

**Experiment Number:** 20515 - 04  
**Test Type:** CHRONIC  
**Route:** RESPIRATORY EXPOSURE WHOLE BODY  
**Species/Strain:** MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
Metal working fluids (CIMSTAR 3800)  
**CAS Number:** CIMSTAR3800

**Date Report Requested:** 03/08/2013  
**Time Report Requested:** 14:13:47  
**First Dose M/F:** 05/05/08 / 05/05/08  
**Lab:** BNW

F1\_M3

**NTP Study Number:** C20515  
**Lock Date:** 01/12/2011  
**Cage Range:** ALL  
**Date Range:** ALL  
**Reasons For Removal:** ALL  
**Removal Date Range:** ALL  
**Treatment Groups:** Include ALL  
**Study Gender:** Both  
**TDMSE Version:** 3.0.1.1\_001  
**PWG Approval Date:** NONE



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 Lab: BNW

B6C3F1 MICE MALE Control	DAY ON TEST																									males (cont...)
	0730	0731	0732	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	
ANIMAL ID	0001	0002	0003	0004	0005	0006	0007	0008	0009	0010	0011	0012	0013	0014	0015	0016	0017	0018	0019	0020	0021	0022	0023	0024	0025	
Mixed Cell Focus Necrosis Tension Lipidosis					2				1	2	3				X				X			2			X	
Mesentery Fat, Necrosis	+		+																							
Pancreas Fibrosis Acinus, Hypertrophy	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Salivary Glands	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Stomach, Forestomach Hyperplasia, Squamous Inflammation, Chronic Active	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Stomach, Glandular Erosion Inflammation, Chronic Active	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Tooth Dysplasia Inflammation, Chronic Active	2	1	1	2		1	2			1	1	1	1	2	1	1	1	1	1	1	2	1		1	1	

**CARDIOVASCULAR SYSTEM**

Blood Vessel Inflammation, Chronic Active	+	+	+	+	+	+	+	+	+	+	+	+	+	+	M	+	+	M	+	M	+	M	+	+
Heart	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

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Lab: BNW

B6C3F1 MICE MALE Control	DAY ON TEST																						* TOTALS	
	0730	0730	0735	0772	0779	0773	0774	0777	0777	0777	0777	0777	0777	0777	0777	0777	0777	0777	0777	0777	0777	0777		
ANIMAL ID	00026	00007	00008	00009	00000	00001	00002	00003	00004	00005	00006	00007	00008	00009	00000	00001	00002	00003	00004	00005	00006	00007		
Mixed Cell Focus		X									X		X										6	
Necrosis																							5	2.0
Tension Lipidosis										X													3	1.0
Mesentery																							4	
Fat, Necrosis																							1	2.0
Pancreas																							50	
Fibrosis				4																			1	4.0
Acinus, Hypertrophy																							1	1.0
Salivary Glands																							50	
Stomach, Forestomach																							50	
Hyperplasia, Squamous																							2	3.0
Inflammation, Chronic Active																							1	3.0
Stomach, Glandular																							50	
Erosion																							1	2.0
Inflammation, Chronic Active																						1	1	1.0
Tooth																							50	
Dysplasia																							43	1.3
Inflammation, Chronic Active																							3	3.0

**CARDIOVASCULAR SYSTEM**

Blood Vessel																							45	
Inflammation, Chronic Active																							1	2.0
Heart																							50	

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B6C3F1 MICE MALE Control	DAY ON TEST	0730	0730	0725	0722	0719	0713	0709	0707	0707	0707	0706	0707	0707	0707	0707	0707	0707	0705	0707	0707	0707	0707	0707	* TOTALS		
	ANIMAL ID	00026	00007	00008	00009	00000	00001	00002	00003	00004	00005	00006	00007	00008	00009	00000	00001	00002	00003	00004	00005	00006	00007	00008		00009	
Preputial Gland		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50		
Ectasia		1	3		2						1														8	2.1	
Inflammation, Chronic Active							3							3			1					1	2		9	2.2	
Prostate		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50		
Seminal Vesicle		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50		
Testes		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50		
Germinal Epithelium, Atrophy											2														1	2.0	
<b>HEMATOPOIETIC SYSTEM</b>																											
Bone Marrow		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50		
Lymph Node				+																					4		
Lumbar, Infiltration Cellular, Mixed Cell																									1	2.0	
Lumbar, Lymphoid Follicle, Hyperplasia				4																					1	4.0	
Lymphoid Follicle, Renal, Hyperplasia				4																					1	4.0	
Lymph Node, Bronchial		M	M	+	+	M	+	+	M	M	+	M	+	M	M	M	+	M	+	+	+	+	M	+	+	26	
Infiltration Cellular, Polymorphonuclear				2																					1	2.0	
Lymph Node, Mandibular		+	M	M	M	+	+	+	+	M	+	+	+	+	M	+	M	M	M	M	+	M	+	M	M	31	
Lymph Node, Mediastinal		M	+	+	+	+	+	M	+	+	M	+	M	+	+	+	+	+	+	M	+	+	+	+	M	39	
Lymphoid Follicle, Hyperplasia				4																					1	4.0	
Lymph Node, Mesenteric		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	M	+	+	+	+	+	+	+	+	49	
Fibrosis				4																					1	4.0	

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B6C3F1 MICE MALE 10 mg/m3	DAY ON TEST																				ANIMAL ID	males (cont...)			
	0713	0723	0731	0764	0772	0773	0776	0777	0778	0779	0780	0781	0782	0783	0784	0785	0786	0787	0788	0789			0790		
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	7	7	7	6	7	7	7	6	7	7	7	7	7	7	7	5	7	6	7	7	5	7	4	0	
	1	2	3	4	2	3	3	6	3	0	2	3	3	2	2	9	2	3	3	9	3	9	3	0	
	3	9	1	7	9	1	0	2	0	6	9	0	0	9	9	0	9	2	9	0	9	3	9	0	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	
	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	2	2	2	2	0	
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	0	
Respiratory Epithelium, Hyperplasia	1	1	2	2	1	2	2	1	2	2	2	2	2	2	1	1	2	2	1	2	1	2	2	1	
Respiratory Epithelium, Metaplasia, Squamous Turbinate, Degeneration															1	1								2	
Trachea	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
<b>SPECIAL SENSES SYSTEM</b>																									
Eye	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Cornea, Inflammation, Chronic Active Lens, Degeneration																							2		
Harderian Gland Cyst Hyperplasia	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		1
<b>URINARY SYSTEM</b>																									
Kidney Cyst Infarct Metaplasia, Osseous Nephropathy Artery, Inflammation, Chronic Active Capsule, Fibrosis Capsule, Hemorrhage Papilla, Necrosis Pelvis, Inflammation, Suppurative	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
	1	2	2	2	2	3	2	1	2	3	2	3	2	2	2	1	2	2	2	2	2	2	2		
								1																	
																									2
																									2
Urinary Bladder	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		

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Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

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First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

<b>B6C3F1 MICE MALE</b>	DAY ON TEST	0729	0688	0709	0703	0556	0752	0591	0730	0536	0733	0592	0779	0572	0779	0573	0744	0573	0722	0622	0733	0573	0799	0572	<b>* TOTALS</b>
	ANIMAL ID	00226	00227	00228	00229	00230	00231	00232	00233	00234	00235	00236	00237	00238	00239	00240	00241	00242	00243	00244	00245	00246	00247	00248	

ALIMENTARY SYSTEM

Esophagus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Gallbladder	+	+	+	+	+	+	+	M	+	+	+	+	+	+	+	+	+	+	+	+	+	+	M	44		
Intestine Large, Cecum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Intestine Large, Colon Ulcer	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	1 2.0
Intestine Large, Rectum Cyst Fibrosis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	1 1.0 1 1.0
Intestine Small, Duodenum	+	+	+	+	A	+	A	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	48	
Intestine Small, Ileum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Intestine Small, Jejunum	+	+	+	+	A	+	A	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	48	
Liver	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Angiectasis																									1 2.0	
Basophilic Focus											X														3	
Clear Cell Focus											X		X					X							9	
Congestion																	1								1 1.0	
Cyst																									1 3.0	
Eosinophilic Focus																		X							3	
Fatty Change		1		1			1	1		1	1			1			1		1				1		22 1.3	
Hyperplasia							2																		1 2.0	
Mixed Cell Focus																									4	

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B6C3F1 MICE MALE 10 mg/m3	DAY ON TEST																								* TOTALS
	0729	0628	0709	0703	0556	0771	0571	0773	0575	0777	0579	0773	0579	0779	0579	0770	0577	0772	0660	0773	0667	0773	0578	0779	
ANIMAL ID	002226	00087	00090	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000	
Necrosis				3	2	3	2		2																7 2.4
Tension Lipidosis								1																	2 1.5
Mesentery		+														+						+	+		5
Inflammation, Chronic Active																									1 3.0
Arteriole, Inflammation, Chronic Active																							3		1 3.0
Fat, Necrosis															2							1			2 1.5
Pancreas	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Lipomatosis																									1 2.0
Acinus, Hypertrophy																									1 2.0
Artery, Inflammation, Chronic Active																							2		1 2.0
Salivary Glands	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Infiltration Cellular, Lymphocyte																									1 1.0
Stomach, Forestomach	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Cyst, Squamous																								1	1 1.0
Hyperplasia, Squamous													2												2 2.0
Inflammation, Chronic Active																									2 2.5
Stomach, Glandular	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Arteriole, Serosa, Inflammation, Chronic Active																							2		1 2.0
Tooth	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	47
Dysplasia	1	1	1	1		1				2	3		1	1	1	1		1		1	1	1		35 1.3	
Inflammation, Chronic Active																									1 4.0

**CARDIOVASCULAR SYSTEM**

Blood Vessel	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	49
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	ANIMAL ID	002226	002227	002228	002229	002230	002231	002232	002233	002234	002235	002236	002237	002238	002239	002240	002241	002242	002243	002244	002245	002246	002247	002248	

Aorta, Inflammation, Chronic Active																									2	1 2.0
Heart	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Cardiomyopathy																									2	3 2.0
Artery, Inflammation, Chronic Active																									3	1 3.0

**ENDOCRINE SYSTEM**

Adrenal Cortex	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Hyperplasia																									1	23 1.3
Adrenal Medulla	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Hyperplasia																									1	1 1.0
Islets, Pancreatic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Parathyroid Gland	M	+	M	M	+	M	M	M	M	+	M	+	+	M	+	M	+	+	M	+	+	M	+	+	28	
Pituitary Gland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Pars Distalis, Hyperplasia																									1	8 1.3
Pars Intermedia, Hypertrophy																									2	1 2.0
Thyroid Gland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	

**GENERAL BODY SYSTEM**

Tissue NOS																										2
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**GENITAL SYSTEM**

Epididymis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
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	0729	0628	0709	0703	0556	0771	0571	0793	0530	0755	0731	0576	0779	0779	0592	0722	0733	0544	0733	0722	0620	0737	0673	0739		0572	
	ANIMAL ID																										
	002226	002227	002228	002229	002230	002231	002232	002233	002234	002235	002236	002237	002238	002239	002240	002241	002242	002243	002244	002245	002246	002247	002248	002249	002250		
Inflammation, Chronic Active Spermatocele																										1 3.0 1 2.0	
Preputial Gland Ectasia	+	+	+	+	+	+	+	+	+	+	+	+	+	+	M	+	+	+	+	+	+	+	+	+	+	49	
Inflammation, Chronic Active																										4 2.3 4 2.3	
Prostate	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	49	
Seminal Vesicle	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Testes Nuclear Alteration, Focal Germinal Epithelium, Atrophy	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50 1 2.0 4 1.5	
<b>HEMATOPOIETIC SYSTEM</b>																											
Bone Marrow	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Lymph Node			+																							3	
Lymph Node, Bronchial	+	+	+	M	+	M	M	+	+	M	+	+	+	+	M	M	+	M	M	M	M	M	+	+	+	31	
Lymph Node, Mandibular Hyperplasia, Lymphoid Infiltration Cellular, Plasma Cell	+	M	M	+	M	+	+	+	+	+	+	+	+	M	+	+	M	M	M	+	+	+	+	+	+	36 2 2.0 1 2.0	
Lymph Node, Mediastinal	+	+	+	+	+	+	+	+	+	+	M	+	+	M	M	M	+	M	+	+	+	+	M	M	+	+	39
Lymph Node, Mesenteric Hemorrhage	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50 1 2.0	

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically  
 1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

B6C3F1 MICE MALE 10 mg/m3	DAY ON TEST	0729	0628	0709	0703	0526	0721	0529	0730	0536	0733	0733	0529	0722	0722	0334	0334	0547	0730	0622	0622	0737	0639	0739	0529	0722	* TOTALS
	ANIMAL ID	002226	002227	002228	002229	002230	002231	002232	002233	002234	002235	002236	002237	002238	002239	002240	002241	002242	002243	002244	002245	002246	002247	002248	002249	002250	

Spleen	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Fibrosis																										3	1 3.0
Hematopoietic Cell Proliferation																											1 2.0
Lymphoid Follicle, Hyperplasia																											2 2.5
Thymus	+	+	+	+	M	M	+	+	+	M	M	M	+	+	+	+	M	+	+	+	+	+	+	+	+	38	

**INTEGUMENTARY SYSTEM**

Mammary Gland	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0
Skin	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	49
Inflammation, Chronic Active					3																					4 2.3
Ulcer											2										4				3	4 3.0
Sebaceous Gland, Hyperplasia										2																1 2.0

**MUSCULOSKELETAL SYSTEM**

Bone	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Fibro-Osseous Lesion	2												2		1	1										7 1.3
Cranium, Fracture																										1 3.0
Cranium, Inflammation, Chronic Active													4													2 3.5
Joint, Vertebra, Fracture																										1 1.0
Maxilla, Necrosis																										1 3.0
Skeletal Muscle																										3
Infiltration Cellular, Lymphocyte																										1 1.0

**NERVOUS SYSTEM**

Brain	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
-------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	----

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically  
 1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

B6C3F1 MICE MALE	DAY ON TEST	0																				* TOTALS					
		7	6	7	7	5	7	5	7	5	7	7	5	7	7	7	7	5	7	6	7		6	7	5	7	
10 mg/m3		2	2	0	3	5	2	9	3	6	3	3	9	2	2	3	3	4	3	2	2	3	7	3	9	2	
		9	8	9	0	6	7	1	0	5	0	1	6	9	9	0	0	7	0	9	0	0	7	0	8	9	
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	5		
	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0		

Arteriole, Inflammation, Chronic Active 2 1 2.0  
 Venule, Infiltration Cellular, Lymphoid 1 1.0

Peripheral Nerve + 2

Spinal Cord + 3

**RESPIRATORY SYSTEM**

Larynx 50  
 Inflammation, Suppurative 1 1 1.0  
 Inflammation, Chronic Active 1 1.5  
 Metaplasia, Squamous 1 1 1 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 2 1 1 1 1 1 50 1.0  
 Necrosis 2 1 2.0

Lung 50  
 Erythrophagocytosis 2 1 2.0  
 Infiltration Cellular, Histiocyte 1 5 1.6  
 Alveolar Epithelium, Hyperplasia 1 1 1.3  
 Bronchiole, Hyperplasia 1 2 1.1  
 Perivascular, Inflammation, Chronic Active 1 1 2.0

Nose 50  
 Inflammation, Chronic Active 3 2 8 2.1  
 Necrosis 3 2 3.0  
 Olfactory Epithelium, Accumulation, Hyaline Droplet 2 1 1 1 2 1 2 2 1 1 2 1 2 2 31 1.5  
 Olfactory Epithelium, Metaplasia, Respiratory 2 3 1 1 1 15 1.3  
 Olfactory Epithelium, Necrosis 1 1.0  
 Respiratory Epithelium, Accumulation, Hyaline Droplet 1 2 1 1 1 2 1 2 2 1 2 1 1 2 36 1.4

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically M .. Missing tissue 1-4 .. Lesion qualified as:  
 X .. Lesion present A .. Autolysis precludes evaluation 1) Minimal 3) Moderate  
 I .. Insufficient tissue BLANK .. Not examined microscopically 2) Mild 4) Marked

Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

B6C3F1 MICE MALE 10 mg/m3	DAY ON TEST	0729	0628	0709	0703	0526	0721	0529	0730	0536	0701	0705	0527	0707	0707	0529	0703	0703	0434	0333	0709	0622	0622	0703	0627	0703	0529	0708	0709	* TOTALS
	ANIMAL ID	002226	002222	002222	002222	002222	002222	002222	002222	002222	002222	002222	002222	002222	002222	002222	002222	002222	002222	002222	002222	002222	002222	002222	002222	002222	002222	002222	002222	
Respiratory Epithelium, Hyperplasia		2	2		1	2	2	1	1		1	1		1	2	1	1				1	2	1	1	1	1			44	1.5
Respiratory Epithelium, Metaplasia, Squamous Turbinate, Degeneration				3																									3	1.3
Trachea		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
<b>SPECIAL SENSES SYSTEM</b>																														
Eye		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Cornea, Inflammation, Chronic Active				4																2					3				4	2.8
Lens, Degeneration				3																									1	3.0
Harderian Gland		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Cyst																													1	1.0
Hyperplasia																										2			1	2.0
<b>URINARY SYSTEM</b>																														
Kidney		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Cyst														X															2	
Infarct																									2				1	2.0
Metaplasia, Osseous																			1										1	1.0
Nephropathy		2	1	2	2	1	3	1	2	3	2	2	1	2	2	2	2	2			1	2	2	2	2	2	2		48	1.9
Artery, Inflammation, Chronic Active																											2		3	2.3
Capsule, Fibrosis																													1	1.0
Capsule, Hemorrhage																								3					1	3.0
Papilla, Necrosis																													1	2.0
Pelvis, Inflammation, Suppurative																													1	2.0
Urinary Bladder		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

2) Mild 4) Marked









Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

### P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

<b>B6C3F1 MICE MALE</b>	DAY ON TEST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																											
	ANIMAL ID	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																										
<b>30 mg/m3</b>		7	6	7	7	6	7	7	7	4	7	7	7	7	7	7	7	7	6	7	7	7	6	7	6	7	2	4	3	2	6	2	3	3	3	2	3	2	3	3	8	3	2	3	2	3	2	4	3	1							
		9	0	0	9	3	9	1	0	0	8	0	9	0	9	9	9	1	3	0	3	9	1	9	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	2	2	2	2	2	2	4	5

males (cont...)

Lymphoid Follicle, Hyperplasia

3

Thymus  
Atrophy

+ M + + + + M M + M + + + + + + + + + M M + + +

### INTEGUMENTARY SYSTEM

Mammary Gland

M M M M M M M M M M M M M M M M M M M M M M M M M

Skin  
Angiectasis  
Inflammation, Chronic Active  
Ulcer

+ + + + + + + + + + + + + + + + + + + + + + + + + + + +  
3

### MUSCULOSKELETAL SYSTEM

Bone  
Fibro-Osseous Lesion  
Cranium, Inflammation, Chronic Active

+ + + + + + + + + + + + + + + + + + + + + + + + + + + +  
1 2 2 1 1  
3 3

Skeletal Muscle

+

### NERVOUS SYSTEM

Brain  
Inflammation, Suppurative  
Thrombosis  
Ventricle, Dilatation

+ + + + + + + + + + + + + + + + + + + + + + + + + + + +  
3

Peripheral Nerve

+

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
+ .. Tissue examined microscopically  
X .. Lesion present  
I .. Insufficient tissue  
M .. Missing tissue  
A .. Autolysis precludes evaluation  
BLANK .. Not examined microscopically  
1-4 .. Lesion qualified as:  
1) Minimal 3) Moderate  
2) Mild 4) Marked

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

| B6C3F1 MICE MALE | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|                  |             | 7 | 6 | 7 | 7 | 6 | 7 | 7 | 7 | 4 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 7 | 6 | 7 |
| 30 mg/m3         | ANIMAL ID   | 2 | 4 | 3 | 2 | 6 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 8 | 3 | 3 | 2 | 4 | 3 |   |
|                  |             | 9 | 0 | 0 | 9 | 3 | 9 | 1 | 0 | 8 | 0 | 0 | 0 | 0 | 9 | 9 | 9 | 1 | 0 | 3 | 0 | 9 | 1 | 9 | 0 |
|                  |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   |
|                  |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   |
|                  |             | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |   |
|                  |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   |
|                  |             | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |   |

**males (cont...)**

Spinal Cord +

### RESPIRATORY SYSTEM

|                                                       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Larynx                                                | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Hyperplasia                                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Inflammation, Chronic Active                          |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Metaplasia, Squamous                                  | 2 | 2 | 2 | 2 | 2 | 2 | 2 |   | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |   |   |
| Necrosis                                              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Lung                                                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |   |
| Congestion                                            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Hemorrhage                                            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Infiltration Cellular, Histiocyte                     |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 |   |   |   |   |   |   |   |   |   |   |   |
| Inflammation, Acute                                   |   |   | 3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Alveolar Epithelium, Hyperplasia                      |   |   |   |   |   |   |   |   | 1 |   | 2 |   |   |   |   |   | 4 |   |   | 2 |   |   | 4 |   |   |
| Bronchiole, Hyperplasia                               |   |   |   | 1 | 1 |   | 1 | 1 | 1 |   | 1 | 1 | 1 | 2 | 1 | 1 |   |   | 1 |   | 1 | 1 | 1 |   |   |
| Interstitial, Inflammation, Chronic Active            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Perivascular, Inflammation, Chronic Active            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 3 |   |
| Nose                                                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |   |
| Inflammation, Chronic Active                          |   |   |   |   |   |   | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Olfactory Epithelium, Accumulation, Hyaline Droplet   | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 |   | 2 | 1 |   | 2 | 2 |   | 1 | 2 | 1 | 1 | 3 |   |
| Olfactory Epithelium, Metaplasia, Respiratory         | 1 |   |   | 1 | 1 | 1 | 2 |   |   | 1 |   |   | 1 | 1 |   |   | 2 | 1 |   |   |   | 1 | 1 | 1 |   |
| Respiratory Epithelium, Accumulation, Hyaline Droplet | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 3 |
| Respiratory Epithelium, Hyperplasia                   |   |   |   | 1 | 1 | 1 | 2 | 1 | 2 | 2 |   | 2 |   | 2 | 2 | 1 | 2 |   |   | 2 | 2 | 2 | 2 | 1 |   |
| Trachea                                               | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

2) Mild 4) Marked

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

|                         |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                            |
|-------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------------------------|
| <b>B6C3F1 MICE MALE</b> | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <b>males<br/>(cont...)</b> |
|                         |             | 7 | 6 | 7 | 7 | 6 | 7 | 7 | 7 | 4 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 7 | 6 | 7 | 7 |                            |
|                         |             | 2 | 4 | 3 | 2 | 6 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 8 | 3 | 2 | 3 | 2 | 4 | 3 |                            |
| <b>30 mg/m3</b>         | ANIMAL ID   | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <b>males<br/>(cont...)</b> |
|                         |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |                            |
|                         |             | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |                            |
|                         |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |                            |
|                         |             | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 |                            |

**SPECIAL SENSES SYSTEM**

|                                      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Eye                                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Cornea, Inflammation, Chronic Active |   |   |   |   |   | 2 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Harderian Gland                      | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Hyperplasia                          |   |   |   | 2 |   |   |   |   |   |   |   |   |   |   |   |   |   | 2 |   |   |   |   |   |   |

**URINARY SYSTEM**

|                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Kidney                    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Cyst                      |   |   | X | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Infarct                   |   |   |   |   |   |   |   |   |   |   |   | 2 |   |   |   |   |   |   |   |   |   |   |   |   |
| Inflammation, Suppurative |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 4 |   |   |
| Nephropathy               | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 1 | 3 | 2 | 2 | 3 | 2 | 2 |
| Urinary Bladder           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically  
 1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

|                  |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |          |
|------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|
| B6C3F1 MICE MALE | DAY ON TEST | 7 | 7 | 5 | 7 | 7 | 7 | 7 | 7 | 6 | 4 | 5 | 5 | 6 | 7 | 5 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 7 | 7 |          |
| 30 mg/m3         | ANIMAL ID   | 3 | 3 | 7 | 3 | 3 | 3 | 1 | 3 | 2 | 4 | 4 | 3 | 3 | 9 | 3 | 8 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 |          |
|                  |             | 0 | 1 | 3 | 1 | 1 | 0 | 5 | 1 | 9 | 5 | 7 | 4 | 4 | 8 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |          |
|                  |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |          |
|                  |             | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |          |
|                  |             | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 |          |
|                  |             | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | * TOTALS |

