

Appendix C: Errata

PROTOCOL FOR HANDLING ERRATA IN LLNL ENVIRONMENTAL REPORTS

The primary form of publication for the LLNL site environmental annual report (SAER) is electronic, either on CD (compact disk) or on the Internet. The secondary form is hard copy, which is produced from the electronic copy. Hard copy is made available to the public at local libraries.

Because there are both publicly distributed and Internet versions of the report, the two versions must be fully equivalent, both in their original versions as first presented to the public, and as they are changed (noted as published errata) subsequent to the original publication.

In October 1998, LLNL developed a protocol for making post-publication revisions to the Internet versions of SAERs. The main criteria are that (1) the SAER home page must simply and clearly convey what revisions, if any, have been made to a particular report, and directly link to an errata information section; (2) the Internet version of the SAER must be accurately maintained; (3) each SAER accessible on the Internet at any time shall be the most current version of the report, incorporating all revisions; and (4) the content of the Internet and distributed versions of the SAER must be the same, in the sense that the published version plus its errata, if any, must provide the same information as the current (revised) Internet version.

Presently SAERs covering calendar years 1994 through 2002 can be accessed on the Internet at the address of the LLNL SAER homepage: <http://www.llnl.gov/saer>. Both the main volume and the data supplement volume of each individual report can be viewed in its most up-to-date form. A link to an errata section provides a complete record of post-publication changes that have been made.

RECORD OF CHANGES TO 2002 SAER

The following changes have been made to the Internet version of the main document.

- On page xi, the eleventh line from the bottom of the page (“Environmental Impact”) was deleted.
- On page EX-2, in line 4 of the second paragraph of the right-hand column, “responsions” was changed to “resuspension”.

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- On page EX-3, in the label for the right-hand axis in Figure EX-1, “Bqm³” was changed to “Bq/m³”.
- On page EX-4, in line 9 of the left-hand column, “1982” was changed to “1984”.
- On page 2-4, in line 15 of the the second paragraph of the left-hand column, “895 million L” was changed to “865 million L”.
- On page 2-5, in line 5 of the first paragraph in the right-hand column, “32 grams” was changed to “32 mCi (1.2×10^{-9} Bq)”.
- On page 2-9, in Table 2-3, the following changes were made in the “Livermore site” column on the row titled “Air.”
 - “Cold cleaners” was changed to “solvent cleaners”.
 - “Ultrasonic cleaners,” “degreasers,” “image tube fabrication,” and “plating tanks” were deleted.
- On page 8-44, in the left-hand column, the second “Environmental Impact” heading (below “Livermore Site Ground Water Project”) was deleted.
- On page 12-4, in line 5 of the second paragraph in the left-hand column, “0.646 ± 0.028 mSv (64.6 ± 2.8 mrem)” was changed to 0.571 ± 0.025 mSv (57.1 ± 2.5 mrem)”.
- On page 12-4, in the first paragraph of the right-hand column, the following numbers were changed.
 - “0.755 ± 0.025 mSv (75.5 ± 2.3 mrem)” was changed to “0.666 ± 0.021 mSv (66.6 ± 2.1 mrem)”.
 - “0.751 ± 0.068 mSv (75.1 ± 6.8 mrem)” was changed to “0.672 ± 0.047 mSv (67.2 ± 4.7 mrem)”.
 - “0.679 ± 0.060 mSv (67.9 ± 6.0 mrem)” was changed to “0.597 ± 0.055 mSv (59.7 ± 5.5 mrem)”
- On page 12-5, the end of the second paragraph was changed to “... show a similar trend although the data does not suggest a serious impact on either health or the environment.” (from “... show a similar trend. Although the data does not suggest a serious impact on either health or the environment, it falls within the action level of investigation. There are no plausible explanations at this time.”)
- On page 12-6, Table 12-1 and Figure 12-4 were replaced.
- On page 12-7, Figure 12-5 was replaced.
- On page AC-1, the acronym and definition “CEI Compliance evaluation inspection” was added.

The following changes have been made to the Internet version of the Data Supplement.

- On pages 167–170, Tables 12-1 through 12-4 were replaced.

