



KERR-MCGEE CORPORATION

KERR-MCGEE CENTER • OKLAHOMA CITY, OKLAHOMA 73125

ENVIRONMENT AND HEALTH MANAGEMENT DIVISION

December 2, 1982

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Mr. William A. Nixon
Uranium Process Licensing Section
Uranium Fuel Licensing Branch
Division of Fuel Cycle & Material Safety
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Re: License STA 583
Docket No. 40-2061

Dear Mr. Nixon:

In accordance with requests from you and Mr. Ping Chee of Argonne National Laboratory, additional data relative to the West Chicago facility is attached.

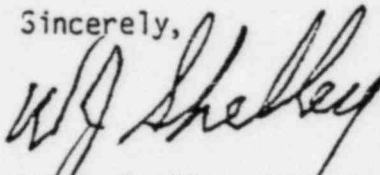
1. Surface water samples analyses providing Gross α and Gross β values for all sampling sites are contained on Table 1. Table 2 contains isotopic analyses for those sample analyses 15 pCi/l Gross α . Sample locations are identified in Figure 1.
2. Airborne exposure as measured by TH Nat MPC Hours at West Chicago during 1981 and the three quarters of 1982 are attached.
3. The personal dosimetry report of August 15 to September 14, 1982 as measured by R. S. Landauer, Jr. & Co. showing total cumulative, monthly, quarterly and year to date exposures is attached. Exposure histories prior to employment at West Chicago are contained in Table 3.

8303220442 830328
PDR ADOCK 04002061
C PDR

Mr. William Nixon
December 2, 1982
page two

If you have questions, please call me.

Sincerely,

A handwritten signature in cursive script, appearing to read "W.J. Shelley".

W.J. Shelley, Vice-President
Nuclear Licensing & Regulation

WJS/TLB/pd

Attachments

cc: I. L. Denny
J. B. Rhinelanders
J. C. Berghoff

SITE IDENTIFICATION

Date	Gross α Gross β	1	2	3	4	5	6	7	8	9	10	11	12	13	14
11/13/81		(1)													
12/1/81		<10 <20		<10 <20	<10 <20	39 <20									
12/21/81							<10 <20	<10 <20	<10 <20	<10 <20	(4)	<10 <20	13 <20		
2/22/82		<10 <20	<10 <20	<10 <20	<10 <20	<10 <20	17 <20	<10 <20	<10 <20	<10 <20	<10 <20	<10 <20	<10 <20		
3/15/82		(3)	11 <20	23 <20	53 <20	84 <20	<10 <20	<10 <20	(4)	(4)	<10 <20	<10 <20	<10 <20		
3/16/82														170 (5)	
3/19/82		<10 <20	<10 <20	11 <20	11 <20	49 <20	<10 <20			<10 <20	<10 <20			32	
3/30/82		<10 <20	<10 <20	<10 <20	<10 <20	40 <20	<10 <20			<10 <20					
4/2/82		(3)	<10 <20	<10 <20	<10 <20	73 <20	<10 <20			<10 <20					
4/3/82		<10 <20	<10 <20	<10 <20	39 <20	54 <20	<10 <20			<10 <20					
4/14/82		<10 <20	<10 <20	14 <20	<10 <20	20 <20	14 <20			<10 <20				105 (5)	
4/28/82		(3)	<10 <20	13 <20	64 <20	86 <20	11 <20	<10 <20	<10 <20	46 <20	12 <20	<10 <20	10 <20	64 (5)	
5/14/82		(3)	<10 <20	<10 <20	47 <20	63 <20	<10 <20	<10 <20	<10 <20	29 <20	<10 <20	<10 <20	14 <20	20	
5/24/82		10 <20	11 <20	<10 <20	<10 <20	41 <20	<10 <20			12 <20					
5/29/82		13 <20	13 <20	11 <20	14 <20	51 <20	13 <20			13 <20					
6/15/82		14 <20	<10 <20	13 <20	21 <20	56 <20	11 <20	131 <20	<10 <20	20 <20	14 <20	14 <20	13 <20		
6/28/82		<10 <20	11 <20	12 <20	25 <20	47 <20	<10 <20			21 <20					
7/7/82		18 <20	<10 <20	<10 <20	31 <20	83 <20	<10 <20			<10 <20				70 (5)	
7/15/82		21 <20	<10 <20	<10 <20	48 <20	80 <20	<10 <20	<10 <20	<10 <20	33 <20	<10 <20	<10 <20	<10 <20		
7/14/82		33 <20	11 <20	15 <20	32 <20	84 <20	11 <20			14 <20				51 (5)	
7/22/82		18 <20	<10 <20	<10 <20	18 <20	30 <20	<10 <20			<10 <20				29 (5)	
7/29/82														24 (5)	

Notes:

1. Spaces marked (-) indicate a sample was not collected.
2. Blank spaces indicate analytical results are not yet available.
3. Insufficient water to collect sample.
4. Sample lost in shipment.
5. An overflow of the Bldg. 14 sump was observed into the City's storm sewer on this date. Sample collected in sump, not from overflow.

