

Ser 2170

RESULTS BY 10:30 A.M.
4/11/64

4/9/64
sh

FEDERAL BUREAU OF INVESTIGATION
UNITED STATES DEPARTMENT OF JUSTICE

EXPEDITE

Laboratory Work Sheet

Re: ASSASSINATION OF PRESIDENT JOHN F.
KENNEDY, DALLAS, TEXAS, 11/22/64

File # 62-109060-2870
Lab. # PC-80135 GBX HB

Honorable J. Lee Rankin Letter 4/9/64
General Counsel
The President's Commission
200 Maryland Avenue, Northeast
Washington, D. C. 20002

Examination requested by:

Examination requested:

Result of Examination:

Firearms (Guns & Ammun.) Date received: 4/9/64 pd
Spectrographic

Examination by: Frazier
Heyberger ✓

Out Evidence personally delivered by Special Agent Robert E. Neill
of the FBI Laboratory, on 4/9/64

*The coat, trousers & shirt and tie were microscopically
examined. No foreign deposits of metal were found
on the cloth surrounding the holes in the coat,
trousers and shirt.*

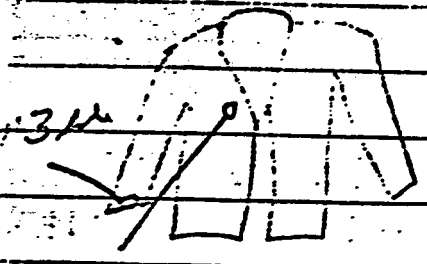
Specimens submitted for examination

- Q566 C311 Black suit coat worn by Governor John Connolly
- Q567 C312 Black suit trousers worn by Governor John Connolly
- Q568 C313 White dress shirt worn by Governor John Connolly
- Q569 C314 Tie *in the register*

*Test Soil X-ray of Lab # 209566
with found debris - traces
12 KV 30 sec X-ray - traces
12 KV 120 sec X-ray - traces
in metal run.*

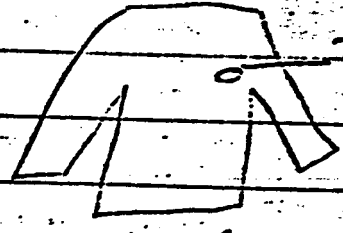
Q 566

- clean. no blood



#1 hole

back hole

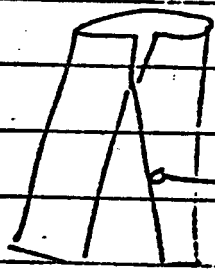


Match control button for
inside length and
over # 2 hole

There - no metal or anything significant

Q 567

- clean. no blood



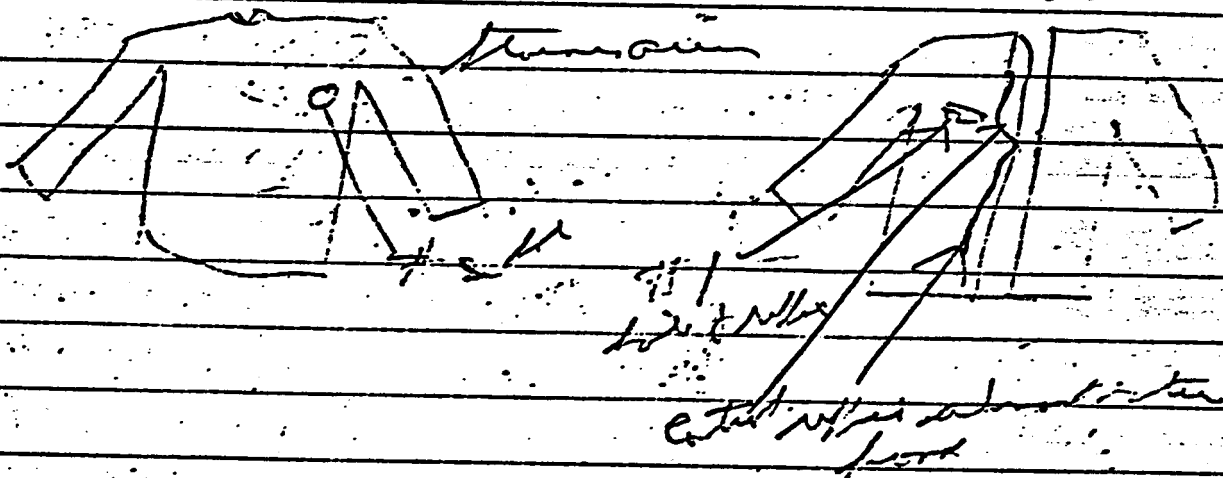
only hole

Control this for and control

There - nothing significant

052 Arrow Head

Very stem like and divided? Little
 blood like like in water solution



transverse longitudinal

JA

JA #143 Over low air

	Ca	Ph	Cr			
Trouser hole	t	0	-			
Trouser button	th		-			
Shirt hole #2	t					
Shirt button	t					
Coat #1 hole	t		+			
Coat button	-		+			
Coat #2 hole	t		+			
Coat button	-		+			

