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#### **EXPOSURES ASSESSMENT TOTALS**

#### NUMBER OF PERSONNEL WITH EXPOSURES

BATTALIONS	2 KILOMETERS - 3 DAYS	2 KILOMETERS - 6 DAYS
	PERSONNEL	PERSONNEL
BATTALION #2	301	338
BATTALION #6	150	150
BATTALION #10	65	65
BATTALION #20	0	0
BATTALION #22	106	144
BATTALION #43	7	7
BATTALION #50	20	23
TOTALS	649 /4	727
-	166	

- 1. Over 16,000 study subjects were qualified for all Battalions in the study to date.
- 2. Over 5,000 of these qualified study subjects were members of the seven (7) battalions in the Pilot Study.
- 3. Since study subjects were qualified prior to identifying the spray dates (exposure hit dates) of the units, only 700 plus subjects were provided exposures.
- 4. This Pilot Study has proven that identifying and qualifying study subjects before we know the spray or exposure hit dates of the units is a waste of time and resources.
- 5. Now that we know the spray hit dates of the battalions for the Pilot Study we can now review the Company Morning Reports to identify additional personnel who were in the units on those specific spray dates.
- 6. This procedure should be followed for the remaining battalions in the main Agent Orange Epidemiological Study.

UNIT EXPOSURE ASSESSMENT

#### UNIT EXPOSURE ASSESSMENT

		· · · · · · · · · · · · · · · · · · ·	
BATTALION #2	2 KILOMETE RANCH HAND	ERS - 3 DAYS SERVICES	TOTAL
A COMPANY	1	0	1 .
B COMPANY	0	, 1	1
C COMPANY	3	2	5
D COMPANY	0	0	0
E COMPANY	0	0	0
TOTALS '	4	3	7
BATTALION #2	2 KILOMETE RANCH HAND	ERS - 6 DAYS SERVICES	TOTAL
A COMPANY	2	0	2
B COMPANY	· 3	1	4
C COMPANY	3	5	8

ON DWS

14

6

# BATTALION #2 UNKNOWN SPRAYS

0

0

8

D COMPANY

E COMPANY

TOTALS

	2 KILOMETERS - 3 DAYS	2 KILOMETERS - 6 DAYS
A COMPANY	2	5
B COMPANY	0	1
C COMPANY	3	5
D COMPANY	0	0
E COMPANY	0	0
TOTALS	5	11

#### UNIT EXPOSURE ASSESSMENT

BATTALION #6			RS - 3 DAYS	
	RANCH	HAND	SERVICES	TOTAL
A BATTERY	0		- 11	. 11
B BATTERY	0		. 0	0
C BATTERY	. 0		1	1.
D BATTERY	٠. 0		0	0
E BATTERY	0		0	0
TOTALS	0		12	12
BATTALION #6		2 KILOMETE	RS - 6 DAYS	
	RANCH		SERVICES	TOTAL
A BATTERY	0		. 19	19
B BATTERY	0		0 .	0
C BATTERY	0		1	1
D BATTERY	0	•	0	0
E BATTERY	0		0	0
TOTALS	0		20	20
BATTALION #6		IINKNOW	N SPRAYS	•
		<del></del>	<del></del>	
•	2 KILOMETERS	S - 3 DAYS	Z KILOME	TERS - 6 DAYS
A BATTERY	13			28
B BATTERY	24			35
C BATTERY	1			1
D BATTERY	7			11

75

45

E BATTERY

TOTALS

#### UNIT EXPOSURE ASSESSMENT

BATTALION #10	2 KILOMETER	S - 3 DAYS	
	RANCH HAND	SERVICES	TOTAL
A TROOP	0	0	0
B TROOP	0	0	0
C TROOP	0	0	0
D TROOP	0	2	2
E TROOP		0	<u> </u>
TOTAL	0	2	2
BATTALION #10	2 KILOMETER	S - 6 DAYS	
·	RANCH HAND	SERVICES	TOTAL
A TROOP	0	0	0
B TROOP	0	0	0
C TROOP	0	0	0
D TROOP	0	4	4
E TROOP	0	0	0
TOTAL	O	4	4
BATTALION #10	UNKNOWN SPR	<u>ays</u>	
	2 KILOMETERS -	3 DAYS	2 KILOMETERS - 6 DAYS
A TROOP	11		16
B TROOP	19	•	26
C TROOP	4		9
D TROOP	14		23
E TROOP	0	<del></del>	0
TOTAL	48		74