Table 12-1. Summary of dose calculations for gamma-monitoring locations (mSv)^(a) at all LLNL sites, 2002

Quarter	Location									
	Livermore site		Livermore Valley		Site 300		Tracy		Near Site 300	
	Mean	2 SE ^(b)	Mean	2 SE ^(b)	Mean	2 SE ^(b)	Mean	2 SE ^(b)	Mean	2 SE ^(b)
First	0.134 ± 0.006		0.134 ± 0.005		0.152 ± 0.08		0.140 ± 0.033		0.157 ± 0.031	
Second	0.145 ± 0.006		0.144 ± 0.007		0.164 ± 0.011		0.141 ± 0.035		0.173 ± 0.018	
Third	0.144 ± 0.007		0.145 ± 0.008		0.178 ± 0.09		0.145 ± 0.024		0.171 ± 0.028	
Fourth	0.148 ± 0.006		0.147 ± 0.006		0.172 ± 0.014		0.171 ± 0.010		0.171 ± 0.010	
Annual dose ^(c)	0.571 ± 0.025		0.570 ± 0.013		0.666 ± 0.021		0.597 ± 0.055		0.672 ± 0.047	

a 1 mSv = 100 mrem

b SE = Standard Error (standard deviation of the mean)

c Annual dose is reported as the summation of the quarterly doses. The reported error is the root mean square of the quarterly errors.

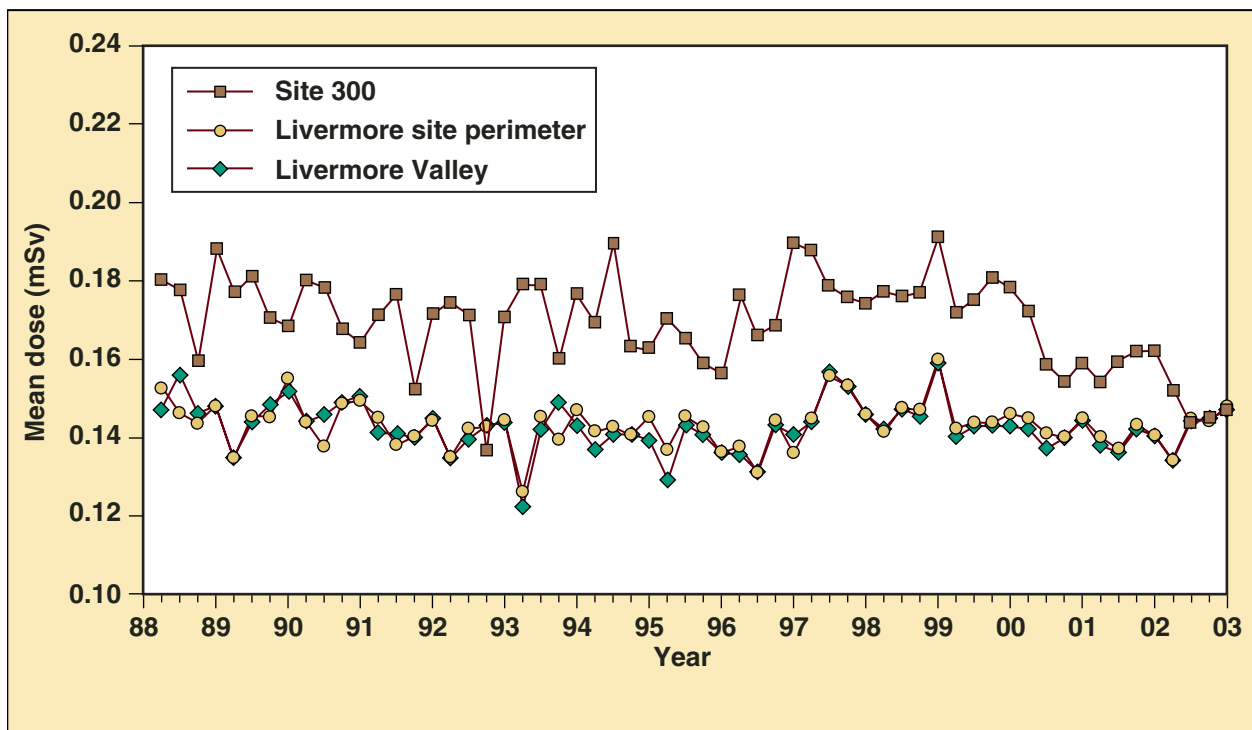


Figure 12-4. Quarterly gamma dose measurements at the Livermore site perimeter, Livermore Valley, and Site 300, 1998–2002