Kerr-McGee Chemical Corporation
 West Chicago, Illinois Facility
 Surface Water Discharge Sampling Data
 Gross α and β (pCi/l)

Date	Gross α	Gross β	1	2	3	4	5	6	7	8	9	10	11	12	13	14
7/28/82			38 <20	<10 <20	<10 <20	39 <20	80 <20	<10 <20	-	-	41 <20	-	-	-	-	<10 <20
8/4/82			<10 <20	<10 <20	<10 <20	(2) <10 <20	19 <20	<10 <20	-	-	78 <20	-	-	-	-	<10 <20
8/5/82			<10 <20	<10 <20	<10 <20	<10 <20	12 <20	<10 <20	-	-	<10 <20	-	-	-	-	<10 <20
8/17/82			-	-	-	-	-	<10 <20	<10 <20	<10 <20	33 <20	<10 <20	<10 <20	<10 <12	-	<10 <20
9/15/82			-	-	-	-	-	<10 <20	<10 <20	<10 <20	14 <20	<10 <20	<10 <20	<10 <20	-	<10 <20
10/11/82			(3)	-	-	-	(3)	-	-	-	-	-	-	-	-	-
10/18/82			-	-	-	-	-	-	-	-	-	-	-	-	-	-
10/20/82			(3)	-	-	-	(3)	-	-	-	-	-	-	-	-	-
11/1/82			-	-	-	-	(3)	-	-	-	-	-	-	-	-	-
11/2/82			-	-	-	-	(3)	-	-	-	-	-	-	-	-	-
11/9/82			-	-	-	-	(3)	-	-	-	-	-	-	-	-	-

Table 2
 Kerr-McGee Chemical Corporation
 West Chicago, Illinois Facility
 Surface Water Discharge Sampling Data
 Isotopic Analyses

Site No.	Date	Gross α (pCi/l)	Gross β (pCi/l)	Ra-224 _s (pCi/l)	Ra-226 _s (pCi/l)	Th-230 (pCi/l)	Th-232 (pCi/l)	U-238 (mg/l)
9	11/13/91	22	<20	0.02 ±0.05	0.17 ±0.04	0.040 ±0.011	0.003 ±0.004	0.02
5	12/1/91	39	<20	0.12 ±0.03	0.20 ±0.02	0.051 ±0.014	0.008 ±0.006	0.06
6	2/22/92	17	<20	0.02 ±0.08	0.24 ±0.10	0.019 ±0.009	0.003 ±0.005	0.001
3	3/15/92	23	<20	2.0 ±0.2	0.87 ±0.14	0.090 ±0.020	0.016 ±0.002	0.007
4	3/15/92	53	<20	0.097 ±0.061	0.44 ±0.07	0.043 ±0.014	0.004 ±0.004	0.07
5	3/15/92	84	<20	0.023 ±0.048	0.032 ±0.050	0.049 ±0.013	0.009 ±0.006	0.12
13	3/14/92	170	32	0.45 ±0.23	1.48 ±0.25	0.049 ±0.015	0.004 ±0.005	0.18
5	3/19/92	49	<20	0.13 ±0.08	0.05 ±0.08	0.068 ±0.017	0.004 ±0.006	0.07
5	3/30/92	40	<20	0.25 ±0.02	0.06 ±0.02	0.023 ±0.013	0.006 ±0.008	0.077
5	4/2/92	73	<20	0.00 ±0.01	0.02 ±0.01	0.031 ±0.011	0.007 ±0.008	0.11
9	4/2/92	29	<20	0.14 ±0.11	0.03 ±0.13	0.111 ±0.019	0.003 ±0.004	0.04
	4/3/92	39	<20	0.08 ±0.05	0.22 ±0.07	0.027 ±0.013	0.011 ±0.009	0.06
5	4/3/92	54	<20	0.03 ±0.02	0.18 ±0.03	0.019 ±0.008	0.006 ±0.005	0.08
13	4/3/92	105	35	8.54 ±0.41	1.31 ±0.37	0.041 ±0.011	0.009 ±0.006	0.06
5	4/14/92	20	20	0.11 ±0.05	0.08 ±0.07	0.023 ±0.009	0.003 ±0.003	0.04
9	4/14/92	26	<20	0.08 ±0.04	0.03 ±0.04	0.11 ±0.006	0.006 ±0.005	0.004
13	4/14/92	64	20	2.83 ±0.22	0.78 ±0.22	0.041 ±0.015	0.008 ±0.007	0.03
4	4/23/92	66	<20	0.26 ±0.27	0.29 ±0.35	0.035 ±0.012	0.008 ±0.007	0.11
5	4/23/92	86	<20	0.02 ±0.01	0.02 ±0.01	0.028 ±0.011	0.009 ±0.006	0.11
9	4/23/92	46	<20	0.09 ±0.05	0.05 ±0.06	0.018 ±0.009	0.003 ±0.003	0.05
4	5/14/92	67	<20	0.00 ±0.09	0.51 ±0.06	0.02 ±0.01	0.13 ±0.025	0.07
5	5/14/92	63	<20	0.13 ±0.06	0.04 ±0.07	0.023 ±0.009	0.009 ±0.006	0.07
9	5/14/92	29	<20	0.00 ±0.06	0.10 ±0.05	0.25 ±0.10	0.007 ±0.006	0.04
5	5/20/92	61	<20	0.14 ±0.01	0.01 ±0.01	0.035 ±0.016	0.006 ±0.006	0.07
5	5/27/92	51	<20	0.12 ±0.01	0.25 ±0.01	0.032 ±0.014	0.016 ±0.011	0.09
4	6/15/92	21	<20	0.13 ±0.06	0.18 ±0.03	0.036 ±0.012	0.015 ±0.013	0.02
5	6/15/92	56	<20	0.08 ±0.05	0.04 ±0.07	0.047 ±0.014	0.004 ±0.004	0.11

