

APPENDIX P-2.

Interaction Tables for the Pulmonary Assessment

This appendix contains exposure analyses results of interactions between covariates and group or dioxin. Results are presented for each separate stratum of the covariate and include sample sizes, percent abnormal, relative risks, confidence intervals, and p-values for discrete dependent variables. Sample sizes, adjusted means, differences of adjusted means and confidence intervals or adjusted slopes and standard errors, and p-values are given for continuous dependent variables. Means are transformed back to the original scale, if necessary. Chapter 7, Statistical Methods, provides further details on the analytical approaches used in the interaction analyses. The covariate involved in the interaction and a reference to the analysis table in Chapter 20 are given in the heading of each subtable. A summary of the interactions described in this appendix follows.

Appendix P-2 Table	Chapter 20 Table	Dependent Variable	Model	Covariate
P-2-1	20-3	Asthma	4 6	Age Age
P-2-2	20-4	Bronchitis	4 5 6	Industrial Chemicals Exposure Industrial Chemicals Exposure Industrial Chemicals Exposure
P-2-3	20-6	Thorax and Lung Abnormalities	4	Current Cigarette Smoking
P-2-4	20-7	X Ray Interpretation	3 4 5 6	Occupation Current Cigarette Smoking Current Cigarette Smoking Current Cigarette Smoking
P-2-5	20-9	FEV ₁	2	Current Cigarette Smoking
P-2-6	20-10	Ratio of Observed FEV ₁ to Observed FVC	3	Age
P-2-7	20-11	Loss of Vital Capacity	4 5	Race, Current Cigarette Smoking Current Cigarette Smoking
P-2-8	20-12	Obstructive Abnormality	1 3	Lifetime Cigarette Smoking History Lifetime Cigarette Smoking History

Table P-2-1.
Interaction Table for Asthma

a) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Age: Table 20-3)					
Stratum	Current Dioxin Category Summary Statistics			Analysis Results for \log_2 (Current Dioxin + 1)	
	Current Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^a	p-Value
Born ≥ 1942	Low	97	1.0	1.33 (0.95,1.85)	0.095
	Medium	97	8.2		
	High	170	5.9		
Born < 1942	Low	195	4.6	0.68 (0.43,1.08)	0.104
	Medium	199	3.0		
	High	126	1.6		

b) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Age: Table 20-3)					
Stratum	Current Dioxin Category Summary Statistics			Analysis Results for \log_2 (Current Dioxin + 1)	
	Current Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^a	p-Value
Born ≥ 1942	Low	101	3.0	1.24 (0.93,1.66)	0.149
	Medium	96	7.3		
	High	167	5.4		
Born < 1942	Low	195	5.6	0.74 (0.54,1.03)	0.072
	Medium	197	1.0		
	High	127	3.1		

^a Relative risk for a twofold increase in current dioxin.

Note: Model 4: Low = ≤8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Model 6: Low = ≤46 ppq; Medium = >46-128 ppq; High = >128 ppq.

Table P-2-2.
Interaction Table for Bronchitis

a) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Industrial Chemicals Exposure: Table 20-4)					
Stratum	Current Dioxin Category Summary Statistics			Analysis Results for \log_2 (Current Dioxin + 1)	
	Current Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^a	p-Value
No	Low	155	13.6	1.02 (0.82,1.27)	0.826
	Medium	125	14.4		
	High	93	21.5		
Yes	Low	131	29.8	0.77 (0.66,0.90)	0.001
	Medium	164	22.0		
	High	200	17.0		

b) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Industrial Chemicals Exposure: Table 20-4)					
Stratum	Current Dioxin Category Summary Statistics			Analysis Results for \log_2 (Current Dioxin + 1)	
	Current Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^a	p-Value
No	Low	151	14.6	1.06 (0.88,1.28)	0.556
	Medium	128	12.5		
	High	94	22.3		
Yes	Low	141	30.5	0.82 (0.71,0.93)	0.003
	Medium	157	22.3		
	High	197	15.7		

c) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Industrial Chemicals Exposure: Table 20-4)					
Stratum	Current Dioxin Category Summary Statistics			Analysis Results for \log_2 (Current Dioxin + 1)	
	Current Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.) ^a	p-Value
No	Low	152	14.5	1.00 (0.82,1.21)	0.974
	Medium	128	12.5		
	High	94	22.3		
Yes	Low	140	30.0	0.77 (0.66,0.89)	0.001
	Medium	157	22.3		
	High	197	15.7		