6002 D 46 mg

$$\begin{array}{r} \Sigma 162,579 \\ \Sigma 875 \\ \hline 154,829 \end{array}$$

dry film

$$\begin{array}{r} 154,829 \\ \hline 955 \end{array}$$

$$\begin{array}{r} 162,125 \\ \hline 2 \end{array}$$

$$\begin{array}{r} 20:68 \\ 16:42 \\ \hline 4:26 \end{array}$$

4.73

dry factor .956

$$\begin{array}{r} 162,125 \\ \hline 4.6 \end{array}$$

$$\begin{array}{r} 25,244 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 35,244 \\ \hline 50,783 \end{array}$$

$$\begin{array}{r} 699 \\ \hline 1 \end{array}$$

699 parts/million

Pb for A₁
6000-1

$$\begin{array}{r} \text{wt } 15.7 \text{ mg} \quad \Sigma C = 6706 \\ \hline \Sigma B = 167 \\ \hline 6741 \end{array}$$

$$\frac{6741}{15.7} = 429 \text{ C/mg lead}$$

$$429 \times 10^{-3} \text{ C/mg lead}$$

$$\frac{429 \times 10^{-3}}{45521} = 9.4 \times 10^{-6}$$

$$9.4 \text{ parts/million}$$

6000-2

$$\begin{array}{r} \text{wt } 18.5 \text{ mg} \quad \Sigma C = 7597 \\ \hline \Sigma B = 1080 \\ \hline 8911 \end{array}$$

$$\frac{8911}{18.5} = 481 \text{ C/mg}$$

$$481 \times 10^{-3} \text{ C/mg}$$

$$\frac{481 \times 10^{-3}}{45521} = 10.3 \times 10^{-6} \text{ mg/mg lead}$$

$$10.3 \text{ parts/million}$$

6000-3

$$\begin{array}{r} \text{wt } 21.1 \quad \Sigma C = 10257 \\ \hline \Sigma B = 1512 \\ \hline 8745 \end{array}$$

$$\frac{8745}{21.1} = 414 \text{ C/mg lead}$$

$$414 \times 10^{-3} \text{ C/mg lead}$$

$$\frac{414 \times 10^{-3}}{45521} = 9.1 \times 10^{-6}$$

$$9.1 \text{ parts/million}$$

Sb 6000 B 5.6 mg

$$\begin{array}{r} \Sigma 26,725 \\ 2,366 \\ \hline 24,359 \end{array}$$

Disay time 21:12
17:04
4:08 ✓

$$\frac{24,359}{.958} = 25,437$$

$$\frac{25,437}{5.6} = 4,542$$

$$\frac{4,542}{50,383} = .0901$$

90 parts/million ✓

Sb 6000 C 5.4 mg

$$\begin{array}{r} \Sigma 27,298 \\ \Sigma = 2,583 \\ \hline 24,715 \end{array}$$

21:17
17:04
4:13 ✓ 4.2
.958

$$\frac{24,715}{.958} = 25,798$$

$$\frac{25,798}{5.4} = 4,777$$

$$\frac{4,777}{50,382} = .0948$$

90 parts/million

TMC

Q16 Sp. Cu Substrate

5.7 mg.

out counter 19:10 May 15
counter 1:43 May 15

$$\begin{array}{r} \sum C = 4,046 \\ \text{57} \\ \hline \text{57} = 154 \\ \hline 3,892 \end{array}$$

Decay time

21:43

19:10

2:33 → 2.5

$$\frac{3892}{971} = 4,008$$

Decay Factor .971

$$\frac{4008}{771.4} = 5.13$$

$$\frac{5.13}{5.7} = .900 \text{ } \mu\text{g}/\text{mg lead}$$

$$.900 \times 10^{-3} \text{ } \mu\text{g}/\text{mg lead}$$

$$900 \times 10^{-6} \text{ } \mu\text{g}/\text{mg lead}$$

$$900 \text{ parts/million}$$

TMC.

Q12 Sb a wbtmL

8mg

19:01

$$\sum_{54}^6 c = 7129$$

$$\sum_{407}^D = \frac{280}{6849}$$

Days

$$\frac{6849}{.965} = 7097$$

22728

19:01

$$3:27 \rightarrow 3:45$$

.965 = Days

$$\frac{7097}{781.4} = 9.08$$

$$\frac{9.08}{P.O} = 1135 \text{ ng/mg lead}$$

$$1135 \times 10^{-3} \text{ ng/mg lead}$$

$$1135 \times 10^{-6} \text{ ng/mg lead}$$

$$1135 \text{ parts/million}$$

TMC

Q_{2a} for S₀ a water table
41.8

$$\frac{Q}{C} = 36,176$$

$$\frac{Q_{2a}}{C} = \frac{1,015}{25.161}$$

Density

25.00

1117

27.22

→ 2.38

.966 density factor

$$\frac{35,161}{.966} = 36,407$$

$$\frac{36,407}{7814} = 33.33$$

$$\frac{33.33}{41.8} = .797 \text{ mg/g soil}$$

$$.797 \times 10^3 \text{ mg/kg soil}$$

$$797 \times 10^6 \text{ mg/kg soil}$$

$$797 \text{ } \mu\text{g/g soil}$$

TMC

Q26) - cu.

5b

25.2 mg.
Imp. @ 19:21

$$\sum C = 7700$$

$$E_{imp} = \frac{770}{16,970}$$

Dust
23.42
192.24

$$3:20 - 3:33$$

$$\frac{16,970}{196} = 17,567$$

1966

$$\frac{17,567}{196.4} = 22.42$$

$$\frac{22.42}{25.2} = .892 \text{ mg/gm}$$

$892 \times 10^6 \text{ mg/mg soil}$

892 $\mu\text{g/mile}$

Age	No. Gain lost of 1000	By Calculations		Using Comptrol factor		Using Chart		H alt night	M Com Chart	Days Factor	Mr Chart	H alt night	M Com Chart	Days Factor	Mr Chart	H alt night	M Com Chart	
		Correlation factor (r)	F K At	F K At	F K At	F K At	F K At											
30"	95%	.446	29.3	40.3	3123	311	9952	235210	961 x 10 ⁴									
30"	93.5%	.447	19.6	39.6	339	2367	7420	50910	8.85 x 10 ⁴									
34"	92.0%	.450	17.9	42.9	229	1237	910	81000	8.85 x 10 ⁴									
30"	95.7%	.444	25.5	40.5	3103	452	14673	108300	8.85 x 10 ⁴									
30"	95.8%	.441	32	40	275	796	2204	17150	8.85 x 10 ⁴									
30"	95	.453	19.1	31.1	333	952	2871	8110	8.85 x 10 ⁴									
30"	94	.451	17.5	30.5	329	912	2049	5130	8.85 x 10 ⁴									
30"	94	.447	20.1	40.1	415	1001	1270	9400	8.85 x 10 ⁴									
30"	91.8%	.447	20	38.2	307	823	670	7330	8.85 x 10 ⁴									
30"	90.1%	.452	18.1	38.9	352	127	551	3720	8.85 x 10 ⁴									
35"	85.5%	.447	17	38.1	124	121	425	1210	8.85 x 10 ⁴									
35"	84.5%	.445	17	38.1	124	121	425	1210	8.85 x 10 ⁴									

