	2175.906	18.500	0.1103e-07
6273cond	3.0	033181	2182.906	18.000	0.1083e-07
6274cond	3.0	040781	2189.906	18.600	0.1204e-07
6275cond	3.0	041481	2196.906	18.400	0.1190e-07
6276cond	3.0	042181	2203.906	18.500	0.1151e-07
6277cond	3.0	042881	2210.906	18.500	0.1508e-07
6278cond	3.0	050581	2217.906	18.000	0.1167e-07
6279cond	3.0	051281	2224.906	19.000	0.1221e-07
6280cond	3.0	052181	2233.906	18.000	0.4633e-07
6281cond	3.0	052781	2239.906	19.000	0.4947e-07
6282cond	3.0	060381	2246.906	19.000	0.2274e-06
6283cond	3.0	061081	2253.906	18.000	0.4211e-07
6284cond	3.0	061681	2259.906	18.000	0.4794e-07
6285cond	4.0	062281	2265.906	19.000	0.3621e-07
6286cond	4.0	062981	2272.906	18.500	0.3211e-07
6287cond	4.0	070281	2275.906	15.000	0.3053e-07
6288cond	4.0	070881	2281.906	19.000	0.2816e-07
6289cond	4.0	071481	2287.906	17.000	0.2647e-07
6290cond	4.0	072081	2293.906	16.500	0.2800e-07
6291cond	4.0	072481	2297.906	16.500	0.2491e-07
6292cond	4.0	072981	2302.906	18.000	0.2333e-07
6293cond	4.0	080481	2308.906	17.000	0.2235e-07
6294cond	4.0	081081	2314.906	19.000	0.2263e-07
6295cond	4.0	081381	2317.906	17.000	0.1953e-07
6296cond	4.0	081881	2322.906	18.000	0.2278e-07
6297cond	4.0	082181	2325.906	16.000	0.2188e-07
6298cond	4.0	082581	2329.906	18.000	0.1889e-07
6299cond	4.0	083181	2335.906	19.000	0.2158e-07
6300cond	4.0	090381	2338.906	18.000	0.2000e-07
6301cond	4.0	090881	2343.906	19.000	0.2211e-07
6302cond	4.0	091181	2346.906	20.000	0.1650e-07
6303cond	4.0	092581	2360.906	17.000	0.1706e-07
6304cond	4.0	100981	2374.906	17.700	0.1412e-07
6305cond	4.0	102381	2388.906	17.000	0.1412e-07
6306cond	4.0	110681	2402.906	17.000	0.1294e-07
6307cond	4.0	112081	2416.906	16.000	0.1063e-07
6308cond	4.0	120381	2429.906	17.000	0.6765e-08
6309cond	4.0	121581	2441.906	18.000	0.1389e-07
6310cond	4.0	122181	2447.906	9.000	0.3667e-07