^a Relative risk for a twofold increase in current dioxin.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = $> 8.1\text{--}20.5$ ppt; High = > 20.5 ppt.

Models 5 and 6: Low = ≤ 46 ppq; Medium = $> 46\text{--}128$ ppq; High = > 128 ppq.

Table P-2-3.
Interaction Table for Thorax and Lung Abnormalities

a) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Cigarette Smoking: Table 20-6)					
Stratum	Current Dioxin Category Summary Statistics			Analysis Results for Log₂ (Current Dioxin + 1)	
	Current Dioxin	n	Percent Yes	Adjusted Relative Risk (95% C.I.)^a	p-Value
0-Never Smoked	Low	84	4.8	1.04 (0.51,2.11)	0.922
	Medium	84	1.2		
	High	80	2.5		
0-Former Smoker	Low	138	9.4	0.72 (0.51,1.01)	0.060
	Medium	144	7.6		
	High	126	7.1		
>0-20 Cigarettes/Day	Low	46	34.8	0.93 (0.71,1.21)	0.588
	Medium	44	25.0		
	High	57	35.1		
>20 Cigarettes/Day	Low	26	57.7	1.19 (0.86,1.63)	0.290
	Medium	28	39.3		
	High	36	30.6		

^a Relative risk for a twofold increase in current dioxin.

Note: Low = ≤8.1 ppt; Medium = >8.1-20.5 ppt; High = >20.5 ppt.

Table P-2-4.
Interaction Table for X Ray Interpretation

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Occupation: Table 20-7)					
Stratum	Dioxin Category	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.)	p-Value
Officer	Comparison	409	12.5		
	Background RH	236	14.8	1.24 (0.78,1.99)	0.354
	Low RH	103	4.9	0.33 (0.13,0.87)	0.024
	High RH	9	22.2	1.90 (0.38,9.48)	0.436
Enlisted Flyer	Comparison	173	15.6		
	Background RH	40	25.0	2.00 (0.87,4.61)	0.105
	Low RH	55	23.6	1.65 (0.78,3.50)	0.510
	High RH	55	12.7	0.74 (0.30,1.82)	0.807
Enlisted Groundcrew	Comparison	481	14.1		
	Background RH	98	9.2	0.56 (0.27,1.17)	0.123
	Low RH	102	16.7	1.17 (0.65,2.11)	0.825
	High RH	195	10.8	0.77 (0.46,1.31)	0.826
	Low plus High RH	297	12.8	0.91 (0.59,1.41)	0.878

b) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Cigarette Smoking: Table 20-7)					
Stratum	Current Dioxin Category Summary Statistics			Analysis Results for Log ₂ (Current Dioxin + 1)	
	Current Dioxin	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.) ^a	p-Value
0-Never Smoked	Low	84	10.7		
	Medium	84	14.3		
	High	79	11.4		
0-Former Smoker	Low	138	13.0		
	Medium	144	16.0		
	High	126	17.5		
>0-20 Cigarettes/Day	Low	46	4.4		
	Medium	44	9.1		
	High	57	12.3		
>20 Cigarettes/Day	Low	26	34.6		
	Medium	28	10.7		
	High	36	2.8		