By Calculations
Using Comptrol factor
is comparable to 7th

Age No. Gain lost of 1000

30"

35"

Sl. St. 1: 27.5 mg in 2/10/60

1979 cont./300 mg for 1.45 g and 20 mg cont.

$$1979 \times \frac{3}{2} = 2968.5$$

2968.5 cont./300 mg for 1.45 g and 20 mg cont.

56 67.2% T/S

Q1a 5/26/64 - 8:00 AM

May 15 In 1981 out 19' + 28 in.

Cont'd - May 26 08:45

240
13
253.44

Dredging time

240 hrs until 19' on site

- 13.44

226.56 → 253.63 hrs

Dredging cost 0.0733

53
1925 Gross

53 - 203 - 1722

1722 Net cost for 2000

1722
0.0733 = 23,492 cost for 2000 for 5000 @ 4.69

23,492 - 2927 units for 2000 for 1/4 mgal @ material

2927
2568.5 = 999

999 - 10⁶ mg. lb / mg. P₂O₅

999 P₂O₅

Q1.b 5/26/64 5.7 mg.
May 15 in 19° on 19° + 20 sec.
cont. 0855

Day time
240 hours with 19° on May 2
11:00 with 19.2
+ 8155
12:05 → 12:05

$$\frac{57}{2} = 141$$
$$\frac{1250}{2} = 625$$

$$\frac{253.75}{.0733} = 253.75$$

Day Factor = 0733

$$\frac{1250}{.0733} = 17,053 \text{ units per 5.7 mg bulb @ water level}$$

$$\frac{17,053}{57} = 2992$$

$$\frac{2992}{2968} = 1008$$

1008 ppm

(Cila) 5/26/64 41.8 mg.
 May 15 in 15" at 15" + 20 in.
 Sent May: 6 at 87"

Denny's
 240. for all 15" in May 25
 41.8
 + 91.15
 13.57
 253.54 → 253.97
 Denny factor .073

$\frac{703}{5} = 140.6$
 703 | 8 in
 5 406 8 in
 6625 net

$\frac{6625}{.073} = 90,753$ cost for 41.8 mg total @ cost - discharge

$\frac{90,753}{41.8} = 2,171$

$\frac{2,171}{2968.5} = 731$

731 ppm

@26 8/1-1/4 2500 ft.
 July 15 1964 in 19⁰⁰ out 19⁰⁰ 21 1/2
 Contain May 26 @ 2522

Drying time

240 hrs until 19⁰⁰ on May 2

	13:54	19:22
		12:54
	253.54	→ 252.9 hrs
		Drying time .073

57	4484	Gross
52	326	Regrd.
	4148	Net

4148	56,822
.073	

52.822	2,255
25.2	

2255	760
2965.5	

760 ft.

Q. 5 6/26/64 2.8 mg.
 May 15 1964 in 192 at 17' 1200m
 Cont'd May 26 Cont'd

Drain time
 240.000 at 15' on May
 4:15
 9:35
 12:07 13:54
 253.54 → 253.9
 Drain 1.75 = 673

$$\begin{array}{r} 6 \\ \Sigma = 923 \\ 51 \quad 154 \\ \hline 749 \end{array}$$

$$\begin{array}{r} 749 = 10,260 \\ 073 \end{array}$$

$$\begin{array}{r} 10,260 = 2700 \\ 3.8 \end{array}$$

$$\begin{array}{r} 2700 = 910 \\ 2968.5 \end{array}$$

910 ppm

Q4,5 ha 5/26/60 13.0 mg.
along 1504 at 5:5 out 17:20
cont. May 26 60 C 0912

Daily P215

240

		4:37
		9:53
2582	8:00	13:50
205	7:45	12:50
2337	net	253.50 → 253.23
		.072

2387 32000
073

32000 = 2460
73.0

2460 = 825
2965.5

825 ppm

2-16 215 mg
July 15 1965 20127 45
Catal No. 24 1965 (3) 1100 AM

Living Florida

SHO Aug 2 1965

3128
+ 13128 12.28
253128

6
4172 1965
280 1965
3892 Nat

253128 → 258.46
.0734

3892 = 539.06
.0734

53900 = 2460
2115

2460 = 830
2918.5

Q9c 2.2 mg.

May 15 @ 20:00 of 20:00+

Counted May 16 10:00

240 dm to May 15 @ 20

3:52

10:15

13:67 → 41.

14.12

254.12

60	Arms
126	diag
554	flat

diag flat = 0.737

534 = 7.549
.0737

564.90

7518 = 3268.5
2.3

3268 = 7.107
5.892

1109.7

Q9 (L)

23 mg.

May 15 in 30' ...
counted May 26 @ 10:00

240 hrs to May 25

668 Gross	254.72	13:27	14.1
140 - Blgs			
528 Net			Duty 8737

528	-	7170
8737		

2170	-	3130
2.3		

3130	-	1050
2968.5		

1050 ft

Q14 S

10.9 mg

May 15 in 20:24 out 20:34 7:30'

Continue May 26 @ 10:53 for 200 mg.