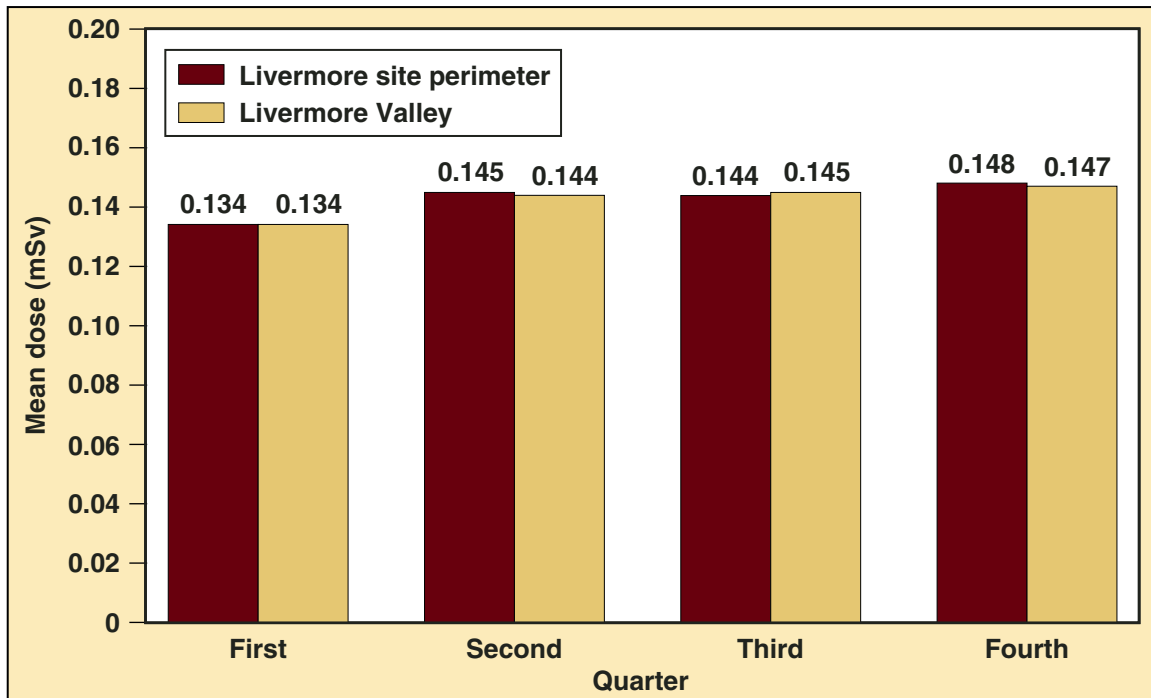


Figure 12-5. Comparison of the 2002 LLNL site perimeter and the Livermore Valley TLD quarterly mean dose (mSv)

Table 12-1. Calculated dose from TLD environmental radiation measurement, Livermore site perimeter, 2002

Location ^(a)	Quarterly Dose (mSv) ^(b)				Annual Dose ^(c) (mSv)
	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	
L-001-TD	0.133 ± 0.013	0.154 ± 0.009	0.143 ± 0.005	0.141 ± 0.001	0.571 ± 0.017
L-004-TD	0.147 ± 0.007	0.148 ± 0.007	0.160 ± 0.003	0.163 ± 0.012	0.618 ± 0.016
L-005-TD	0.141 ± 0.008	0.155 ± 0.009	0.157 ± 0.005	0.156 ± 0.009	0.609 ± 0.016
L-006-TD	0.157 ± 0.008	0.165 ± 0.002	0.159 ± 0.004	0.168 ± 0.011	0.649 ± 0.014
L-011-TD	0.116 ± 0.004	0.128 ± 0.005	0.120 ± 0.010	0.124 ± 0.006	0.488 ± 0.013
L-014-TD	0.125 ± 0.008	0.135 ± 0.002	0.136 ± 0.003	0.142 ± 0.010	0.538 ± 0.013
L-016-TD	0.131 ± 0.008	0.138 ± 0.007	0.143 ± 0.005	0.143 ± 0.015	0.555 ± 0.019
L-042-TD	0.132 ± 0.009	0.147 ± 0.012	0.144 ± 0.006	0.152 ± 0.008	0.575 ± 0.018
L-043-TD	0.133 ± 0.010	0.140 ± 0.007	0.131 ± 0.004	0.142 ± 0.009	0.546 ± 0.016
L-047-TD	0.119 ± 0.015	0.128 ± 0.007	0.127 ± 0.012	0.135 ± 0.004	0.509 ± 0.021
L-052-TD	0.131 ± 0.008	0.146 ± 0.008	0.143 ± 0.005	0.145 ± 0.010	0.565 ± 0.016
L-056-TD	0.134 ± 0.008	0.152 ± 0.001	0.153 ± 0.005	0.154 ± 0.006	0.593 ± 0.011
L-068-TD	0.146 ± 0.013	0.148 ± 0.005	0.157 ± 0.003	0.155 ± 0.004	0.606 ± 0.015
L-069-TD	0.130 ± 0.005	0.143 ± 0.003	0.138 ± 0.004	0.149 ± 0.012	0.560 ± 0.014
Mean^(d)	0.134 ± 0.006	0.145 ± 0.006	0.144 ± 0.007	0.148 ± 0.006	0.571 ± 0.025

Note: Measurement represents the TLD absorbed dose in mR converted to mSv.

a See Figure 12-1 in the main volume for locations.

b Measurement uncertainty is reported as $\pm 2\sigma$ of the data.

c Uncertainty is reported as the root mean square of the quarterly means.

d Uncertainty associated with the quarterly means is reported as two standard errors of the location data.