#### UNIT EXPOSURE ASSESSMENT

BATTALION #20	2 KILOME	rers - 3 days	
	RANCH HAND	SERVICES	TOTAL
A TROOP	2	-2	4
B TROOP	0	0	0
C TROOP	0	5	5
D TROOP	0	3	3
E TROOP	0	0	- 0
TOTALS	2	10	12

BATTALION #20	2 KILOMETERS - 6 DAYS		
	RANCH HAND	SERVICES	TOTAL
A TROOP	3	4	7
B TROOP	0 .	. 0	0
C TROOP	3	10	13
D TROOP	1	5	6
E TROOP	0	0	0
TOTALS	7	19	26

#### BATTALION #20

#### UNKNOWN SPRAY

	2 KILOMETERS - 3 DAYS	2 KILOMETERS - 6 DAYS
A TROOP	21	32
B. TROOP	22	28
C TROOP	25	36
D TROOP	8	11
E TROOP	0	0
TOTALS	76	107

# AGENT ORANGE PILOT STUDY UNIT EXPOSURE ASSESSMENT

BATTALION #22	2 KILOMETERS - 3 DAYS			
_	RANCH HAND	SERVICES	TOTAL.	
A COMPANY	1	3	4	
B COMPANY	1	0.	1	
C COMPANY	1	2	3	
D COMPANY	. 0	. 3	3	
E COMPANY	0	0	0	
TOTALS	3	8	11 ,	
BATTALION #22	2 KILOM	ETERS - 6 DA	AYS	
	RANCH HAND	SERVICES	TOTAL	
A COMPANY	. 1	7	8	
B COMPANY	1	0	1	
C COMPANY	1	3	4	
D COMPANY	0	4	4	
E COMPANY	0	0	0	
TOTALS	3	14	17	
BATTALION #22	UNKNOWN	SPRAYS		
	2 KILOMETERS - 3 DAYS	2 KILOME	STERS - 6 DAY	
A COMPANY	3		10	
B COMPANY	9		15	
C COMPANY	7		13	
D COMPANY	5		13	
E COMPANY	0		0	
TOTALS	24		51	

# AGENT ORANGE PILOT STUDY UNIT EXPOSURE ASSESSMENT

BATTALION #43	2 KILOME	CTERS - 3 .DAYS	<u>}</u>
	RANCH HAND	SERVICES	TOTAL
A COMPANY	0	2	2
B COMPANY	0	2	2
C COMPANY	1	0	1
D COMPANY	0	2	2
E COMPANY	0	0	0
TOTALS	1 .	6	7
BATTALION #43	2 KILOME	TERS - 6 DAYS	, 1
<del></del>	RANCH HAND	SERVICES	TOTAL
A COMPANY	0	2	2
B COMPANY	0	2	2
C COMPANY	1	0	1
D COMPANY	o	3	3
E COMPANY	0	0	0
TOTALS	1 .	7	8
BATTALION #43	UNKNOWN SPRAYS		
	2 KILOMETERS -	3 DAYS 2	KILOMETERS - 6 DAYS
A COMPANY	2		4
B COMPANY	0		0
C COMPANY	4		8
D COMPANY	3		4
E COMPANY	0		0
TOTALS	9		16

# UNIT EXPOSURE ASSESSMENT

BATTALION #50	2 KILOMETERS -		TOTAL C
•	RANCH HAND	SERVICES	TOTALS
A COMPANY	2	3	5.
B COMPANY	1	3	4
C COMPANY	5	3	. 8
D COMPANY	0	- 0	0
E COMPANY	2	3	5
TOTALS	10	12	22
_			
BATTALION #50	2 KILOMETERS - (	6 DAYS SERVICES	TOTALS
A COMPANY	13	6	19
B COMPANY	9	6	15
C COMPANY	13	4	17
D COMPANY	0	0	0
E COMPANY	8	6	14
TOTAL	43	22	65
BATTALION #50	UNKNOWN SPI		
DATTALION VOO			•
	2 KILOMETERS - 3 DAYS	2 KILOMETER	RS - 6 DAYS
A COMPANY	0		
B COMPANY	0		)
C COMPANY	0	0	)
D COMPANY	0	C	)
e company	0		)
TOTALS	0	C	)