Daily time

240 hrs until 25 May 29

27	6	
151	2269	
	54	189
	2081	

7:30
12:53
20:24

254.5 hrs.

2080	=	28730
.0725		

Daily factor .0725

28730	=	2635
10.6		

2635	=	889
254.5		

889 ppm

Q. La 8.5ms

May 15 in 2021 2021 = 20

con. Lk May 26 2022 200

240 km to 20:31 May

3:29

10:22

M.03 13:42 → 14.0

254.02 hrs

Decay factor = 0

60	1736
54	189
<u>127</u>	<u>1547</u>

$\frac{1547}{0.73} = 21191$

$\frac{21191}{8.5} = 2493$

$\frac{2493}{2968.5} = 840$

840 ppm

Q10 - 61 4.7 mg.

1. 15. 20127 out 22:37 = 26"

Level 12:16 12:52 for 2.0

\sum 1068 gross
- 53 = 147 bleed.
921 net

240 km = 20:37.42
2:53
12:52
12:55 = 14.0
20:40 km
= 67.5 km

921
073 = 12616

12616 = 2684.1
4.7

2684 = 904.
2918.5

904 fpm

T₂ = 6.2 hr

Item	Net	Gross	Basic	Net	Actual Time	Dummy Time	Dummy Factor
a	159	104,463	3223	101,745	2'	25.8	.766
b	567	77,046	2521	75,566	2'	26.4	.762
c	155	22,61		27,259	2'	25.0	.773
d	136	19979	681	19328	2'	25.22	.771
e	548	51485	1540	49945	2'	29.35	.750
f	418	267137	9100	258038	2'	29.7	.736
g	249	252,477	8460	244017	2'	27.65	.752
h	457	30565	1050	29515	1'	17.2	.8375
i	529	24,920	819	24,101	1'	17.27	.8368
j	323	925	462	463	1'	19.5	.8177
k	374	41170	1750	39420	2'	27.75	.751
l	127	58,144	1365	56779	2'	25.27	.739
m	214	133,050	5125	127925	2'	27.5	.750
n	214	218,150	7750	210400	2'	27.95	.750
o	122	14481	616	13865	2'	26.57	.7602
p	227	30,351	1260	29091	2'	25.18	.748
q	237	31,185	1190	29995	2'	25.2	.747
r	152	21,355	820	20535	2'	27.15	.7558
s	127	114,910	3223	111687	2'	25.7	.742
t	157	105,244	3070	102174	2'	29.02	.741
u	543	86,910	2521	84389	2'	25.6	.745
v	411	49,881	1673	48208	2'	26.72	.7455
w		39683	1200	38483	2'	27.2	.751

Std. 2.24×10^4 cm²/hr for 2 min extraction

net = CRT ₀	CRT ₀	$\frac{C_{net}}{C_{CRT_0}}$
13574	16942	7.55
99108	17470	7.71
35714	19062	8.57
25059	18483	8.23
66593	19136	8.54
35055	7377 (1.3%)	562
36275	8677 (1.4%)	581
32632	13105	585
320570	13935	572
35242	7712	679
28801	7404	661
57622	24618	$\frac{2.198 \times 10^3}{2} = 733$ plus 2 small for 50
52403	74035	627
41769	13307	574
170493	13320	595
220609	13113	575
18239	14950	667
38292	17133	765
40154	16743	756
27141	17886	797
18435	14009	628
132757	14499	557
118243	18803	623
64790	14054	637
...

42

Q1a 9:00 mg 20 units from center to start margin
 XP _____ $\frac{E}{E_0} = 3,543$
 RATE Flow 15 OPER _____ $\frac{E_1}{E_0} = 432$
 CUSTOMER _____ $\frac{E_2}{E_0} = 3,111$
 I.C. NO. _____ $\frac{3,111}{45,537} = .0686$
 AD. POS. 9-7-47 _____ $\frac{.0686}{80} = .00257 \text{ mg/mg}$
 IN. OUT. _____ $\frac{.0686}{80} = .00257 \text{ mg/mg}$
 TECT. 4.0 VOLTS _____ $\frac{.0686}{80} = .00257 \text{ mg/mg}$
 ON 9 ABS. 1/2 _____ $\frac{.0686}{80} = .00257 \text{ mg/mg}$
 IN. SECT. 1 2 3 4 _____ $\frac{.0686}{80} = .00257 \text{ mg/mg}$

ZERO _____ Using Corradis. when count time is changed
 BG _____
 C _____

$\frac{E}{E_0} \text{ count} = 4,247$
 $\frac{E}{E_0} = 576$
 $\frac{3671}{215} = 17,053$ $\frac{11552}{164,386} = .0708$ $\frac{.0708}{8.5} = 00825 \text{ mg}$
 $\frac{11552}{164,386} = .0708$ $\frac{.0708}{8.5} = 00825 \text{ mg}$
 $\frac{.0708}{8.5} = 00825 \text{ mg}$
 8.25 300:5%

$$\begin{array}{r} 16,130 \\ - 840 \\ \hline 15,290 \end{array}$$

$$\begin{array}{r} \text{Daily time } 21.55 \\ - 19.01 \\ \hline 2.54 \end{array} \rightarrow 2.9$$

$$\begin{array}{r} 15,290 \\ - 971 \\ \hline 14,319 \end{array} \text{ units/2000 @ water discharge}$$

$$\begin{array}{r} 15,243 \\ - 2070 \\ \hline 13,173 \end{array} = 2605 \text{ mg/mg lead}$$

$$\begin{array}{r} 13,173 \\ - 810 \\ \hline 12,363 \end{array} = 951 \text{ mg/mg lead}$$