TABLE B-II. Dehumidifier Condensate Data for Chamber 8

sample	season	date modyyr	time (days)	volume (l)	activity (ci/l)
8001cond	1.0	041775	7.927	19.000	0.1368e-07
8002cond	1.0	042275	12.927	18.000	0.2944e-07
8003cond	1.0	050275	22.927	28.000	0.7107e-07
8004cond	1.0	050575	25.927	24.000	0.9542e-07
8005cond	1.0	050975	29.927	16.000	0.1875e-08
8006cond	1.0	051475	34.927	18.000	0.8667e-08
8007cond	1.0	061675	67.927	18.000	0.1211e-07
8008cond	1.0	062375	74.927	22.000	0.3000e-07
8009cond	2.0	063075	81.927	20.000	0.3550e-07
8010cond	2.0	070775	88.927	20.000	0.3950e-07
8011cond	2.0	071575	96.927	20.000	0.1085e-07
8012cond	2.0	072275	103.927	19.900	0.1759e-07
8013cond	2.0	072875	109.927	19.000	0.2211e-07
8014cond	2.0	080475	116.927	20.000	0.1500e-07
8015cond	2.0	081175	123.927	20.000	0.1500e-07
8016cond	2.0	081875	130.927	20.000	0.1500e-07
8017cond	2.0	082575	137.927	18.100	0.1276e-07
8018cond	2.0	090375	146.927	20.000	0.1850e-07
8019cond	2.0	091075	153.927	18.000	0.1667e-07
8020cond	2.0	091775	160.927	20.000	0.1080e-07
8021cond	2.0	092475	167.927	20.000	0.1315e-07
8022cond	2.0	093075	173.927	18.100	0.1254e-07
8023cond	2.0	100775	180.927	20.000	0.1110e-07
8024cond	2.0	101075	183.927	13.300	0.2195e-07
8025cond	2.0	101775	190.927	18.000	0.1094e-07
8026cond	2.0	102375	196.927	18.000	0.1667e-07
8027cond	2.0	103075	203.927	18.000	0.1272e-07
8028cond	2.0	110575	209.927	18.500	0.1351e-07
8029cond	2.0	111475	218.927	20.000	0.1250e-07
8030cond	2.0	111975	223.927	18.000	0.2056e-07
8031cond	2.0	112675	230.927	18.000	0.1833e-07
8032cond	2.0	120275	236.927	20.000	0.1750e-07
8033cond	2.0	120975	243.927	18.500	0.1503e-07
8034cond	2.0	121575	249.927	18.000	0.2944e-07
8035cond	2.0	121875	252.927	19.000	0.4895e-07
8036cond	2.0	122475	258.927	16.000	0.3250e-07
8037cond	2.0	123175	265.927	19.000	0.1579e-07
8038cond	1.0	010876	273.927	18.500	0.1054e-07
8039cond	1.0	011576	280.927	20.000	0.1700e-07
8040cond	1.0	012376	288.927	24.000	0.1875e-06
8041cond	1.0	013076	295.927	20.000	0.2850e-07
8042cond	1.0	020576	301.927	18.000	0.2278e-07
8043cond	1.0	021176	307.927	18.000	0.1833e-07
8044cond	1.0	021876	314.927	18.000	0.1444e-07
8045cond	1.0	022576	321.927	19.000	0.1579e-07
8046cond	1.0	030376	328.927	19.000	0.1947e-07
8047cond	1.0	030976	334.927	18.000	0.1611e-07
8048cond	1.0	031676	341.927	19.000	0.1737e-07
8049cond	1.0	032376	348.927	17.000	0.2647e-07
8050cond	1.0	033076	355.927	18.300	0.1678e-07
8051cond	1.0	040576	361.927	18.000	0.1183e-07
8052cond	1.0	040976	365.927	14.000	0.2429e-07
8053cond	1.0	041676	372.927	18.000	0.1444e-07
8054cond	1.0	042276	378.927	17.700	0.1339e-07
8055cond	1.0	042976	385.927	18.000	0.1500e-07

(cont)

TABLE B-II. (cont)