INDIVIDUAL EXPOSURE ASSESSMENT

SCORES

124

#### INDIVIDUAL AGENT ORANGE

#### EXPOSURE ASSESSMENT SCORES

BATTALION #2	2 KILOMETERS - 3 DAYS	
A COMPANY	EXPOSURES	PERSONNEL
	1	75
BATTALION #2	2 KILOMETERS - 6 DAYS	
A COMPANY	EXPOSURES	PERSONNEL
	1 2	82 24
momat.	<b>4</b>	· <del>- 1</del>
TOTAL		106
BATTALION #2	2 KILOMETERS - 3 DAYS	
B COMPANY	EXPOSURES	PERSONNEL
	1	102
BATTALION #2	2 KILOMETERS - 6 DAYS	
B COMPANY	EXPOSURES	PERSONNEL
	1 2	. 46 1
	3	5
TOTAL	4	<u> 56</u> 108
		•
BATTALION #2	2 KILOMETERS - 3 DAYS	
C COMPANY	EXPOSURES	PERSONNEL
	1 2	· 4 57
	4 5	39
momat	<del></del> _	
TOTAL		124_
BATTALION #2	2 KILOMETERS - 6 DAYS	
C COMPANY	EXPOSURES	PERSONNEL
	1 2	4 4
	1 2 5 7	53
		39 

-11-

TOTAL

#### INDIVIDUAL AGENT ORANGE

#### EXPOSURE ASSESSMENT SCORES

BATTALION #6	2 KILOMETERS - 3 DAYS	
A COMPANY	EXPOSURES	PERSONNEL
	1 2 4 5 6 7 8 10	4 1 3 6 27 1 3 35 2
TOTÁL	·	86
BATTALION #6	2 KILOMETERS - 6 DA	Y <u>s</u>
A COMPANY	EXPOSURES	PERSONNEL
	1 5 6 7 8 11 12 13 18	4 1 2 2 5 27 1 3 3 5 2
TOTAL		86
BATTALION #6 C COMPANY	2 KILOMETERS - 3 DA EXPOSURES  1	PERSONNEL TOTAL 64
BATTALION #6	2 KILOMETERS - 6 DA	<u>rs</u>
C COMPANY	EXPOSURES	PERSONNEL
	1	TOTAL 64

#### INDIVIDUAL AGENT ORANGE

# EXPOSURE ASSESSMENT SCORES

BATTALION #10	2 KILOMETERS - 3	DAYS
_	EXPOSURES	PERSONNEL
D TROOP	2	65
BATTALION #10	2 KILOMETERS - 6	DAYS
	EXPOSURES	PERSONNEL
D TROOP	4	65

#### INDIVIDUAL AGENT ORANGE

#### EXPOSURE ASSESSMENT SCORES

BATTALION #22	2 KILOMETER	S - 3 DAYS
A COMPANY	EXPOSURES	PERSONNEL
	1 3	2 36
TOTAL		38
BATTALION #22 A COMPANY	2 KILOMETER EXPOSURES	S - 6 DAYS PERSONNEL
A CONTANT		
	1 6 7	40 5 31
TOTAL		76
BATTALION #22	2 KILOMETER	S - 3 DAYS
B COMPANY	EXPOSURES	PERSONNEL
	1	1
BATTALION #22	2 KILOMETER	S - 6 DAYS
B COMPANY	EXPOSURES	PERSONNEL
	1	1

CONTINUED ON NEXT PAGE.