951 parts/million
0.95% Sr

$$\begin{array}{r} 15,444 \\ - 700 \\ \hline 14,744 \end{array}$$

$$\begin{array}{r} 14,744 \\ - 971 \\ \hline 13,773 \end{array}$$

$$\begin{array}{r} 13,773 \\ - 1779 \\ \hline 11,994 \end{array} = 7.67$$

$$\begin{array}{r} 11,994 \\ - 810 \\ \hline 11,184 \end{array} = 958$$

958 parts/million

Q1b - Cu

Channel 57 actual at 2,200

$$\frac{11,407}{640} = 10,767$$

$$\frac{2(11,407 + 840)}{1077-7} = \frac{2(12,247)}{1070} = \frac{24,494}{1070} = 22.89$$

Drayton = 0.02

21:63

19:10

2:53 → 2.28

.971

$$\frac{10,767}{1971} = 11,088 \text{ count/300 sec @ 2000 dpm}$$

$$\frac{11,088}{2070} = 5.357 \text{ mg/5.7 mg lead}$$

$$\frac{5.357}{5.7} = 939 \text{ mg/mg lead}$$

939 parts/million

.094 % Pb

970

.02%

1940

$$970 \pm 0.2 = 19.4$$

$$970 \pm 20 =$$

$$\frac{10,719}{570} = 18.82$$

$$\frac{10,172}{570} = 17.85$$

$$\frac{10,172}{1979} = 5.14$$

$$\frac{5.14}{5.7} = 899$$

928 parts/million

S20 41.8 mg
 P _____
 TE *May 15* OPER _____
 STONEE _____
 IG. NO. _____
 RAD. POS. _____
 IN OUT *197 + 20* _____
 EJECT. VOLTS _____
 EOM ABS _____
 TRAN. SECT. 1 2 3 4 _____
 MP ZERO _____
 AIN _____
 LINE BG _____
 64C _____

$\sum = 14461$
 $63 = 2280$
 $12,181$
 $12,181 = 127$
 $45,337$
 $.27 = 200645$
 $41.8 = 6.45 \text{ gts/mile}$

A) $\sum \text{ counts } 17,135$
 $390 = 3040$
 $14,095$ counts at (20 + 20) min
 $.215 = 44,746$ counts for 41.8 mg Carb @ 20 min
 $44,746 = .272$ mg gts/mile for 41.8 mg Carb
 $164,396$
 $.272 = 3251$ mg gts/mile for mg of Carb
 41.8
 6.51 gts/mile
 20065 gts/mile

Q2c

$$\frac{20}{23} c = 64,732$$

$$\Sigma 241 = 1,880$$

$$61,852$$

Days Factor

$$22:10 \rightarrow 2150$$

$$19:17$$

$$2:53 \rightarrow 2.85$$

$$.970$$

$$\frac{61,852}{.970} = 63,771 \text{ cut/100 in } \odot \text{ water discharge}$$

$$\frac{63,771}{2070} = 30.80 \text{ mg/100 gm sand}$$

$$\frac{30.80}{41.8} = .736 \text{ mg/gm sand}$$

73% fine / medium

$$.074\% \text{ Sb}$$

$$\frac{20}{23} c = 61,385$$

$$\Sigma 241 = 1,400$$

$$59,985$$

$$\frac{59,985}{.970} = 61,840$$

$$61,840 = 3124$$

$$1979$$

$$\frac{21.24}{41.8} = .747$$

74.7% fine / medium

Q2b 25.2 mg

TE 14.5 OPER

ATOMER

IG. NO.

READ. POS. 5719

OUTLINE + 25.2 45327

ELECT. VOLTS

FORM ABS

CAN. SECT. 1 2 3 4

MP ZERO

AIN

MP BC

24 °C

$\frac{157}{122} \times 6641 = 822$

$822 - 5819 = -4997$

$4997 \times \frac{315}{205} = 7719$

$7719 - 7500 = 219$

$219 \times \frac{315}{205} = 339$

$339 - 25.2 = 313.8$

$\frac{6725}{205} = 32,800$

$\frac{15728}{154,396} = 0.1019$

$32,800 \times 0.1019 = 3342$

$3342 - 25.2 = 3316.8$

$\frac{6725}{205} = 32,800$ counts for 25.2 mg Pb at reactor discharge

$\frac{32,800}{154,396} = 0.2124$ - 0.199 ug Pb for 25.2 mg Pb

$\frac{0.199}{25.2} = 0.0079$

7.91 p.p.m. - 0.0079

S6³³ T^{1/2} 67.2 hrs.

S6 Q26

$$\begin{array}{r} 60 \\ \sum C = 40,018 \\ 52 \\ \hline 39,718 \end{array}$$

Days factor

$$22.17 \rightarrow 21.77$$

$$\frac{19.25}{2.99} = 2.81$$

.971

$$\frac{39,718}{.971} = 39,565 \text{ cost for } 200 \text{ m @ meter dialing.}$$

$$\frac{39,565}{2070} = 19.11 \text{ } \mu\text{g}/25.2 \text{ mg of lead}$$

$$\frac{19.11}{25.2} = .758 \text{ } \mu\text{g}/\text{mg of lead}$$

758 parts per million

276 % S6.

$$\begin{array}{r} \sum C = 37,877 \\ \sum E = 1,000 \\ \hline 36,477 \end{array}$$

$$\frac{36,477}{.971} = 37,520$$

$$\frac{37,520}{1975} = 18.98$$

$$\frac{18.98}{25.2} = .753$$

045 3 P mg

2.45 OPEE

TOMER

S. NO.

AD. POS.