8056cond	1.0	050676	392.927	18.000	0.1500e-07
8057cond	1.0	051376	399.927	19.000	0.1947e-07
8058cond	1.0	052076	406.927	19.000	0.1579e-07
8059cond	1.0	052776	413.927	18.000	0.1389e-07
8060cond	1.0	060476	421.927	19.000	0.1737e-07
8061cond	1.0	061076	427.927	18.300	0.2027e-07
8062cond	1.0	061776	434.927	19.000	0.1789e-07
8063cond	1.0	062476	441.927	19.500	0.2205e-07
8064cond	2.0	063076	447.927	18.000	0.4856e-07
8065cond	2.0	070876	455.927	18.000	0.3556e-07
8066cond	2.0	071576	462.927	19.000	0.3000e-07
8067cond	2.0	072276	469.927	19.000	0.2063e-07
8068cond	2.0	072976	476.927	18.200	0.2280e-07
8069cond	2.0	080576	483.927	18.500	0.1389e-07
8070cond	2.0	081376	491.927	19.500	0.1703e-07
8071cond	2.0	082076	498.927	19.000	0.1542e-07
8072cond	2.0	082776	505.927	19.000	0.1537e-07
8073cond	2.0	090276	511.927	18.200	0.1599e-07
8074cond	2.0	090976	518.927	18.100	0.2088e-07
8075cond	2.0	091676	525.927	20.100	0.1234e-07
8076cond	2.0	092376	532.927	19.000	0.1711e-07
8077cond	2.0	093076	539.927	19.100	0.1251e-07
8078cond	2.0	100776	546.927	19.000	0.1595e-07
8079cond	2.0	101576	554.927	19.100	0.1990e-07
8080cond	2.0	102276	561.927	19.500	0.1995e-07
8081cond	2.0	102976	568.927	20.000	0.2045e-07
8082cond	2.0	110576	575.927	18.200	0.2549e-07
8083cond	2.0	111276	582.927	19.000	0.2368e-07
8084cond	2.0	111876	588.927	18.000	0.6111e-07
8085cond	2.0	112476	594.927	18.000	0.2444e-07
8086cond	2.0	120176	601.927	20.000	0.3200e-07
8087cond	2.0	120976	609.927	20.000	0.3745e-07
8088cond	2.0	121676	616.927	20.500	0.5624e-07
8089cond	2.0	122276	622.927	18.000	0.3261e-07
8090cond	2.0	122976	629.927	20.000	0.5085e-07
8091cond	2.0	010577	636.927	18.200	0.4588e-07
8092cond	2.0	011177	642.927	18.000	0.6089e-07
8093cond	2.0	011877	649.927	20.000	0.1995e-07
8094cond	1.0	012577	656.927	20.000	0.9950e-07
8095cond	1.0	020177	663.927	18.000	0.3039e-07
8096cond	1.0	020877	670.927	19.500	0.4856e-07
8097cond	1.0	021577	677.927	18.500	0.1514e-07
8098cond	1.0	022277	684.927	19.000	0.1553e-07
8099cond	1.0	030277	692.927	22.000	0.4827e-07
8100cond	1.0	031077	700.927	20.000	0.4245e-07
8101cond	1.0	031677	706.927	19.000	0.4984e-07
8102cond	1.0	032277	712.927	18.000	0.2889e-07
8103cond	1.0	032977	719.927	20.500	0.2463e-07
8104cond	1.0	040677	727.927	18.200	0.1929e-07
8105cond	1.0	041277	733.927	18.500	0.2951e-07
8106cond	1.0	041877	739.927	18.000	0.2394e-07
8107cond	1.0	042577	746.927	18.200	0.1670e-07
8108cond	1.0	050277	753.927	24.000	0.1371e-06
8109cond	1.0	050977	760.927	20.500	0.8000e-07
8110cond	1.0	051677	767.927	18.500	0.3838e-07
8111cond	1.0	052377	774.927	18.500	0.3762e-07
8112cond	1.0	053177	782.927	19.000	0.3800e-07
8113cond	1.0	060677	788.927	19.000	0.5537e-07
8114cond	1.0	061377	795.927	18.000	0.3789e-07
8115cond	1.0	062077	802.927	19.000	0.4137e-07
8116cond	1.0	062777	809.927	19.000	0.4042e-07
8117cond	1.0	070677	818.927	24.500	0.9592e-07
8118cond	1.0	071177	823.927	18.500	0.9568e-07
8119cond	1.0	071877	830.927	18.500	0.4205e-07
8120cond	1.0	072577	837.927	18.000	0.3494e-07

(cont)

TABLE B-II. (cont)