**ALIMENTARY SYSTEM**

|                                                       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |    |         |     |     |
|-------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----|---------|-----|-----|
| Esophagus                                             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |    |         |     |     |
| Gallbladder                                           | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | M | + | + | M | M | + | + | + | +  | 44 |         |     |     |
| Intestine Large, Cecum Hemorrhage                     | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +  | 49 | 1 3.0   |     |     |
| Intestine Large, Colon                                | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +  | 50 |         |     |     |
| Intestine Large, Rectum                               | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +  | 50 |         |     |     |
| Intestine Small, Duodenum                             | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +  | 48 |         |     |     |
| Intestine Small, Ileum Inflammation, Chronic Active   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +  | 49 | 2 2 3.0 |     |     |
| Intestine Small, Jejunum Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +  | 49 | 1 3.0   |     |     |
| Liver                                                 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +  | 50 |         |     |     |
| Clear Cell Focus                                      |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    | 3  |         |     |     |
| Congestion                                            |   |   |   |   |   |   |   |   |   |   | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |    | 1       | 1.0 |     |
| Cyst                                                  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |    | 1       | 2.0 |     |
| Eosinophilic Focus                                    |   |   |   | X |   | X |   | X |   |   |   |   |   | X |   |   |   | X |   | X |   | X |   |   |   |    |    | 20      |     |     |
| Fatty Change                                          |   |   |   | 2 |   | 2 |   | 1 | 1 | 2 | 1 |   | 2 |   | 2 |   | 1 | 2 |   | 2 | 2 |   | 1 |   |   |    |    | 24      | 1.5 |     |
| Hepatodiaphragmatic Nodule                            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |    | 1       |     |     |
| Hyperplasia                                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2 |   |   |   |    |    |         | 1   | 2.0 |
| Infiltration Cellular, Lymphocyte                     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |    | 1       | 2.0 |     |
| Mixed Cell Focus                                      |   |   |   | X |   | X | X | X |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   | X |   |    |    |         | 11  |     |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically  
 1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

| B6C3F1 MICE MALE<br>30 mg/m3 | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS |       |    |     |
|------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|----|-----|
|                              | 0730        | 0731  | 0733  | 0735  | 0737  | 0739  | 0741  | 0743  | 0745  | 0747  | 0749  | 0751  | 0753  | 0755  | 0757  | 0759  | 0761  | 0763  | 0765  | 0767  |          | 0769  |    |     |
| ANIMAL ID                    | ANIMAL ID   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |    |     |
|                              | 00426       | 00447 | 00448 | 00449 | 00450 | 00451 | 00452 | 00453 | 00454 | 00455 | 00456 | 00457 | 00458 | 00459 | 00460 | 00461 | 00462 | 00463 | 00464 | 00465 | 00466    | 00467 |    |     |
| Necrosis                     |             |       |       |       |       |       |       |       | 2     | 3     |       |       | 2     |       | 2     |       |       |       |       | 2     |          |       | 6  | 2.3 |
| Tension Lipidosis            |             |       |       |       |       |       |       |       |       |       |       |       |       |       | 2     |       |       |       |       |       |          |       | 5  | 1.3 |
| Mesentery                    |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       | 3  |     |
| Inflammation, Chronic Active |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       | 1  | 3.0 |
| Fat, Necrosis                |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       | 2  | 1.5 |
| Pancreas                     | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | 50 |     |
| Salivary Glands              | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | 50 |     |
| Stomach, Forestomach         | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | 50 |     |
| Hyperplasia, Squamous        |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          | 4     | 1  | 4.0 |
| Inflammation, Chronic Active |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          | 2     | 1  | 2.0 |
| Ulcer                        |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       | 1  | 2.0 |
| Stomach, Glandular           | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | 50 |     |
| Glands, Mineralization       |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          | 1     | 2  | 1.0 |
| Tooth                        | +           | +     |       | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | 49 |     |
| Dysplasia                    | 2           | 2     |       | 2     | 1     | 2     | 2     | 1     | 1     | 1     | 1     |       |       |       | 3     | 3     | 1     | 1     | 1     | 2     |          | 1     | 41 | 1.6 |
| Inflammation, Chronic Active |             |       |       | 2     | 2     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          | 2     | 6  | 2.2 |

CARDIOVASCULAR SYSTEM

|                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |     |
|---------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|-----|
| Blood Vessel              | + | + | + | + | + | M | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |     |
| Heart                     | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |     |
| Cardiomyopathy            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  | 2.0 |
| Inflammation, Suppurative |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 3 |   |   |   |   |   |   |   | 1  | 3.0 |
| Valve, Fibrosis           |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 |   |   |   |   |   |   |   | 1  | 1.0 |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
+ .. Tissue examined microscopically  
X .. Lesion present  
I .. Insufficient tissue

M .. Missing tissue  
A .. Autolysis precludes evaluation  
BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:  
1) Minimal 3) Moderate  
2) Mild 4) Marked

**Experiment Number:** 20515 - 04  
**Test Type:** CHRONIC  
**Route:** RESPIRATORY EXPOSURE WHOLE BODY  
**Species/Strain:** MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
**CAS Number:** CIMSTAR3800

**Date Report Requested:** 03/08/2013  
**Time Report Requested:** 14:13:47  
**First Dose M/F:** 05/05/08 / 05/05/08  
**Lab:** BNW

|                         |                 |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-------------------------|-----------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| <b>B6C3F1 MICE MALE</b> | <b>30 mg/m3</b> | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   |
|                         |                 | ANIMAL ID   | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|                         |                 |             | 7 | 7 | 5 | 7 | 7 | 7 | 7 | 7 | 6 | 4 | 5 | 5 | 6 | 7 | 5 | 7 | 7 | 7 | 7 | 7 | 2 | 2 | 6 | 7 | 7 | 7 | 2 | 2 | 6 | 7 | 7 | 7 | 2 | 2 |
|                         |                 | 3           | 3 | 7 | 3 | 3 | 3 | 1 | 3 | 2 | 4 | 4 | 3 | 3 | 9 | 3 | 8 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |   |
|                         |                 | 0           | 1 | 3 | 1 | 1 | 0 | 5 | 1 | 9 | 5 | 7 | 4 | 4 | 8 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|                         |                 | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|                         |                 | 4           | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
|                         |                 | 2           | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 |
|                         |                 | 6           | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |
| <b>* TOTALS</b>         |                 |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

**ENDOCRINE SYSTEM**

|                              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |           |  |  |  |   |           |          |          |            |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|-----------|--|--|--|---|-----------|----------|----------|------------|
| Adrenal Cortex               | + |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  | <b>50</b> |  |  |  |   |           |          |          |            |
| Hyperplasia                  | 1 | 2 |   |   | 1 |   |   | 1 |   | 2 | 2 |   |   |   |   |   |   |   | 1 |   | 2 | 2 | 1 |   | 1 |   |   |  |           |  |  |  | 1 |           |          |          |            |
| Adrenal Medulla              | + |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  | <b>50</b> |  |  |  |   |           |          |          |            |
| Islets, Pancreatic           | + |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  | <b>50</b> |  |  |  |   |           |          |          |            |
| Parathyroid Gland            | + | M | + | + | M | M | + | M | + | M | + | + | M | M | M | + | M | M | M | + | + | + | + | + | + | M | + |  |           |  |  |  |   | <b>27</b> |          |          |            |
| Pituitary Gland              | + |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  | <b>50</b> |  |  |  |   |           |          |          |            |
| Pars Distalis, Hyperplasia   | 1 | 1 |   |   | 1 |   |   | 4 | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |           |  |  |  |   |           | <b>7</b> |          |            |
| Thyroid Gland                | + |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  | <b>49</b> |  |  |  |   |           |          |          |            |
| Inflammation, Chronic Active |   | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |           |  |  |  |   |           |          | <b>1</b> |            |
| Follicular Cell, Hyperplasia |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |           |  |  |  |   |           |          | <b>1</b> |            |
|                              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |           |  |  |  |   |           |          |          | <b>2.0</b> |

**GENERAL BODY SYSTEM**

NONE

**GENITAL SYSTEM**

|                              |   |  |  |  |   |   |  |  |   |  |  |  |  |  |   |  |   |   |  |  |  |  |  |  |  |  |   |   |           |  |  |  |  |  |           |
|------------------------------|---|--|--|--|---|---|--|--|---|--|--|--|--|--|---|--|---|---|--|--|--|--|--|--|--|--|---|---|-----------|--|--|--|--|--|-----------|
| Epididymis                   | + |  |  |  |   |   |  |  |   |  |  |  |  |  |   |  |   |   |  |  |  |  |  |  |  |  |   |   | <b>50</b> |  |  |  |  |  |           |
| Preputial Gland              | + |  |  |  |   |   |  |  |   |  |  |  |  |  |   |  |   |   |  |  |  |  |  |  |  |  |   |   | <b>48</b> |  |  |  |  |  |           |
| Ectasia                      |   |  |  |  | 4 | 4 |  |  | 4 |  |  |  |  |  |   |  |   |   |  |  |  |  |  |  |  |  |   |   |           |  |  |  |  |  | <b>7</b>  |
| Inflammation, Chronic Active |   |  |  |  |   | 2 |  |  | 1 |  |  |  |  |  | 2 |  | 3 | 1 |  |  |  |  |  |  |  |  | 2 | 3 |           |  |  |  |  |  | <b>11</b> |
| Prostate                     | + |  |  |  |   |   |  |  |   |  |  |  |  |  |   |  |   |   |  |  |  |  |  |  |  |  |   |   | <b>50</b> |  |  |  |  |  |           |

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 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
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Experiment Number: 20515 - 04  
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 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

| B6C3F1 MICE MALE                                         | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   |   |    |    |
|----------------------------------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------------|---|---|---|---|---|---|---|---|---|---|---|----|----|
|                                                          |             | 7 | 7 | 5 | 7 | 7 | 7 | 7 | 7 | 6 | 4 | 5 | 5 | 6 | 7 | 5 | 7 | 7 | 7 | 2 | 2 | 6 | 7 | 6 | 7 | 7 | 6 | 7 | 7               | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |    |    |
| 30 mg/m3                                                 | ANIMAL ID   | 3 | 3 | 7 | 3 | 3 | 3 | 1 | 3 | 2 | 4 | 4 | 3 | 3 | 9 | 3 | 8 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3               | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |    |    |
|                                                          |             | 0 | 1 | 3 | 1 | 1 | 0 | 5 | 1 | 9 | 5 | 7 | 4 | 4 | 8 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  |
|                                                          |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  |    |
|                                                          |             | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4               | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4  |    |
|                                                          |             | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4               | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4  |    |
|                                                          |             | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 0 | 0 | 0               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0  | 0  |
|                                                          |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | <b>* TOTALS</b> |   |   |   |   |   |   |   |   |   |   |   |    |    |
| Seminal Vesicle Dilatation                               |             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +               | + | + | + | + | + | + | + | + | + | + | + | 50 |    |
|                                                          |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | <b>1 2.0</b>    |   |   |   |   |   |   |   |   |   |   |   |    |    |
| Testes                                                   |             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +               | + | + | + | + | + | + | + | + | + | + | + | +  | 50 |
| <b>HEMATOPOIETIC SYSTEM</b>                              |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                 |   |   |   |   |   |   |   |   |   |   |   |    |    |
| Bone Marrow Hyperplasia                                  |             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +               | + | + | + | + | + | + | + | + | + | + | + | +  | 50 |
|                                                          |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | <b>1 3.0</b>    |   |   |   |   |   |   |   |   |   |   |   |    |    |
| Lymph Node                                               |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | <b>1</b>        |   |   |   |   |   |   |   |   |   |   |   |    |    |
| Lymph Node, Bronchial                                    |             | + | M | + | + | M | + | M | M | + | M | + | M | + | M | M | + | + | + | M | M | + | + | + | M | M | + | + | +               | + | + | + | + | + | + | + | + | + | + | + | 26 |    |
| Lymph Node, Mandibular Hyperplasia, Lymphoid             |             | + | + | + | + | M | + | M | + | M | M | + | + | M | M | + | + | + | + | M | + | + | + | + | + | + | + | + | +               | + | + | + | + | + | + | + | + | + | + | + | +  | 34 |
|                                                          |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | <b>1 2.0</b>    |   |   |   |   |   |   |   |   |   |   |   |    |    |
| Lymph Node, Mediastinal Hematopoietic Cell Proliferation |             | + | + | M | + | + | + | + | + | M | + | M | M | + | M | + | M | M | + | + | + | + | + | + | + | + | + | + | +               | + | + | + | + | + | + | + | + | + | + | + | 32 |    |
| Hyperplasia, Plasma Cell                                 |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | <b>1 2.0</b>    |   |   |   |   |   |   |   |   |   |   |   |    |    |
| Infiltration Cellular, Mixed Cell                        |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | <b>1 2.0</b>    |   |   |   |   |   |   |   |   |   |   |   |    |    |
| Lymph Node, Mesenteric Hemorrhage                        |             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +               | + | + | + | + | + | + | + | + | + | + | + | 48 |    |
| Hyperplasia, Plasma Cell                                 |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | <b>1 4.0</b>    |   |   |   |   |   |   |   |   |   |   |   |    |    |
| Infiltration Cellular, Histiocyte                        |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | <b>1 2.0</b>    |   |   |   |   |   |   |   |   |   |   |   |    |    |
|                                                          |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | <b>1 3.0</b>    |   |   |   |   |   |   |   |   |   |   |   |    |    |
| Spleen Congestion                                        |             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +               | + | + | + | + | + | + | + | + | + | + | + | 49 |    |
| Hematopoietic Cell Proliferation                         |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | <b>1 2.0</b>    |   |   |   |   |   |   |   |   |   |   |   |    |    |
|                                                          |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | <b>3 2.0</b>    |   |   |   |   |   |   |   |   |   |   |   |    |    |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically M .. Missing tissue  
 X .. Lesion present A .. Autolysis precludes evaluation  
 I .. Insufficient tissue BLANK .. Not examined microscopically  
 1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04  
Test Type: CHRONIC  
Route: RESPIRATORY EXPOSURE WHOLE BODY  
Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
Metal working fluids (CIMSTAR 3800)  
CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
Time Report Requested: 14:13:47  
First Dose M/F: 05/05/08 / 05/05/08  
Lab: BNW

| B6C3F1 MICE MALE<br>30 mg/m3          | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS      |  |  |
|---------------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------------|--|--|
|                                       | 0730        | 0731  | 0732  | 0733  | 0734  | 0735  | 0736  | 0737  | 0738  | 0739  | 0740  | 0741  | 0742  | 0743  | 0744  | 0745  | 0746  | 0747  | 0748  | 0749  | 0750  | 0751  | 0752  | 0753  |               |  |  |
|                                       | ANIMAL ID   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |               |  |  |
|                                       | 00426       | 00447 | 00448 | 00449 | 00450 | 00451 | 00452 | 00453 | 00454 | 00455 | 00456 | 00457 | 00458 | 00459 | 00460 | 00461 | 00462 | 00463 | 00464 | 00465 | 00466 | 00467 | 00468 | 00469 | 00470         |  |  |
| Lymphoid Follicle, Hyperplasia        |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | <b>1 3.0</b>  |  |  |
| Thymus Atrophy                        | +           | +     | +     | +     | +     | M     | +     | +     | +     | +     | +     | M     | M     | M     | +     | +     | +     | +     | +     | +     | M     | +     | +     | +     | <b>39</b>     |  |  |
|                                       |             |       |       |       |       |       |       |       |       |       |       | 1     |       |       |       |       |       |       |       |       |       |       |       |       | <b>1 1.0</b>  |  |  |
| <b>INTEGUMENTARY SYSTEM</b>           |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |               |  |  |
| Mammary Gland                         | M           | M     | M     | M     | M     | M     | M     | M     | M     | M     | M     | M     | M     | +     | M     | M     | M     | M     | M     | M     | M     | M     | M     | M     | 1             |  |  |
| Skin                                  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | <b>50</b>     |  |  |
| Angiectasis                           |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | <b>1 2.0</b>  |  |  |
| Inflammation, Chronic Active          |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | <b>1 3.0</b>  |  |  |
| Ulcer                                 |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | <b>2 3.5</b>  |  |  |
| <b>MUSCULOSKELETAL SYSTEM</b>         |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |               |  |  |
| Bone                                  | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | <b>50</b>     |  |  |
| Fibro-Osseous Lesion                  |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | <b>10 1.3</b> |  |  |
| Cranium, Inflammation, Chronic Active |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | <b>3 3.0</b>  |  |  |
| Skeletal Muscle                       |             |       |       |       |       |       |       |       |       |       |       |       |       | +     |       |       |       |       |       |       |       |       |       |       | <b>2</b>      |  |  |
| <b>NERVOUS SYSTEM</b>                 |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |               |  |  |
| Brain                                 | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | <b>50</b>     |  |  |
| Inflammation, Suppurative             |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | <b>1 2.0</b>  |  |  |
| Thrombosis                            |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | <b>1 2.0</b>  |  |  |
| Ventricle, Dilatation                 |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | <b>1 3.0</b>  |  |  |
| Peripheral Nerve                      |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | <b>1</b>      |  |  |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
+ .. Tissue examined microscopically  
X .. Lesion present  
I .. Insufficient tissue  
M .. Missing tissue  
A .. Autolysis precludes evaluation  
BLANK .. Not examined microscopically  
1-4 .. Lesion qualified as:  
1) Minimal 3) Moderate  
2) Mild 4) Marked



Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

|                         |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                 |   |
|-------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------------|---|
| <b>B6C3F1 MICE MALE</b> | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |                 |   |
|                         |             | 7 | 7 | 5 | 7 | 7 | 7 | 7 | 7 | 6 | 4 | 5 | 5 | 6 | 7 | 5 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 7 | 7 |                 | 7 |
|                         |             | 3 | 3 | 7 | 3 | 3 | 3 | 1 | 3 | 2 | 4 | 4 | 3 | 3 | 9 | 3 | 8 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 |                 | 2 |
| <b>30 mg/m3</b>         | ANIMAL ID   | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <b>* TOTALS</b> |   |
|                         |             | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |   |                 |   |
|                         |             | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 |   |                 |   |
|                         |             | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |                 |   |

### SPECIAL SENSES SYSTEM

|                                      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           |          |            |
|--------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|----------|------------|
| Eye                                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | <b>50</b> |          |            |
| Cornea, Inflammation, Chronic Active |   |   |   |   |   |   |   | 3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>2</b> | <b>2.5</b> |
| Harderian Gland                      | + | + |   | + | + |   | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | <b>49</b> |          |            |
| Hyperplasia                          |   |   | 3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>3</b> | <b>2.3</b> |

### URINARY SYSTEM

|                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           |           |            |
|---------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|-----------|------------|
| Kidney                    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | <b>50</b> |           |            |
| Cyst                      |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>3</b>  |            |
| Infarct                   |   |   |   | 2 |   |   |   |   |   |   |   | 3 |   |   |   |   |   |   |   |   |   | 3 |   |   |   |           | <b>4</b>  | <b>2.5</b> |
| Inflammation, Suppurative |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>1</b>  | <b>4.0</b> |
| Nephropathy               | 2 | 2 |   | 2 | 2 | 2 | 2 | 2 | 2 | 1 |   |   |   | 2 | 2 |   |   | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |           | <b>45</b> | <b>2.0</b> |
| Urinary Bladder           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | <b>50</b> |           |            |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically M .. Missing tissue  
 X .. Lesion present A .. Autolysis precludes evaluation  
 I .. Insufficient tissue BLANK .. Not examined microscopically  
 1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

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First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

|                                             |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|---------------------------------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <b>B6C3F1 MICE MALE</b><br><b>100 mg/m3</b> | DAY ON TEST | 0729 | 0687 | 0729 | 0733 | 0732 | 0672 | 0772 | 0772 | 0772 | 0772 | 0671 | 0771 | 0773 | 0723 | 0723 | 0729 | 0729 | 0723 | 0733 | 0733 | 0723 | 0733 | 0723 | 0723 | 0729 | 0723 | 0723 | 0723 | 0723 | 0723 | 0723 | 0723 | 0723 |
|                                             | ANIMAL ID   | 0060 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 |

**males (cont...)**

**ALIMENTARY SYSTEM**

|                                                                                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus                                                                       | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Gallbladder<br>Cytoplasmic Alteration<br>Inflammation, Suppurative              | M | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | M | + | + | + | + | + | + |   |   |   |   |   |   |   |   |   | 1 |
| Intestine Large, Cecum                                                          | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Intestine Large, Colon                                                          | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Intestine Large, Rectum                                                         | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Intestine Small, Duodenum                                                       | + | + | + | + | + | + | A | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Intestine Small, Ileum<br>Hyperplasia, Lymphoid<br>Inflammation, Chronic Active | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 2 |
| Intestine Small, Jejunum<br>Serosa, Inflammation, Granulomatous                 | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 1 |   |
| Liver                                                                           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Basophilic Focus                                                                |   |   |   |   | X |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |
| Clear Cell Focus                                                                | X |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |
| Eosinophilic Focus                                                              |   |   |   | X | X |   |   |   |   | X | X |   |   |   |   |   | X | X | X | X | X | X | X |   |   |   |   |   |   |   |   |   |   |   | X |   |
| Fatty Change                                                                    | 1 |   | 1 |   |   | 1 |   |   | 2 | 1 | 1 | 2 |   |   |   | 1 | 1 | 1 | 2 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 |
| Inflammation, Chronic Active                                                    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Mixed Cell Focus                                                                |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |
| Necrosis                                                                        |   |   |   |   |   | 1 | 2 | 3 |   |   |   |   |   |   |   |   | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically M .. Missing tissue  
 X .. Lesion present A .. Autolysis precludes evaluation  
 I .. Insufficient tissue BLANK .. Not examined microscopically  
 1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04  
Test Type: CHRONIC  
Route: RESPIRATORY EXPOSURE WHOLE BODY  
Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL  
Metal working fluids (CIMSTAR 3800)  
CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
Time Report Requested: 14:13:47  
First Dose M/F: 05/05/08 / 05/05/08  
Lab: BNW

| B6C3F1 MICE MALE<br>100 mg/m3                                                         |  | DAY ON TEST |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | males<br>(cont...) |      |   |   |   |   |   |
|---------------------------------------------------------------------------------------|--|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--------------------|------|---|---|---|---|---|
| ANIMAL ID                                                                             |  | 0729        | 0679 | 0770 | 0771 | 0772 | 0673 | 0774 | 0775 | 0776 | 0777 | 0778 | 0679 | 0780 | 0781 | 0782 | 0783 | 0784 | 0785 | 0786 | 0787 |                    | 0788 |   |   |   |   |   |
| Tension Lipidosis                                                                     |  |             |      |      |      |      |      |      |      |      |      | 2    |      | 1    |      |      |      |      |      |      | 1    | 3                  | 1    |   |   |   |   |   |
| Mesentery<br>Artery, Inflammation, Chronic Active<br>Fat, Necrosis                    |  |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                    | +    |   |   |   |   |   |
| Pancreas<br>Necrosis                                                                  |  | +           | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +                  | +    |   |   |   |   |   |
| Salivary Glands                                                                       |  | +           | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +                  | +    |   |   |   |   |   |
| Stomach, Forestomach<br>Hyperplasia, Squamous                                         |  | +           | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +                  | +    |   |   |   |   |   |
| Stomach, Glandular<br>Inflammation, Chronic Active<br>Ulcer<br>Glands, Mineralization |  | +           | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +                  | 3    |   |   |   |   |   |
| Tooth<br>Dysplasia<br>Inflammation, Chronic Active                                    |  | +           | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +                  | +    |   |   |   |   |   |
|                                                                                       |  | 2           | 1    | 4    |      | 1    | 4    | 1    | 2    | 2    | 1    | 2    |      | 2    |      | 2    | 1    | 2    |      |      | 1    | 1                  | 1    | 2 | 3 | 1 |   |   |
|                                                                                       |  |             |      |      |      |      |      |      | 1    |      |      |      |      |      |      |      |      |      |      |      |      |                    |      |   |   | 3 |   |   |
| <b>CARDIOVASCULAR SYSTEM</b>                                                          |  |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                    |      |   |   |   |   |   |
| Blood Vessel                                                                          |  | +           | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +                  | +    | + | + |   |   |   |
| Heart<br>Cardiomyopathy<br>Inflammation, Chronic Active<br>Thrombosis                 |  | +           | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +                  | +    | + | + | 2 | 3 | 2 |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
+ .. Tissue examined microscopically M .. Missing tissue  
X .. Lesion present A .. Autolysis precludes evaluation  
I .. Insufficient tissue BLANK .. Not examined microscopically  
1-4 .. Lesion qualified as:  
1) Minimal 3) Moderate  
2) Mild 4) Marked



Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

|                         |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                        |
|-------------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------------------------|
| <b>B6C3F1 MICE MALE</b> | DAY ON TEST | 0729 | 0672 | 0773 | 0773 | 0772 | 0672 | 0773 | 0773 | 0773 | 0676 | 0773 | 0773 | 0773 | 0773 | 0773 | 0772 | 0772 | 0772 | 0773 | 0773 | 0773 | 0773 | 0773 | 0773 | 0773 |                        |
|                         | ANIMAL ID   | 0060 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 | 0066 |                        |
| <b>100 mg/m3</b>        |             | 11   | 22   | 33   | 44   | 55   | 66   | 77   | 88   | 99   | 00   | 11   | 11   | 11   | 11   | 11   | 11   | 11   | 11   | 11   | 22   | 22   | 22   | 22   | 22   | 22   | <b>males (cont...)</b> |

|                                                      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Penis Congestion                                     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Preputial Gland Ectasia Inflammation, Chronic Active | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 3 |
| Prostate                                             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Seminal Vesicle Dilatation                           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Testes Angiectasis Germinal Epithelium, Atrophy      | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 3 |

**HEMATOPOIETIC SYSTEM**

|                                                                                                                                    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone Marrow Hyperplasia, Granulocytes                                                                                              | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Lymph Node Lumbar, Inflammation, Pyogranulomatous Pancreatic, Inflammation, Pyogranulomatous Renal, Inflammation, Pyogranulomatous |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Lymph Node, Bronchial                                                                                                              | M | M | M | M | M | + | M | M | + | M | + | + | M | M | M | + | + | M | M | + | + | M | M | + |   |
| Lymph Node, Mandibular Inflammation, Pyogranulomatous                                                                              | + | M | + | + | + | + | M | + | + | + | + | M | + | M | + | + | M | + | + | + | M | M | + | + | M |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
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 1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

| B6C3F1 MICE MALE<br>100 mg/m3                                                | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ANIMAL ID | males<br>(cont...) |                            |   |
|------------------------------------------------------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|--------------------|----------------------------|---|
|                                                                              | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |           |                    |                            |   |
| Lymph Node, Mediastinal<br>Inflammation, Pyogranulomatous                    |             | + | + | M | + | M | + | M | + | + | + | + | M | + | + | M | + | + | + | + | M | + | M | + | + | M         |                    |                            |   |
| Lymph Node, Mesenteric<br>Inflammation, Pyogranulomatous                     |             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +         |                    |                            |   |
| Spleen<br>Hematopoietic Cell Proliferation<br>Lymphoid Follicle, Hyperplasia |             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +         |                    | 4                          |   |
| Thymus<br>Atrophy                                                            |             | + | M | + | + | + | + | + | + | M | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +         |                    | 2                          |   |
| <b>INTEGUMENTARY SYSTEM</b>                                                  |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           |                    |                            |   |
| Mammary Gland                                                                |             | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M         |                    |                            |   |
| Skin<br>Abscess<br>Inflammation, Chronic Active<br>Epidermis, Hyperplasia    |             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +         |                    | 3<br>3<br>1<br>3           |   |
| <b>MUSCULOSKELETAL SYSTEM</b>                                                |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           |                    |                            |   |
| Bone<br>Fibro-Osseous Lesion<br>Cranium, Inflammation, Chronic Active        |             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +         |                    | 1<br>1<br>2<br>3<br>3<br>3 |   |
| Skeletal Muscle<br>Infiltration Cellular, Mixed Cell                         |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           |                    | +                          | + |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
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 1) Minimal 3) Moderate  
 2) Mild 4) Marked



Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

|                                                                 |             | 0               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |  |
|-----------------------------------------------------------------|-------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|--|
|                                                                 |             | 7               | 6 | 7 | 7 | 7 | 6 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |  |  |
|                                                                 |             | 2               | 8 | 2 | 3 | 3 | 2 | 2 | 3 | 3 | 2 | 0 | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 |   |  |  |
|                                                                 |             | 9               | 7 | 9 | 0 | 1 | 9 | 3 | 0 | 1 | 9 | 7 | 1 | 0 | 9 | 0 | 9 | 9 | 9 | 0 | 9 | 0 | 9 | 0 | 9 | 1 | 1 |   |  |  |
| B6C3F1 MICE MALE<br><br>100 mg/m3                               | DAY ON TEST |                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |
|                                                                 | ANIMAL ID   | 0               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |  |
|                                                                 | 0           | 0               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  |  |
|                                                                 | 6           | 6               | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |  |  |
| 0                                                               | 0           | 0               | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |   |  |  |
| 1                                                               | 2           | 3               | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |   |  |  |
|                                                                 |             | males (cont...) |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |
| Olfactory Epithelium, Accumulation, Hyaline Droplet             |             | 2               | 3 | 1 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 |   |  |  |
| Olfactory Epithelium, Atrophy                                   |             |                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 |   |   |   |  |  |
| Olfactory Epithelium, Metaplasia, Respiratory                   |             | 1               | 2 | 1 |   | 2 | 2 |   | 2 | 2 | 1 | 2 | 2 |   | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 2 |   |   |  |  |
| Respiratory Epithelium, Accumulation, Hyaline Droplet           |             | 1               | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 2 |   |  |  |
| Respiratory Epithelium, Hyperplasia                             |             | 2               | 2 | 1 | 2 | 1 |   | 2 |   | 1 | 1 | 1 | 2 |   | 2 | 1 | 2 |   | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |   |  |  |
| Respiratory Epithelium, Metaplasia, Squamous Turbinate, Atrophy |             |                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |
| Trachea Ulcer                                                   |             | +               | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |  |  |
| <b>SPECIAL SENSES SYSTEM</b>                                    |             |                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |
| Eye                                                             |             | +               | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |  |  |
| Cornea, Hyperplasia, Squamous                                   |             |                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 |   |   |   |  |  |
| Cornea, Inflammation, Chronic Active                            |             |                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 | 2 |   |   |   |   |   |  |  |
| Lens, Degeneration                                              |             |                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 |   |   |   |   |   |   |  |  |
| Harderian Gland Hyperplasia                                     |             | +               | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |  |  |
|                                                                 |             |                 |   |   |   |   |   |   |   |   |   | 3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |
| <b>URINARY SYSTEM</b>                                           |             |                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |
| Kidney Cyst                                                     |             | +               | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |  |  |
| Infarct                                                         |             |                 |   |   |   |   |   |   |   |   |   | X | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |
| Nephropathy                                                     |             | 1               | 2 | 2 | 3 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 |  |  |
| Ureter                                                          |             |                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:

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2) Mild 4) Marked

**Experiment Number:** 20515 - 04

**Test Type:** CHRONIC

**Route:** RESPIRATORY EXPOSURE WHOLE BODY

**Species/Strain:** MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**

Metal working fluids (CIMSTAR 3800)

**CAS Number:** CIMSTAR3800

**Date Report Requested:** 03/08/2013

**Time Report Requested:** 14:13:47

**First Dose M/F:** 05/05/08 / 05/05/08

**Lab:** BNW

|                                             |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---------------------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| <b>B6C3F1 MICE MALE</b><br><b>100 mg/m3</b> | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   |
|                                             |             | 7 | 6 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
|                                             |             | 2 | 8 | 2 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 2 | 0 | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 3 |
|                                             |             | 9 | 7 | 9 | 0 | 1 | 9 | 3 | 9 | 0 | 1 | 9 | 7 | 1 | 0 | 9 | 0 | 9 | 9 | 9 | 0 | 9 | 0 | 1 | 9 |
|                                             |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|                                             |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|                                             | ANIMAL ID   | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |   |
|                                             | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |   |
|                                             | 1           | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 |   |
|                                             |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|                                             |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

**males (cont...)**

Inflammation, Chronic Active

Urinary Bladder

+ + + + + + + + + + + + + + + + + + + M + +

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

2) Mild 4) Marked



Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

| B6C3F1 MICE MALE<br>100 mg/m3        | DAY ON TEST                                       | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | * TOTALS |   |    |     |
|--------------------------------------|---------------------------------------------------|-----------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|---|----|-----|
|                                      |                                                   | 7 7 5 6 7 3 7 7 6 7 7 7 7 7 7 7 7 7 5 7 7 7   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          |   |    |     |
|                                      |                                                   | 3 0 7 6 3 4 2 3 6 3 3 3 3 2 3 2 2 3 0 9 3 3 3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          |   |    |     |
| ANIMAL ID                            | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0       |                                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          |   |    |     |
|                                      | 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6       |                                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          |   |    |     |
|                                      | 2 2 2 2 3 3 3 3 3 3 3 3 3 4 4 4 4 4 4 4 4 4       |                                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          |   |    |     |
|                                      | 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 |                                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          |   |    |     |
| Tension Lipidosis                    |                                                   |                                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          |   | 7  | 1.4 |
| Mesentery                            |                                                   |                                               |   | + | + |   |   |   |   | + |   |   |   |   |   |   |   |   |   |   |   |          |   | 4  |     |
| Artery, Inflammation, Chronic Active |                                                   |                                               |   |   |   |   | 3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          |   | 1  | 3.0 |
| Fat, Necrosis                        |                                                   |                                               |   | 1 |   |   |   |   |   | 1 |   |   |   |   |   |   |   |   |   |   |   |          |   | 3  | 1.3 |
| Pancreas                             | +                                                 | +                                             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +        | + | 50 |     |
| Necrosis                             |                                                   |                                               | 2 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          |   | 1  | 2.0 |
| Salivary Glands                      | +                                                 | +                                             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +        | + | 50 |     |
| Stomach, Forestomach                 | +                                                 | +                                             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +        | + | 50 |     |
| Hyperplasia, Squamous                |                                                   |                                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 4        |   | 3  | 3.0 |
| Stomach, Glandular                   | +                                                 | +                                             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +        | + | 50 |     |
| Inflammation, Chronic Active         |                                                   |                                               |   |   |   |   |   |   |   | 1 |   |   |   |   |   |   |   |   |   |   |   |          |   | 2  | 2.0 |
| Ulcer                                |                                                   |                                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 3 |          |   | 1  | 3.0 |
| Glands, Mineralization               |                                                   |                                               |   |   |   |   | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          |   | 1  | 1.0 |
| Tooth                                | +                                                 | +                                             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +        | + | 50 |     |
| Dysplasia                            | 1                                                 | 2                                             |   | 1 |   |   | 2 | 2 |   | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 4 | 1 | 3 | 3        |   | 40 | 1.8 |
| Inflammation, Chronic Active         |                                                   |                                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 3 | 3 |   |   | 3        |   | 5  | 2.6 |

CARDIOVASCULAR SYSTEM

|                              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |     |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|-----|--|
| Blood Vessel                 | + | + | + | I | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | +  | 48  |  |
| Heart                        | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |     |  |
| Cardiomyopathy               |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2 |   |   |   |   |   |   |   |   | 2  | 2.0 |  |
| Inflammation, Chronic Active |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  | 3.0 |  |
| Thrombosis                   |   |   | 3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2  | 2.5 |  |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

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Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

|                                                 |             |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                 |
|-------------------------------------------------|-------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------------|
| <b>B6C3F1 MICE MALE</b><br><br><b>100 mg/m3</b> | DAY ON TEST | 0<br>7<br>3<br>0 | 0<br>7<br>0<br>6 | 0<br>5<br>7<br>2 | 0<br>6<br>6<br>2 | 0<br>7<br>3<br>4 | 0<br>7<br>4<br>2 | 0<br>7<br>2<br>3 | 0<br>7<br>6<br>1 | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>0 | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>0 | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>0 | 0<br>7<br>2<br>9 | 0<br>7<br>2<br>9 | 0<br>7<br>2<br>9 | 0<br>7<br>2<br>9 | 0<br>7<br>2<br>9 | 0<br>7<br>3<br>9 | 0<br>5<br>9<br>0 | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>1 | * <b>TOTALS</b> |
|                                                 | ANIMAL ID   | 0<br>6<br>2<br>6 | 0<br>6<br>2<br>7 | 0<br>6<br>2<br>8 | 0<br>6<br>2<br>9 | 0<br>6<br>3<br>0 | 0<br>6<br>3<br>1 | 0<br>6<br>3<br>2 | 0<br>6<br>3<br>3 | 0<br>6<br>3<br>4 | 0<br>6<br>3<br>5 | 0<br>6<br>3<br>6 | 0<br>6<br>3<br>7 | 0<br>6<br>3<br>8 | 0<br>6<br>3<br>9 | 0<br>6<br>4<br>0 | 0<br>6<br>4<br>1 | 0<br>6<br>4<br>2 | 0<br>6<br>4<br>3 | 0<br>6<br>4<br>4 | 0<br>6<br>4<br>5 | 0<br>6<br>4<br>6 | 0<br>6<br>4<br>7 | 0<br>6<br>4<br>8 |                 |

Artery, Inflammation, Chronic Active

**1 1.0**

### ENDOCRINE SYSTEM

|                                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |               |
|-----------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|---------------|
| Adrenal Cortex<br>Hyperplasia                 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | <b>24 1.5</b> |
| Adrenal Medulla<br>Hyperplasia                | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | <b>2 1.5</b>  |
| Islets, Pancreatic                            | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |               |
| Parathyroid Gland                             | M | + | + | M | M | M | + | M | + | M | M | + | M | M | + | M | + | + | M | M | M | + | M |   |   |   | 21 |               |
| Pituitary Gland<br>Angiectasis                | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 | <b>1 1.0</b>  |
| Pars Distalis, Cyst                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  | <b>1 1.0</b>  |
| Pars Distalis, Hyperplasia                    |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 |   |   |   |   |   |   |   |   |   |   |   | 1  | <b>2 1.0</b>  |
| Thyroid Gland<br>Follicular Cell, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | <b>1 2.0</b>  |

### GENERAL BODY SYSTEM

|            |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |
|------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|----------|
| Tissue NOS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | <b>1</b> |
|------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|----------|

### GENITAL SYSTEM

|                                            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |              |
|--------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|--------------|
| Epididymis<br>Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | <b>2 2.5</b> |
|--------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|--------------|

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
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 X .. Lesion present  
 I .. Insufficient tissue  
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Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

| B6C3F1 MICE MALE<br>100 mg/m3                                                | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS |      |    |     |     |
|------------------------------------------------------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|------|----|-----|-----|
|                                                                              | 0730        | 0730  | 0730  | 0730  | 0730  | 0730  | 0730  | 0730  | 0730  | 0730  | 0730  | 0730  | 0730  | 0730  | 0730  | 0730  | 0730  | 0730  | 0730  | 0730  |          | 0730 |    |     |     |
|                                                                              | ANIMAL ID   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |      |    |     |     |
|                                                                              | 00626       | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626 | 00626    | 35   |    |     |     |
| Lymph Node, Mediastinal<br>Inflammation, Pyogranulomatous                    | +           | +     | +     | M     | +     | M     | +     | +     | +     | +     | +     | M     | +     | +     | M     | +     | +     | +     | M     | +     | +        | 4    | 1  | 4.0 |     |
| Lymph Node, Mesenteric<br>Inflammation, Pyogranulomatous                     | +           | +     | +     | +     | +     | M     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | 4    | 1  | 4.0 |     |
| Spleen<br>Hematopoietic Cell Proliferation<br>Lymphoid Follicle, Hyperplasia | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | 3    | 1  | 3.0 |     |
| Thymus<br>Atrophy                                                            | +           | M     | +     | +     | +     | +     | +     | M     | +     | +     | +     | +     | +     | +     | +     | +     | M     | +     | M     | +     | +        | M    | 41 | 1   | 2.0 |
| <b>INTEGUMENTARY SYSTEM</b>                                                  |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |      |    |     |     |
| Mammary Gland                                                                | M           | M     | M     | M     | M     | M     | M     | M     | M     | M     | M     | M     | M     | M     | M     | M     | M     | M     | M     | M     | M        | M    | 0  |     |     |
| Skin<br>Abscess<br>Inflammation, Chronic Active<br>Epidermis, Hyperplasia    | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +    | 50 | 1   | 3.0 |
|                                                                              |             |       |       |       |       | 2     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |      |    | 3   | 2.7 |
|                                                                              |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |      |    | 1   | 1.0 |
| <b>MUSCULOSKELETAL SYSTEM</b>                                                |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |      |    |     |     |
| Bone<br>Fibro-Osseous Lesion<br>Cranium, Inflammation, Chronic Active        | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +    | 50 | 7   | 1.1 |
|                                                                              |             |       |       |       |       |       | 2     |       |       | 1     |       |       |       |       |       |       |       |       |       |       |          |      |    | 5   | 3.0 |
| Skeletal Muscle<br>Infiltration Cellular, Mixed Cell                         |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |      |    |     | 3   |
|                                                                              |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |      |    | 1   | 1.0 |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically  
 1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked



Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

| B6C3F1 MICE MALE<br>100 mg/m3                                   | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS |   |      |   |           |            |            |          |            |
|-----------------------------------------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|---|------|---|-----------|------------|------------|----------|------------|
|                                                                 | 0730        | 0736  | 0752  | 0756  | 0773  | 0773  | 0776  | 0776  | 0766  | 0777  | 0777  | 0777  | 0777  | 0777  | 0777  | 0777  | 0777  | 0777  | 0777  | 0777  |          |   | 0777 |   |           |            |            |          |            |
| ANIMAL ID                                                       | 00626       | 00662 | 00662 | 00662 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666 | 00666    |   |      |   |           |            |            |          |            |
| Olfactory Epithelium, Accumulation, Hyaline Droplet             | 3           | 2     | 3     | 3     | 3     | 3     | 3     | 3     | 2     | 3     | 2     | 2     | 2     | 2     | 2     | 2     | 3     | 2     | 2     | 3     | 3        | 3 | 2    | 3 | <b>49</b> | <b>2.6</b> |            |          |            |
| Olfactory Epithelium, Atrophy                                   |             | 1     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1     |          |   |      |   | <b>4</b>  | <b>1.0</b> |            |          |            |
| Olfactory Epithelium, Metaplasia, Respiratory                   | 2           | 1     | 1     | 1     |       | 1     |       |       | 2     | 2     | 2     | 1     |       |       |       | 1     | 2     |       |       | 1     | 1        | 1 |      | 2 | <b>37</b> | <b>1.5</b> |            |          |            |
| Respiratory Epithelium, Accumulation, Hyaline Droplet           | 3           | 2     | 3     | 3     | 3     | 3     | 3     | 3     | 2     | 3     | 2     | 2     | 2     | 2     | 2     | 2     | 3     | 2     | 2     | 3     | 1        | 3 | 3    | 2 | 3         | <b>50</b>  | <b>2.6</b> |          |            |
| Respiratory Epithelium, Hyperplasia                             | 1           | 2     | 1     | 1     | 2     | 1     | 1     |       | 2     | 1     |       | 2     | 1     |       | 2     | 2     | 1     | 1     | 1     | 2     | 1        |   | 1    | 2 | 2         | <b>41</b>  | <b>1.6</b> |          |            |
| Respiratory Epithelium, Metaplasia, Squamous Turbinate, Atrophy |             | 1     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |   |      |   |           | <b>1</b>   | <b>1.0</b> |          |            |
|                                                                 |             | 2     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |   |      |   |           | <b>1</b>   | <b>2.0</b> |          |            |
| Trachea                                                         | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | + | +    | + | +         | <b>50</b>  |            |          |            |
| Ulcer                                                           |             |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |       |       |          |   |      |   |           |            | <b>1</b>   |          |            |
| <b>SPECIAL SENSES SYSTEM</b>                                    |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |   |      |   |           |            |            |          |            |
| Eye                                                             | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | + | +    | + | +         | +          | <b>50</b>  |          |            |
| Cornea, Hyperplasia, Squamous                                   |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |   |      |   |           |            |            | <b>1</b> | <b>1.0</b> |
| Cornea, Inflammation, Chronic Active                            |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |   |      |   |           |            |            | <b>2</b> | <b>1.5</b> |
| Lens, Degeneration                                              |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |   |      |   |           |            |            | <b>1</b> | <b>1.0</b> |
| Harderian Gland                                                 | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | + | +    | + | +         | +          | <b>50</b>  |          |            |
| Hyperplasia                                                     |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 3     |       |       |       |          |   |      |   |           |            |            | <b>2</b> | <b>3.0</b> |
| <b>URINARY SYSTEM</b>                                           |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |   |      |   |           |            |            |          |            |
| Kidney                                                          | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | + | +    | + | +         | +          | <b>50</b>  |          |            |
| Cyst                                                            |             |       |       |       |       |       |       | X     |       |       |       |       |       |       |       |       |       |       |       |       | X        |   |      |   |           |            |            | <b>5</b> |            |
| Infarct                                                         |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |   |      |   |           |            |            | <b>2</b> | <b>2.0</b> |
| Nephropathy                                                     | 3           | 2     |       | 1     | 3     |       | 2     | 2     | 1     | 2     | 3     | 2     | 2     | 2     | 2     | 2     | 4     | 2     | 2     | 3     | 2        | 2 | 1    | 2 | 2         | <b>48</b>  | <b>2.1</b> |          |            |
| Ureter                                                          |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |   |      |   |           |            |            | <b>1</b> |            |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

2) Mild 4) Marked

**Experiment Number:** 20515 - 04  
**Test Type:** CHRONIC  
**Route:** RESPIRATORY EXPOSURE WHOLE BODY  
**Species/Strain:** MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
**CAS Number:** CIMSTAR3800

**Date Report Requested:** 03/08/2013  
**Time Report Requested:** 14:13:47  
**First Dose M/F:** 05/05/08 / 05/05/08  
**Lab:** BNW

|                              |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |       |   |   |
|------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-------|---|---|
| <b>B6C3F1 MICE MALE</b>      | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0     | 0 |   |
|                              |             | 7 | 7 | 5 | 6 | 7 | 3 | 7 | 7 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 5     | 7 | 7 |
|                              |             | 3 | 0 | 7 | 6 | 3 | 4 | 2 | 3 | 6 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 0 | 9     | 3 | 3 |
|                              |             | 0 | 6 | 2 | 2 | 0 | 4 | 9 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 9 | 1 | 9 | 9 | 0 | 9 | 9 | 0     | 1 | 1 |
| <b>100 mg/m3</b>             | ANIMAL ID   | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0     | 0 |   |
|                              |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0     | 0 |   |
|                              |             | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6     | 6 |   |
|                              |             | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4     | 4 |   |
|                              |             | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7     |   |   |
| <b>* TOTALS</b>              |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |       |   |   |
| Inflammation, Chronic Active |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 4 | 1 4.0 |   |   |
| Urinary Bladder              |             | + |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | + | 49    |   |   |