OUT 150 + 20

EJECT VOLTS

ION ABS

AN. SECT. 1 2 3 4

ZERO

BG

Δ°C

$$\frac{0}{63} \text{ Counts} = 1.427$$

$$Z = \frac{90}{1.337}$$

$$\frac{7337}{45,337} = 0.029$$

$$0.029 \times \frac{315}{125} = 0.0326$$

$$\frac{0.0326}{3.8} = 0.00857$$

8.57

$$\frac{0}{15 \times 8} \text{ Counts} = 1,640$$

$$1.520 \text{ Counts at } \left(\frac{24 \mu + 40}{2}\right)''$$

$$\frac{1520}{.25} = 5428 \text{ counts for } 3.8 \text{ mg lead at cent line}$$

$$\frac{5428}{16,350} = 0.3302 \text{ mg for } 3.8 \text{ mg lead}$$

$$\frac{0.3302}{3.8} = 0.00868 \text{ mg for } 1 \text{ mg lead}$$

8.65 for 1 mg lead

Sb 045,3 (approx to be over subtraction of Cu)

$$\begin{array}{r} \sum_{33} = 6,636 \\ \sum_{12} = 608 \\ \hline 6,028 \end{array}$$

Daily intake

22:22 - 21:52

19:41

2:41 - 2:28

$$\frac{6028}{1973} = 3.055$$

2.195

cons. from C. 100% discharge

$$\frac{6195}{2070} = 2.993 \text{ mg/s.s.mg}$$

$$\frac{2.993}{3.8} = .787 \text{ mg/mg lead}$$

$$.787 \times 10^{-3} \text{ mg/mg lead}$$

.787 parts/million

.08% = 70 Sb.

$$\begin{array}{r} \sum_{33} = 6286 \\ \sum_{12} = 532 \\ \hline 5754 \end{array}$$

$$\frac{5754}{.973} = 5913$$

$$\frac{5913}{1.7} = 3478$$

① 4.5 Lc. 13.0 mg

P. $\frac{49}{45}$ count = 5060

TE Always OPEP $\frac{49}{45}$ = 498

STOMER $\frac{49}{45}$ = 4562

IG. NO. 4572

TRAD. POS. 4572

INJECT. VOLTS 45337

CON. AFS 0100 = 600769

AN. SECT. 1 2 3 4 13.0

MP ZERO 7.69 parts/million

IN BG

CG

$\frac{6}{52}$ count = 5882

83 x 8 = 664

5218 count for 13.0 mg at 30 sec 2.00 sec

$\frac{5218}{.315} = 16,565$ count for 13.0 mg (incl. @ 30 sec discharge)

$\frac{16,565}{16,4296} = .1007$ ug for 13.0 mg

$\frac{.1007}{12.0} = .00775$ ug for 13.0 mg

7.75 parts per million

Q4562 13.0 mg

Sb¹²²

$$\begin{array}{r} \text{AVG} \\ \Sigma \text{ 124} \\ \hline 20,566 \end{array} \quad \begin{array}{l} \text{count} = 21,906 \\ 1,240 \\ \hline \end{array}$$

Drift

$$\begin{array}{r} 22:29 \rightarrow 21:09 \\ 19:53 \rightarrow 19:53 \\ \hline 2:36 \rightarrow 2:00 \end{array}$$

$$\frac{20,566}{974} = 21,115 \text{ count for } 200 \text{ cm } \textcircled{D} \text{ rather than } 1974$$

$$\frac{21,115}{2070} = 10.20 \text{ } \mu\text{g} / 13.0 \text{ mg}$$

$$\frac{10.20}{13.0} = .784 \text{ } \mu\text{g} / \text{mg}$$

$$.784 \times 10^3 \text{ } \mu\text{g} / \text{mg lead}$$

$$784 \text{ parts / million}$$

$$.078\% \text{ Sb}$$

$$\Sigma C = 20723$$

$$\Sigma D = 1085$$

$$\frac{19,628}{974} = 20,150$$

$$\frac{20,150}{1079} = 1878$$

$$1211 = 121$$

4.5 Lb 2. mg
 TE 5/15 OPER
 STONER
 G. NO.
 AD. POS. 7046 = .0155
 20.01 - OUT 45237
 EJECT VOLTS
 ZOM ABS 0155 = 0.0721
 HAN. SECT. 1 2 3 4 21.5 7.21 fms/mill
 MP ZERO
 AIN
 MP BG
 PL A/C

4.5 Lb Ag
 Sum = 9,517
 1000 = 1360
 8157 counts for 21.5 mg at 2000 cps
 $\frac{8157}{.315} = 25,895$ counts for 21.5 mg lead at counter location
 $\frac{25,895}{164,356} = .157$ mg for 21.5 mg of lead
 $\frac{.157}{21.5} = .00732$ mg for mg of lead
 $= 7.32 \times 10^{-6}$ mg for 25 of lead

Ø4,5 lb)

Sb. 122

$$\begin{array}{r} \text{Net} \\ \hline 25,322 \\ - 1,600 \\ \hline 23,723 \end{array}$$

Drying time

22:35

20:01

2:34 → 2.5%

33,723 - 24,664 units for 200 mg of reactor product
974 = Drying Time

974

$$\frac{24,664}{2070} = 11.91 \text{ mg / 21.5 mg lead}$$

$$\frac{1674}{21.5} = .778 \text{ mg / mg lead}$$

$$= 778 \times 10^{-6} \text{ g/g lead}$$

778 parts / million

.78 % Sb

$$\frac{33,588}{24} = 1,399.5$$

$$\frac{32,188}{24} = 1,341.17$$

$$\frac{32,188}{974} = 33.06$$

$$\frac{23,040}{1,979} = 11.64$$

$$\frac{16.69}{21.5} = .776$$

Ag

0961 2.3 mg.