8121cond	2.0	080177	844.927	20.000	0.4215e-07
8122cond	2.0	081077	853.927	20.500	0.3810e-07
8123cond	2.0	081577	858.927	20.000	0.3160e-07
8124cond	2.0	082277	865.927	20.000	0.2900e-07
8125cond	2.0	082977	872.927	20.000	0.2520e-07
8126cond	2.0	090677	880.927	20.000	0.2675e-07
8127cond	2.0	091277	886.927	20.500	0.1537e-06
8128cond	2.0	091977	893.927	19.000	0.2368e-07
8129cond	2.0	092677	900.927	23.000	0.7130e-07
8130cond	2.0	100377	907.927	19.000	0.4532e-07
8131cond	2.0	101177	915.927	20.000	0.2120e-07
8132cond	2.0	101877	922.927	18.100	0.3309e-07
8133cond	2.0	101977	923.927	18.000	0.5172e-07
8134cond	2.0	102577	929.927	20.700	0.5797e-07
8135cond	2.0	103177	935.927	28.000	0.5179e-07
8136cond	2.0	110777	942.927	19.000	0.2911e-07
8137cond	2.0	111577	950.927	21.100	0.3493e-07
8138cond	2.0	111877	953.927	19.000	0.4311e-07
8139cond	2.0	112977	964.927	23.000	0.9130e-07
8140cond	2.0	120577	970.927	21.000	0.1038e-06
8141cond	2.0	121277	977.927	19.700	0.7919e-07
8142cond	2.0	121977	984.927	21.000	0.4367e-07
8143cond	2.0	122077	985.927	15.300	0.6131e-07
8144cond	2.0	123077	995.927	20.500	0.3990e-07
8145cond	2.0	010678	1002.927	22.000	0.4291e-07
8146cond	2.0	011178	1007.927	17.500	0.4086e-07
8147cond	2.0	011878	1014.927	19.000	0.3589e-07
8148cond	2.0	012478	1020.927	19.500	0.3631e-07
8149cond	1.0	013078	1026.927	17.500	0.3594e-07
8150cond	1.0	020678	1033.927	18.000	0.4300e-07
8151cond	1.0	021378	1040.927	19.500	0.3918e-07
8152cond	1.0	022178	1048.927	20.000	0.2920e-07
8153cond	1.0	022778	1054.927	18.000	0.3444e-07
8154cond	1.0	030678	1061.927	19.000	0.3205e-07
8155cond	1.0	031378	1068.927	18.000	0.2989e-07
8156cond	1.0	032078	1075.927	18.500	0.2341e-07
8157cond	1.0	032778	1082.927	19.500	0.3056e-07
8158cond	1.0	033178	1086.927	15.000	0.3540e-07
8159cond	1.0	040778	1093.927	19.000	0.3705e-07
8160cond	1.0	041378	1099.927	18.000	0.4094e-07
8161cond	1.0	041978	1105.927	18.500	0.3908e-07
8162cond	1.0	042678	1112.927	19.000	0.3558e-07
8163cond	1.0	050278	1118.927	19.500	0.6892e-07
8164cond	1.0	050878	1124.927	18.000	0.5056e-07
8165cond	1.0	051578	1131.927	19.000	0.6379e-07
8166cond	1.0	052278	1138.927	18.000	0.5444e-07
8167cond	1.0	053078	1146.927	19.000	0.4621e-07
8168cond	1.0	060578	1152.927	18.300	0.6415e-07
8169cond	1.0	061278	1159.927	20.000	0.5465e-07
8170cond	1.0	061978	1166.927	19.000	0.4826e-07
8171cond	1.0	062678	1173.927	19.000	0.5200e-07
8172cond	2.0	070578	1182.927	24.000	0.3104e-06
8173cond	2.0	071078	1187.927	19.000	0.1158e-06
8174cond	2.0	071478	1191.927	16.000	0.5313e-07
8175cond	2.0	071978	1196.927	18.000	0.3111e-06
8176cond	2.0	072478	1201.927	18.000	0.3589e-07
8177cond	2.0	073178	1208.927	22.000	0.1264e-06
8178cond	2.0	080778	1215.927	20.000	0.4395e-07
8179cond	2.0	081478	1222.927	22.000	0.5168e-07
8180cond	2.0	082178	1229.927	24.000	0.6750e-07
8181cond	2.0	082578	1233.927	16.000	0.5688e-07
8182cond	2.0	083078	1238.927	17.000	0.4053e-07
8183cond	2.0	090578	1244.927	16.000	0.3300e-07
8184cond	2.0	091178	1250.927	17.500	0.3983e-07
8185cond	2.0	091478	1253.927	14.200	0.4268e-07