\*\*\* END OF MALE DATA \*\*\*

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

|                           |             |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                              |                       |
|---------------------------|-------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------------|-----------------------|
| <b>B6C3F1 MICE FEMALE</b> | DAY ON TEST | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>6<br>1<br>7      | 0<br>6<br>7<br>3      | 0<br>7<br>3<br>4      | 0<br>7<br>3<br>3      | 0<br>7<br>6<br>0      | 0<br>6<br>5<br>4      | 0<br>7<br>3<br>3      | 0<br>7<br>6<br>8      | 0<br>7<br>3<br>3      | 0<br>7<br>6<br>1      | 0<br>7<br>7<br>3      | 0<br>7<br>7<br>3      | 0<br>7<br>7<br>3      | 0<br>7<br>7<br>3      | 0<br>5<br>2<br>7      | 0<br>7<br>3<br>2      | <b>females<br/>(cont...)</b> |                       |
|                           | ANIMAL ID   | 0<br>0<br>1<br>0<br>1 | 0<br>0<br>1<br>0<br>2 | 0<br>0<br>1<br>0<br>3 | 0<br>0<br>1<br>0<br>4 | 0<br>0<br>1<br>0<br>5 | 0<br>0<br>1<br>0<br>6 | 0<br>0<br>1<br>0<br>7 | 0<br>0<br>1<br>0<br>8 | 0<br>0<br>1<br>0<br>9 | 0<br>0<br>1<br>1<br>0 | 0<br>0<br>1<br>1<br>1 | 0<br>0<br>1<br>1<br>2 | 0<br>0<br>1<br>1<br>3 | 0<br>0<br>1<br>1<br>4 | 0<br>0<br>1<br>1<br>5 | 0<br>0<br>1<br>1<br>6 | 0<br>0<br>1<br>1<br>7 | 0<br>0<br>1<br>1<br>8 | 0<br>0<br>1<br>1<br>9 | 0<br>0<br>1<br>2<br>0 | 0<br>0<br>1<br>2<br>1 | 0<br>0<br>1<br>2<br>2 |                              | 0<br>0<br>1<br>2<br>3 |

ALIMENTARY SYSTEM

|                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus                 | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Gallbladder               | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | M | + | + | + |
| Intestine Large, Cecum    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Colon    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + |
| Intestine Large, Rectum   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | A | + | + | + | + | + | + |
| Intestine Small, Ileum    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + |
| Intestine Small, Jejunum  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + |
| Liver                     | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Basophilic Focus          |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Clear Cell Focus          |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Eosinophilic Focus        |   | X |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   | X | X | X |   |   |   |   |
| Fatty Change              |   |   |   |   |   |   |   |   |   |   |   | 2 |   |   |   |   |   | 2 |   |   |   |   |   |   |
| Mixed Cell Focus          |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Necrosis                  |   |   |   |   |   | 3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Tension Lipidosis         |   |   |   |   |   |   |   |   |   |   |   | 1 |   |   |   |   |   | 2 |   |   |   | 1 | X |   |
| Vacuolization Cytoplasmic |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 |   |   |
| Mesentery                 |   |   |   |   |   | + |   |   |   |   |   |   |   | + | + |   |   |   |   | + | + | + |   |   |
| Angiectasis               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Cyst                      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 3 |   |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

2) Mild 4) Marked

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

| B6C3F1 MICE FEMALE | DAY ON TEST      |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |  | females<br>(cont...) |
|--------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|--|----------------------|
|                    | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>3 | 0<br>7<br>3<br>3 | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>2 | 0<br>6<br>1<br>3 | 0<br>6<br>7<br>7 | 0<br>6<br>3<br>2 | 0<br>7<br>4<br>5 | 0<br>7<br>3<br>3 | 0<br>7<br>0<br>5 | 0<br>6<br>0<br>5 | 0<br>5<br>4<br>9 | 0<br>7<br>3<br>3 | 0<br>7<br>8<br>2 | 0<br>6<br>3<br>1 | 0<br>7<br>9<br>4 | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>3 | 0<br>7<br>3<br>2 | 0<br>5<br>2<br>7 | 0<br>7<br>3<br>2 |  |                      |
| Control            | ANIMAL ID        |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |  |                      |
|                    | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                |  |                      |
|                    | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                |  |                      |
|                    | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                |  |                      |
|                    | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 0                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 2                | 2                | 2                | 2                |  |                      |
|                    | 1                | 2                | 3                | 4                | 5                | 6                | 7                | 8                | 9                | 0                | 1                | 2                | 3                | 4                | 5                | 6                | 7                | 8                | 9                | 0                | 1                | 2                | 3                |  |                      |

Inflammation, Chronic Active  
 Fat, Necrosis

2 2 1 2

Pancreas  
 Fibrosis  
 Inflammation, Chronic Active  
 Acinus, Atrophy

+ + + + + + + + + + + + + + + + + + + + + + + +  
 2  
 3

Salivary Glands

+ + + + + + + + + + + + + + + + + + + + + + + +

Stomach, Forestomach  
 Fibrosis  
 Hyperplasia, Squamous

+ + + + + + + + + + + + + + + + + + + + + + + +  
 1  
 4

Stomach, Glandular  
 Degeneration, Hyaline  
 Inflammation, Chronic Active

+ + + + + + + + + + + + + + + + + + + + + + + +

Tooth  
 Dysplasia

**CARDIOVASCULAR SYSTEM**

Blood Vessel  
 Aorta, Embolus Bacterial

M M + + + + + + + + + + + + + + + + + + + + + M  
 3

Heart  
 Cardiomyopathy  
 Necrosis  
 Artery, Inflammation, Chronic Active

+ + + + + + + + + + + + + + + + + + + + + + + +  
 2  
 2

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically  
 1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

|                           |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                          |   |
|---------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------------------------|---|
| <b>B6C3F1 MICE FEMALE</b> | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <b>females (cont...)</b> |   |
|                           | ANIMAL ID   | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 6 | 7 | 3 | 7 | 7 | 6 | 5 | 7 | 7 | 6 | 7 | 1 | 7 | 7 | 7 | 7 |                          | 5 |
| <b>Control</b>            |             | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 7 | 3 | 4 | 3 | 0 | 0 | 4 | 3 | 3 | 8 | 3 | 9 | 3 | 3 | 3 | 3 | 2                        | 3 |
|                           |             | 2 | 1 | 3 | 3 | 2 | 2 | 3 | 7 | 2 | 5 | 3 | 5 | 5 | 9 | 3 | 2 | 3 | 1 | 4 | 2 | 3 | 2 | 3 | 7                        | 2 |
|                           |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                        | 0 |
|                           |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                        | 0 |
|                           |             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1                        | 1 |
|                           |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2                        | 2 |
|                           |             | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4                        | 5 |

Capillary, Hyperplasia

1

**ENDOCRINE SYSTEM**

Adrenal Cortex  
 Angiectasis  
 Hyperplasia  
 Vacuolization Cytoplasmic

+ + + + + + + + + + + M + + + + + + + + + + + + + +  
 2  
 2  
 2  
 3

Adrenal Medulla  
 Hyperplasia

+ + + + + + + + + + + M + + + + + + + + + + + + + +  
 1

Islets, Pancreatic

+ + + + + + + + + + + + + + + + + + + + + + + + + +

Parathyroid Gland  
 Hyperplasia

+ + + + + + + M + M + + M M + M M M M + + M M M  
 4

Pituitary Gland  
 Angiectasis  
 Pars Distalis, Hyperplasia

+ + + + + + + + + + + + + + + + + + + + + + + + + +  
 4  
 1  
 1 2 1 2 1 2 4 2 2 2 2

Thyroid Gland  
 C-cell, Hyperplasia  
 Follicular Cell, Hyperplasia

+ + + + + + + + + + + + + + + + + + + + + + + + + +  
 2

**GENERAL BODY SYSTEM**

Tissue NOS  
 Mediastinum, Infiltration Cellular, Lymphocyte  
 Mediastinum, Thrombosis

+ + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + + +  
 +  
 1

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

|                           |             |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |
|---------------------------|-------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| <b>B6C3F1 MICE FEMALE</b> | DAY ON TEST | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>6<br>1<br>3      | 0<br>6<br>7<br>7      | 0<br>7<br>3<br>5      | 0<br>3<br>4<br>3      | 0<br>7<br>0<br>5      | 0<br>7<br>0<br>5      | 0<br>5<br>4<br>9      | 0<br>7<br>3<br>3      | 0<br>7<br>8<br>3      | 0<br>6<br>3<br>1      | 0<br>7<br>9<br>4      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>2      | 0<br>5<br>2<br>7      | 0<br>7<br>3<br>2      |                       |
|                           | ANIMAL ID   | 0<br>0<br>1<br>0<br>1 | 0<br>0<br>1<br>0<br>2 | 0<br>0<br>1<br>0<br>3 | 0<br>0<br>1<br>0<br>4 | 0<br>0<br>1<br>0<br>5 | 0<br>0<br>1<br>0<br>6 | 0<br>0<br>1<br>0<br>7 | 0<br>0<br>1<br>0<br>8 | 0<br>0<br>1<br>0<br>9 | 0<br>0<br>1<br>0<br>0 | 0<br>0<br>1<br>1<br>1 | 0<br>0<br>1<br>1<br>1 | 0<br>0<br>1<br>1<br>1 | 0<br>0<br>1<br>1<br>1 | 0<br>0<br>1<br>1<br>1 | 0<br>0<br>1<br>1<br>1 | 0<br>0<br>1<br>1<br>1 | 0<br>0<br>1<br>1<br>2 | 0<br>0<br>1<br>2<br>2 | 0<br>0<br>1<br>2<br>2 | 0<br>0<br>1<br>2<br>2 | 0<br>0<br>1<br>2<br>2 | 0<br>0<br>1<br>2<br>2 |
|                           | Control     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |

### GENITAL SYSTEM

Clitoral Gland  
 Inflammation, Chronic Active

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| + | + | + | + | M | + | + | + | + | + | + | M | + | + | + | + | M | + | M | + | + | + | + | + |
|   |   |   |   |   |   |   |   |   |   |   | 1 |   |   |   |   |   |   |   |   |   |   |   |   |

Ovary  
 Angiectasis  
 Cyst  
 Hemorrhage  
 Inflammation, Chronic Active  
 Mineralization  
 Necrosis  
 Corpus Luteum, Hyperplasia

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|   |   |   |   |   |   |   | 2 |   |   |   |   | 3 |   | 3 |   |   |   | 1 |   | 2 | 2 |   |   |
| 1 |   |   |   |   |   |   |   | 1 |   | 1 |   |   | 1 |   |   |   |   | 1 | 1 |   | 1 |   |   |
|   |   |   |   |   |   |   |   |   |   | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2 |   |   |   |   |

Uterus  
 Angiectasis  
 Atrophy  
 Decidual Reaction  
 Dilatation  
 Inflammation, Suppurative  
 Inflammation, Chronic Active  
 Thrombosis  
 Endometrium, Hyperplasia, Cystic

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|   | 4 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   | 3 |   | 3 | 3 |   |   |   |   |   |   |   |   | 3 |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 2 | 1 |   | 1 | 1 |   |   |   |   | 2 | 1 | 4 |   | 2 |   | 3 | 3 |   |   |   | 3 | 3 | 3 | 3 |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2 |

### HEMATOPOIETIC SYSTEM

Bone Marrow

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

Lymph Node  
 Hemorrhage

|   |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |   |  |   |  |
|---|--|---|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|---|--|---|--|
| + |  | + |  |  |  |  |  |  |  |  |  | + |  |  |  |  |  |  |  | + |  | + |  |
|   |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |   |  |   |  |
|   |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |   |  | 3 |  |

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 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

|                           |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                              |
|---------------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------------------------------|
| <b>B6C3F1 MICE FEMALE</b> | DAY ON TEST | 0732 | 0731 | 0733 | 0733 | 0732 | 0732 | 0667 | 0667 | 0773 | 0773 | 0766 | 0765 | 0777 | 0776 | 0767 | 0767 | 0771 | 0777 | 0777 | 0777 | 0575 | 0773 | <b>females<br/>(cont...)</b> |
|                           | ANIMAL ID   | 0010 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 |                              |

|                                                             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-------------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Iliac, Ectasia                                              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 4 |   |
| Iliac, Hyperplasia, Lymphoid                                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Lumbar, Ectasia                                             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 |   |
| Pancreatic, Inflammation, Chronic Active                    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Renal, Ectasia                                              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 4 |   |
| Lymph Node, Bronchial                                       | M | + | + | + | M | M | M | M | M | + | M | M | + | + | + | M | + | + | + | + | M | + | M | + | M |
| Lymph Node, Mandibular                                      | + | + | + | + | + | + | + | M | + | M | + | + | + | M | M | + | + | + | + | + | + | + | + | + |   |
| Lymph Node, Mediastinal                                     | + | M | + | + | + | + | + | + | + | M | + | + | M | M | + | + | M | + | M | + | + | + | + | + |   |
| Lymph Node, Mesenteric<br>Infiltration Cellular, Histiocyte | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Spleen<br>Hematopoietic Cell Proliferation                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 2 | 2 |
| Thymus<br>Atrophy<br>Hyperplasia, Lymphoid                  | + | + | + | + | + | + | M | + | + | + | + | + | + | M | + | + | + | M | + | M | + | + | + | + |   |

**INTEGUMENTARY SYSTEM**

|                                         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-----------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mammary Gland<br>Hyperplasia            | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Skin<br>Ulcer<br>Epidermis, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

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 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically  
 1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

|                           | DAY ON TEST |           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | females<br>(cont...) |   |  |
|---------------------------|-------------|-----------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------------------|---|--|
| <b>B6C3F1 MICE FEMALE</b> | 0           | 0         | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   |                      |   |  |
|                           | 7           | 7         | 7 | 7 | 7 | 7 | 6 | 6 | 7 | 3 | 7 | 7 | 6 | 5 | 7 | 7 | 6 | 7 | 1 | 7 | 7 | 7 | 7 | 5 |                      | 7 |  |
| <b>Control</b>            | 3           | 3         | 3 | 3 | 3 | 3 | 1 | 7 | 3 | 4 | 3 | 0 | 0 | 4 | 3 | 3 | 8 | 3 | 9 | 3 | 3 | 3 | 3 | 2 |                      | 3 |  |
|                           | 2           | 1         | 3 | 3 | 2 | 2 | 3 | 7 | 2 | 5 | 3 | 5 | 9 | 3 | 2 | 3 | 1 | 4 | 2 | 3 | 2 | 3 | 3 | 7 |                      | 2 |  |
|                           | 0           | 0         | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                    |   |  |
|                           |             | ANIMAL ID |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |   |  |
|                           |             | 0         | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                    |   |  |
|                           |             | 0         | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                    |   |  |
|                           |             | 1         | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1                    |   |  |
|                           |             | 0         | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2                    |   |  |
|                           |             | 1         | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4                    | 5 |  |

MUSCULOSKELETAL SYSTEM

|                                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |
|-------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|--|
| Bone                                      | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |  |  |
| Fibro-Osseous Lesion                      |   | 1 | 1 |   | 2 |   | 1 |   | 2 |   | 1 | 2 |   | 2 |   | 2 |   |   |   | 1 |   |   |   |  |  |
| Cartilage, Femur, Metaphysis, Hyperplasia |   |   |   | 4 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |
| Cranium, Inflammation, Chronic Active     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |
| Femur, Fracture                           |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |
| Skeletal Muscle                           |   |   |   |   |   |   |   |   |   |   |   |   | + | + |   |   |   |   |   |   | + |   |   |  |  |
| Infiltration Cellular, Lymphocyte         |   |   |   |   |   |   |   |   |   |   |   |   | 1 | 2 |   |   |   |   |   |   | 1 |   |   |  |  |

NERVOUS SYSTEM

|                                   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Brain                             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |  |
| Compression                       |   |   |   |   |   |   |   |   |   |   |   |   |   | 2 |   |   |   |   |   |   |   |   |   |   |  |
| Peripheral Nerve                  |   |   |   |   |   |   |   |   |   |   |   |   |   | + |   |   |   |   |   |   |   |   |   | + |  |
| Infiltration Cellular, Mixed Cell |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 |  |
| Spinal Cord                       |   |   |   |   |   |   |   |   |   |   |   |   |   | + | + |   |   |   |   |   |   |   |   | + |  |

RESPIRATORY SYSTEM

|                                             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
|---------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Larynx                                      | + | I | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |  |
| Metaplasia, Squamous                        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| Lung                                        | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |  |
| Hemorrhage                                  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2 |   |   |   |   |   |   |   |  |
| Infiltration Cellular, Histiocyte           |   |   |   |   |   |   | 1 |   |   |   | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| Alveolar Epithelium, Hyperplasia            | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| Alveolus, Infiltration Cellular, Histiocyte |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 |   |   |   |   |   |   |   |   |  |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
+ .. Tissue examined microscopically                               M .. Missing tissue  
X .. Lesion present                                                        A .. Autolysis precludes evaluation  
I .. Insufficient tissue                                                 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:  
1) Minimal 3) Moderate  
2) Mild 4) Marked

Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

| B6C3F1 MICE FEMALE<br>Control                         | DAY ON TEST      |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | ANIMAL ID | females<br>(cont...) |                  |                  |                  |                  |                  |  |   |  |
|-------------------------------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------|----------------------|------------------|------------------|------------------|------------------|------------------|--|---|--|
|                                                       | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>3 | 0<br>7<br>3<br>3 | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>2 | 0<br>6<br>1<br>3 | 0<br>6<br>7<br>7 | 0<br>6<br>3<br>2 | 0<br>7<br>4<br>5 | 0<br>3<br>3<br>3 | 0<br>7<br>4<br>5 | 0<br>7<br>3<br>5 | 0<br>6<br>0<br>5 | 0<br>5<br>4<br>9 | 0<br>7<br>3<br>3 | 0<br>7<br>3<br>2 | 0<br>6<br>8<br>3 | 0<br>7<br>3<br>1 | 0<br>1<br>9<br>4 |           |                      | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>3 | 0<br>7<br>3<br>2 | 0<br>5<br>2<br>7 | 0<br>7<br>3<br>2 |  |   |  |
| Bronchiole, Hyperplasia                               | 1                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | 1                |                  |                  |                  | 1                |                  |           |                      |                  |                  |                  |                  |                  |  |   |  |
| Interstitial, Inflammation, Chronic Active            |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | 2                |                  |                  |                  |                  |                  |                  |                  |                  |                  |           |                      |                  |                  |                  |                  |                  |  |   |  |
| Perivascular, Inflammation, Chronic Active            |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | 3                |                  |                  |                  |                  |                  |                  |                  |                  |                  |           |                      |                  |                  |                  |                  |                  |  |   |  |
| Nose                                                  | +                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |           |                      |                  |                  |                  |                  |                  |  |   |  |
| Inflammation, Chronic Active                          |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | 2                |                  |                  |                  |                  |                  |                  |                  |                  |                  | 1         |                      |                  |                  |                  |                  |                  |  |   |  |
| Necrosis                                              |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | 1                |                  |                  |                  |                  |                  |                  |                  |                  |                  |           |                      |                  |                  |                  |                  |                  |  |   |  |
| Olfactory Epithelium, Accumulation, Hyaline Droplet   | 1                |                  | 1                |                  | 2                |                  | 2                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | 1                |                  | 1         |                      | 2                |                  | 2                |                  | 2                |  | 2 |  |
| Olfactory Epithelium, Atrophy                         |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | 1                |                  |                  |                  |                  |                  |                  |                  |                  |                  |           |                      |                  |                  |                  |                  |                  |  |   |  |
| Olfactory Epithelium, Metaplasia, Respiratory         |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | 1                |                  |                  |                  |                  |                  |                  |                  |                  |                  | 1         |                      |                  |                  |                  |                  |                  |  |   |  |
| Respiratory Epithelium, Accumulation, Hyaline Droplet | 1                |                  | 1                |                  | 2                |                  | 1                |                  | 2                |                  | 1                |                  | 1                |                  | 1                |                  | 2                |                  | 1                |                  | 1         |                      | 2                |                  | 2                |                  | 2                |  |   |  |
| Respiratory Epithelium, Hyperplasia                   | 1                |                  | 2                |                  | 1                |                  | 2                |                  | 2                |                  | 2                |                  | 1                |                  | 1                |                  | 2                |                  | 1                |                  | 1         |                      | 1                |                  | 2                |                  | 1                |  | 2 |  |
| Trachea                                               | +                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |           |                      |                  |                  |                  |                  |                  |  |   |  |
| <b>SPECIAL SENSES SYSTEM</b>                          |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |           |                      |                  |                  |                  |                  |                  |  |   |  |
| Eye                                                   | +                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |           |                      |                  |                  |                  |                  |                  |  |   |  |
| Lens, Degeneration                                    |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | 1                |                  |                  |                  |                  |                  |                  |                  |                  |                  | 1         |                      |                  |                  |                  |                  |                  |  |   |  |
| Harderian Gland                                       | +                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |           |                      |                  |                  |                  |                  |                  |  |   |  |
| Atrophy                                               |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | 1                |                  |                  |                  |                  |                  |                  |                  |                  |                  |           |                      |                  |                  |                  |                  |                  |  |   |  |
| Hyperplasia                                           |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | 4                |                  |                  |                  |                  |                  |                  |                  |                  |                  | 2         |                      |                  |                  |                  |                  |                  |  |   |  |
| <b>URINARY SYSTEM</b>                                 |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |           |                      |                  |                  |                  |                  |                  |  |   |  |
| Kidney                                                | +                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |           |                      |                  |                  |                  |                  |                  |  |   |  |
| Accumulation, Hyaline Droplet                         |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | 2                |                  |                  |                  |                  |                  |                  |                  |                  |                  |           |                      |                  |                  |                  |                  |                  |  |   |  |
| Infarct                                               |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |           |                      |                  |                  |                  |                  |                  |  |   |  |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

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1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

2) Mild 4) Marked



Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

| B6C3F1 MICE FEMALE | DAY ON TEST | 0 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | * TOTALS |   |
|--------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|---|
|                    |             | 7 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |          | 7 |
| Control            |             | 3 | 8 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3        |   |
|                    |             | 1 | 6 | 3 | 1 | 2 | 2 | 3 | 2 | 2 | 1 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 3 | 2 | 3        | 1 |
|                    |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0        | 0 |
|                    |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0        | 0 |
|                    |             | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1        | 1 |
|                    |             | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4        | 4 |
|                    | 6           | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7        |   |

**ALIMENTARY SYSTEM**

|                           |   |  |  |   |   |  |  |   |  |  |   |   |  |   |   |   |   |   |   |   |              |              |           |  |              |
|---------------------------|---|--|--|---|---|--|--|---|--|--|---|---|--|---|---|---|---|---|---|---|--------------|--------------|-----------|--|--------------|
| Esophagus                 | + |  |  |   |   |  |  |   |  |  |   |   |  |   |   |   |   |   |   |   | <b>50</b>    |              |           |  |              |
| Gallbladder               | + |  |  |   |   |  |  |   |  |  |   |   |  |   |   |   |   |   | M | + |              | <b>46</b>    |           |  |              |
| Intestine Large, Cecum    | + |  |  |   |   |  |  |   |  |  |   |   |  |   |   |   |   |   |   |   | <b>50</b>    |              |           |  |              |
| Intestine Large, Colon    | + |  |  |   |   |  |  |   |  |  |   |   |  |   |   |   |   |   |   |   | <b>49</b>    |              |           |  |              |
| Intestine Large, Rectum   | + |  |  |   |   |  |  |   |  |  |   |   |  |   |   |   |   |   |   |   | <b>50</b>    |              |           |  |              |
| Intestine Small, Duodenum | + |  |  |   |   |  |  |   |  |  |   |   |  |   |   |   |   |   |   |   | A            | <b>47</b>    |           |  |              |
| Intestine Small, Ileum    | + |  |  |   |   |  |  |   |  |  |   |   |  |   |   |   |   |   |   |   | <b>49</b>    |              |           |  |              |
| Intestine Small, Jejunum  | + |  |  |   |   |  |  |   |  |  |   |   |  |   |   |   |   |   |   |   | A            | <b>48</b>    |           |  |              |
| Liver                     | + |  |  |   |   |  |  |   |  |  |   |   |  |   |   |   |   |   |   |   | <b>50</b>    |              |           |  |              |
| Basophilic Focus          |   |  |  | X |   |  |  | X |  |  |   | X |  |   |   | X |   |   |   | X |              |              | <b>6</b>  |  |              |
| Clear Cell Focus          |   |  |  |   |   |  |  |   |  |  |   |   |  |   |   |   |   |   | X |   |              | <b>1</b>     |           |  |              |
| Eosinophilic Focus        | X |  |  |   |   |  |  |   |  |  |   |   |  |   |   |   |   |   |   |   | <b>6</b>     |              |           |  |              |
| Fatty Change              |   |  |  |   |   |  |  |   |  |  |   |   |  |   |   |   |   | 2 |   |   |              | <b>3 2.0</b> |           |  |              |
| Mixed Cell Focus          |   |  |  |   |   |  |  |   |  |  |   |   |  |   |   |   |   |   | X |   |              | <b>2</b>     |           |  |              |
| Necrosis                  | 1 |  |  |   |   |  |  |   |  |  |   |   |  |   |   |   |   |   |   |   | <b>2 2.0</b> |              |           |  |              |
| Tension Lipidosis         |   |  |  |   |   |  |  |   |  |  |   |   |  |   | X |   |   |   |   |   |              | X            |           |  | <b>6 1.3</b> |
| Vacuolization Cytoplasmic |   |  |  |   |   |  |  |   |  |  |   |   |  |   |   |   |   |   |   |   | <b>1 1.0</b> |              |           |  |              |
| Mesentery                 |   |  |  |   | + |  |  | + |  |  | + |   |  | + |   |   | + |   |   | + |              |              | <b>16</b> |  |              |
| Angiectasis               |   |  |  |   |   |  |  |   |  |  |   |   |  |   |   |   |   |   | 2 |   |              | <b>1 2.0</b> |           |  |              |
| Cyst                      |   |  |  |   |   |  |  |   |  |  |   |   |  |   |   |   |   |   |   |   | <b>1 3.0</b> |              |           |  |              |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically  
 1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
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Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

| B6C3F1 MICE FEMALE | DAY ON TEST |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | * TOTALS |      |
|--------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|------|
|                    | 0731        | 0736 | 0737 | 0738 | 0739 | 0740 | 0741 | 0742 | 0743 | 0744 | 0745 | 0746 | 0747 | 0748 | 0749 | 0750 | 0751 | 0752 | 0753 | 0754 | 0755 | 0756 | 0757 | 0758 |          | 0759 |
| Control            | 001         | 002  | 003  | 004  | 005  | 006  | 007  | 008  | 009  | 010  | 011  | 012  | 013  | 014  | 015  | 016  | 017  | 018  | 019  | 020  | 021  | 022  | 023  | 024  | 025      | 026  |