Table 12-2. Calculated dose from TLD environmental radiation measurement, Livermore Valley, 2002

Location ^(a)	Quarterly Dose (mSv) ^(b)				Annual Dose ^(c) (mSv)
	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	
V-018-TD	0.110 ± 0.007	0.119 ± 0.005	0.113 ± 0.004	0.121 ± 0.001	0.463 ± 0.010
V-019-TD	0.129 ± 0.004	0.135 ± 0.003	0.136 ± 0.010	0.134 ± 0.002	0.534 ± 0.011
V-022-TD	0.142 ± 0.010	0.160 ± 0.008	0.154 ± 0.019	0.160 ± 0.007	0.616 ± 0.024
V-024-TD	0.139 ± 0.003	— ^(d)	0.150 ± 0.008	0.161 ± 0.005	0.600 ± 0.010
V-027-TD	0.126 ± 0.009	0.133 ± 0.007	0.136 ± 0.003	0.137 ± 0.008	0.532 ± 0.014
V-028-TD	0.135 ± 0.014	0.144 ± 0.005	0.141 ± 0.010	0.149 ± 0.014	0.569 ± 0.023
V-030-TD	0.135 ± 0.008	0.142 ± 0.008	0.143 ± 0.004	0.145 ± 0.015	0.565 ± 0.019
V-032-TD	0.131 ± 0.004	0.150 ± 0.007	0.180 ± 0.127	0.142 ± 0.005	0.603 ± 0.127
V-033-TD	0.148 ± 0.012	0.150 ± 0.003	0.155 ± 0.001	0.145 ± 0.008	0.598 ± 0.015
V-035-TD	0.140 ± 0.007	0.135 ± 0.005	0.138 ± 0.008	0.143 ± 0.005	0.556 ± 0.013
V-037-TD	0.144 ± 0.013	0.147 ± 0.006	0.158 ± 0.005	0.143 ± 0.003	0.592 ± 0.015
V-045-TD	0.130 ± 0.012	0.143 ± 0.005	0.147 ± 0.005	0.147 ± 0.003	0.567 ± 0.014
V-057-TD	0.144 ± 0.002	0.154 ± 0.012	0.161 ± 0.010	0.160 ± 0.002	0.619 ± 0.016
V-060-TD	0.147 ± 0.011	0.150 ± 0.007	0.146 ± 0.008	0.152 ± 0.005	0.595 ± 0.016
V-066-TD	0.128 ± 0.009	— ^(d)	0.149 ± 0.003	0.149 ± 0.002	0.568 ± 0.010
V-070-TD	0.130 ± 0.006	0.141 ± 0.006	0.136 ± 0.006	0.152 ± 0.010	0.559 ± 0.014
V-072-TD	0.157 ± 0.006	0.178 ± 0.011	0.176 ± 0.029	0.174 ± 0.006	0.685 ± 0.032
V-074-TD	0.127 ± 0.007	0.142 ± 0.006	0.125 ± 0.003	— ^(d)	0.525 ± 0.010
V-075-TD	0.110 ± 0.007	0.117 ± 0.006	0.113 ± 0.011	0.124 ± 0.009	0.464 ± 0.017
V-076-TD	0.124 ± 0.007	0.124 ± 0.014	0.122 ± 0.002	0.133 ± 0.007	0.503 ± 0.017
V-077-TD	0.129 ± 0.005	0.135 ± 0.004	0.140 ± 0.005	0.150 ± 0.017	0.554 ± 0.019
V-122-TD	0.146 ± 0.012	0.178 ± 0.010	0.172 ± 0.008	0.170 ± 0.003	0.666 ± 0.018
Mean^(e)	0.134 ± 0.005	0.144 ± 0.007	0.145 ± 0.008	0.147 ± 0.006	0.570 ± 0.013

Note: Measurement represents the TLD absorbed dose in mR converted to mSv.

a See Figure 12-2 in the main volume for locations.

b Measurement uncertainty is reported as $\pm 2\sigma$ of the data.

c Annual dose is reported as 4 times the available quarterly mean data. The uncertainty is reported as the root mean square of the quarterly errors reported.

d Data are not available due to missing or damaged TLD.

e Uncertainty associated with the quarterly means is reported as two standard errors of the location data.