BATTALION #22	2 KILOMETERS -	3 DAYS
C COMPANY	EXPOSURES	PERSONNEL
	1 2 3	1 32 4
TOTAL		37
BATTALION #22	2 KILOMETERS -	6 DAYS
C COMPANY	EXPOSURES	PERSONNEL
	1 3 4	32 4
TOTAL		37
BATTALION #22	2 KILOMETERS -	3 DAYS
D COMPANY	EXPOSURES	PERSONNEL
	2 3	1 29
TOTAL		30
BATTALION #22	2 KILOMETERS -	6 DAYS
D COMPANY	EXPOSURES	PERSONNEL
:	2 4	1 29
TOTAL	•	30

# INDIVIDUAL AGENT ORANGE

# EXPOSURE ASSESSMENT SCORES

BATTALION #43	2 KILOMETERS -	- 3 DAYS	
	EXPOSURES	PERSONNEL	
B TROOP	1	2	
BATTALION #43	2 KILOMETERS -	- 6 DAYS	
	EXPOSURES	PERSONNEL	
B TROOP	1	2	
BATTALION #43	2 KILOMETERS -	· 3 DAYS	
	EXPOSURES	PERSONNEL	
C TROOP	1	3	
BATTALION #43	2 KILOMETERS -	6 DAYS	
	EXPOSURES	PERSONNEL	
C TROOP	1	3	
BATTALION #43	2 KILOMETERS -	3 DAYS	
	EXPOSURES	PERSONNEL	
D TROOP	I 2	<u> </u>	
TOTAL		2	
BATTALION #43	2 KILOMETERS -	6 DAYS	
	EXPOSURES	PERSONNEL	
D TROOP	1 3	1 1	
TOTAL		2 .	

#### INDIVIDUAL AGENT ORANGE

#### EXPOSURE ASSESSMENT SCORES

BATTALION #50	2 KILOMETERS - 3	DAYS
	EXPOSURES	PERSONNEL
A COMPANY	1 4	4 3
TOTAL		7
BATTALION #50	2 KILOMETERS - 6	DAYS
	EXPOSURES	PERSONNEL
A COMPANY.	2 - 6	1 1
	8	1
	9 13	4
TOTAL		8
BATTALION #50	2 KILOMETERS - 3	DAYS
	EXPOSURES	PERSONNEL
B COMPANY	4	<b>2</b> .
BATTALION #50	2 KILOMETERS - 6	DAYS
·	EXPOSURE <b>S</b>	PERSONNEL
B COMPANY	1	2
	6 9	1 2
TOTAL		5 -

BATTALION #50	2 KILOMETERS - 3	DAYS
•	EXPOSURES	PERSONNEL
C COMPANY	1	5
BATTALION #50	2 KILOMETERS - 6	DAYS
	EXPOSURES	PERSONNEL
C COMPANY	1 5 6	2 3 2
TOTAL		7
BATTALION #50	2 KILOMETERS - 3	DAYS
	EXPOSURES	PERSONNEL
E COMPANY	5	1
BATTALION #50	2 KILOMETERS - 6	DAYS
	EXPOSURES	PERSONNEL
E COMPANY	2 11	2 _1
TOTAL		3

#### INDIVIDUAL AGENT ORANGE

#### EXPOSURE ASSESSMENT SCORES

BATTALION #2	0.5 KILOMETEI	R - 1 DAY
	EXPOSURES	PERSONNEL
B COMPANY	. 1	102
BATTALION #6		
A COMPANY	1	2
	2	62
		64

#### NUMBER OF PERSONNEL WITH EXPOSURES

0.5 KILOMETERS - 1 DAY

BATTALIONS	0.5 KILOMETERS - 1 DAY
BATTALION #2	102
BATTALION #6	64
	166

THERE ARE NOT ENOUGH PREVIOUSLY QUALIFIED PERSONNEL TO PROVIDE EXPOSURE OPPORTUNITY SCORES FOR BATTALION #50.