Capillary, Hyperplasia

1 1.0

**ENDOCRINE SYSTEM**

|                              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |        |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|--------|
| Adrenal Cortex               | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +  | 49     |
| Angiectasis                  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    | 1 2.0  |
| Hyperplasia                  | 1 |   | 2 |   |   | 2 |   |   | 1 |   |   |   | 1 |   |   | 1 |   |   |   | 1 |   |   |   |   |   |    | 10 1.3 |
| Vacuolization Cytoplasmic    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    | 2 2.5  |
| Adrenal Medulla              | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +  | 49     |
| Hyperplasia                  |   |   |   |   |   |   |   | 2 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    | 2 1.5  |
| Islets, Pancreatic           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +  | 50     |
| Parathyroid Gland            | M | + | M | + | M | + | M | + | M | + | M | + | + | M | + | + | M | + | M | M | M | + | + | M | + | 26 |        |
| Hyperplasia                  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    | 1 4.0  |
| Pituitary Gland              | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +  | 50     |
| Angiectasis                  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    | 2 2.5  |
| Pars Distalis, Hyperplasia   | 2 |   |   |   |   |   |   |   | 3 |   |   |   |   | 1 |   |   |   | 1 |   |   | 1 |   | 3 |   |   |    | 17 1.9 |
| Thyroid Gland                | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +  | 50     |
| C-cell, Hyperplasia          |   |   | 3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    | 1 3.0  |
| Follicular Cell, Hyperplasia |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    | 1 2.0  |

**GENERAL BODY SYSTEM**

|                                                |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |       |
|------------------------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|-------|
| Tissue NOS                                     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | + | 3     |
| Mediastinum, Infiltration Cellular, Lymphocyte |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 3 | 1 3.0 |
| Mediastinum, Thrombosis                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   | 1 1.0 |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

| B6C3F1 MICE FEMALE | DAY ON TEST |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | * TOTALS |   |  |
|--------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|---|--|
|                    | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |          |   |  |
| Control            | 7           | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |          |   |  |
|                    | 3           | 8 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 0        |   |  |
|                    | 1           | 6 | 3 | 1 | 2 | 2 | 3 | 2 | 1 | 3 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 3 | 2 | 3 | 1 | 1 | 2 | 2 | 0 | 2        |   |  |
|                    | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0        | 0 |  |
|                    | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0        | 0 |  |
|                    | 1           | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1        | 1 |  |
| 2                  | 2           | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5        |   |  |
| 6                  | 7           | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 0 |          |   |  |

**GENITAL SYSTEM**

|                                  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |     |    |     |
|----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|-----|----|-----|
| Clitoral Gland                   | M | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 44 |     |    |     |
| Inflammation, Chronic Active     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  | 1.0 |    |     |
| Ovary                            | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |     |    |     |
| Angiectasis                      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 4 |   | 2 |   |   | 3  | 2.3 |    |     |
| Cyst                             |   |   |   | 1 |   |   | 2 |   |   | 1 | 1 | 3 |   |   |   |   | 3 | 2 | 2 |   |   |   |   |   | 14 | 2.0 |    |     |
| Hemorrhage                       |   |   |   |   |   |   |   |   | 1 |   | 1 | 1 |   |   |   |   |   |   |   |   |   | 1 | 1 |   | 12 | 1.0 |    |     |
| Inflammation, Chronic Active     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 3 |   |   |   |   | 1  | 3.0 |    |     |
| Mineralization                   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2 |   |   | 1  | 2.0 |    |     |
| Necrosis                         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  | 1.0 |    |     |
| Corpus Luteum, Hyperplasia       | 1 |   |   |   |   | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 3  | 1.3 |    |     |
| Uterus                           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |     |    |     |
| Angiectasis                      |   |   |   |   | 1 |   |   |   |   |   |   |   |   |   | 2 |   |   |   |   |   | 2 |   | 2 |   | 5  | 2.2 |    |     |
| Atrophy                          |   |   |   | 3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  | 3.0 |    |     |
| Decidual Reaction                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 3 |   |   |   | 1  | 3.0 |    |     |
| Dilatation                       |   |   |   |   | 2 | 3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 6  | 2.8 |    |     |
| Inflammation, Suppurative        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2 |   |   |   |   | 1  | 2.0 |    |     |
| Inflammation, Chronic Active     |   |   |   |   |   |   |   |   | 2 | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2  | 1.5 |    |     |
| Thrombosis                       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  | 3.0 |    |     |
| Endometrium, Hyperplasia, Cystic |   |   |   |   |   |   |   |   |   | 3 | 1 |   |   | 2 | 2 | 2 | 2 | 2 | 2 |   | 1 | 3 |   | 1 | 2  | 2   | 28 | 2.1 |

**HEMATOPOIETIC SYSTEM**

|             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |    |     |
|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----|-----|
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |    |     |
| Lymph Node  |   |   |   |   | + |   |   | + |   |   | + |   |   |   |   |   |   |   |   |   |   |   |   |   |    | 11 |     |
| Hemorrhage  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    | 1  | 3.0 |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

| B6C3F1 MICE FEMALE<br>Control                               | DAY ON TEST           |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | * TOTALS              |                       |                       |   |     |     |     |     |
|-------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|---|-----|-----|-----|-----|
|                                                             | 0<br>7<br>3<br>1      | 0<br>6<br>8<br>6      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>3      |                       | 0<br>7<br>3<br>2      |                       |   |     |     |     |     |
|                                                             | ANIMAL ID             |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |   |     |     |     |     |
|                                                             | 0<br>0<br>1<br>2<br>6 | 0<br>0<br>1<br>2<br>7 | 0<br>0<br>1<br>2<br>8 | 0<br>0<br>1<br>2<br>9 | 0<br>0<br>1<br>3<br>0 | 0<br>0<br>1<br>3<br>1 | 0<br>0<br>1<br>3<br>2 | 0<br>0<br>1<br>3<br>3 | 0<br>0<br>1<br>3<br>4 | 0<br>0<br>1<br>3<br>5 | 0<br>0<br>1<br>3<br>6 | 0<br>0<br>1<br>3<br>7 | 0<br>0<br>1<br>3<br>8 | 0<br>0<br>1<br>3<br>9 | 0<br>0<br>1<br>4<br>0 | 0<br>0<br>1<br>4<br>1 | 0<br>0<br>1<br>4<br>2 | 0<br>0<br>1<br>4<br>3 | 0<br>0<br>1<br>4<br>4 | 0<br>0<br>1<br>4<br>5 | 0<br>0<br>1<br>4<br>6 | 0<br>0<br>1<br>4<br>7 | 0<br>0<br>1<br>4<br>8 | 0<br>0<br>1<br>4<br>9 | 0<br>0<br>1<br>5<br>0 |   |     |     |     |     |
| Iliac, Ectasia                                              |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1 | 4.0 |     |     |     |
| Iliac, Hyperplasia, Lymphoid                                |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |   | 1   | 1.0 |     |     |
| Lumbar, Ectasia                                             |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |   | 1   | 1.0 |     |     |
| Pancreatic, Inflammation, Chronic Active                    |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 4                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |   | 1   | 4.0 |     |     |
| Renal, Ectasia                                              |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |   | 1   | 4.0 |     |     |
| Lymph Node, Bronchial                                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |   |     | 26  |     |     |
| Lymph Node, Mandibular                                      |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |   |     | 41  |     |     |
| Lymph Node, Mediastinal                                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |   |     | 43  |     |     |
| Lymph Node, Mesenteric<br>Infiltration Cellular, Histiocyte |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |   |     | 48  |     |     |
|                                                             |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |   | 1   | 2.0 |     |     |
| Spleen                                                      |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |   |     | 50  |     |     |
| Hematopoietic Cell Proliferation                            |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |   |     | 4   | 2.3 |     |
| Thymus                                                      |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |   |     | 44  |     |     |
| Atrophy                                                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |   |     | 2   | 1.5 |     |
| Hyperplasia, Lymphoid                                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |   |     | 1   | 3.0 |     |
|                                                             |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |   |     |     |     |     |
| <b>INTEGUMENTARY SYSTEM</b>                                 |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |   |     |     |     |     |
| Mammary Gland                                               |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |   |     | 50  |     |     |
| Hyperplasia                                                 |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |   |     | 2   | 1.0 |     |
| Skin                                                        |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |   |     |     | 50  |     |
| Ulcer                                                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |   |     |     | 1   | 3.0 |
| Epidermis, Hyperplasia                                      |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |   |     |     | 1   | 2.0 |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

| DAY ON TEST | B6C3F1 MICE FEMALE |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | * TOTALS |   |   |         |           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-------------|--------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|---|---|---------|-----------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|             | 0                  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |          | 0 | 0 | Control | ANIMAL ID | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

MUSCULOSKELETAL SYSTEM

|                                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |     |
|-------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|-----|
| Bone                                      | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |     |
| Fibro-Osseous Lesion                      | 1 | 1 | 1 | 1 |   |   | 2 | 1 | 1 |   |   |   |   | 1 |   |   |   | 2 | 2 | 2 |   | 2 |   |   | 1 | 23 | 1.4 |
| Cartilage, Femur, Metaphysis, Hyperplasia |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  | 4.0 |
| Cranium, Inflammation, Chronic Active     |   |   |   |   |   |   |   |   |   |   |   |   | 3 |   |   |   |   |   |   |   |   |   |   |   |   | 1  | 3.0 |
| Femur, Fracture                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |     |
| Skeletal Muscle                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 3  |     |
| Infiltration Cellular, Lymphocyte         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 3  | 1.3 |

NERVOUS SYSTEM

|                                   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |     |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|-----|
| Brain                             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |     |
| Compression                       |   |   | 3 |   |   | 3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 3  | 2.7 |
| Peripheral Nerve                  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2  |     |
| Infiltration Cellular, Mixed Cell |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  | 1.0 |
| Spinal Cord                       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 3  |     |

RESPIRATORY SYSTEM

|                                             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |     |
|---------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|-----|
| Larynx                                      | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |     |
| Metaplasia, Squamous                        |   |   |   |   |   |   |   |   |   |   |   |   | 1 |   |   |   |   |   |   |   |   |   |   |   |   | 1  | 1.0 |
| Lung                                        | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |     |
| Hemorrhage                                  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  | 2.0 |
| Infiltration Cellular, Histiocyte           |   |   |   |   |   |   |   |   |   |   |   |   | 1 |   |   |   |   |   |   |   | 1 |   |   |   |   | 4  | 1.0 |
| Alveolar Epithelium, Hyperplasia            |   |   |   |   |   |   |   |   |   |   |   | 2 |   |   | 2 |   |   |   |   |   |   |   |   |   |   | 4  | 1.5 |
| Alveolus, Infiltration Cellular, Histiocyte |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  | 1.0 |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
+ .. Tissue examined microscopically  
X .. Lesion present  
I .. Insufficient tissue  
M .. Missing tissue  
A .. Autolysis precludes evaluation  
BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:  
1) Minimal 3) Moderate  
2) Mild 4) Marked



Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

| B6C3F1 MICE FEMALE             | DAY ON TEST |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | * TOTALS |     |     |
|--------------------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|-----|-----|
|                                | 0731        | 0736 | 0738 | 0731 | 0733 | 0735 | 0737 | 0739 | 0741 | 0743 | 0745 | 0747 | 0749 | 0751 | 0753 | 0755 | 0757 | 0759 | 0761 | 0763 | 0765 | 0767 | 0769 | 0771 |          |     |     |
| Control                        | 001         | 002  | 003  | 004  | 005  | 006  | 007  | 008  | 009  | 010  | 011  | 012  | 013  | 014  | 015  | 016  | 017  | 018  | 019  | 020  | 021  | 022  | 023  | 024  |          |     |     |
| Necrosis                       |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | 1        | 1.0 |     |
| Nephropathy                    | 1           |      | 1    | 1    | 2    | 2    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 2    | 2    | 1    | 2    | 1    | 2    | 1    | 1    | 2    | 1    | 2    | 1        | 47  | 1.5 |
| Glomerulus, Amyloid Deposition |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | 1        | 4.0 |     |
| Urinary Bladder Angiectasis    | +           | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | 50       | 3.0 |     |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

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 1) Minimal 3) Moderate  
 2) Mild 4) Marked



Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

| B6C3F1 MICE FEMALE | DAY ON TEST | 0 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | females<br>(cont...) |   |   |   |   |   |
|--------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------------------|---|---|---|---|---|
|                    |             | 6 | 7 | 7 | 7 | 7 | 5 | 6 | 7 | 7 | 7 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |                      |   |   |   |   |   |
| 10 mg/m3           |             | 7 | 3 | 3 | 3 | 3 | 9 | 7 | 3 | 3 | 3 | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |                      |   |   |   |   |   |
|                    | ANIMAL ID   | 7 | 2 | 3 | 3 | 3 | 9 | 7 | 3 | 3 | 2 | 5 | 7 | 3 | 2 | 3 | 3 | 1 | 3 | 2 | 2 | 1                    | 2 | 3 | 3 | 3 | 2 |
|                    |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                    | 0 | 0 | 0 | 0 | 0 |
|                    |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                    | 0 | 0 | 0 | 0 | 0 |
|                    |             | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3                    | 3 | 3 | 3 | 3 | 3 |
|                    |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2                    | 2 | 2 | 2 | 2 | 2 |
|                    |             | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1                    | 2 | 3 | 4 | 5 |   |

Tension Lipidosis  
 Centrilobular, Degeneration, Acute  
 Centrilobular, Necrosis

1 X X

Mesentery  
 Inflammation, Chronic Active  
 Necrosis  
 Fat, Necrosis

+ + + + + + + + + + + + + + + + + + + + + + +  
 2 1 3 2 1 2 2 2  
 1 1 1 3 2 1 2 2

Pancreas  
 Cyst  
 Lipomatosis

+ + + + + + + + + + + + + + + + + + + + + + + + + + + + +  
 3

Salivary Glands

+ + + + + + + + + + + + + + + + + + + + + + + + + + + + +

Stomach, Forestomach  
 Hyperplasia, Squamous  
 Ulcer

+ + + + + + + + + + + + + + + + + + + + + + + + + + + + +  
 3  
 1

Stomach, Glandular

+ + + + + + + + + + + + + + + + + + + + + + + + + + + + +

CARDIOVASCULAR SYSTEM

Blood Vessel

+ + + + + + + + + + + + + + + + + + + + + + + + + + + + +

Heart  
 Cardiomyopathy  
 Congestion  
 Necrosis  
 Thrombosis

+ + + + + + + + + + + + + + + + + + + + + + + + + + + + +  
 3 1 2 3

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
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 1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
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**Experiment Number:** 20515 - 04  
**Test Type:** CHRONIC  
**Route:** RESPIRATORY EXPOSURE WHOLE BODY  
**Species/Strain:** MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
Metal working fluids (CIMSTAR 3800)  
**CAS Number:** CIMSTAR3800

**Date Report Requested:** 03/08/2013  
**Time Report Requested:** 14:13:47  
**First Dose M/F:** 05/05/08 / 05/05/08  
**Lab:** BNW

| B6C3F1 MICE FEMALE<br>10 mg/m3 | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ANIMAL ID | females<br>(cont...) |   |
|--------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|----------------------|---|
|                                |             | 6 | 7 | 7 | 7 | 7 | 5 | 6 | 7 | 7 | 7 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |           |                      | 7 |
|                                |             | 7 | 3 | 3 | 3 | 3 | 9 | 7 | 3 | 3 | 3 | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |           |                      |   |
|                                |             | 7 | 2 | 3 | 3 | 3 | 9 | 7 | 3 | 3 | 3 | 2 | 5 | 7 | 3 | 2 | 3 | 3 | 1 | 3 | 3 | 2 | 2 | 2 | 1 | 2 |           |                      |   |
|                                |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0         |                      |   |
|                                |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0         |                      |   |
|                                |             | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3         |                      |   |
|                                |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1         |                      |   |
|                                |             | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 2 | 2 | 2 | 2         |                      |   |

**GENITAL SYSTEM**

|                                   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Clitoral Gland                    | M | + | + | + | M | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |  |
| Inflammation, Chronic Active      |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| Ovary                             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |  |
| Angiectasis                       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| Cyst                              |   |   |   | 2 | 2 |   |   |   |   |   |   |   |   | 3 | 2 | 2 |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| Hemorrhage                        |   |   |   | 1 | 1 | 1 |   |   |   |   | 1 |   |   | 1 |   |   | 1 | 1 |   |   | 1 |   |   |   |   |   |   |   |   |  |
| Infiltration Cellular, Lymphocyte |   |   |   |   |   |   |   |   | 2 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| Inflammation, Chronic Active      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| Corpus Luteum, Hyperplasia        | 4 |   |   |   |   |   |   |   |   |   |   |   |   |   | 2 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| Uterus                            | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |  |
| Angiectasis                       |   |   |   |   |   |   |   |   | 2 |   |   |   |   |   |   |   | 4 |   |   |   |   |   |   |   |   |   |   |   |   |  |
| Dilatation                        |   |   |   |   |   | 2 |   |   |   | 3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| Inflammation, Chronic Active      |   |   |   |   |   |   |   |   |   |   | 3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| Endometrium, Hyperplasia, Cystic  |   |   |   | 3 | 2 | 2 |   |   |   | 1 | 3 |   | 2 |   | 2 | 1 |   | 2 | 1 | 2 | 2 |   | 1 | 2 |   |   | 2 | 2 |   |  |

**HEMATOPOIETIC SYSTEM**

|                                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |
|-------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|---|
| Bone Marrow                               | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |  |   |
| Lymph Node                                | + |   |   | + |   |   |   |   |   | + |   |   |   |   |   |   | + | + |   |   | + |   |   |   |   |   |   | + | + |  |   |
| Iliac, Angiectasis                        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  | 3 |
| Iliac, Hyperplasia, Lymphoid              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |
| Lumbar, Ectasia                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |
| Lumbar, Hyperplasia, Lymphoid             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |
| Lumbar, Infiltration Cellular, Histiocyte | 3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |
| Renal, Angiectasis                        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  | 3 |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
+ .. Tissue examined microscopically  
X .. Lesion present  
I .. Insufficient tissue  
M .. Missing tissue  
A .. Autolysis precludes evaluation  
BLANK .. Not examined microscopically  
1-4 .. Lesion qualified as:  
1) Minimal 3) Moderate  
2) Mild 4) Marked

Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

| B6C3F1 MICE FEMALE<br><br>10 mg/m3                                                      | DAY ON TEST |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | females<br>(cont...) |
|-----------------------------------------------------------------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------------------|
|                                                                                         | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   |                      |
|                                                                                         | 6           | 7 | 7 | 7 | 7 | 5 | 6 | 7 | 7 | 7 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |   |                      |
| ANIMAL ID                                                                               |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |
| 0                                                                                       | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   |                      |
| 3                                                                                       | 3           | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |   |                      |
| 0                                                                                       | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |   |                      |
| 1                                                                                       | 2           | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 |   |                      |
| Renal, Hyperplasia, Lymphoid                                                            | 3           |   |   |   |   |   |   | 2 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |
| Lymph Node, Bronchial                                                                   | M           | M | + | M | + | M | + | + | + | + | + | M | + | M | + | M | + | M | M | M | M | M | + | + | M |                      |
| Lymph Node, Mandibular                                                                  | +           | M | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M |   |                      |
| Lymph Node, Mediastinal<br>Hematopoietic Cell Proliferation<br>Hyperplasia, Lymphoid    | +           | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |                      |
| Lymph Node, Mesenteric<br>Angiectasis<br>Hematopoietic Cell Proliferation<br>Hemorrhage | +           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 3 |   |                      |
| Spleen<br>Hematopoietic Cell Proliferation<br>Hyperplasia, Lymphoid                     | +           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |                      |
|                                                                                         | 2           |   |   |   |   |   | 1 |   |   |   |   |   |   | 3 |   |   |   |   |   |   |   |   |   |   |   |                      |
| Thymus                                                                                  | M           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |                      |
| <b>INTEGUMENTARY SYSTEM</b>                                                             |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |
| Mammary Gland                                                                           | +           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |                      |
| Skin                                                                                    | +           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |                      |
| <b>MUSCULOSKELETAL SYSTEM</b>                                                           |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |
| Bone<br>Fibro-Osseous Lesion                                                            | +           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |                      |
|                                                                                         | 1           |   |   | 2 | 2 |   |   |   | 1 | 2 |   |   | 1 | 2 | 2 | 1 | 2 | 2 |   | 2 | 1 |   | 2 |   |   |                      |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

2) Mild 4) Marked





Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

|                           |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| <b>B6C3F1 MICE FEMALE</b> | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|                           |             | 6 | 7 | 7 | 7 | 7 | 5 | 6 | 7 | 7 | 7 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
|                           |             | 7 | 3 | 3 | 3 | 3 | 9 | 7 | 3 | 3 | 3 | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| <b>10 mg/m3</b>           |             | 7 | 2 | 3 | 3 | 3 | 9 | 7 | 3 | 3 | 2 | 5 | 7 | 3 | 2 | 3 | 3 | 1 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 3 |   |
|                           | ANIMAL ID   | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   |
|                           |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   |
|                           | 3           | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |   |
|                           | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |   |
|                           | 1           | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 |   |   |

**females  
(cont...)**

|                                              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|----------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Urinary Bladder                              | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Artery, Serosa, Inflammation, Chronic Active |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 3 |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically                                                M .. Missing tissue  
 X .. Lesion present                                                                                A .. Autolysis precludes evaluation  
 I .. Insufficient tissue                                                                                BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

|                           |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                 |   |
|---------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------------|---|
| <b>B6C3F1 MICE FEMALE</b> | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |                 |   |
|                           |             | 7 | 5 | 7 | 6 | 7 | 7 | 5 | 7 | 5 | 7 | 6 | 7 | 7 | 7 | 6 | 7 | 5 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |                 | 7 |
|                           |             | 3 | 8 | 3 | 5 | 3 | 0 | 9 | 3 | 0 | 3 | 3 | 3 | 3 | 3 | 9 | 3 | 5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |                 | 3 |
| <b>10 mg/m3</b>           | ANIMAL ID   | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |                 |   |
|                           |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |                 |   |
|                           |             | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |                 |   |
|                           |             | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 |   |                 |   |
|                           |             | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | <b>* TOTALS</b> |   |