Table P-2-4. (Continued)
Interaction Table for X Ray Interpretation

c) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Cigarette Smoking: Table 20-7)				Analysis Results for \log_2 (Current Dioxin + 1)	
Current Dioxin Category Summary Statistics				Adjusted Relative Risk (95% C.I.)^a	
Stratum	Current Dioxin	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.)^a	p-Value
0-Never Smoked	Low	88	12.5	0.95 (0.73,1.22)	0.676
	Medium	83	12.0		
	High	76	11.8		
0-Former Smoker	Low	136	14.0	1.04 (0.86,1.26)	0.665
	Medium	145	15.9		
	High	127	16.5		
>0-20 Cigarettes/Day	Low	49	4.1	1.23 (0.87,1.73)	0.244
	Medium	43	11.6		
	High	55	10.9		
>20 Cigarettes/Day	Low	26	38.5	0.69 (0.53,0.91)	0.010
	Medium	26	0.0		
	High	38	7.9		

d) MODEL 6: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Cigarette Smoking: Table 20-7)				Analysis Results for \log_2 (Current Dioxin + 1)	
Current Dioxin Category Summary Statistics				Adjusted Relative Risk (95% C.I.)^a	
Stratum	Current Dioxin	n	Percent Abnormal	Adjusted Relative Risk (95% C.I.)^a	p-Value
0-Never Smoked	Low	88	12.5	0.89 (0.69,1.16)	0.404
	Medium	83	12.0		
	High	76	11.8		
0-Former Smoker	Low	137	13.9	0.97 (0.80,1.18)	0.745
	Medium	145	15.9		
	High	127	16.5		
>0-20 Cigarettes/Day	Low	48	4.2	1.14 (0.80,1.64)	0.472
	Medium	43	11.6		
	High	55	10.9		
>20 Cigarettes/Day	Low	26	38.5	0.65 (0.49,0.86)	0.002
	Medium	26	0.0		
	High	38	7.9		

^a Relative risk for a twofold increase in current dioxin.

Note: Model 3: RH = Ranch Hand.

Comparison: Current Dioxin \leq 10 ppt.

Background (Ranch Hand): Current Dioxin \leq 10 ppt.

Low (Ranch Hand): Current Dioxin $>$ 10 ppt, 10 ppt $<$ Initial Dioxin \leq 143 ppt.

High (Ranch Hand): Current Dioxin $>$ 10 ppt, Initial Dioxin $>$ 143 ppt.

Model 4: Low = \leq 8.1 ppt; Medium = $>$ 8.1-20.5 ppt; High = $>$ 20.5 ppt.

Models 5 and 6: Low = \leq 46 ppq; Medium = $>$ 46-128 ppq; High = $>$ 128 ppq.

Table P-2-5.
Interaction Table for FEV₁
(Percent of Predicted)

a) MODEL 2: RANCH HANDS — INITIAL DIOXIN — ADJUSTED (Initial Dioxin-by-Current Cigarette Smoking: Table 20-9)				Analysis Results for Log ₂ (Initial Dioxin)	
Initial Dioxin Category Summary Statistics				Analysis Results for Log ₂ (Initial Dioxin)	
Stratum	Initial Dioxin	n	Adjusted Mean	Adjusted Slope (Std. Error)	p-Value
0-Never Smoked	Low	47	98.6	-3.093 (0.955)	0.001
	Medium	39	96.4		
	High	53	90.8		
0-Former Smoker	Low	91	93.0	-1.287 (0.795)	0.106
	Medium	80	91.0		
	High	68	88.7		
>0-20 Cigarettes/Day	Low	24	80.1	1.791 (1.304)	0.170
	Medium	30	88.1		
	High	34	89.6		
>20 Cigarettes/Day	Low	12	86.7	2.838 (1.899)	0.136
	Medium	24	85.0		
	High	18	92.0		

Note: Low = 39-98 ppt; Medium = >98-232 ppt; High = >232 ppt.