EXP _____
 DATE 5/15 OPEP _____
 CUSTOMER _____
 CHG. NO. _____
 IRRAD. POS. _____
 IN 20 OF OUT 2012 + 20 am. _____
 DETECT. VOLTS _____
 GEOM. ABS. _____
 CHAN. SECT. 1 2 3 4 _____
 AMP. ZERO _____
 GAIN _____
 TIME BG _____
 4% ΔC _____

1025
69
956

956 = 0.211

48337

0.211 = 100.917 mg/amp

2.3 = 9.17 x 10⁻² mg/mg

9.17 x 10⁻² mg/mg

9.17 mg/mg

Ag
1.161
92

1.019 mg for 2.3 mg lead (20%)

1069 = 3,393

3,393 / 164,396 = 0.0206

0.206 = 2.97 x 10⁻² mg for 2.3 mg lead

0.77 x 10⁻² mg for 2.3 mg lead

56

(92)

$$\begin{array}{r} \text{max } 4880 \\ \text{1.2 mg } 440 \\ \hline 4440 \end{array}$$

Dry film

22:41

20:08

2:33 → 2.55

Dry film .974

$$\frac{4440}{.974} = 4,558 \text{ counts/hour @ center detector}$$

$$\frac{4558}{2.070} = 2.201 \text{ } \mu\text{g}/2.3 \text{ mg lead}$$

$$\frac{2.201}{2.3} = .956 \text{ } \mu\text{g}/\text{mg lead}$$

$$.956 \times 10^{-3} \text{ } \mu\text{g}/\text{mg lead}$$

956 parts per million

.096% Pb

$$\frac{4266}{24} = 177.75$$

$$\frac{4266}{24} = 177.75$$

$$\frac{4266}{.974} = 4379$$

$$\frac{4379}{1.979} = 2.21$$

$$\frac{4379}{1.979} = 2.21$$

876 2.3 mg

EXP. _____

DATE Mar 15 OPER. _____

CUSTOMER _____

CHG. NO. _____

IRRAD. POS. _____

IN 20:16 OUT 20:16 + 24 min

DETECT. _____ VOLTS _____

GEOM. _____ ABS. _____

CHAN. SECT. 1 2 3 4

AMP _____ ZERO _____

GAIN _____

TIME _____ BG _____

CEL. _____ DEG. _____

$$\begin{array}{r} 15 \\ \sum C = 1033 \\ 12 \\ \hline \sum B = 81 \\ \hline 952 \end{array}$$

$$\frac{952}{45337} = .0209$$

$$\frac{209}{2.3} = 00909$$

9.09 μ g/g

¹⁴C₃ D₃ Th₃ van

$$\sum \text{count} = 1229$$

$$\sum \text{Ch. 5} = 104$$

1125 μ g of ¹⁴C₃D₃ van f. 2.3

$$\frac{1125}{.315} = 3,571 \text{ count @ } 2.3 \text{ mg } \mu\text{g}^{-1}$$

$$\frac{3571}{164,396} = .0217 \text{ mg for } 2.3 \text{ mg } \mu\text{g}^{-1}$$

$$\frac{.0217}{2.3} = .0094 \text{ mg for } 2.3 \text{ mg } \mu\text{g}^{-1}$$

9.44 μ g/g

SB 0961

$$\frac{5000}{\text{count}} = 5001$$

$$\frac{400}{\text{count}} = 4601$$

Daily rate
21:54
20:16

2:38 → 2.63 hrs

$$\frac{4601}{.973} = 4728 \text{ count/area @ count drain}$$

$$\frac{4728}{2070} = 2.284 \text{ mg}/2.3 \text{ mg}$$

$$\frac{2.284}{2.3} = .993 \text{ mg/mg}$$

$$= .993 \times 10^2 \text{ mg/mg actual}$$

$$9.93 \times 10^4 \text{ mg/mg result}$$

993 parts/million

.099% SB

$$\frac{4762}{\text{count}} = 4762$$

$$\frac{350}{\text{count}} = 4412$$

$$\frac{4412}{.973} = 4534$$

$$\frac{4534}{1577} = 2.875$$

$$\frac{2.875}{2.3} = .956$$

Q45 10.9 m

REP.		$\frac{45}{63} C = 4397$
DATE	OPER	396
CUSTOMER		4001
SEC. NO.		4001 - 08P
RAD. POS.		45,937
IN 20.2V	OUT 20.2V	
DETECT.	VOLTS	08P = 00809
GEOM.	ABS	10.9
CHAN. SECT.	1 2 3 4	8.09 feet/mile
AMP	ZERO	
GAIN		
TIME 2258	BG 200 am	
°C	°C	

$\frac{4597}{315} = 14.593$ count for 10.9 m lead at 200 m/sec
 $\frac{14593}{164396} = 0.0887$ mg for 10.9 m lead
 $\frac{0587}{10.9} = 0.0538$ mg for 10.9 m lead
 8.14 feet for mile

Q145

SB detector

$$\frac{\sum \text{counts}}{54} = 18,569$$

$$\frac{\sum \text{range}}{2.670} = 870$$

$$17,728$$

Range time

$$32:60$$

$$- 30:24$$

$$2:36 \rightarrow 2.6 \text{ hrs}$$

range factor = 974

$$\frac{17,728}{974} = 18,201 \text{ counts/200 cm}^2 \text{ @ reactor core}$$

$$\frac{18,201}{2.670} = 8,779 \text{ } \mu\text{g}/10.9 \text{ mg lead}$$

$$\frac{8,779}{10.9 \times 10^3} = 8.06 \times 10^{-4} \text{ } \mu\text{g}/\mu\text{gm lead}$$

806 parts/million

081 % SB

$$\frac{\sum \text{counts}}{54} = 17,574$$

$$\frac{\sum \text{range}}{2.670} = 870$$

$$16,804$$

$$\frac{16,804}{974} = 17,250$$

$$\frac{17,250}{2.670} = 8,720$$

$$\frac{8,720}{10.7} = 800$$

800 parts/million

Q14 Lc: 8.5mg

EXP _____

DATE May 15 OPER _____

CUSTOMER _____

CHG. NO. _____

RRAD. POS. _____

IN 20131 OUT 20131 + 2

DETECT. VOLTS _____

GEOM. ABS _____

CHAN. SECT. 1 2 3 4

AMP _____ ZERO _____

GAIN _____

TIME _____ BG _____

ΔL _____ ΔC _____

$\sum C = 3419$
 $\sum C = 336$
 3083
 $45337 = .068$
 $.068 = .00800$
 $.85$
 8.00 pps/mil