(cont)

TABLE B-II. (cont)

8186cond	2.0	091978	1258.927	17.000	0.3806e-07
8187cond	2.0	092578	1264.927	19.000	0.4747e-07
8188cond	2.0	100278	1271.927	18.000	0.3706e-07
8189cond	2.0	100678	1275.927	17.000	0.4418e-07
8190cond	2.0	100878	1277.927	17.000	0.3765e-07
8191cond	2.0	101678	1285.927	18.000	0.3967e-07
8192cond	2.0	102378	1292.927	18.200	0.3995e-07
8193cond	2.0	102778	1296.927	18.000	0.4094e-07
8194cond	2.0	110178	1301.927	18.000	0.4344e-07
8195cond	2.0	110778	1307.927	20.000	0.3865e-07
8196cond	2.0	111378	1313.927	19.000	0.3989e-07
8197cond	2.0	111678	1316.927	17.500	0.9029e-07
8198cond	2.0	112178	1321.927	18.000	0.8056e-07
8199cond	2.0	112778	1327.927	17.000	0.3559e-07
8200cond	2.0	113078	1330.927	18.500	0.4584e-07
8201cond	2.0	120578	1335.927	19.000	0.4089e-07
8202cond	2.0	121178	1341.927	29.000	0.4931e-07
8203cond	1.0	121578	1345.927	17.500	0.8743e-07
8204cond	1.0	122178	1351.927	18.000	0.5611e-07
8205cond	1.0	122878	1358.927	19.000	0.5474e-07
8206cond	1.0	010379	1364.927	18.000	0.4400e-07
8207cond	1.0	011279	1373.927	18.000	0.9111e-07
8208cond	1.0	012279	1383.927	18.000	0.4983e-07
8209cond	1.0	013079	1391.927	18.000	0.3828e-07
8210cond	1.0	020979	1401.927	18.000	0.2328e-07
8211cond	1.0	022079	1412.927	18.500	0.2243e-07
8212cond	1.0	022779	1419.927	18.000	0.2600e-07
8213cond	1.0	030879	1428.927	18.000	0.2617e-07
8214cond	1.0	031979	1439.927	19.000	0.1905e-07
8215cond	1.0	032779	1447.927	18.000	0.2717e-07
8216cond	1.0	040579	1456.927	18.000	0.2561e-07
8217cond	1.0	041679	1467.927	19.000	0.2247e-07
8218cond	1.0	042379	1474.927	18.000	0.5039e-07
8219cond	1.0	050279	1483.927	18.000	0.3467e-07
8220cond	1.0	051179	1492.927	17.600	0.2875e-07
8221cond	1.0	052179	1502.927	18.500	0.2714e-07
8222cond	1.0	053079	1511.927	18.000	0.3056e-07
8223cond	1.0	060879	1520.927	18.000	0.2644e-07
8224cond	2.0	061879	1530.927	22.000	0.3736e-07
8225cond	2.0	062579	1537.927	19.000	0.4321e-07
8226cond	2.0	070279	1544.927	20.000	0.2665e-07
8227cond	2.0	070979	1551.927	20.000	0.1435e-06
8228cond	2.0	071679	1558.927	20.000	0.7850e-07
8229cond	2.0	072379	1565.927	20.000	0.1400e-06
8230cond	2.0	073079	1572.927	18.000	0.3178e-07
8231cond	2.0	080679	1579.927	18.000	0.2850e-07
8232cond	2.0	081379	1586.927	19.000	0.2626e-07
8233cond	2.0	082379	1596.927	18.400	0.2375e-07
8234cond	2.0	083179	1604.927	18.000	0.2417e-07
8235cond	2.0	090779	1611.927	18.000	0.3717e-07
8236cond	2.0	091479	1618.927	18.000	0.3589e-07
8237cond	2.0	092479	1628.927	19.400	0.3242e-07
8238cond	2.0	100179	1635.927	20.000	0.3845e-07
8239cond	2.0	100979	1643.927	19.000	0.4416e-07
8240cond	2.0	101679	1650.927	19.800	0.5859e-08
8241cond	2.0	102479	1658.927	18.500	0.4270e-07
8242cond	2.0	103179	1665.927	20.000	0.5850e-07
8243cond	2.0	110879	1673.927	19.000	0.4947e-07
8244cond	2.0	111579	1680.927	17.000	0.4706e-07
8245cond	2.0	112179	1686.927	16.000	0.4875e-07
8246cond	2.0	112979	1694.927	19.000	0.9895e-08
8247cond	2.0	120779	1702.927	18.500	0.5324e-07
8248cond	1.0	121479	1709.927	16.000	0.8688e-07
8249cond	1.0	122779	1722.927	18.000	0.5506e-07
8250cond	1.0	010780	1733.927	18.500	0.8378e-07