Table 2 (Cont.)

Site No.	Date	Gross α (pCi/l)	Gross β (pCi/l)	Ra-224 _s (pCi/l)	Ra-226 _s (pCi/l)	Th-230 (pCi/l)	Th-232 (pCi/l)	U-238 (mg/l)
9	6/15/82	20	<20	0.034 ±0.01	0.047 ±0.01	0.028 ±0.013	0.004 ±0.004	0.02
4	6/23/82	25	<20	0.3 ±0.04	0.67 ±0.05	0.037 ±0.018	0.007 ±0.010	0.02
5	6/23/82	67	<20	0.2 ±0.05	0.02 ±0.04	0.025 ±0.009	0.013 ±0.006	0.09
9	6/28/82	21	<20	0.00 ±0.18	0.25 ±0.13	0.025 ±0.012	0.009 ±0.008	0.03
1	7/7/82	18	<20	1.49 ±0.70	0.37 ±0.59	0.053 ±0.046	0.027 ±0.027	0.0004
4	7/7/82	31	<20	0.05 ±0.05	0.53 ±0.07	0.012 ±0.007	0.003 ±0.004	0.04
5	7/7/82	83	<20	0.10 ±0.10	0.15 ±0.12	0.017 ±0.008	0.003 ±0.003	0.13
13	7/7/82	70	28	1.81 ±0.16	0.91 ±0.17	0.046 ±0.015	0.005 ±0.006	0.06
1	7/15/82	21	<20	2.11 ±0.22	0.67 ±0.19	0.022 ±0.011	0.013 ±0.009	0.0009
4	7/15/82	48	<20	0.14 ±0.15	0.79 ±0.17	0.049 ±0.022	0.008 ±0.008	0.06
5	7/15/82	80	<20	0.15 ±0.03	0.08 ±0.03	0.040 ±0.011	0.007 ±0.007	0.13
7	7/15/82	33	<20	0.33 ±0.14	0.05 ±0.12	0.027 ±0.009	0.003 ±0.004	0.04
1	7/19/82	33	<20	2.83 ±0.76	0.72 ±0.65	0.035 ±0.017	0.009 ±0.007	0.0009
4	7/19/82	32	<20	0.00 ±0.00	0.08 ±0.02	0.026 ±0.015	0.006 ±0.006	0.04
5	7/19/82	84	<20	0.011 ±0.026	0.05 ±0.028	0.022 ±0.015	0.007 ±0.007	0.14
9	7/19/82	14	<20	0.16 ±0.03	0.16 ±0.02	0.053 ±0.013	0.009 ±0.006	0.03
13	7/19/82	51	<20	4.27 ±0.56	2.05 ±0.6	0.014 ±0.006	0.003 ±0.003	0.03
1	7/22/82	18	<20	3.13 ±0.4	0.91 ±0.44	0.024 ±0.011	0.004 ±0.004	<0.002
4	7/22/82	18	<20	0.24 ±0.22	0.56 ±0.28	0.029 ±0.012	0.012 ±0.008	0.01
5	7/22/82	30	<20	0.05 ±0.21	0.06 ±0.28	0.050 ±0.017	0.005 ±0.005	0.07
13	7/22/82	29	<20	3.31 ±0.14	0.41 ±0.17	0.038 ±0.014	0.013 ±0.008	0.009
13	7/27/82	26	<20	0.54 ±0.12	0.97 ±0.14	0.016 ±0.007	0.003 ±0.004	0.008
1	7/23/82	38	<20	3.97 ±1.93	2.45 ±2.24	0.020 ±0.013	0.006 ±0.009	0.003
4	7/23/82	39	<20	0.08 ±0.09	0.59 ±0.13	0.036 ±0.011	0.001 ±0.001	0.06
5	7/29/82	80	<20	0.06 ±0.03	0.04 ±0.02	0.022 ±0.008	0.003 ±0.003	0.11
9	7/29/82	41	<20	0.17 ±0.10	0.15 ±0.12	0.028 ±0.010	0.006 ±0.005	0.04
5	7/4/82	19	<20	0.11 ±0.007	0.03 ±0.005	0.027 ±0.009	0.009 ±0.006	0.02