Ag Q14 LA

$\sum C = 2,979$

$\sum C = 448$

3.521 11209 counts for 8.5mg lead at 100% efficiency

$\frac{11209}{164396} = .0681 \text{ mg. for } 8.5 \text{ mg. lead}$

$\frac{8691}{8.5} = .00802 \text{ mg. for } 8.5 \text{ mg. lead}$

8.00 pps/mil

Q14 ²/₂

785 feet / miller

$$\begin{array}{r} \sum_{34}^{34} = 13,448 \\ \text{(34)} = \quad \quad \quad 672 \\ \hline 12,776 \end{array}$$

$$\frac{12,776}{171} = 13,150$$

$$\frac{13,150}{1979} = 6.64$$

$$\frac{6.64}{8.5} = .781$$

781 feet = miller

14 Lh 4.7 mg

XP _____

DATE _____ OPER _____

CUSTOMER _____

HC. NO. _____

TRAD. POS. _____

26137 OUT + 20 mg

DETECT VOLTS _____

GEOM. ABS. _____

TRAN. SPEC. 1 2 3 4

IMP. ZERO _____

GAIN _____

TIME _____ PG _____

DEL. 6°C _____

$\frac{1871}{144} = 1727$

$\frac{1727}{45337} = .0381$

$.0381 \times 4.7 = .00811$

8.11 fwt/mill

Ag Determination

$\frac{9}{62} \text{ counts} = 2,209$

$\frac{192}{62} = 3,097$

2,017 net count for 4.7 mg lead at 4.7 mg

$\frac{2,017}{164,256} = 6.002 \times 10^{-5}$ count for 4.7 mg lead at 4.7 mg

$\frac{6,403}{164,256} = .0389 \text{ mg Ag for } 4.7 \text{ mg lead.}$

$\frac{6,403}{4.7} = .00822 \text{ mg Ag for } 1 \text{ mg lead.}$

$\frac{6,403}{4.7} = 8.22 \text{ mg fwt for } 1 \text{ mg lead.}$

14 L(6)

GN6

785 feet/mile
079 70 86

Σ	7648
54	455
Σ(54)	<u>7193</u>

$\frac{7193}{971} = 7407$

$\frac{7407}{1979} = 3.743$

$\frac{3.743}{4.700} = .796$ 3/4 in lead

716 ft per mile

015

REP. _____
DATE _____ OPER _____
CUSTOMER _____
EG. NO. _____
TRAD. POS. _____
IN. 2144 _____ OUT. 2114 + 24 _____
ELECT. _____ VOLTS _____
SEOM _____ ABS _____
CHAN. SECT. ... 1 2 3 4 _____
AMP _____ ZERO _____
GAIN _____
TIME _____ BG _____
CAL _____ d/c _____

Aj .164 mg 20" @ 21.25 May 15

Sb 5.11g 20" @ 21.34 May 15

R A R-1
204 40

For 6000 - 6003 Batch of

Sh. Std.

4X4 Detector

$$\frac{60}{54} C = 90, 2: 2$$

66, 5: 3 counts for 100 sec
for 5 min detn
for 37.5 mg.

$$\frac{66, 583}{37.5} = 1, 776 \text{ counts for 100 sec for 5 min}$$

$$1, 776 \times 4 = 7, 104 \text{ counts for 100 sec for 20 min}$$

Activity @ React. discharge

$$\frac{7, 104}{.141} = 50, 383 \text{ At} = 189.65$$

dry detn 141

50, 383

C 1/5 for 100 sec for
20 min det. for 141
@ reactor discharge

$\frac{110}{Ag}$ Std. Wt. .163 mg
 $\frac{40''}{20'' \text{ days}}$

$\Sigma 75.0$	$\frac{7420}{.163} = 45,521 \text{ counts/mg}$
$\Sigma 25.0$	
$\frac{74.0}{}$	

Pb #1 6003
 11.7 mg

$\Sigma 5616$
$\Sigma 747$
1842

$\frac{1842}{11.7} = 157.4 \text{ counts/mg}$
 $\frac{5616}{11.7} = 479.9 \text{ counts/mg}$
 $\frac{.329}{45521} = 7.2 \times 10^{-6}$
 7.2 fpc/millicurie

Pb #2 6003
 11.7 mg

$\Sigma 3096$
$\Sigma 188$
1928

$\frac{1928}{11.7} = 164.8 \text{ counts/mg}$
 $\frac{3096}{11.7} = 264.6 \text{ counts/mg}$
 $\frac{.170}{45521} = 3.7 \text{ fpc/millicurie}$

Sb

6002 B 7.9 mg

Σ Cms	275,483
Blghl.	15,501
	<hr/>
	259,982

Dry time
 20:52
 16:42
 4:10 = 4:16

259,982 = 270,375 Cms @ rate delivery
 .968

270,375 = 34,225 Cms @ rate delivery
 7.9

34,225 = 679 mg / meter
 50,223 = 679 mg / meter

6002 C 5.1 mg

Σ Cms	192,250
Blghl.	10,924
	<hr/>
	172,256

Dry time 20:64
 16:52
 4:12

172,256 = 150,184
 .988

150,184 = 35,230 Cms @ rate delivery
 5.1

35,230 = 701 mg / meter
 50,383 = 701 mg / meter

Pb #3 6003
6.9 m

$$\Sigma c = 2216$$

$$q_b = \frac{42}{2273}$$

$$\frac{2273}{6.9} = 329$$

$$\frac{329}{45521} = 7.2 \times 10^{-6}$$

7.2 μ per mile

1.83