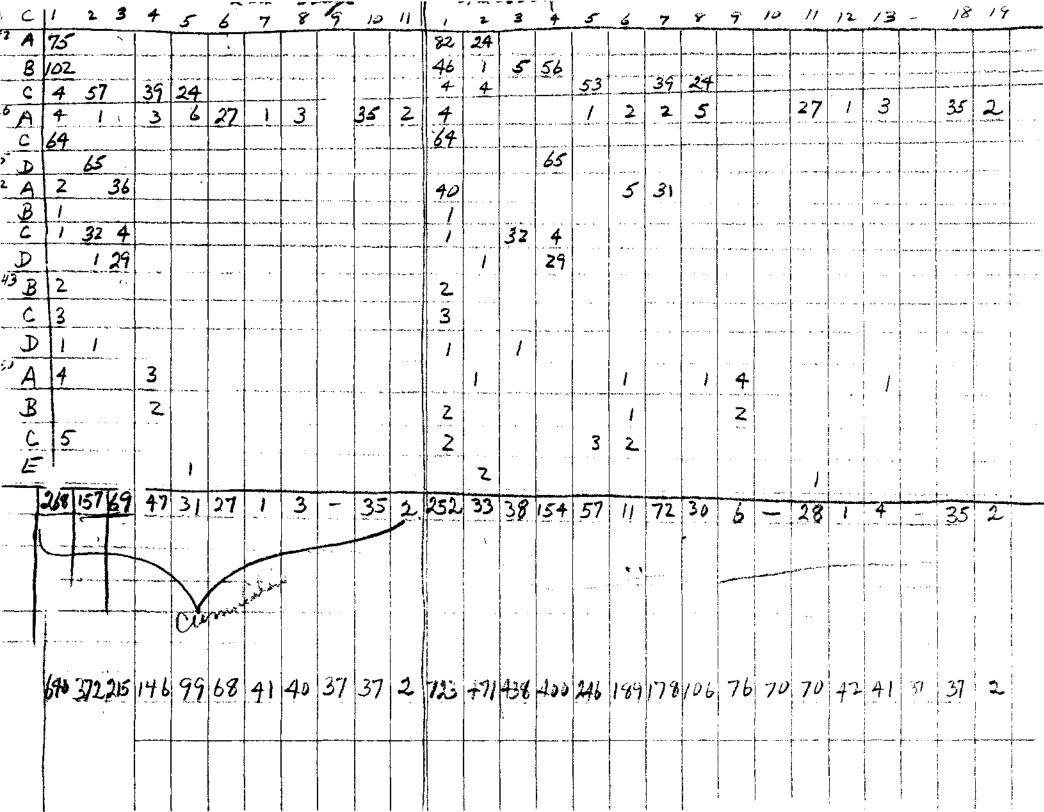
#### UNIT EXPOSURE ASSESSMENT

BATTALION #2		OMETER - 1 DAY	
	RANCH HAND	SERVICES	TOTAL
A COMPANY	0	0	0
B COMPANY	0	1	1
C COMPANY	0	0	0
D COMPANY	0	0	0
E COMPANY	0	0	0
BATTALION #6			
A BATTERY	0	2	2
B BATTERY	0	0	O
C BATTERY	0	0	0
D BATTERY.	0	0	0
E BATTERY	0	0	0
BATTALION #10			
A TROOP	0	. 0	0
B TROOP	0	0	O
C TROOP	0	0	0
D TROOP	0	0	0
E TROOP	0	0	0
BATTALION #20			
A TROOP	0	0	0
B TROOP	0	0	0
C TROOP	0	0	0
D TROOP	0	0	0
E TROOP	0	0	0
BATTALION #22			
A COMPANY	0	0	0
B COMPANY	0	Ō	0
C COMPANY	ŏ	ő	ŏ
D COMPANY	Ō	Õ	0
E COMPANY	Ō	ō	0

	BATTALION #43		OMETER - 1 DAY	_
		RANCH HAND	SERVICES	TOTAL
	A COMPANY	0	0 -	. 0
	B COMPANY	0	0	0
	C COMPANY	0	0	0
	D COMPANY	0	0 .	-0
•	E COMPANY	0	0	0
•	BATTALION #50			
~				
	A COMPANY	i	0	1
	B COMPANY	1	0	1
	C COMPANY	0	0	0
	D COMPANY	0	0	0
yes.	E COMPANY	0	0	0

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, i



# Exposure Comparison by JG Bricker

	Value
TCDD(Orange)(ppm)	2.0
Jungle Canopy	No
Protective Clothing	No
Dermal Absorption	3%
Vapor Inhalation	2\$
Gastro-Intestinal Absorption	1%
$\mu$ g TCDD/m <sup>2</sup> (ground spray, 46,0m)= 9.594	
μg TCDD/serviceman (1.85m <sup>2</sup> /man)=17.75	
ug TCDD skin absorbed/servicem ug TCDD inhaled/serviceman ug TCDD absorbed GI tract ug Total TCDD absorbed/exposur	= .192 $\left\{ \text{spray, 460m.} \right\}$
14 days x .542 = 7.59 Residual absorption for 2 weeks $\mu$ g Total absorbed in 2 wks 8.41 $\mu$ g TCDD absorbed / kg BW = .12 Fraction of FDA's = 25.48 VSD of 13 x $10^{-6}$ ug (3.3 x $10^{-1}$ for 70 yrs) Fraction of MTD	
of 1 x $10^{-1} \mu g/kg = 1.2$	