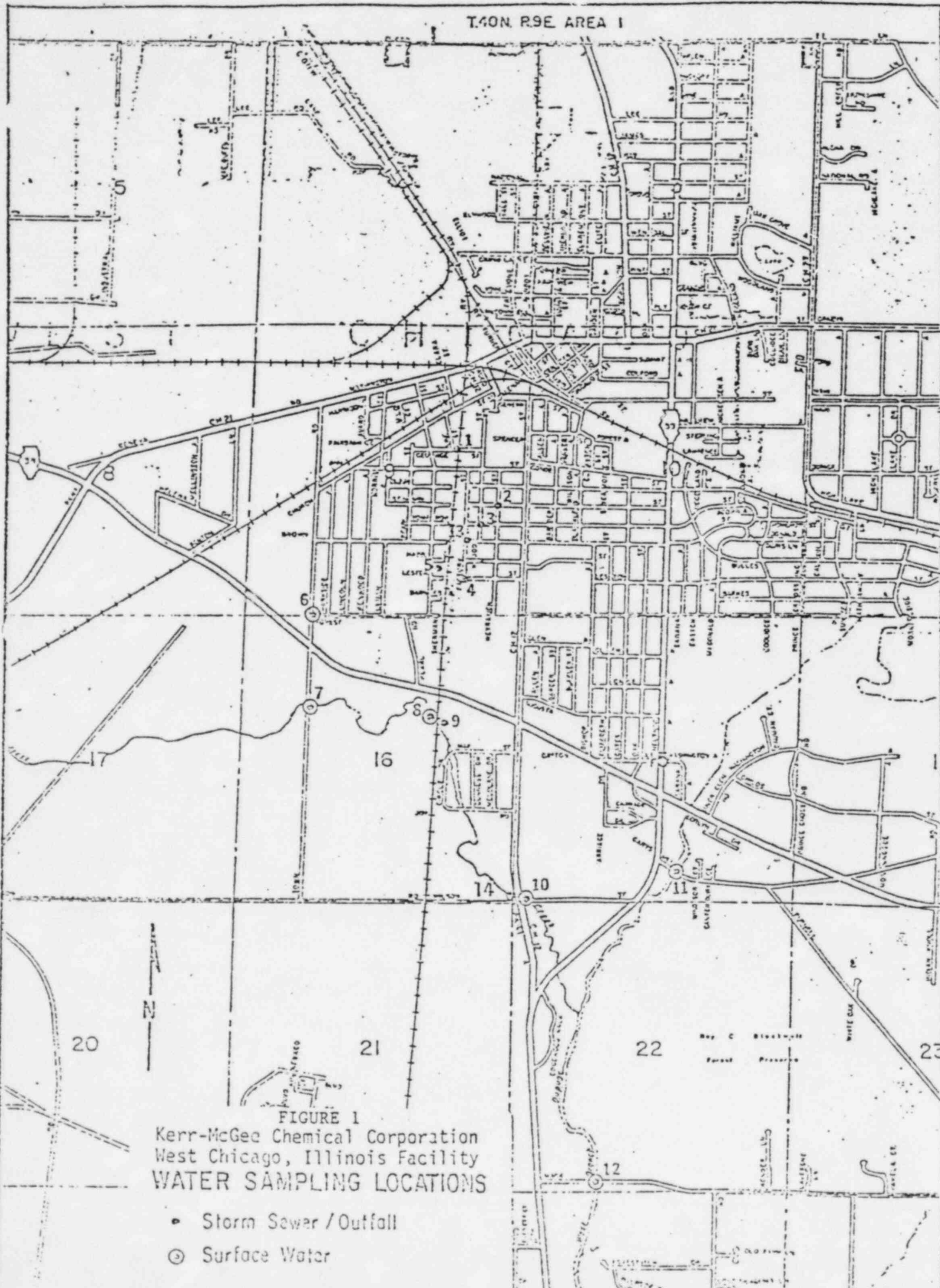


FIGURE 1
Kerr-McGee Chemical Corporation
West Chicago, Illinois Facility
WATER SAMPLING LOCATIONS

- Storm Sewer / Outfall
- ⊙ Surface Water

QUARTERLY MPC HOURS
WEST CHICAGO FACILITY

YEAR 1982

WORKER	BADGE #	SOCIAL SEC. #	MPC HOURS				TOTAL
			1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	
	951		2.02	3.30	4.66		
	958		1.42	11.09	7.10		
	974		3.11	12.92	8.10		
	978		0.12	1.39	7.53		
	979		3.08	7.75	10.72		
	980		6.59	36.49	8.61		
	984		—	—	3.91		
	985		1.56	6.35	7.70		
	995		—	10.37	8.39		
	996		—	5.60	4.83		
	998		—	7.14	0.96		
	1002		—	2.91	4.68		
	969		—	.14	—		
	981		—	.20	—		
	964		—	.16	—		
	* 973		11.01	8.47	—		

Y. Technical

KLDR MCGEE CHEM CORP
 ATTN SCOTT MUNSON
 790 FACTORY ST
 WEST CHICAGO IL 60185

1837

1 MONTH F H1025 10/04/82 9/24/82 6 WORK DAYS 2 20 12

Landauer

R. S. Landauer, Jr. & Co.
 Glenwood Science Park
 Glenwood, Illinois 60425
 Telephone (312)755-7000

RADIATION DOSIMETRY REPORT

a company