(cont)

TABLE B-II. (cont)

8251cond	1.0	011480	1740.927	18.000	0.6278e-07
8252cond	1.0	012580	1751.927	18.000	0.9056e-07
8253cond	1.0	020780	1764.927	18.000	0.5161e-07
8254cond	1.0	021580	1772.927	12.500	0.3120e-07
8255cond	1.0	022680	1783.927	18.000	0.2433e-07
8256cond	1.0	030780	1793.927	16.000	0.2181e-07
8257cond	1.0	031880	1804.927	18.000	0.2117e-07
8258cond	1.0	032880	1814.927	15.600	0.2115e-07
8259cond	1.0	040980	1826.927	18.000	0.2217e-07
8260cond	1.0	042180	1838.927	17.750	0.1780e-07
8261cond	1.0	050280	1849.927	18.200	0.2368e-07
8262cond	1.0	051380	1860.927	18.200	0.2099e-07
8263cond	1.0	052380	1870.927	14.500	0.1628e-07
8264cond	1.0	060380	1881.927	18.000	0.2356e-07
8265cond	2.0	061380	1891.927	16.000	0.1625e-07
8266cond	2.0	062380	1901.927	19.000	0.1937e-07
8267cond	2.0	070280	1910.927	18.500	0.2984e-07
8268cond	2.0	071180	1919.927	17.000	0.2441e-07
8269cond	2.0	071880	1926.927	14.800	0.2628e-07
8270cond	2.0	072580	1933.927	16.000	0.2569e-07
8271cond	2.0	080480	1943.927	18.000	0.2361e-07
8272cond	2.0	081280	1951.927	19.000	0.3258e-07
8273cond	2.0	082080	1959.927	18.000	0.3167e-07
8274cond	2.0	082880	1967.927	18.000	0.2867e-07
8275cond	2.0	090580	1975.927	18.000	0.3156e-07
8276cond	2.0	091280	1982.927	19.000	0.3584e-07
8277cond	2.0	091980	1989.927	17.000	0.3294e-07
8278cond	2.0	092680	1996.927	17.000	0.3435e-07
8279cond	2.0	100380	2003.927	17.800	0.3770e-07
8280cond	2.0	101080	2010.927	18.000	0.3694e-07
8281cond	2.0	101780	2017.927	18.000	0.3694e-07
8282cond	2.0	102480	2024.927	17.500	0.3931e-07
8283cond	2.0	103180	2031.927	18.000	0.3889e-07
8284cond	2.0	110780	2038.927	17.000	0.4406e-07
8285cond	2.0	111780	2048.927	18.000	0.3844e-07
8286cond	2.0	112580	2056.927	19.000	0.4395e-07
8287cond	2.0	120380	2064.927	18.500	0.5351e-07
8288cond	1.0	121180	2072.927	18.000	0.5044e-07
8289cond	3.0	121980	2080.927	14.200	0.4979e-07
8290cond	3.0	123180	2092.927	17.500	0.4789e-07
8291cond	3.0	011281	2104.927	19.500	0.5282e-07
8292cond	3.0	012381	2115.927	16.000	0.5988e-07
8293cond	3.0	020381	2126.927	18.500	0.5459e-07
8294cond	3.0	021781	2140.927	20.000	0.4145e-07
8295cond	3.0	030281	2153.927	21.000	0.5667e-07
8296cond	3.0	031381	2164.927	17.000	0.6059e-07
8297cond	3.0	032381	2174.927	18.000	0.4611e-07
8298cond	3.0	040681	2188.927	18.500	0.8541e-07
8299cond	3.0	041781	2199.927	17.500	0.1343e-06
8300cond	3.0	042981	2211.927	18.000	0.9167e-07
8301cond	3.0	051281	2224.927	19.000	0.9474e-07
8302cond	3.0	052681	2238.927	18.800	0.8351e-07
8303cond	3.0	060581	2248.927	15.000	0.1067e-06
8304cond	3.0	061281	2255.927	18.000	0.9556e-07
8305cond	4.0	062681	2269.927	19.400	0.8196e-07
8306cond	4.0	070281	2275.927	16.000	0.6938e-07
8307cond	4.0	070981	2282.927	19.000	0.8158e-07
8308cond	4.0	071481	2287.927	18.000	0.1556e-06
8309cond	4.0	071681	2289.927	20.500	0.1024e-06
8310cond	4.0	072081	2293.927	18.000	0.9611e-07
8311cond	4.0	072481	2297.927	14.000	0.7643e-07
8312cond	4.0	072781	2300.927	24.000	0.6500e-07
8313cond	4.0	072981	2302.927	18.000	0.9722e-07
8314cond	4.0	080381	2307.927	17.000	0.5941e-07
8315cond	4.0	080681	2310.927	16.000	0.6563e-07