Table P-2-6.
Interaction Table for Ratio of Observed FEV₁ to Observed FVC

a) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Age: Table 20-10)					
Stratum	Dioxin Category	n	Adjusted Mean^a	Difference of Adjusted Mean vs. Comparisons (95% C.I.)^b	p-Value^c
Born ≥ 1942	Comparison	451	0.794		
	Background RH	128	0.799	0.005 --	0.441
	Low RH	85	0.791	-0.003 --	0.701
	High RH	154	0.793	-0.001 --	0.828
	Low plus High RH	239	0.780	-0.014 --	0.565
Born < 1942	Comparison	609	0.756		
	Background RH	244	0.743	-0.014 --	0.012
	Low RH	175	0.763	0.006 --	0.297
	High RH	106	0.768	0.011 --	0.135
	Low plus High RH	281	0.774	0.018 --	0.065

^a Transformed from natural logarithm (1-X) scale.

^b Difference of adjusted means after transformation to original scale; confidence interval on difference of adjusted means not presented because analysis was performed on natural logarithm (1-X) scale.

^c P-value is based on difference of means on natural logarithm (1-X) scale.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin > 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin > 10 ppt, Initial Dioxin > 143 ppt.

Table P-2-7.
Interaction Table for Loss of Vital Capacity

a) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Race: Table 20-11)									
Stratum	Dioxin Category	n	Analysis Results for Log ₂ (Current Dioxin + 1)			Mild vs. None		Moderate or Severe vs. None	
			Percent	Mild	Mod. or Sev.	Adj. Relative Risk (95% C.I.) ^a	p-Value	Adj. Relative Risk (95% C.I.) ^a	p-Value
Non-Black	Low	282	95.0	4.3	0.7	1.20 (0.96,1.51)	0.110	0.85 (0.43,1.64)	0.619
	Medium	277	93.5	5.4	1.1				
	High	282	94.0	5.7	0.3				
Black	Low	12	83.3	16.7	0.0	0.49 (0.21,1.13)	0.095	1.63 (0.53,5.07)	0.395
	Medium	22	81.8	13.6	4.6				
	High	17	76.5	5.9	17.6				

b) MODEL 4: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Cigarette Smoking: Table 20-11)									
Stratum	Dioxin Category	n	Analysis Results for Log ₂ (Current Dioxin + 1)			Mild vs. None		Moderate or Severe vs. None	
			Percent	Mild	Mod. or Sev.	Adj. Relative Risk (95% C.I.) ^a	p-Value	Adj. Relative Risk (95% C.I.) ^a	p-Value
0-Never Smoked	Low	84	100.0	0.0	0.0	2.12 (1.31,3.41)	0.002	1.41 (0.62,3.24)	0.415
	Medium	83	96.4	1.2	2.4				
	High	80	88.7	8.8	2.5				
0-Former Smoker	Low	138	94.9	3.6	1.5	1.16 (0.82,1.62)	0.405	0.39 (0.14,1.15)	0.087
	Medium	144	93.8	6.2	0.0				
	High	126	93.6	5.6	0.8				
>0-20 Cigarettes/ Day	Low	46	91.3	8.7	0.0	0.70 (0.45,1.10)	0.126	1.50 (0.52,4.33)	0.458
	Medium	44	81.8	15.9	2.3				
	High	57	96.5	1.8	1.8				
>20 Cigarettes/ Day	Low	26	80.8	19.2	0.0	0.86 (0.52,1.41)	0.540	1.83 (0.43,7.84)	0.417
	Medium	28	92.9	3.6	3.6				
	High	36	94.4	5.6	0.0				

^a Relative risk for a twofold increase in current dioxin.