**ALIMENTARY SYSTEM**

|                                     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |       |
|-------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|-------|
| Esophagus                           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |       |
| Gallbladder Epithelium, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | 1 2.0 |
| Intestine Large, Cecum Hyperplasia  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 1 3.0 |
| Intestine Large, Colon              | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |       |
| Intestine Large, Rectum             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |       |
| Intestine Small, Duodenum           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |       |
| Intestine Small, Ileum              | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |       |
| Intestine Small, Jejunum            | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |       |
| Liver                               | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |       |
| Angiectasis                         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 |   |   |   |   |   |   |   | 2  | 1.0   |
| Basophilic Focus                    |   |   |   |   | X |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   | X |   |   |   | 5  |       |
| Cyst                                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  |       |
| Degeneration                        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  | 3.0   |
| Eosinophilic Focus                  |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   | 1  |       |
| Fatty Change                        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2 |   |   | 2  | 1.5   |
| Hyperplasia                         |   |   |   |   | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  | 1.0   |
| Infiltration Cellular, Lymphocyte   |   |   |   |   |   | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  | 1.0   |
| Infiltration Cellular, Mixed Cell   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1  | 3.0   |
| Mixed Cell Focus                    |   |   |   |   |   | X |   |   |   |   | X |   |   |   |   |   |   |   |   |   | X |   |   |   | 4  |       |

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X .. Lesion present

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M .. Missing tissue

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2) Mild 4) Marked

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

| B6C3F1 MICE FEMALE<br>10 mg/m3     | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS |        |
|------------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|--------|
|                                    | 0733        | 0758  | 0773  | 0765  | 0777  | 0757  | 0775  | 0757  | 0775  | 0757  | 0766  | 0777  | 0777  | 0777  | 0766  | 0777  | 0755  | 0773  | 0777  | 0777  |          | 0777   |
| ANIMAL ID                          | 00326       | 00337 | 00332 | 00335 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333    |        |
| Tension Lipidosis                  |             |       |       | 1     |       |       |       |       |       |       |       |       |       | 1     |       |       |       |       |       |       |          | 5 1.0  |
| Centrilobular, Degeneration, Acute |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 2     |       |       |       |          | 1 2.0  |
| Centrilobular, Necrosis            |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 2     |       |       |       |          | 1 2.0  |
| Mesentery                          |             | +     | +     | +     |       |       | +     | +     |       | +     | +     | +     | +     |       |       |       |       | +     | +     |       | +        | 23     |
| Inflammation, Chronic Active       |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          | 1 2.0  |
| Necrosis                           |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          | 1 1.0  |
| Fat, Necrosis                      |             | 1     |       |       |       |       | 2     |       |       | 2     | 2     | 2     |       |       |       |       | 3     | 1     |       | 1     |          | 17 1.7 |
| Pancreas                           | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | 50     |
| Cyst                               |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          | 1 3.0  |
| Lipomatosis                        |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 2     |       |       |       |       |          | 1 2.0  |
| Salivary Glands                    | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | 50     |
| Stomach, Forestomach               | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | 50     |
| Hyperplasia, Squamous              |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          | 1 3.0  |
| Ulcer                              |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          | 1 1.0  |
| Stomach, Glandular                 | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | 50     |
| <b>CARDIOVASCULAR SYSTEM</b>       |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |        |
| Blood Vessel                       | +           | +     | +     | +     | M     | +     | +     | +     | +     | I     | +     | +     | +     | M     | I     | +     | +     | +     | M     | +     | +        | 44     |
| Heart                              | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | 50     |
| Cardiomyopathy                     |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          | 3 2.0  |
| Congestion                         |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          | 1 1.0  |
| Necrosis                           |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          | 1 2.0  |
| Thrombosis                         |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          | 1 3.0  |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically  
 1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

**Experiment Number:** 20515 - 04  
**Test Type:** CHRONIC  
**Route:** RESPIRATORY EXPOSURE WHOLE BODY  
**Species/Strain:** MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
**CAS Number:** CIMSTAR3800

**Date Report Requested:** 03/08/2013  
**Time Report Requested:** 14:13:47  
**First Dose M/F:** 05/05/08 / 05/05/08  
**Lab:** BNW

| DAY ON TEST               | 0 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                 |
|---------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------------|
|                           | 7 | 5 | 7 | 6 | 7 | 7 | 5 | 7 | 5 | 7 | 6 | 7 | 7 | 7 | 6 | 7 | 5 | 7 | 7 | 7 |   | 7 | 7               |
| <b>B6C3F1 MICE FEMALE</b> | 3 | 8 | 3 | 5 | 3 | 0 | 9 | 3 | 0 | 3 | 3 | 3 | 3 | 3 | 9 | 3 | 5 | 3 | 3 | 3 | 3 | 3 |                 |
|                           | 3 | 3 | 2 | 5 | 2 | 1 | 8 | 3 | 8 | 3 | 4 | 3 | 3 | 1 | 2 | 8 | 2 | 2 | 3 | 1 | 1 | 3 | 2               |
| <b>10 mg/m3</b>           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |                 |
|                           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |                 |
| ANIMAL ID                 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |                 |
|                           | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |                 |
|                           | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | <b>* TOTALS</b> |

**ENDOCRINE SYSTEM**

|                              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           |           |            |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|-----------|------------|
| Adrenal Cortex               | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | <b>50</b> |           |            |
| Degeneration, Cystic         |   |   |   |   |   |   | 2 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>1</b>  | <b>2.0</b> |
| Hyperplasia                  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 3 |   |           | <b>5</b>  | <b>1.4</b> |
| Vacuolization Cytoplasmic    |   |   |   |   |   |   |   |   |   |   |   |   |   | 3 |   |   |   |   |   |   |   |   |           | <b>2</b>  | <b>3.0</b> |
| Adrenal Medulla              | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | <b>50</b> |           |            |
| Hyperplasia                  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>1</b>  | <b>2.0</b> |
| Islets, Pancreatic           | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | <b>50</b> |           |            |
| Parathyroid Gland            | M | M | M | + | + | M | + | + | M | + | + | M | + | + | + | M | + | M | M | + | M | M | <b>29</b> |           |            |
| Cyst                         |   |   |   |   |   |   |   |   |   |   |   |   | 1 |   |   |   |   |   |   |   |   |   |           | <b>1</b>  | <b>1.0</b> |
| Pituitary Gland              | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | <b>50</b> |           |            |
| Angiectasis                  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>1</b>  | <b>3.0</b> |
| Pars Distalis, Cyst          | 2 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>1</b>  | <b>2.0</b> |
| Pars Distalis, Hyperplasia   |   |   |   |   | 1 |   |   | 1 |   | 2 |   | 2 |   |   |   |   |   | 1 |   |   |   | 3 |           | <b>21</b> | <b>1.7</b> |
| Thyroid Gland                | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | <b>48</b> |           |            |
| Inflammation, Chronic Active |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>1</b>  | <b>1.0</b> |
| C-cell, Hyperplasia          |   |   |   |   |   |   |   |   |   |   |   | 2 |   |   |   |   |   |   |   |   |   |   |           | <b>1</b>  | <b>2.0</b> |
| Follicle, Cyst               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>1</b>  | <b>2.0</b> |
| Follicular Cell, Hyperplasia |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2 |           | <b>1</b>  | <b>2.0</b> |

**GENERAL BODY SYSTEM**

|            |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |
|------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|----------|
| Tissue NOS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | <b>2</b> |
|------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|----------|

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically  
 1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

|                           |             |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |          |
|---------------------------|-------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------|
| <b>B6C3F1 MICE FEMALE</b> | DAY ON TEST | 0<br>7<br>3<br>3      | 0<br>5<br>8<br>3      | 0<br>7<br>3<br>2      | 0<br>6<br>5<br>5      | 0<br>7<br>3<br>2      | 0<br>7<br>0<br>1      | 0<br>5<br>9<br>8      | 0<br>7<br>3<br>3      | 0<br>5<br>0<br>8      | 0<br>7<br>3<br>3      | 0<br>6<br>3<br>4      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>1      | 0<br>6<br>9<br>8      | 0<br>7<br>3<br>2      | 0<br>7<br>5<br>3      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>2      | * TOTALS |
|                           | ANIMAL ID   | 0<br>0<br>3<br>2<br>6 | 0<br>0<br>3<br>2<br>7 | 0<br>0<br>3<br>2<br>8 | 0<br>0<br>3<br>2<br>9 | 0<br>0<br>3<br>3<br>0 | 0<br>0<br>3<br>3<br>1 | 0<br>0<br>3<br>3<br>2 | 0<br>0<br>3<br>3<br>3 | 0<br>0<br>3<br>3<br>3 | 0<br>0<br>3<br>3<br>4 | 0<br>0<br>3<br>3<br>5 | 0<br>0<br>3<br>3<br>6 | 0<br>0<br>3<br>3<br>7 | 0<br>0<br>3<br>3<br>8 | 0<br>0<br>3<br>4<br>0 | 0<br>0<br>3<br>4<br>1 | 0<br>0<br>3<br>4<br>2 | 0<br>0<br>3<br>4<br>3 | 0<br>0<br>3<br>4<br>4 | 0<br>0<br>3<br>4<br>5 | 0<br>0<br>3<br>4<br>6 | 0<br>0<br>3<br>4<br>7 | 0<br>0<br>3<br>4<br>8 |          |

**GENITAL SYSTEM**

|                                                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           |               |
|------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|---------------|
| Clitoral Gland<br>Inflammation, Chronic Active | + | + | + | + | + | + | M | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | <b>45</b> | <b>1 1.0</b>  |
| Ovary                                          | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | <b>50</b> |               |
| Angiectasis                                    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2 |   |   |   | 1 |   |   |   |           | <b>2 1.5</b>  |
| Cyst                                           |   | 2 |   | 1 |   |   |   |   |   |   | 2 | 2 |   | 1 | 3 |   |   |   |   | 2 |   |   |   |   |   |           | <b>12 2.0</b> |
| Hemorrhage                                     | 1 |   |   |   |   | 1 |   |   |   |   |   | 1 | 1 | 1 | 1 | 2 |   |   |   |   |   | 2 |   |   |   |           | <b>16 1.1</b> |
| Infiltration Cellular, Lymphocyte              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>1 2.0</b>  |
| Inflammation, Chronic Active                   |   |   |   |   |   |   |   |   |   |   | 2 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>2 3.0</b>  |
| Corpus Luteum, Hyperplasia                     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>1 2.0</b>  |
| Uterus                                         | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | <b>50</b> |               |
| Angiectasis                                    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 |   |   |           | <b>3 2.3</b>  |
| Dilatation                                     |   |   |   |   |   |   | 2 |   |   |   |   | 3 |   |   |   |   |   | 1 |   |   |   |   |   |   |   |           | <b>5 2.2</b>  |
| Inflammation, Chronic Active                   |   |   |   |   |   | 2 |   |   |   |   |   | 2 |   |   |   |   |   |   | 1 |   |   |   |   |   |   |           | <b>2 2.0</b>  |
| Endometrium, Hyperplasia, Cystic               | 3 |   | 2 |   | 1 |   |   |   |   |   |   |   | 2 | 2 | 1 | 2 | 2 |   |   |   | 2 | 2 | 2 | 3 | 2 |           | <b>29 1.9</b> |

**HEMATOPOIETIC SYSTEM**

|                                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           |              |
|-------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|--------------|
| Bone Marrow                               | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | <b>50</b> |              |
| Lymph Node                                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>12</b>    |
| Iliac, Angiectasis                        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>1 3.0</b> |
| Iliac, Hyperplasia, Lymphoid              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>1 1.0</b> |
| Lumbar, Ectasia                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>1 2.0</b> |
| Lumbar, Hyperplasia, Lymphoid             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>1 3.0</b> |
| Lumbar, Infiltration Cellular, Histiocyte |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2 |   |           | <b>1 2.0</b> |
| Renal, Angiectasis                        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>1 3.0</b> |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
+ .. Tissue examined microscopically  
X .. Lesion present  
I .. Insufficient tissue  
M .. Missing tissue  
A .. Autolysis precludes evaluation  
BLANK .. Not examined microscopically  
1-4 .. Lesion qualified as:  
1) Minimal 3) Moderate  
2) Mild 4) Marked

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

| B6C3F1 MICE FEMALE<br>10 mg/m3   | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS |        |
|----------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|--------|
|                                  | 0733        | 0583  | 0732  | 0655  | 0730  | 0779  | 0573  | 0753  | 0758  | 0733  | 0634  | 0733  | 0773  | 0773  | 0676  | 0735  | 0773  | 0773  | 0733  | 0773  |          | 0773   |
| ANIMAL ID                        | 00326       | 00337 | 00338 | 00339 | 00340 | 00341 | 00342 | 00343 | 00344 | 00345 | 00346 | 00347 | 00348 | 00349 | 00350 | 00351 | 00352 | 00353 | 00354 | 00355 | 00356    |        |
| Renal, Hyperplasia, Lymphoid     |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          | 2 2.5  |
| Lymph Node, Bronchial            | M           | M     | +     | +     | M     | +     | +     | +     | M     | M     | +     | M     | +     | +     | +     | M     | +     | +     | M     | +     | M        | 27     |
| Lymph Node, Mandibular           | +           | +     | M     | +     | +     | +     | M     | M     | M     | M     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | 42     |
| Lymph Node, Mediastinal          | +           | +     | +     | +     | +     | M     | +     | +     | +     | +     | M     | +     | +     | +     | M     | +     | +     | +     | +     | +     | +        | 46     |
| Hematopoietic Cell Proliferation |             |       |       |       |       |       |       |       |       | 1     |       |       |       |       |       |       |       |       |       |       |          | 1 1.0  |
| Hyperplasia, Lymphoid            |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          | 1 3.0  |
| Lymph Node, Mesenteric           | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | 50     |
| Angiectasis                      |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          | 1 3.0  |
| Hematopoietic Cell Proliferation |             |       |       |       |       |       |       |       |       | 1     |       |       |       |       |       |       |       |       |       |       |          | 1 1.0  |
| Hemorrhage                       |             |       |       |       |       |       |       |       |       |       |       |       | 2     |       |       |       |       | 2     |       |       |          | 2 2.0  |
| Spleen                           | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | 50     |
| Hematopoietic Cell Proliferation |             |       | 1     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          | 3 1.3  |
| Hyperplasia, Lymphoid            |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          | 1 3.0  |
| Thymus                           | +           | +     | +     | +     | +     | +     | M     | +     | M     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | M     | +        | 46     |
| <b>INTEGUMENTARY SYSTEM</b>      |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |        |
| Mammary Gland                    | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | 50     |
| Skin                             | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | 50     |
| <b>MUSCULOSKELETAL SYSTEM</b>    |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |        |
| Bone                             | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | 50     |
| Fibro-Osseous Lesion             | 1           |       |       |       |       |       | 1     |       | 1     | 2     |       | 2     | 1     |       | 1     |       | 1     | 1     |       |       | 1        | 25 1.5 |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

| B6C3F1 MICE FEMALE | DAY ON TEST |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | * TOTALS |       |
|--------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|-------|
|                    | 0733        | 0758 | 0773 | 0765 | 0777 | 0757 | 0777 | 0757 | 0777 | 0758 | 0773 | 0766 | 0777 | 0777 | 0767 | 0777 | 0757 | 0773 | 0777 | 0777 |          | 0777  |
| 10 mg/m3           | 0032        | 0003 | 0002 | 0002 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003     | 3     |
| ANIMAL ID          | 0032        | 0003 | 0002 | 0002 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003 | 0003     | 1 1.0 |

Skeletal Muscle Infiltration Cellular, Lymphocyte + 3 1 1.0

**NERVOUS SYSTEM**

Brain Compression + + + + + + + + + + + + + + + + + + + + + + 50 1 2.0

Peripheral Nerve Degeneration Infiltration Cellular, Polymorphonuclear + 2 2 3 1 2.0 1 2.0

Spinal Cord Infiltration Cellular, Lymphocyte + 3 1 1.0

**RESPIRATORY SYSTEM**

Larynx Metaplasia, Squamous + + + + + + + + + + + + + + + + + + + + + + 49 49 1.1

Lung Hemorrhage Infiltration Cellular, Histiocyte Infiltration Cellular, Lymphocyte Metaplasia, Osseous Alveolar Epithelium, Hyperplasia Bronchiole, Hyperplasia Perivascular, Inflammation, Chronic Active + + + + + + + + + + + + + + + + + + + + + + 50 1 2.0 1 1.0 1 1.0 1 1.0 2 2.0 4 1.0 3 1.7

Nose Necrosis + + + + + + A + + + + + + + + + + + + + + + + 49 1 1.0

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically M .. Missing tissue 1-4 .. Lesion qualified as:  
 X .. Lesion present A .. Autolysis precludes evaluation 1) Minimal 3) Moderate  
 I .. Insufficient tissue BLANK .. Not examined microscopically 2) Mild 4) Marked

Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

| B6C3F1 MICE FEMALE<br>10 mg/m3                        | DAY ON TEST |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | * TOTALS |     |   |    |     |     |
|-------------------------------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|-----|---|----|-----|-----|
|                                                       | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |          |     |   |    |     |     |
|                                                       | 7           | 5 | 7 | 6 | 7 | 7 | 5 | 7 | 5 | 7 | 6 | 7 | 7 | 7 | 6 | 7 | 5 | 7 | 7 | 7 | 7 |          |     |   |    |     |     |
| ANIMAL ID                                             |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |          |     |   |    |     |     |
|                                                       |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |          |     |   |    |     |     |
|                                                       |             | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |          |     |   |    |     |     |
|                                                       |             | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |          |     |   |    |     |     |
|                                                       |             | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 |          |     |   |    |     |     |
| Olfactory Epithelium, Accumulation, Hyaline Droplet   |             | 2 | 2 | 1 | 2 | 2 |   | 2 | 3 | 2 | 1 |   | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 40       | 1.9 |   |    |     |     |
| Olfactory Epithelium, Atrophy                         |             |   |   |   |   | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1        | 1.0 |   |    |     |     |
| Olfactory Epithelium, Metaplasia, Respiratory         |             |   |   |   |   |   |   |   | 2 |   |   |   |   | 1 |   |   |   |   |   |   |   | 4        | 1.3 |   |    |     |     |
| Respiratory Epithelium, Accumulation, Hyaline Droplet | 1           | 2 | 2 | 1 | 2 | 2 |   | 2 | 3 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2        | 2   | 2 | 48 | 1.7 |     |
| Respiratory Epithelium, Hyperplasia                   | 2           | 1 | 2 | 1 | 2 | 2 |   | 2 | 1 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 2        | 2   | 2 | 1  | 48  | 1.5 |
| Respiratory Epithelium, Metaplasia, Squamous          |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          |     |   | 1  | 1.0 |     |
| Respiratory Epithelium, Necrosis                      |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          |     |   | 1  | 1.0 |     |
| Trachea                                               |             | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +        | +   | + | 49 |     |     |
| <b>SPECIAL SENSES SYSTEM</b>                          |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          |     |   |    |     |     |
| Eye                                                   |             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +        | +   | + | +  | 50  |     |
| Cornea, Inflammation, Chronic Active                  |             |   |   |   |   |   |   |   |   |   |   |   |   | 2 |   |   |   |   |   |   |   |          |     |   |    | 1   | 2.0 |
| Harderian Gland                                       |             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +        | +   | + | +  | 50  |     |
| Hyperplasia                                           |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          |     |   |    | 1   | 1.0 |
| Inflammation, Chronic Active                          |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          |     |   |    | 1   | 4.0 |
| <b>URINARY SYSTEM</b>                                 |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          |     |   |    |     |     |
| Kidney                                                |             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +        | +   | + | +  | 50  |     |
| Accumulation, Hyaline Droplet                         |             |   |   |   |   |   |   |   | 2 |   |   |   |   |   |   |   |   |   |   |   |   |          |     |   |    | 1   | 2.0 |
| Infarct                                               |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2 |   |   |   |   |          |     |   |    | 4   | 2.0 |
| Metaplasia, Osseous                                   |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          |     |   |    | 1   | 1.0 |
| Nephropathy                                           | 1           | 2 | 2 |   | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 3 |   | 2 |   | 1        | 1   | 2 | 2  | 46  | 1.8 |
| Urethra                                               |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          |     |   | +  | 1   |     |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

2) Mild 4) Marked

Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

| B6C3F1 MICE FEMALE<br>10 mg/m3               | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0     | * TOTALS |
|----------------------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-------|----------|
|                                              | ANIMAL ID   | 7 | 5 | 7 | 6 | 7 | 7 | 5 | 7 | 5 | 7 | 6 | 7 | 7 | 7 | 6 | 7 | 5 | 7 | 7 | 7 | 7 | 7 | 7     |          |
|                                              |             | 3 | 8 | 3 | 5 | 3 | 0 | 9 | 3 | 0 | 3 | 3 | 3 | 3 | 3 | 9 | 3 | 5 | 3 | 3 | 3 | 3 | 3 | 3     |          |
|                                              |             | 3 | 3 | 2 | 5 | 2 | 1 | 8 | 3 | 8 | 3 | 4 | 3 | 3 | 1 | 2 | 8 | 2 | 2 | 3 | 1 | 1 | 3 | 3     |          |
|                                              |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0     |          |
|                                              |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0     |          |
|                                              |             | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3     |          |
|                                              |             | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5     |          |
|                                              |             | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0     |          |
| Urinary Bladder                              |             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50    |          |
| Artery, Serosa, Inflammation, Chronic Active |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 3.0 |          |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
+ .. Tissue examined microscopically  
X .. Lesion present  
I .. Insufficient tissue  
M .. Missing tissue  
A .. Autolysis precludes evaluation  
BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:  
1) Minimal 3) Moderate  
2) Mild 4) Marked

|                                                      |  |             |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |                   |
|------------------------------------------------------|--|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------------------|
| <p><b>B6C3F1 MICE FEMALE</b><br/><b>30 mg/m3</b></p> |  | DAY ON TEST | 0732   | 0573   | 0773   | 0773   | 0773   | 0476   | 0773   | 0773   | 0773   | 0773   | 0773   | 0773   | 0773   | 0773   | 0673   | 0773   | 0773   | 0660   | 0773   | 0773   | 0773   | 0773   | 0773   | 0773   | females (cont...) |
|                                                      |  | ANIMAL ID   | 005011 | 005012 | 005013 | 005014 | 005015 | 005016 | 005017 | 005018 | 005019 | 005020 | 005021 | 005022 | 005023 | 005024 | 005025 | 005026 | 005027 | 005028 | 005029 | 005030 | 005031 | 005032 | 005033 | 005034 |                   |