PARTICIPANT NUMBER	NAME	SOCIAL SECURITY NUMBER	EXPOSURE PERIOD	EXPOSURE TO BADGE (IN MILLIREMS) FOR THE PERIOD OR PERIODS INDICATED BELOW					ENERGY RANGE	CUMULATIVE TOTALS IN MILLIREMS			ADJUSTMENT FACTOR	UPPER LIMIT ESTIMATED DOSE IN MILLIREMS	BIRTH DATE	AGE	SEX	RACE	HAIR	EYES	
				GAMMA X-RAY	BETA	THERMAL NEUTRON	FAST NEUTRON	TOTAL		CALENDAR QUARTER	YEAR TO DATE	PERMANENT									
00000	CONTROL																				
00927																					
00928	SPARE																				
00929	SPARE																				
00930	SPARE																				
00931	SPARE																				
00932	SPARE																				
00933	SPARE																				
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00958																					

EXPOSURE TYPE CONTROLLED
 CONTROLLED
 CONTROLLED

EXPOSURE PERIOD

EXPOSURE TO BADGE

EXPOSURE TO RADIATION

ACCOUNT NO
1037

PERIOD
1 MONTH F M1025

INCIDENT DATE
10/04/62

WORKING TIME
6 WORK DAYS

NO WORKS
2

NO WORKS
20

NO WORKS
1200

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Glenwood Science Park
Glenwood, Illinois 60425
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Landauer
a company