Table P-2-7. (Continued)
Interaction Table for Loss of Vital Capacity

c) MODEL 5: RANCH HANDS — CURRENT DIOXIN — ADJUSTED (Current Dioxin-by-Current Cigarette Smoking; Table 20-11)									
Stratum	Dioxin Category	n	Percent			Mild vs. None		Moderate or Severe vs. None	
			None	Mild	Mod. or Sev.	Adj. Relative Risk (95% C.I.) ^a	p-Value	Adj. Relative Risk (95% C.I.) ^a	p-Value
0-Never Smoked	Low	88	100.0	0.0	0.0	2.06 (1.31,3.22)	0.002	1.29 (0.60,2.78)	0.509
	Medium	82	96.3	1.2	2.4				
	High	77	88.3	9.1	2.6				
0-Former Smoker	Low	136	94.9	3.7	1.5	1.14 (0.84,1.55)	0.388	0.57 (0.29,1.15)	0.116
	Medium	145	93.8	6.2	0.0				
	High	127	93.7	5.5	0.8				
>0-20 Cigarettes/ Day	Low	49	91.8	8.2	0.0	0.81 (0.58,1.14)	0.224	1.49 (0.58,3.82)	0.404
	Medium	43	81.4	16.3	2.3				
	High	55	96.4	1.8	1.8				
>20 Cigarettes/ Day	Low	26	80.8	19.2	0.0	0.93 (0.65,1.33)	0.676	1.64 (0.44,6.16)	0.462
	Medium	26	92.3	3.9	3.9				
	High	38	94.7	5.3	0.0				

^a Relative risk for a twofold increase in current dioxin.

Note: Model 4: Low = ≤ 8.1 ppt; Medium = $> 8.1-20.5$ ppt; High = > 20.5 ppt.

Model 5: Low = ≤ 46 ppq; Medium = $> 46-128$ ppq; High = > 128 ppq.

Table P-2-8.
Interaction Table for Obstructive Abnormality

a) MODEL 1: RANCH HANDS VS. COMPARISONS — ADJUSTED (Group-by-Lifetime Cigarette Smoking History; Table 20-12)												
Stratum	Occupational Category	Group	Percent			Mild vs. None		Moderate or Severe vs. None				
			n	None	Mild	Mod. or Sev.	Adj. Relative Risk (95% C.I.)	p-Value	Adj. Relative Risk (95% C.I.)	p-Value		
0 Pack-years	<i>All</i>	Ranch Hand	256	77.7	19.9	2.3	0.85 (0.56,1.30)	0.457	1.21 (0.37,3.89)	0.752		
		Comparison	355	77.2	21.1	1.7						
	Officer	Ranch Hand	133	69.9	26.3	3.8	0.89 (0.57,1.40)	0.618	1.32 (0.39,4.45)	0.656		
		Comparison	194	75.8	23.2	1.0						
	Enlisted	Ranch Hand	25	72.0	24.0	4.0	0.96 (0.50,1.81)	0.889	1.81 (0.43,7.63)	0.420		
		Flyer	28	75.0	25.0	0.0						
	Enlisted	Ranch Hand	98	89.8	10.2	0.0	0.75 (0.45,1.25)	0.266	0.94 (0.26,3.40)	0.928		
		Groundcrew	133	79.7	17.3	3.0						
	>0-10 Pack-years	<i>All</i>	Ranch Hand	298	61.7	32.2	6.0	0.97 (0.69,1.36)	0.846	1.51 (0.73,3.14)	0.268	
			Comparison	383	60.1	35.5	4.4					
		Officer	Ranch Hand	96	59.4	36.5	4.2	1.04 (0.68,1.59)	0.868	1.61 (0.64,4.08)	0.313	
			Comparison	142	51.4	45.1	3.5					
		Enlisted	Ranch Hand	53	56.6	30.2	13.2	1.11 (0.64,1.94)	0.712	2.21 (0.83,5.91)	0.114	
			Flyer	61	55.7	37.7	6.6					
		Enlisted	Ranch Hand	149	65.1	30.2	4.7	0.87 (0.58,1.30)	0.498	1.15 (0.50,2.68)	0.742	
			Groundcrew	180	68.3	27.2	4.4					
		>10 Pack-years	<i>All</i>	Ranch Hand	396	36.4	51.3	12.4	1.24 (0.92,1.67)	0.154	1.18 (0.74,1.87)	0.494
				Comparison	540	43.2	45.7	11.1				
			Officer	Ranch Hand	136	28.7	58.1	13.2	1.34 (0.89,2.02)	0.163	1.28 (0.64,2.53)	0.483
				Comparison	166	34.3	51.8	13.9				
			Enlisted	Ranch Hand	84	26.2	59.5	14.3	1.43 (0.86,2.40)	0.171	1.75 (0.75,4.07)	0.192
				Flyer	114	41.2	48.3	10.5				
			Enlisted	Ranch Hand	176	47.2	42.1	10.8	1.12 (0.78,1.61)	0.531	0.91 (0.48,1.73)	0.780
				Groundcrew	260	49.6	40.8	9.6				