Sequences of Ference les Spraying at lonk interseals 70% preser 30% sail 1 month; 1.13×10-6 1.13×10-6 Spray = 6 whs (1/6) 4,70 ×10-6 1.05 × 10-6 3.68 ×10-6 Zowetto 2,24 × 10-6 1.01 × 10-6 1.23×10-4 Aprel-12 mbs (5) 5.66 x 10-6 7.63 x 10-7 1.05×10-6 4 months 3.02× 10 - 4 9.08×10 -7 9.85×10-7 Spray 2-18 who (4/2) 6.55 ×18 - 8.81 × 10-7 9.63215-7 3 65 × 10 -6 Smarth 4.03×14-6 8.69×10-7 9,30×10-7 1. 01×10-6 2 1.23×10-6 Spray 24mbs (6) 7.37×10-6 8.20×10-7 8,86×10-7 9.63×10-7 1.05×10-6 3.65×10-6 7th month 4.63 × 10-6 7.66 × 10-7 9.08×10-7 9.85×10-7 8.42×10-7 Spray 30 who (7.5) 8.12×10-6 7.55× 10-7 8.20×10-7 3.86×10-7 9.63×10-7 1.05×10-6 3.65×10-6 8th m 5,56×10-6 7,27×10-7 8:84×10-76 9.30×10-7 1.01×10-6 7.98110-7 1,23x 10- F 5.15×10-6 6.78×10-7 9th m 7.85×10-7 8.20×10-7 8.86×10-7 863×10-7 1.05×10-6 4,84×10-6 6.34×10-7 7.00×10-7 7.66×10-7 8.42×10-7 10 mm 7.08 ×10-7 9.85×10-7 4.61×10-6 5.85×10-7 6,56×10-7 7,25×10-7 8,20×10-7 11 m 9.63×10-7 439×10-6 547×10-7 6.13×10-7 6.78×10-7 7.98×10-7 1 yr. 9.30×10-7

Concentration of TCDD distributed per square meter of soil to a depth of I cm. after a series of Perimeter Sprayings at 6 week intervals by ground units your of spray is 65.6 ft to 150 ft fram spraying rehiele \* Total TOPD Concentration faid Down (gos/m 2) TCDD Concentration in sail (1en x m2) Time Spray Operations (gors/m2-1cm day) .26 ×10-9 3.65 × 10-6 Spray! (4gol/sur) Day / 1.13 × 10-6 .08 × 10-9 1 Morth 4.70 × 10 -6 .33 × 10-9 6 weeks Spray 2. (4gal/acre) 2,24 × 10-6 .16 × 10-9 & morth. 5.66 × 10-6 .40 × 10-9 Spray 3, (Ygal/aere) 12 weeks 3.02 × 10 - 6 .21 × 10-9 4 months 6.55 × 10-6 .46 × 10 -9 Spray 4. (4 gal/ane) 18 weeks 4,03 × 10 -6 .28 × 10-9 5 months 7.37 × 10-6 .52 × 10 -9 24 weeks Agray 5. (Houl/acre) 4.63 × 10-6 .32 × 10-9 7th month 8.12 × 10-6 .57/X 10-9 30 weeks Apray 6, (4gal/scre) .39 × 10-9 5,56 × 10 -6 8 th month x 10-9 5,15 × 10 -6 9th mouth . 36 4.84 × 10 -6 .34 × 10-9 10th month 4.61 × 10-6 .32 X/0-9 11th month

\* Half left decay figured on 10% impaction on grasses with a 6 day half-left and 30% impaction on soil with a one year half-life. Loil based on 1.43 gms / cc 3 × 10,000 cm/m² = 14,300 gms/m² to dythof / cm.

4.39 X10-6

Typor

X 10 -9

.31