RADIATION DOSIMETRY REPORT

PARTICIPANT NO	NAME	SOCIAL SECURITY NUMBER	EXPOSURE	EXPOSURE TO BADGE (IN MILLIREMS) FOR THE PERIOD OR PERIODS INDICATED BELOW			ENERGY RANGE	CUMULATIVE TOTALS - IN MILLIREMS		WORKING TIME	BIRTH DATE	NO WORKS	NO WORKS	NO WORKS
				GAMMA X-RAY	BETA	THERMAL NEUTRON		FAST NEUTRON	YEAR-TO DATE					
00963			10/3/502					1962	20		23	2	20	1200
00964									20		23	2	20	1200
00969									2110		24	2	20	1200
00971											21	2	20	1200
00976									30		21	2	20	1200
00975									630		22	2	20	1200
00970									39370		22	2	20	1200
00979									49970		21	2	20	1200
00980									64910		16	2	20	1200
00981									381304		17	2	20	1200
00982									49970		16	2	20	1200
00984									49970		16	2	20	1200
00985									49970		16	2	20	1200
00987									49970		16	2	20	1200
00988									49970		16	2	20	1200
00989									49970		16	2	20	1200
00990									49970		16	2	20	1200
00991									49970		16	2	20	1200
00992									49970		16	2	20	1200
00993									49970		16	2	20	1200
00994									49970		16	2	20	1200
00995									49970		16	2	20	1200
00996									49970		16	2	20	1200
00997									49970		16	2	20	1200
00998									49970		16	2	20	1200
00999									49970		16	2	20	1200
01000									49970		16	2	20	1200

10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

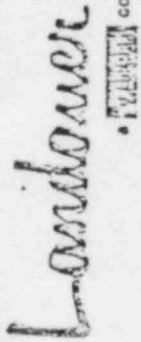
ALBERT NO. 1837

EMPLOYEE NO. 100402

1 MONTH F M1025 100402

WORKING HRS 6 WORK DAYS 2 23 1200 3

NO LINES 23 1200 3



R. S. Landauer, Jr. & Co.
Glenwood Science Park
Glenwood, Illinois 60125
Telephone (312)755-7000

QUALITY CONTROL WILLIAM J.D.W.

INDIATION DOSIMETRY REPORT

FILE NO. / EMP. NO.	NAME	SOCIAL SECURITY NUMBER	EXPOSURE TYPE	EXPOSURE TO BADGE (IN MILLIREMS) FOR THE PERIOD OR PERIODS INDICATED BELOW			THERMAL NEUTRON	FAST NEUTRON	TOTAL	CUMULATIVE TOTALS IN MILLIREMS		BIRTH DATE	MO DA YR	NO. YR
				ALPHA	BETA	GAMMA X-RAY				CALENDAR QUARTER	YEAR-TO DATE			
01002									1982					
01003														
01004														
01005														
01006														
01007														
01008														
01009														

NO. 100402

NO. 100402

NO. 100402



UNLESS THE NATIONAL RADIATION PROTECTION FOUNDATION HAS BEEN TESTED AND APPROVED BY A NATIONAL TESTING ORGANIZATION, THE FOLLOWING INFORMATION SHOULD BE OBTAINED FROM THE MANUFACTURER:

- 1. **REPORTING OF BETA AND/OR SOFT X RAY**
 A. Minimum beta or soft x-ray skin dose readings are unreported until after a positive skin dose exposure is recorded.
 B. Ring badge readings are calculated as if due to X or gamma rays if produced by beta dose which may be unreported.
 C. This film badge appears to have been shielded during exposure. There is a dose recorded, however, no exact quantitative determination can be made.
 D. This film packet appears to have been misplaced in the badge. The dose reported is not an exact quantitative determination, but it is only an indication that the badge was exposed.
 E. Although this film packet was slightly lightstruck, there seems to be no apparent effect on the reading.
 F. The dose gamma background on this film badge was too high to give a valid fast neutron reading.
 G. This reading is based on 50-150KV x-ray. This film badge appears to be defective please return badge for replacement.
 H. This film packet is too old to process.
 I. This control packet appears to have been placed in a film badge indicating possible misuse. May we remind you that the value of the control films is lost if used for personal monitoring or other radiation measurement purposes.
 J. This film appears to have been exposed from the rear of the badge.
 K. Amounts shown in columns 7 to 10 have been permanently subtracted from cumulative totals at customer's request.
 L. Amounts shown in columns 7 to 10 have been permanently added to cumulative totals at customer's request.
 M. Amounts shown in columns 7 to 10 have been supplied by customer for period prior to inception of Lenduser service and have been permanently added to cumulative totals.
 N. Amounts shown in columns 7 to 10 are previous lifetime exposures supplied by customer and have been permanently added to cumulative totals.
 O. Other comment - See attached note.
 P. Irregular exposure.
 Q. Due to the irregular exposure the effective energy estimated arbitrarily based on 60 to 150 PKV x-rays as probable source of exposure. If different energy the value reported will not be the actual dosage.
 R. Due to the irregular exposure the effective energy cannot be properly determined and the dosage is estimated arbitrarily based on gamma or x-ray over 400KV as probable source of exposure. If different energy, the value reported will not be the actual dosage.
 S. Unused.
 T. Unused.