Table 12-3. Calculated dose from TLD environmental radiation measurement, Site 300 perimeter, 2002

Location ^(a)	Quarterly Dose (mSv) ^(b)				Annual Dose ^(c) (mSv)
	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	
3-078-TD	0.143 ± 0.003	0.149 ± 0.011	0.149 ± 0.010	0.160 ± 0.007	0.601 ± 0.017
3-081-TD	0.171 ± 0.006	0.181 ± 0.015	0.182 ± 0.009	— ^(d)	0.712 ± 0.018
3-082-TD	— ^(e)	0.174 ± 0.002	0.175 ± 0.003	0.168 ± 0.001	0.689 ± 0.004
3-085-TD	0.151 ± 0.010	0.167 ± 0.006	0.197 ± 0.009	0.132 ± 0.002	0.647 ± 0.015
3-086-TD	0.154 ± 0.002	0.174 ± 0.003	0.178 ± 0.014	0.175 ± 0.012	0.681 ± 0.019
3-088-TD	0.158 ± 0.007	0.166 ± 0.005	0.172 ± 0.011	0.177 ± 0.008	0.673 ± 0.016
3-089-TD	0.163 ± 0.007	0.178 ± 0.006	0.178 ± 0.006	0.179 ± 0.006	0.698 ± 0.013
3-091-TD	0.162 ± 0.006	0.172 ± 0.007	0.193 ± 0.012	0.183 ± 0.010	0.710 ± 0.018
3-121-TD	0.171 ± 0.002	0.202 ± 0.001	0.182 ± 0.006	0.202 ± 0.008	0.757 ± 0.010
3-123-TD	0.132 ± 0.004	0.145 ± 0.002	— ^(d)	— ^(d)	0.554 ± 0.004
3-124-TD	0.141 ± 0.010	0.150 ± 0.002	— ^(d)	— ^(d)	0.582 ± 0.010
3-125-TD	— ^(e)	0.137 ± 0.010	— ^(d)	— ^(d)	— ^(f) — ^(g)
3-126-TD	0.121 ± 0.018	0.139 ± 0.007	— ^(d)	— ^(d)	0.520 ± 0.019
Mean^(h)	0.152 ± 0.008	0.164 ± 0.011	0.178 ± 0.009	0.172 ± 0.014	0.666 ± 0.021

Note: Measurement represents the TLD absorbed dose in mR converted to mSv.

a See Figure 12-3 in the main volume for locations.

b Measurement uncertainty is reported as ±2σ of the data.

c Annual dose is reported as 4 times the available quarterly mean data. The uncertainty is reported as the root mean square of the quarterly errors reported.

d Location removed

e Data are not available due to missing or damaged TLD.

f Insufficient number of samples to calculate annual dose.

g Insufficient number of samples to calculate standard error

h Uncertainty associated with the quarterly means is reported as two standard errors of the location data.

Table 12-4. Calculated dose from TLD environmental radiation measurement, Tracy and other off-site locations in the vicinity of Site 300, 2002

Location ^(a)	Quarterly Dose (mSv) ^(b)				Annual Dose ^(c) (mSv)
	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	
3-092-TD	0.156 ± 0.018	0.158 ± 0.005	0.157 ± 0.007	0.176 ± 0.008	0.647 ± 0.021
3-093-TD	0.123 ± 0.003	0.123 ± 0.010	0.133 ± 0.004	0.166 ± 0.013	0.545 ± 0.017
Mean^(d)	0.140 ± 0.033	0.141 ± 0.035	0.145 ± 0.024	0.171 ± 0.010	0.597 ± 0.055
3-090-TD	0.172 ± 0.011	0.182 ± 0.005	0.185 ± 0.007	0.176 ± 0.008	0.715 ± 0.016
3-099-TD	0.141 ± 0.012	0.164 ± 0.010	0.157 ± 0.004	0.166 ± 0.013	0.628 ± 0.021
Mean^(d)	0.157 ± 0.031	0.173 ± 0.018	0.171 ± 0.028	0.171 ± 0.010	0.672 ± 0.047

Note: Measurement represents the TLD absorbed dose in mR converted to mSv.

a See Figure 12-3 in the main volume for locations.

b Measurement uncertainty is reported as ±2σ of the data.

c Annual dose is reported as 4 times the available quarterly mean data. The uncertainty is reported as the root mean square of the quarterly errors reported.

d Uncertainty associated with the quarterly means is reported as two standard errors of the location data.