(cont)

TABLE B-II. (cont)

8316cond	4.0	080781	2311.927	11.000	0.4818e-07
8317cond	4.0	081081	2314.927	24.000	0.1917e-06
8318cond	4.0	081481	2318.927	18.000	0.6944e-07
8319cond	4.0	081781	2321.927	18.000	0.3889e-07
8320cond	4.0	082081	2324.927	18.000	0.3833e-07
8321cond	4.0	082481	2328.927	20.000	0.4800e-07
8322cond	4.0	082781	2331.927	18.000	0.5278e-07
8323cond	4.0	090181	2336.927	18.000	0.4389e-07
8324cond	4.0	090481	2339.927	11.000	0.4455e-07
8325cond	4.0	091481	2349.927	28.000	0.4286e-07
8326cond	4.0	092181	2356.927	20.000	0.5250e-07
8327cond	4.0	092581	2360.927	14.000	0.3000e-07
8328cond	4.0	093081	2365.927	18.000	0.4111e-07
8329cond	4.0	100281	2367.927	12.600	0.2857e-07
8330cond	4.0	100581	2370.927	18.000	0.2111e-07
8331cond	4.0	100981	2374.927	11.300	0.2602e-07
8332cond	4.0	101681	2381.927	16.000	0.2625e-07
8333cond	4.0	102281	2387.927	19.000	0.2368e-07
8334cond	4.0	110281	2398.927	20.000	0.2100e-07
8335cond	4.0	111381	2409.927	18.000	0.6667e-08
8336cond	4.0	112081	2416.927	13.000	0.3000e-07
8337cond	4.0	113081	2426.927	18.000	0.4000e-07
8338cond	4.0	120881	2434.927	18.000	0.8278e-07

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