- 2. **EXPLANATION AND B. MARKS CONCERNING THE REPORT**
 A. **QUALITATIVE BATH COVERED**
 Exposure reported in millirems from gamma and x-ray 10 KV to 20 KV less than 15 MV readings, 1 KV to 10 KV (MIA FAX), 0.1KV to 10 MV (PHOSPHOR LUM), Dose up to 100 millirems is recorded but not in millirems unless arrangements were made for calibration at other energy ranges. DEXA V badge 10KV to 90 KV.
 B. **RETIRED BADGES REPORTED**
 Exposure below minimum sensitivity measurement are recorded "M" in current period columns equals less than 10 millirems X or gamma, 40 millirems hard beta, 20 millirems fast neutron, 10 millirems thermal neutron. For special cases, flag badge (DLX DAY) "M" equals less than 5 millirems "T" in cumulative total columns means all previous current exposures have been minimal, all adjustments to these totals have been made at customer's request.
 C. **ILLUMINATION OF CUMULATIVE DATA**
 Cumulative totals up to sum of most recent readings for badges returned at processing and reported to them should appear as indicated on card. Cumulative totals are indicated in most nearly conforms to HHC and state recording is questionable. Contributing starting date and length of most recent period shown.
 D. **SKIN DOSE TOTALS**
 Total and cumulative skin dose values given are the sum of both the low penetrating radiation and the high penetrating radiation. Thus they will be the sum of all previous skin dose plus total body exposures (beta).
 E. **ADJUSTMENTS TO CUMULATIVE DATA**
 In order to proper presentation of information for records required by the HHC and other regulatory agency, adjustments to the cumulative totals (columns 11, 14 and 15) may have been made to increasing or decreasing the totals from those originally reported. Such adjustments are made at the request of an authorized representative of the client and are only to reflect exposure irregularities. In such a manner as to set off zero than it understates the true dosage to the badge assignee. Prior to adjustment (column 12) of previous exposures prior to commencement of use of the particular film badge assignment reported, it may also be reflected in the cumulative totals.
 F. **USE OF CONTROL DEXA TEN**
 Reporting is ordinarily not excessive and the control exposure reading is often not the percentage exposure (ring) if the control appears to have been exposed differently than the personnel dosimeters, the check of the personnel dosimeters are normalized to reported control dose until the time to begin in actual units and not necessarily millirems. If the control exposure reading is as shown, but is equal to 50 or less (dose) that indicated value will be reported at the bottom of your report.

- 3. **REPORTING OF BETA AND/OR SOFT X RAY**
 A. Minimum beta or soft x-ray skin dose readings are unreported until after a positive skin dose exposure is recorded.
 B. Ring badge readings are calculated as if due to X or gamma rays if produced by beta dose which may be unreported.
 C. This film badge appears to have been shielded during exposure. There is a dose recorded, however, no exact quantitative determination can be made.
 D. This film packet appears to have been misplaced in the badge. The dose reported is not an exact quantitative determination, but it is only an indication that the badge was exposed.
 E. Although this film packet was slightly lightstruck, there seems to be no apparent effect on the reading.
 F. The dose gamma background on this film badge was too high to give a valid fast neutron reading.
 G. This reading is based on 50-150KV x-ray. This film badge appears to be defective please return badge for replacement.
 H. This film packet is too old to process.
 I. This control packet appears to have been placed in a film badge indicating possible misuse. May we remind you that the value of the control films is lost if used for personal monitoring or other radiation measurement purposes.
 J. This film appears to have been exposed from the rear of the badge.
 K. Amounts shown in columns 7 to 10 have been permanently subtracted from cumulative totals at customer's request.
 L. Amounts shown in columns 7 to 10 have been permanently added to cumulative totals at customer's request.
 M. Amounts shown in columns 7 to 10 have been supplied by customer for period prior to inception of Lenduser service and have been permanently added to cumulative totals.
 N. Amounts shown in columns 7 to 10 are previous lifetime exposures supplied by customer and have been permanently added to cumulative totals.
 O. Other comment - See attached note.
 P. Irregular exposure.
 Q. Due to the irregular exposure the effective energy estimated arbitrarily based on 60 to 150 PKV x-rays as probable source of exposure. If different energy the value reported will not be the actual dosage.
 R. Due to the irregular exposure the effective energy cannot be properly determined and the dosage is estimated arbitrarily based on gamma or x-ray over 400KV as probable source of exposure. If different energy, the value reported will not be the actual dosage.
 S. Unused.
 T. Unused.