Table P-2-8. (Continued)
Interaction Table for Obstructive Abnormality

b) MODEL 3: RANCH HANDS AND COMPARISONS BY DIOXIN CATEGORY — ADJUSTED (Dioxin Category-by-Lifetime Cigarette Smoking History: Table 20-12)									
Stratum	Dioxin Category	n	Percent			Mild vs. None		Moderate or Severe vs. None	
			None	Mild	Mod. or Sev.	Adj. Relative Risk (95% C.I.) ^a	p-Value	Adj. Relative Risk (95% C.I.) ^b	p-Value
0 Pack-years	Comparison	282	77.0	21.3	1.8				
	Background RH	108	72.2	24.1	3.7	1.02 (0.59,1.77)	0.983	2.03 (0.51,8.08)	0.318
	Low RH	72	79.2	18.1	2.8	0.62 (0.31,1.24)	0.186	0.84 (0.15,4.69)	0.841
	High RH	67	85.1	14.9	0.0	0.91 (0.42,1.96)	0.945	--	--
	Low plus High RH	139	82.0	16.6	1.4	0.74 (0.42,1.31)	0.305	0.59 (0.11,3.24)	0.545
>0-10 Pack-years	Comparison	323	58.2	36.8	5.0				
	Background RH	109	60.6	33.9	5.5	0.81 (0.49,1.33)	0.402	1.14 (0.40,3.22)	0.807
	Low RH	69	56.5	34.8	8.7	1.06 (0.59,1.91)	0.854	2.05 (0.71,5.91)	0.185
	High RH	93	69.9	25.8	4.3	0.85 (0.48,1.49)	0.567	1.22 (0.36,4.05)	0.751
	Low plus High RH	162	64.2	29.6	6.2	0.93 (0.60,1.45)	0.763	1.61 (0.67,3.90)	0.291
>10 Pack-years	Comparison	455	45.3	43.1	11.7				
	Background RH	155	29.7	55.5	14.8	1.56 (1.00,2.42)	0.048	1.49 (0.77,2.89)	0.235
	Low RH	119	39.5	47.9	12.6	1.20 (0.76,1.91)	0.439	1.11 (0.54,2.28)	0.786
	High RH	100	42.0	48.0	10.0	1.40 (0.85,2.31)	0.184	0.99 (0.43,2.29)	0.980
	Low plus High RH	219	40.6	48.0	11.4	1.29 (0.89,1.86)	0.181	1.06 (0.59,1.91)	0.849

^a Relative risk and confidence interval relative to Comparisons.

--: Relative risk, confidence interval, and p-value not given due to zero abnormalities.

Note: RH = Ranch Hand.

Comparison: Current Dioxin ≤ 10 ppt.

Background (Ranch Hand): Current Dioxin ≤ 10 ppt.

Low (Ranch Hand): Current Dioxin ≤ 10 ppt, 10 ppt < Initial Dioxin ≤ 143 ppt.

High (Ranch Hand): Current Dioxin ≤ 10 ppt, Initial Dioxin > 143 ppt.