- 4. **GENERAL RADIATION EXPOSURE GUIDES**
 A. **TYPE OF EXPOSURE**
 Whole body, head & trunk, 1250 millirem per quarter, 5000 millirem per year up to blood forming organs, 3000 millirem is permitted in lens of eye, or greater.
 B. **DOSE**
 The accumulated occupational dose to the whole body does not exceed 5000 millirem (page 18).
 C. **SKIN OF WHOLE BODY**
 7,500 millirem per quarter
 18,750 millirem per quarter
 D. **HEAD, FOREARM, HAND AND ARM**
 E. **U.S. N. C. REGULATIONS, TITLE 10, PART 20, CODE OF FEDERAL REGULATIONS (10-20)**
 NOTE: Certain states and other regulatory agencies may follow guides that are different from the above.
 F. **COLUMN REFERENCES**
 G. **NOTES (COLUMN 1)**
 A. ABSENT
 B. This film appears to have been damaged by light. The accuracy of any reading given would be affected thereby.
 C. This film appears to have been damaged by chemical fogging. The accuracy of any reading given would be affected thereby.
 D. This dosimeter appears to have been manufactured faulty. The accuracy of any reading given would be affected thereby.
 E. This film appears to have been damaged by heat or pressure. The accuracy of any reading given would be affected thereby.
 F. Evidence of contamination.
 G. This film packet appears to have been exposed out of the badge. Therefore, the value given is based on a high energy gamma calibration and is valid only if the exposure was due to high energy gamma. If it were due to beta particles, the dosage may be from 1.5 to 20.0 times the reported value. If it were due to lower energy gamma rays, the value reported may be from 1.1 to 20.0 times the actual dosage.
 H. This film packet is partially lightstruck. There is apparently a dose recorded, however, no exact quantitative determination can be made. The reported dose is the maximum received.
 I. This film badge appears to have been shielded during exposure. The dose reported is not an exact quantitative determination, but only an indication that the badge was exposed.

- 5. **ENERGY RANGE (COLUMN 13)**
 For some badges, the range column on this report may contain either L, M, or H. These initials are made for exposure in excess of 5r air and indicate the approximate effective energy range of the x or gamma exposure. L indicates below approximately 100 KeV (effective), M indicates between approximately 100 KeV (effective) and approximately 250 KeV (effective), and H indicates in excess of approximately 250 KeV (effective). (Very low energy x or gamma rays which would result in exposure, predominantly to the skin only, are separately limited as type 2 radiation.)
 A. **ADJUSTMENTS (COLUMN 15)**
 Adjustments made to cumulative totals with this or previous report at customer request.
 B. **ADDITIONS**
 C. **SUBTRACTIONS**
 D. **ADDITIONS & SUBTRACTIONS**
 Dosage data supplied by customer for period prior to inception of Lenduser service.
 E. **CHANGES**
 Changes in dosage supplied by customer for period prior to inception of Lenduser service, additional changes have also been made.
 F. **PREVIOUS LIFETIME EXPOSURE SUPPLIED BY CUSTOMER**
 G. **PREVIOUS LIFETIME EXPOSURE SUPPLIED BY CUSTOMER, ADDITIONAL CHANGES HAVE ALSO BEEN MADE**
 H. **UNUSED**
 I. **PERMISSIBLE ACCUMULATED DOSE (COLUMN 17)**
 Unless birth date and lifetime exposure records are supplied by the customer, no values are reported in column 17. If this data is supplied, the difference between the participant's age (in years) and 18 (if age greater than 18) is multiplied by 5000. From this, we subtract the value shown in column 15. The result is that value given in column 17, 5000 (Age-18)-column 15). The value in column 17 is computed monthly. Permissible values are based on January 8, 1957, recommendations of the National Commission on Radiation Protection and Measurements. These values are given for total body exposures only.

UNLESS THE NATIONAL RADIATION PROTECTION FOUNDATION HAS BEEN TESTED AND APPROVED BY A NATIONAL TESTING ORGANIZATION, THE FOLLOWING INFORMATION SHOULD BE OBTAINED FROM THE MANUFACTURER:

Table 3
Previous Employee Exposure Histories (1)
Kerr-McGee Chemical Corporation
West Chicago, Illinois Facility

<u>Badge Number</u>	<u>Name</u>	<u>Previous Exposure (Millirem)</u>
969		
975		
981		
1000		

(1) Exposure prior to employment at the Kerr-McGee Chemical Corp. West Chicago, Illinois Facility. These totals are included in employee cumulative totals on the R. S. Landauer, Jr. & Co. Radiation Dosimetry Report dated Oct. 4, 1982.