**ALIMENTARY SYSTEM**

|                                                         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus                                               | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Gallbladder                                             | M | + | M | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Intestine Large, Cecum<br>Inflammation, Chronic Active  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Intestine Large, Colon                                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Intestine Large, Rectum<br>Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Intestine Small, Duodenum                               | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Intestine Small, Ileum<br>Inflammation, Chronic Active  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Intestine Small, Jejunum                                | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Liver                                                   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |
| Angiectasis                                             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 |   |
| Basophilic Focus                                        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X | X |
| Eosinophilic Focus                                      |   | X |   |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   | X |   |   |   |   |   |   |
| Fatty Change                                            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 |   |   |   |   |   |   |   |   |   |   |   |
| Inflammation, Chronic Active                            |   |   |   |   |   |   |   | 2 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Mixed Cell Focus                                        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | X |
| Necrosis                                                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Tension Lipidosis                                       |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 |   |   |   |   |   |   |   |   |   |   |   |   | 1 |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically  
 1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

| B6C3F1 MICE FEMALE                      | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | females<br>(cont...) |
|-----------------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------------------|
|                                         |             | 7 | 5 | 7 | 7 | 7 | 7 | 4 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 6 | 7 | 7 | 7 | 7 | 7 |                      |
| 30 mg/m3                                | ANIMAL ID   | 3 | 7 | 3 | 3 | 3 | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 3 | 9 | 3 | 3 | 0 | 3 | 3 | 0 | 3 | 3 |                      |
| Centrilobular, Hypertrophy              |             | 2 | 6 | 3 | 1 | 1 | 2 | 0 | 3 | 3 | 2 | 3 | 2 | 2 | 4 | 1 | 8 | 2 | 3 | 8 | 1 | 3 | 9 | 2 |   |                      |
| Mesentery                               |             | + |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |
| Fibrosis                                |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |
| Inflammation, Suppurative               |             | 3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | + |                      |
| Inflammation, Chronic Active            |             |   |   |   |   |   |   |   |   |   | 2 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |
| Necrosis                                |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |
| Arteriole, Inflammation, Chronic Active |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 3 |   |   |   |   |                      |
| Fat, Cyst                               |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |
| Fat, Necrosis                           |             |   |   |   | 2 |   |   |   | 1 | 2 |   |   |   |   | 1 |   |   |   |   |   |   |   |   |   |   |                      |
| Pancreas                                |             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |                      |
| Acinus, Atrophy                         |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2 |   |   |   |   |   |   |                      |
| Acinus, Hypertrophy                     |             |   |   |   |   |   |   | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |
| Salivary Glands                         |             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |                      |
| Stomach, Forestomach                    |             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |                      |
| Hyperplasia, Squamous                   |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |
| Ulcer                                   |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |
| Arteriole, Inflammation, Chronic Active |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 |   |   |   |   |                      |
| Stomach, Glandular                      |             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   |                      |
| Fibrosis                                |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |
| Arteriole, Inflammation, Chronic Active |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 3 |   |   |   |   |                      |
| Glands, Mineralization                  |             | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |
| Tooth                                   |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |
| Dysplasia                               |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically  
 1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
**CAS Number: CIMSTAR3800**

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

| B6C3F1 MICE FEMALE | DAY ON TEST | 0 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | females<br>(cont...) |   |   |   |   |
|--------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------------------|---|---|---|---|
|                    |             | 7 | 5 | 7 | 7 | 7 | 7 | 4 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 6 |                      | 7 | 7 | 7 |   |
| 30 mg/m3           | ANIMAL ID   | 3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                      |   |   |   |   |
| 2                  |             | 6 | 3 | 3 | 3 | 3 | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 9 | 3 | 3 | 8 |                      | 3 | 3 | 3 |   |
|                    |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                    | 0 | 0 |   |   |
|                    |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0                    | 0 | 0 |   |   |
|                    |             | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5                    | 5 | 5 |   |   |
|                    |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2                    | 2 | 2 |   |   |
|                    |             | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1                    | 2 | 3 | 4 | 5 |

**CARDIOVASCULAR SYSTEM**

|                                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Blood Vessel Inflammation, Chronic Active | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|                                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 3 |   |   |   |   |
| Heart Cardiomyopathy Mineralization       | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|                                           | 2 | 1 |   |   |   |   |   |   |   | 2 | 2 | 2 | 2 |   |   |   |   |   | 2 |   |   |   |   |   |   |
|                                           |   |   |   |   |   |   |   | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

**ENDOCRINE SYSTEM**

|                                                                         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adrenal Cortex Atrophy Hyperplasia                                      | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|                                                                         |   |   |   |   | 1 | 2 |   |   |   |   |   |   | 1 | 1 |   |   |   | 1 | 1 |   | 1 | 1 |   |   |   |
| Adrenal Medulla Hyperplasia                                             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|                                                                         |   |   |   |   |   |   |   |   |   |   |   |   | 2 |   |   |   |   |   |   |   |   |   |   |   |   |
| Islets, Pancreatic                                                      | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Parathyroid Gland                                                       | M | + | M | M | M | M | + | M | + | + | + | M | + | + | M | M | M | + | M | M | M | + | + | + | M |
| Pituitary Gland Pars Distalis, Hyperplasia                              | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|                                                                         | 2 |   |   | 1 |   |   |   |   |   | 1 |   |   | 2 | 2 |   | 1 |   | 1 |   |   | 4 |   | 1 | 2 |   |
| Thyroid Gland Inflammation, Chronic Active Follicular Cell, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
|                                                                         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 |   |   |   |   |
|                                                                         |   |   |   |   |   |   |   |   |   |   |   | 2 |   |   |   |   |   |   |   |   |   |   |   |   |   |

**GENERAL BODY SYSTEM**

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

|                           |             |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                              |
|---------------------------|-------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------------------|
| <b>B6C3F1 MICE FEMALE</b> | DAY ON TEST | 0<br>7           | 0<br>5           | 0<br>7           | 0<br>7           | 0<br>7           | 0<br>4           | 0<br>7           | 0<br>7           | 0<br>7           | 0<br>7           | 0<br>7           | 0<br>7           | 0<br>7           | 0<br>7           | 0<br>6           | 0<br>7           | 0<br>7           | 0<br>6           | 0<br>7           | 0<br>7           | 0<br>7           | 0<br>7           | <b>females<br/>(cont...)</b> |
|                           | ANIMAL ID   | 0<br>5<br>0<br>1 | 0<br>5<br>0<br>2 | 0<br>5<br>0<br>3 | 0<br>5<br>0<br>4 | 0<br>5<br>0<br>5 | 0<br>5<br>0<br>6 | 0<br>5<br>0<br>7 | 0<br>5<br>0<br>8 | 0<br>5<br>0<br>9 | 0<br>0<br>1<br>0 | 0<br>0<br>1<br>1 | 0<br>0<br>1<br>1 | 0<br>0<br>1<br>1 | 0<br>0<br>1<br>1 | 0<br>0<br>1<br>1 | 0<br>0<br>1<br>1 | 0<br>0<br>1<br>1 | 0<br>0<br>2<br>2 | 0<br>0<br>2<br>2 | 0<br>0<br>2<br>2 | 0<br>0<br>2<br>2 | 0<br>0<br>2<br>3 |                              |

NONE

**GENITAL SYSTEM**

|                                                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
|------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Clitoral Gland<br>Inflammation, Chronic Active | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |  |
|                                                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| Ovary<br>Cyst                                  | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |  |
| Hemorrhage                                     | 3 |   |   |   |   |   |   |   | 1 |   |   | 1 |   |   |   | 1 |   |   |   |   |   |   |   |   |   |   |   |   |  |
| Infiltration Cellular, Lymphocyte              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| Inflammation, Chronic Active                   |   |   |   |   | 4 | 4 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| Uterus<br>Angiectasis                          | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |  |
| Dilatation                                     | 3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| Inflammation, Chronic Active                   |   | 4 |   |   |   |   | 4 |   |   | 4 |   |   |   |   |   |   |   |   | 3 |   |   | 4 |   |   |   |   |   |   |  |
| Endometrium, Hyperplasia, Cystic               | 2 |   | 4 | 2 | 2 | 3 |   | 2 |   |   |   |   | 2 | 2 | 3 |   | 2 |   |   |   | 2 |   |   | 2 |   | 3 | 1 | 2 |  |

**HEMATOPOIETIC SYSTEM**

|                                            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone Marrow                                | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Lymph Node<br>Iliac, Hyperplasia, Lymphoid | + | + | + |   | + |   | + |   |   | + |   |   |   |   |   | + |   |   |   | + | + |   |   |   |   |   |   | + |
| Lumbar, Ectasia                            | 4 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Lumbar, Infiltration Cellular, Mixed Cell  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Renal, Ectasia                             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Renal, Necrosis                            |   |   | 2 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Lymph Node, Bronchial                      | + | + | + | + | + | + | M | + | M | M | + | M | M | M | + | + | M | M | + | + | M | M | + | + | M | M | + | + |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically  
 1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

|                           |                 | DAY ON TEST |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |   |                              |
|---------------------------|-----------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|---|------------------------------|
|                           |                 | 0732        | 0733 | 0734 | 0735 | 0736 | 0737 | 0738 | 0739 | 0740 | 0741 | 0742 | 0743 | 0744 | 0745 | 0746 | 0747 | 0748 | 0749 | 0750 | 0751 |   | 0752                         |
| <b>B6C3F1 MICE FEMALE</b> | <b>30 mg/m3</b> | 0           | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0 | <b>females<br/>(cont...)</b> |
|                           |                 | 0           | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0 |                              |
|                           |                 | 5           | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5 |                              |
|                           |                 | 0           | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 2    | 2    | 2 |                              |

|                                                                                             |                                                     |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---------------------------------------------------------------------------------------------|-----------------------------------------------------|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Necrosis                                                                                    | 3                                                   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Lymph Node, Mandibular Necrosis                                                             | + + + + M + + + + + + + + + + M + + + + + + + +     | 2 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Lymph Node, Mediastinal                                                                     | + M + + M + + + + + M + + + M + + + + + + + + + +   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Lymph Node, Mesenteric Angiectasis                                                          | + + + + + + M + + + + + + + + + + + + + + + + + + + |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Ectasia<br>Hyperplasia, Lymphoid                                                            |                                                     | 2 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Spleen                                                                                      | + + + + + + + + + + + + + + + + + + + + + + + + + + |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Hematopoietic Cell Proliferation<br>Hyperplasia, Lymphoid<br>Lymphoid Follicle, Hyperplasia |                                                     | 2 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                             |                                                     | 3 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Thymus<br>Angiectasis                                                                       | + + + + + M + + + + M + + + M + + + + M + + + M +   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**INTEGUMENTARY SYSTEM**

|                                       |                                                     |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---------------------------------------|-----------------------------------------------------|---|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Mammary Gland                         | + + + + + + + + + + + + + + + + + + + + + + + + + + |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Skin                                  | + + + + + + + + + + + + + + + + + + + + + + + + + + |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Inflammation, Chronic Active<br>Ulcer |                                                     | 2 |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Subcutaneous Tissue, Fibrosis         |                                                     |   | 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**MUSCULOSKELETAL SYSTEM**

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
+ .. Tissue examined microscopically M .. Missing tissue  
X .. Lesion present A .. Autolysis precludes evaluation  
I .. Insufficient tissue BLANK .. Not examined microscopically  
1-4 .. Lesion qualified as:  
1) Minimal 3) Moderate  
2) Mild 4) Marked

Experiment Number: 20515 - 04  
Test Type: CHRONIC  
Route: RESPIRATORY EXPOSURE WHOLE BODY  
Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
Metal working fluids (CIMSTAR 3800)  
CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
Time Report Requested: 14:13:47  
First Dose M/F: 05/05/08 / 05/05/08  
Lab: BNW

| B6C3F1 MICE FEMALE | 30 mg/m3 | DAY ON TEST |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | ANIMAL ID | females (cont...) |
|--------------------|----------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|-------------------|
|                    |          | 0732        | 0573 | 0773 | 0773 | 0773 | 0477 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0677 | 0777 | 0777 | 0677 |           |                   |

|                                         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-----------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone                                    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Fibro-Osseous Lesion                    |   |   | 2 | 2 | 2 | 2 |   | 1 | 2 | 1 |   |   | 2 | 1 | 1 | 1 | 1 | 2 |   | 1 |   |   | 2 | 1 |   |
| Cranium, Inflammation, Chronic Active   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Maxilla, Hyperostosis                   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Skeletal Muscle                         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | + |
| Arteriole, Inflammation, Chronic Active |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 3 |

**NERVOUS SYSTEM**

|                  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brain            | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Compression      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Peripheral Nerve |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | + |
| Spinal Cord      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | + |

**RESPIRATORY SYSTEM**

|                                   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Larynx                            | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Metaplasia, Squamous              | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| Lung                              | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Hemorrhage                        |   |   |   |   |   |   |   |   |   |   |   |   | 1 |   |   |   |   |   |   |   |   |   |   |   |   |
| Infiltration Cellular, Histiocyte |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 |
| Alveolar Epithelium, Hyperplasia  |   |   |   |   |   |   |   | 1 |   | 1 |   | 2 | 1 |   |   |   |   |   |   |   |   |   |   |   |   |
| Bronchiole, Hyperplasia           | 1 |   | 1 | 1 |   | 1 |   |   | 1 | 1 |   | 1 | 1 |   | 1 |   | 1 |   |   |   | 1 |   |   |   |   |
| Nose                              | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Inflammation, Chronic Active      |   |   |   |   |   |   |   |   |   |   | 2 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Necrosis                          |   |   | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
+ .. Tissue examined microscopically  
X .. Lesion present  
I .. Insufficient tissue  
M .. Missing tissue  
A .. Autolysis precludes evaluation  
BLANK .. Not examined microscopically  
1-4 .. Lesion qualified as:  
1) Minimal 3) Moderate  
2) Mild 4) Marked

Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

| B6C3F1 MICE FEMALE<br>30 mg/m3                                                          | DAY ON TEST      |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | ANIMAL ID | females<br>(cont...) |  |
|-----------------------------------------------------------------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------|----------------------|--|
|                                                                                         | 0<br>7<br>3<br>2 | 0<br>5<br>7<br>6 | 0<br>7<br>3<br>3 | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>2 | 0<br>4<br>6<br>0 | 0<br>7<br>3<br>3 | 0<br>7<br>3<br>3 | 0<br>7<br>3<br>3 | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>3 | 0<br>7<br>3<br>3 | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>2 | 0<br>6<br>9<br>4 | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>3 | 0<br>6<br>0<br>8 | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>3 | 0<br>7<br>7<br>9 | 0<br>7<br>7<br>2 |           |                      |  |
| Olfactory Epithelium, Accumulation, Hyaline Droplet                                     | 2                | 3                | 2                | 3                | 2                | 3                | 3                | 2                | 3                | 2                | 3                | 2                | 2                | 3                | 2                | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 2                | 2                | 2         |                      |  |
| Olfactory Epithelium, Metaplasia, Respiratory Epithelium, Accumulation, Hyaline Droplet | 2                | 3                | 2                | 3                | 2                | 3                | 3                | 2                | 3                | 2                | 3                | 2                | 1                | 3                | 2                | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 2                | 2                | 2         |                      |  |
| Respiratory Epithelium, Hyperplasia                                                     | 2                |                  |                  | 1                |                  | 2                | 2                | 1                | 2                |                  |                  | 1                |                  | 1                | 2                | 1                | 1                | 1                | 1                | 2                | 2                | 1                | 2                | 1                | 2         |                      |  |
| Trachea                                                                                 | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +         |                      |  |
| <b>SPECIAL SENSES SYSTEM</b>                                                            |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |           |                      |  |
| Eye                                                                                     | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +         |                      |  |
| Atrophy                                                                                 |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |           | 4                    |  |
| Lens, Degeneration                                                                      |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |           | 1                    |  |
| Harderian Gland                                                                         | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +         |                      |  |
| Atrophy                                                                                 |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |           | 2                    |  |
| Hyperplasia                                                                             |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |           | 1                    |  |
| Inflammation, Suppurative                                                               |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |           | 1                    |  |
| Inflammation, Chronic Active                                                            |                  |                  |                  | 1                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |           |                      |  |
| <b>URINARY SYSTEM</b>                                                                   |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |           |                      |  |
| Kidney                                                                                  | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +         |                      |  |
| Infarct                                                                                 | 2                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |           | 2                    |  |
| Metaplasia, Osseous                                                                     |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |           | 1                    |  |
| Nephropathy                                                                             | 2                | 1                | 3                | 1                | 2                | 2                | 2                | 2                | 1                | 2                | 1                | 1                | 2                | 1                | 1                | 2                | 2                | 1                | 1                | 1                | 2                | 1                | 1                | 4                | 2         |                      |  |
| Ureter                                                                                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |           | +                    |  |
| Urinary Bladder                                                                         | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +         |                      |  |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

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1) Minimal 3) Moderate

2) Mild 4) Marked





Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

| B6C3F1 MICE FEMALE                      | DAY ON TEST |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | * TOTALS |       |   |   |   |  |
|-----------------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|-------|---|---|---|--|
|                                         | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |          | 0     |   |   |   |  |
| 30 mg/m3                                | 7           | 7 | 6 | 7 | 7 | 7 | 7 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 5        | 7     | 7 | 0 | 5 |  |
|                                         | 3           | 3 | 8 | 3 | 3 | 3 | 0 | 7 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 3 | 3 | 3 | 9        | 3     | 3 | 0 | 0 |  |
|                                         | 3           | 1 | 1 | 1 | 2 | 2 | 5 | 7 | 4 | 3 | 1 | 3 | 3 | 2 | 1 | 3 | 0 | 2 | 2 | 3 | 5        | 3     | 1 | 2 | 0 |  |
|                                         | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0        | 0     | 0 | 0 | 0 |  |
|                                         | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0        | 0     | 0 | 0 | 0 |  |
|                                         | 5           | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5        | 5     | 5 | 5 | 5 |  |
|                                         | 2           | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4        | 4     | 4 | 4 | 5 |  |
|                                         | 6           | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6        | 7     | 8 | 9 | 0 |  |
| Centrilobular, Hypertrophy              |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 3        | 1 3.0 |   |   |   |  |
| Mesentery                               |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          | 21    |   |   |   |  |
| Fibrosis                                |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          | 1 2.0 |   |   |   |  |
| Inflammation, Suppurative               |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          | 1 3.0 |   |   |   |  |
| Inflammation, Chronic Active            |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          | 1 2.0 |   |   |   |  |
| Necrosis                                |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          | 1 2.0 |   |   |   |  |
| Arteriole, Inflammation, Chronic Active |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          | 1 3.0 |   |   |   |  |
| Fat, Cyst                               |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1        | 1 1.0 |   |   |   |  |
| Fat, Necrosis                           |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1        | 7 1.6 |   |   |   |  |
| Pancreas                                |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          | 50    |   |   |   |  |
| Acinus, Atrophy                         |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          | 1 2.0 |   |   |   |  |
| Acinus, Hypertrophy                     |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          | 1 1.0 |   |   |   |  |
| Salivary Glands                         |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          | 50    |   |   |   |  |
| Stomach, Forestomach                    |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          | 50    |   |   |   |  |
| Hyperplasia, Squamous                   |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          | 2 2.5 |   |   |   |  |
| Ulcer                                   |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2        | 1 2.0 |   |   |   |  |
| Arteriole, Inflammation, Chronic Active |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          | 1 1.0 |   |   |   |  |
| Stomach, Glandular                      |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          | 50    |   |   |   |  |
| Fibrosis                                |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          | 1 1.0 |   |   |   |  |
| Arteriole, Inflammation, Chronic Active |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          | 1 3.0 |   |   |   |  |
| Glands, Mineralization                  |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1        | 2 1.0 |   |   |   |  |
| Tooth                                   |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          | 2     |   |   |   |  |
| Dysplasia                               |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          | 2 2.0 |   |   |   |  |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

2) Mild 4) Marked





Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

| B6C3F1 MICE FEMALE<br>30 mg/m3     | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS |       |       |       |             |  |
|------------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|-------------|--|
|                                    | 0733        | 0733  | 0678  | 0773  | 0773  | 0773  | 0666  | 0666  | 0777  | 0777  | 0777  | 0777  | 0777  | 0777  | 0777  | 0777  | 0777  | 0777  | 0777  | 0577  |          | 0777  | 0775  |       |             |  |
| ANIMAL ID                          | 00526       | 00527 | 00528 | 00529 | 00530 | 00531 | 00532 | 00533 | 00534 | 00535 | 00536 | 00537 | 00538 | 00539 | 00540 | 00541 | 00542 | 00543 | 00544 | 00545 | 00546    | 00547 | 00548 | 00549 | 00550       |  |
| Necrosis                           |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       | 1 3.0       |  |
| Lymph Node, Mandibular Necrosis    | +           | +     | +     | +     | +     | +     | +     | +     | +     | M     | +     | +     | +     | M     | M     | +     | +     | +     | +     | +     | +        | M     | M     | +     | 43<br>1 2.0 |  |
| Lymph Node, Mediastinal            | +           | M     | +     | +     | +     | +     | +     | +     | +     | +     | +     | M     | +     | +     | M     | +     | +     | M     | M     | +     | +        | +     | +     | M     | 40          |  |
| Lymph Node, Mesenteric Angiectasis | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | +     | 49          |  |
| Ectasia                            |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       | 2 3.0       |  |
| Hyperplasia, Lymphoid              |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       | 2 2.0       |  |
| Spleen                             | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | +     | 50          |  |
| Hematopoietic Cell Proliferation   |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       | 3 2.0       |  |
| Hyperplasia, Lymphoid              |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       | 1 2.0       |  |
| Lymphoid Follicle, Hyperplasia     |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       | 1 3.0       |  |
| Thymus                             | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | +     | 45          |  |
| Angiectasis                        |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       | 1 4.0       |  |
| <b>INTEGUMENTARY SYSTEM</b>        |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       |             |  |
| Mammary Gland                      | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | +     | 50          |  |
| Skin                               | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | +     | 50          |  |
| Inflammation, Chronic Active       |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       | 1 2.0       |  |
| Ulcer                              |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       | 1 3.0       |  |
| Subcutaneous Tissue, Fibrosis      |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       | 1 1.0       |  |
| <b>MUSCULOSKELETAL SYSTEM</b>      |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       |             |  |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
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1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

**Experiment Number:** 20515 - 04  
**Test Type:** CHRONIC  
**Route:** RESPIRATORY EXPOSURE WHOLE BODY  
**Species/Strain:** MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
Metal working fluids (CIMSTAR 3800)  
**CAS Number:** CIMSTAR3800

**Date Report Requested:** 03/08/2013  
**Time Report Requested:** 14:13:47  
**First Dose M/F:** 05/05/08 / 05/05/08  
**Lab:** BNW

| B6C3F1 MICE FEMALE                      | DAY ON TEST | ANIMAL ID |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | * TOTALS |               |               |
|-----------------------------------------|-------------|-----------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|---------------|---------------|
|                                         |             | 0733      | 0738 | 0761 | 0773 | 0777 | 0777 | 0777 | 0766 | 0766 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 |          | 0777          |               |
| <b>30 mg/m3</b>                         |             | 0         | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0        |               |               |
|                                         |             | 7         | 7    | 6    | 7    | 7    | 7    | 7    | 6    | 6    | 7    | 7    | 7    | 7    | 7    | 7    | 7    | 7    | 7    | 7    | 5    | 7        | 7             |               |
|                                         |             | 3         | 3    | 8    | 3    | 3    | 3    | 0    | 7    | 4    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 0    | 3    | 3    | 3    | 9        | 3             |               |
|                                         |             | 3         | 1    | 1    | 1    | 2    | 2    | 5    | 7    | 4    | 3    | 1    | 3    | 3    | 2    | 1    | 3    | 0    | 2    | 2    | 3    | 3        | 0             |               |
|                                         |             | 0         | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0        | 0             |               |
|                                         |             | 0         | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0        | 0             |               |
|                                         |             | 5         | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5    | 5        | 5             |               |
|                                         |             | 2         | 2    | 2    | 2    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 4    | 4    | 4    | 4    | 4    | 4    | 4    | 4        | 4             |               |
|                                         |             | 6         | 7    | 8    | 9    | 0    | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 0    | 1    | 2    | 3    | 4    | 5    | 6        | 7             |               |
| Bone                                    |             | +         | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +        | <b>50</b>     |               |
| Fibro-Osseous Lesion                    |             |           |      | 1    |      |      |      | 2    | 2    |      |      | 2    |      | 1    | 1    | 1    |      |      | 2    |      |      | 2        | <b>27 1.5</b> |               |
| Cranium, Inflammation, Chronic Active   |             |           |      |      |      | 2    |      |      |      |      |      |      |      |      |      | 2    |      |      |      |      |      | 2        | <b>2 2.0</b>  |               |
| Maxilla, Hyperostosis                   |             |           |      |      |      |      |      |      |      |      |      |      |      |      | 1    |      |      |      |      |      |      | 1        | <b>1 1.0</b>  |               |
| Skeletal Muscle                         |             |           |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |          | <b>1</b>      |               |
| Arteriole, Inflammation, Chronic Active |             |           |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |          | <b>1 3.0</b>  |               |
| <b>NERVOUS SYSTEM</b>                   |             |           |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |          |               |               |
| Brain                                   |             | +         | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +        | <b>50</b>     |               |
| Compression                             |             |           |      | 3    |      |      |      |      |      |      |      |      |      |      |      |      | 3    |      |      |      |      |          | <b>2 3.0</b>  |               |
| Peripheral Nerve                        |             |           |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |          | <b>1</b>      |               |
| Spinal Cord                             |             |           |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |          | <b>1</b>      |               |
| <b>RESPIRATORY SYSTEM</b>               |             |           |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |          |               |               |
| Larynx                                  |             | +         | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +        | <b>50</b>     |               |
| Metaplasia, Squamous                    |             | 2         | 2    | 3    | 2    | 2    | 2    | 3    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 3        | 2             | <b>50 2.1</b> |
| Lung                                    |             | +         | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +        | <b>50</b>     |               |
| Hemorrhage                              |             |           |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |          | <b>1 1.0</b>  |               |
| Infiltration Cellular, Histiocyte       |             |           |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |          | <b>1 1.0</b>  |               |
| Alveolar Epithelium, Hyperplasia        |             |           |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | 1        | <b>5 1.2</b>  |               |
| Bronchiole, Hyperplasia                 |             |           |      |      | 1    |      |      |      |      | 1    |      | 1    | 1    |      | 1    | 1    |      | 1    | 1    |      | 1    | 1        | <b>22 1.0</b> |               |
| Nose                                    |             | +         | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +        | <b>50</b>     |               |
| Inflammation, Chronic Active            |             |           |      |      |      | 1    |      |      |      |      |      |      | 1    |      |      |      |      |      |      |      |      |          | <b>3 1.3</b>  |               |
| Necrosis                                |             |           |      | 2    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |          | <b>2 1.5</b>  |               |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
+ .. Tissue examined microscopically  
X .. Lesion present  
I .. Insufficient tissue  
M .. Missing tissue  
A .. Autolysis precludes evaluation  
BLANK .. Not examined microscopically  
1-4 .. Lesion qualified as:  
1) Minimal 3) Moderate  
2) Mild 4) Marked

Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

| B6C3F1 MICE FEMALE<br>30 mg/m3                        | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS |     |  |
|-------------------------------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-----|--|
|                                                       | 0733        | 0733  | 0681  | 0733  | 0733  | 0733  | 0733  | 0667  | 0667  | 0733  | 0733  | 0733  | 0733  | 0733  | 0733  | 0733  | 0733  | 0733  | 0733  | 0733  | 0577  | 0733  | 0733  | 0577  |          |     |  |
| ANIMAL ID                                             | 00526       | 00527 | 00528 | 00529 | 00530 | 00531 | 00532 | 00533 | 00534 | 00535 | 00536 | 00537 | 00538 | 00539 | 00540 | 00541 | 00542 | 00543 | 00544 | 00545 | 00546 | 00547 | 00548 | 00549 | 00550    |     |  |
| Olfactory Epithelium, Accumulation, Hyaline Droplet   | 3           | 3     | 2     | 3     | 2     | 2     | 3     | 3     | 3     | 3     | 2     | 3     | 3     | 2     | 3     | 3     | 2     | 3     | 3     | 2     | 3     | 3     | 3     | 2     | 50       | 2.6 |  |
| Olfactory Epithelium, Metaplasia, Respiratory         |             |       | 2     | 3     | 2     |       |       |       |       | 1     |       | 2     | 2     | 1     |       |       |       |       |       |       |       |       |       |       | 12       | 1.6 |  |
| Respiratory Epithelium, Accumulation, Hyaline Droplet | 3           | 3     | 2     | 3     | 2     | 2     | 3     | 3     | 3     | 3     | 2     | 3     | 3     | 2     | 3     | 3     | 2     | 3     | 3     | 2     | 1     | 3     | 3     | 2     | 50       | 2.6 |  |
| Respiratory Epithelium, Hyperplasia                   | 1           | 2     |       | 2     | 2     | 2     | 2     |       | 2     | 2     |       | 2     | 2     |       | 2     | 2     | 1     | 1     | 1     | 1     | 1     | 2     | 1     | 2     | 39       | 1.6 |  |
| Trachea                                               | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50       |     |  |
| <b>SPECIAL SENSES SYSTEM</b>                          |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |     |  |
| Eye                                                   | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50       |     |  |
| Atrophy                                               |             |       |       |       |       |       |       |       |       | 4     |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 2        | 4.0 |  |
| Lens, Degeneration                                    |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1     |       |       |       | 2        | 1.0 |  |
| Harderian Gland                                       | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50       |     |  |
| Atrophy                                               |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1        | 2.0 |  |
| Hyperplasia                                           |             |       |       |       |       |       | 3     | 3     |       |       | 1     |       |       |       |       |       |       |       |       |       | 3     |       |       |       | 6        | 2.2 |  |
| Inflammation, Suppurative                             |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1        | 1.0 |  |
| Inflammation, Chronic Active                          |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1        | 1.0 |  |
| <b>URINARY SYSTEM</b>                                 |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |     |  |
| Kidney                                                | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50       |     |  |
| Infarct                                               |             |       |       |       |       |       |       |       |       |       |       | 2     |       |       |       |       |       |       |       |       |       |       |       |       | 4        | 2.0 |  |
| Metaplasia, Osseous                                   |             |       |       |       |       |       |       |       |       |       |       | 2     |       |       |       |       |       |       |       |       |       |       |       |       | 2        | 1.5 |  |
| Nephropathy                                           | 1           | 1     | 1     | 1     | 1     | 1     | 3     | 2     | 2     | 2     | 1     | 1     | 1     | 2     | 1     | 3     | 2     | 1     |       | 2     | 1     | 2     | 1     | 1     | 49       | 1.6 |  |
| Ureter                                                |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1        |     |  |
| Urinary Bladder                                       | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50       |     |  |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

2) Mild 4) Marked

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

|                           |                 |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |
|---------------------------|-----------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|
| <b>B6C3F1 MICE FEMALE</b> | <b>30 mg/m3</b> | DAY ON TEST | 0733  | 0731  | 0681  | 0772  | 0772  | 0775  | 0667  | 0664  | 0773  | 0773  | 0773  | 0773  | 0773  | 0773  | 0773  | 0773  | 0773  | 0773  | 0579  | 0773  | 0773  | 0750  | * TOTALS |       |
|                           |                 | ANIMAL ID   | 00526 | 00527 | 00528 | 00529 | 00530 | 00531 | 00532 | 00533 | 00534 | 00535 | 00536 | 00537 | 00538 | 00539 | 00540 | 00541 | 00542 | 00543 | 00544 | 00545 | 00546 | 00547 |          | 00548 |
|                           |                 |             | 00549 | 00550 | 00551 | 00552 | 00553 | 00554 | 00555 | 00556 | 00557 | 00558 | 00559 | 00560 | 00561 | 00562 | 00563 | 00564 | 00565 | 00566 | 00567 | 00568 | 00569 | 00570 |          | 00571 |
|                           |                 |             | 00572 | 00573 | 00574 | 00575 | 00576 | 00577 | 00578 | 00579 | 00580 | 00581 | 00582 | 00583 | 00584 | 00585 | 00586 | 00587 | 00588 | 00589 | 00590 | 00591 | 00592 | 00593 |          | 00594 |

Angiectasis  
 Arteriole, Inflammation, Chronic Active

1 2.0  
 1 1.0

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
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1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
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Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

|                           |             |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                              |
|---------------------------|-------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------------|
| <b>B6C3F1 MICE FEMALE</b> | DAY ON TEST | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>2      | 0<br>5<br>9<br>6      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>2      | 0<br>4<br>3<br>3      | 0<br>2<br>5<br>0      | 0<br>5<br>3<br>6      | 0<br>6<br>4<br>6      | 0<br>5<br>3<br>3      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>3      | 0<br>6<br>9<br>1      | 0<br>7<br>1<br>2      | 0<br>7<br>3<br>2      | 0<br>5<br>6<br>3      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>1      | 0<br>5<br>7<br>4      | <b>females<br/>(cont...)</b> |
|                           | ANIMAL ID   | 0<br>0<br>7<br>0<br>1 | 0<br>0<br>7<br>0<br>2 | 0<br>0<br>7<br>0<br>3 | 0<br>0<br>7<br>0<br>4 | 0<br>0<br>7<br>0<br>5 | 0<br>0<br>7<br>0<br>6 | 0<br>0<br>7<br>0<br>7 | 0<br>0<br>7<br>0<br>8 | 0<br>0<br>7<br>0<br>9 | 0<br>0<br>7<br>1<br>0 | 0<br>0<br>7<br>1<br>1 | 0<br>0<br>7<br>1<br>1 | 0<br>0<br>7<br>1<br>1 | 0<br>0<br>7<br>1<br>1 | 0<br>0<br>7<br>1<br>1 | 0<br>0<br>7<br>1<br>1 | 0<br>0<br>7<br>1<br>1 | 0<br>0<br>7<br>1<br>1 | 0<br>0<br>7<br>2<br>2 | 0<br>0<br>7<br>2<br>2 | 0<br>0<br>7<br>2<br>2 | 0<br>0<br>7<br>2<br>2 |                              |

**ALIMENTARY SYSTEM**

|                                                         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus                                               | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Gallbladder                                             | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | M |   |
| Intestine Large, Cecum                                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Colon                                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Rectum<br>Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Duodenum                               | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Ileum                                  | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Jejunum                                | + | + | + | + | + | A | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Liver                                                   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Amyloid Deposition                                      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Angiectasis                                             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Basophilic Focus                                        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Cyst                                                    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Eosinophilic Focus                                      |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Fatty Change                                            |   |   |   |   |   |   | 3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Infiltration Cellular, Lymphocyte                       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Necrosis                                                |   |   |   |   |   |   | 3 |   |   |   |   |   | 2 |   |   |   |   |   |   |   |   |   |   |   |
| Tension Lipidosis                                       |   | X |   |   |   |   |   |   |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |
| Mesentery                                               |   | + | + |   |   | + | + | M |   |   | + |   |   |   |   |   |   |   |   |   |   |   |   | + |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically  
 1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
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Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

| B6C3F1 MICE FEMALE<br>100 mg/m3    | DAY ON TEST                                         |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |  | females<br>(cont...) |
|------------------------------------|-----------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--|----------------------|
|                                    | 0<br>7<br>3<br>3                                    | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>2      | 0<br>5<br>9<br>6      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>2      | 0<br>4<br>3<br>3      | 0<br>2<br>5<br>0      | 0<br>5<br>3<br>6      | 0<br>6<br>4<br>4      | 0<br>5<br>3<br>6      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>1      | 0<br>6<br>9<br>1      | 0<br>7<br>1<br>2      | 0<br>7<br>3<br>2      | 0<br>5<br>6<br>3      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>4      | 0<br>5<br>7<br>4      |                       |  |                      |
| ANIMAL ID                          | 0<br>0<br>7<br>0<br>1                               | 0<br>0<br>7<br>0<br>2 | 0<br>0<br>7<br>0<br>3 | 0<br>0<br>7<br>0<br>4 | 0<br>0<br>7<br>0<br>5 | 0<br>0<br>7<br>0<br>6 | 0<br>0<br>7<br>0<br>7 | 0<br>0<br>7<br>0<br>8 | 0<br>0<br>7<br>0<br>9 | 0<br>0<br>7<br>1<br>0 | 0<br>0<br>7<br>1<br>1 | 0<br>0<br>7<br>1<br>1 | 0<br>0<br>7<br>1<br>1 | 0<br>0<br>7<br>1<br>1 | 0<br>0<br>7<br>1<br>1 | 0<br>0<br>7<br>1<br>1 | 0<br>0<br>7<br>1<br>1 | 0<br>0<br>7<br>1<br>1 | 0<br>0<br>7<br>2<br>1 | 0<br>0<br>7<br>2<br>2 | 0<br>0<br>7<br>2<br>2 | 0<br>0<br>7<br>2<br>3 | 0<br>0<br>7<br>2<br>4 | 0<br>0<br>7<br>2<br>5 |  |                      |
| Fat, Necrosis                      | 1                                                   |                       |                       | 3                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1                     |                       |                       | 2                     |                       |                       |                       |                       |                       |  |                      |
| Vein, Inflammation, Chronic Active |                                                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |  |                      |
| Pancreas                           | + + + + + + + + + + + + + + + + + + + + + + + + + + |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |  |                      |
| Inflammation, Chronic Active       |                                                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |  |                      |
| Lipomatosis                        | 1                                                   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |  |                      |
| Acinus, Atrophy                    |                                                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |  |                      |
| Acinus, Hyperplasia                | 2                                                   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |  |                      |
| Acinus, Hypertrophy                |                                                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |  |                      |
| Salivary Glands                    | + + + + + + + + + + + + + + + + + + + + + + + + + + |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |  |                      |
| Stomach, Forestomach               | + + + + + + + + + + + + + + + + + + + + + + + + + + |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |  |                      |
| Hyperplasia, Squamous              | 3                                                   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |  |                      |
| Inflammation, Chronic Active       |                                                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |  |                      |
| Ulcer                              |                                                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1                     |                       |                       |                       |                       |                       |  |                      |
| Stomach, Glandular                 | + + + + + + + + + + + + + + + + + + + + + + + + + + |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |  |                      |
| Ulcer                              |                                                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |  |                      |
| Glands, Mineralization             | 1                                                   |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |  |                      |
| Tooth                              |                                                     |                       |                       | +                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | +                     |                       |                       |  |                      |
| Dysplasia                          |                                                     |                       |                       | 2                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1                     |                       |                       |  |                      |
| Inflammation, Chronic Active       |                                                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |  |                      |

**CARDIOVASCULAR SYSTEM**

|                                  |                                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------------------|---------------------------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Blood Vessel                     | + + + + + + + + + + + M + + + + I + + + + + I + + |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Aorta, Embolus Bacterial         | 3                                                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Aorta, Inflammation, Suppurative | 3                                                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically  
 1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

| B6C3F1 MICE FEMALE<br>100 mg/m3     | DAY ON TEST      |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | ANIMAL ID | females<br>(cont...) |                  |                  |                  |                  |                  |   |  |
|-------------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------|----------------------|------------------|------------------|------------------|------------------|------------------|---|--|
|                                     | 0<br>7<br>3<br>3 | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>2 | 0<br>5<br>9<br>6 | 0<br>7<br>3<br>3 | 0<br>7<br>3<br>2 | 0<br>4<br>3<br>3 | 0<br>2<br>5<br>0 | 0<br>5<br>3<br>6 | 0<br>6<br>4<br>4 | 0<br>5<br>3<br>6 | 0<br>7<br>3<br>3 | 0<br>7<br>3<br>3 | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>3 | 0<br>6<br>9<br>1 | 0<br>7<br>1<br>2 | 0<br>7<br>1<br>3 | 0<br>5<br>6<br>3 |           |                      | 0<br>7<br>3<br>3 | 0<br>7<br>3<br>1 | 0<br>5<br>7<br>4 | 0<br>7<br>3<br>7 | 0<br>5<br>7<br>4 |   |  |
| Heart                               | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +         | +                    | +                | +                | +                | +                |                  |   |  |
| Cardiomyopathy                      |                  |                  | 2                |                  |                  | 2                |                  |                  |                  |                  |                  |                  |                  | 2                |                  |                  | 2                |                  |                  |                  |           |                      |                  |                  |                  | 2                |                  |   |  |
| Congestion                          |                  |                  |                  |                  |                  |                  |                  |                  |                  | 2                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |           |                      |                  |                  |                  |                  |                  |   |  |
| Necrosis                            |                  |                  |                  |                  |                  |                  |                  | 3                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |           |                      |                  |                  |                  |                  |                  |   |  |
| <b>ENDOCRINE SYSTEM</b>             |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |           |                      |                  |                  |                  |                  |                  |   |  |
| Adrenal Cortex                      | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +         | +                    | +                | +                | +                | +                | +                |   |  |
| Atrophy                             |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |           |                      |                  |                  |                  |                  |                  |   |  |
| Hyperplasia                         |                  |                  | 1                |                  | 1                |                  |                  |                  |                  |                  |                  |                  | 2                |                  |                  |                  |                  |                  |                  |                  |           |                      |                  |                  |                  |                  |                  |   |  |
| Vacuolization Cytoplasmic           |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |           |                      |                  |                  |                  |                  | 4                |   |  |
| Adrenal Medulla                     | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +         | +                    | +                | +                | +                | +                | +                |   |  |
| Hyperplasia                         |                  |                  |                  |                  | 1                | 1                |                  |                  |                  |                  |                  |                  |                  | 1                |                  |                  |                  |                  |                  |                  |           |                      |                  |                  |                  |                  |                  |   |  |
| Islets, Pancreatic                  | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +         | +                    | +                | +                | +                | +                | +                | M |  |
| Parathyroid Gland                   | +                | M                | M                | M                | +                | +                | M                | +                | +                | +                | +                | M                | +                | M                | +                | M                | +                | M                | M                | M                | +         | +                    | +                | +                | M                | +                | +                |   |  |
| Pituitary Gland                     | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +         | +                    | +                | +                | +                | +                | +                |   |  |
| Angiectasis                         |                  |                  |                  | 3                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | 3                |                  |                  |                  |                  |           |                      |                  |                  |                  | 3                |                  |   |  |
| Pars Distalis, Cyst                 |                  |                  |                  |                  |                  |                  | 2                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |           |                      |                  |                  |                  |                  |                  |   |  |
| Pars Distalis, Hyperplasia          | 4                | 3                | 3                | 2                | 2                | 2                |                  |                  |                  | 4                | 4                | 2                | 1                |                  | 4                |                  | 1                |                  |                  | 1                |           |                      |                  |                  |                  | 3                |                  |   |  |
| Pars Intermedia, Pars Nervosa, Cyst |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |           |                      |                  |                  |                  |                  |                  |   |  |
| Thyroid Gland                       | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +         | +                    | +                | +                | +                | +                | +                |   |  |
| Inflammation, Chronic Active        |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |           |                      |                  |                  |                  |                  |                  |   |  |
| Follicular Cell, Hyperplasia        |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |           |                      |                  |                  |                  |                  | 3                |   |  |

**GENERAL BODY SYSTEM**

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

|                           |             |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                              |
|---------------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------------------------------|
| <b>B6C3F1 MICE FEMALE</b> | DAY ON TEST | 0733 | 0733 | 0733 | 0593 | 0773 | 0743 | 0225 | 0556 | 0656 | 0577 | 0777 | 0777 | 0777 | 0777 | 0777 | 0676 | 0777 | 0777 | 0777 | 0575 | 0777 | 0755 | <b>females<br/>(cont...)</b> |
|                           | ANIMAL ID   | 0070 | 0070 | 0070 | 0070 | 0070 | 0070 | 0070 | 0070 | 0070 | 0070 | 0070 | 0070 | 0070 | 0070 | 0070 | 0070 | 0070 | 0070 | 0070 | 0070 | 0070 | 0070 |                              |

NONE

**GENITAL SYSTEM**

|                                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Clitoral Gland<br>Hyperplasia, Basal Cell | + | + | + | + | + | + | + | M | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + |
| Ovary                                     | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Angiectasis                               |   |   |   |   |   | 3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Cyst                                      |   | 2 | 1 | 1 | 3 |   | 1 |   |   |   |   |   | 2 | 1 |   |   |   | 1 |   |   |   |   | 2 |   |
| Hemorrhage                                |   |   | 1 |   |   | 2 |   |   | 1 |   |   |   | 1 |   | 1 |   |   |   |   |   |   |   | 1 |   |
| Inflammation, Chronic Active              |   |   |   |   | 2 |   | 4 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Mineralization                            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Thrombosis                                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Uterus                                    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Angiectasis                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Dilatation                                |   |   |   |   |   |   |   |   | 3 |   |   |   |   | 3 |   |   | 4 |   |   |   |   | 3 |   |   |
| Hemorrhage                                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2 |   |   |
| Inflammation, Chronic Active              |   | 2 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Endometrium, Hyperplasia, Cystic          | 3 | 2 | 3 | 4 | 2 | 2 |   |   | 1 |   | 3 | 3 | 2 | 4 | 3 | 1 |   |   | 2 | 2 | 2 |   | 3 |   |

**HEMATOPOIETIC SYSTEM**

|                                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone Marrow                     | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Lymph Node                      |   |   |   |   |   |   | M |   |   |   | + |   |   |   |   |   |   |   |   |   |   |   | + | + |
| Ectasia                         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Iliac, Hyperplasia, Plasma Cell |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Lumbar, Hyperplasia, Lymphoid   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically  
 1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked



Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

|                           |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                              |
|---------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|------------------------------|
| <b>B6C3F1 MICE FEMALE</b> | DAY ON TEST |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | <b>females<br/>(cont...)</b> |
|                           | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |   |                              |
|                           | 7           | 7 | 7 | 5 | 7 | 7 | 4 | 2 | 5 | 6 | 5 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 7 | 5 | 7 | 7 |                              |
| <b>100 mg/m3</b>          | 3           | 3 | 3 | 9 | 3 | 3 | 3 | 5 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 9 | 1 | 1 | 1 | 3 | 6 | 3 | 3 |                              |
|                           | 3           | 1 | 2 | 6 | 3 | 2 | 3 | 0 | 6 | 4 | 6 | 3 | 3 | 2 | 1 | 3 | 2 | 1 | 2 | 3 | 2 | 3 | 3 | 1 |                              |
|                           | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |                              |
|                           | ANIMAL ID   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                              |
|                           | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |                              |
|                           | 7           | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |                              |
|                           | 0           | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |   |                              |
|                           | 1           | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 |   |                              |

**MUSCULOSKELETAL SYSTEM**

|                                          |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone                                     | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Fibro-Osseous Lesion                     |   |   |   | 2 |   | 1 | 2 | 1 |   |   | 1 |   | 1 |   | 2 |   | 2 |   |   |   | 1 |   |   |
| Cranium, Inflammation, Chronic Active    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2 |
| Femur, Tibia, Arthrosis                  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 3 |
| Pelvis, Degeneration                     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Vertebra, Fracture                       |   |   |   |   |   |   |   |   |   | 4 |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Skeletal Muscle                          |   |   |   |   | + |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Degeneration                             |   |   |   |   |   |   |   |   |   |   | + |   |   |   |   |   |   |   |   |   |   |   | 2 |
| Infiltration Cellular, Polymorphonuclear |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2 |

**NERVOUS SYSTEM**

|                                        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|----------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brain                                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Compression                            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 3 |   |   |
| Meninges, Inflammation, Chronic Active |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 |
| Peripheral Nerve                       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Degeneration                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2 |
| Spinal Cord                            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | + |

**RESPIRATORY SYSTEM**

|                              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Larynx                       | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Inflammation, Chronic Active |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 |
| Metaplasia, Squamous         | 3 | 4 | 4 | 3 | 4 | 3 | 2 | 3 | 4 | 3 | 3 | 4 | 3 | 3 | 3 | 4 | 4 | 3 | 4 | 3 | 3 | 4 | 3 |
| Necrosis                     |   |   |   |   |   |   |   |   |   | 2 |   |   |   | 2 |   |   |   |   |   |   |   |   | 1 |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
+ .. Tissue examined microscopically  
X .. Lesion present  
I .. Insufficient tissue  
M .. Missing tissue  
A .. Autolysis precludes evaluation  
BLANK .. Not examined microscopically  
1-4 .. Lesion qualified as:  
1) Minimal 3) Moderate  
2) Mild 4) Marked

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

| B6C3F1 MICE FEMALE<br>100 mg/m3                       | DAY ON TEST      |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |  | ANIMAL ID | females<br>(cont...) |
|-------------------------------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|--|-----------|----------------------|
|                                                       | 0<br>7<br>3<br>3 | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>2 | 0<br>5<br>9<br>6 | 0<br>7<br>3<br>3 | 0<br>7<br>3<br>2 | 0<br>4<br>3<br>3 | 0<br>2<br>5<br>0 | 0<br>5<br>3<br>6 | 0<br>6<br>4<br>6 | 0<br>5<br>3<br>3 | 0<br>7<br>3<br>3 | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>2 | 0<br>6<br>9<br>1 | 0<br>7<br>1<br>2 | 0<br>7<br>3<br>2 | 0<br>5<br>6<br>3 | 0<br>7<br>3<br>3 | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>4 | 0<br>5<br>7<br>4 | 0<br>7<br>3<br>5 |  |           |                      |
| Lung                                                  | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                |  |           |                      |
| Congestion                                            |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | 3                |                  |  |           |                      |
| Hemorrhage                                            | 2                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |  |           |                      |
| Infiltration Cellular, Histiocyte                     |                  | 1                | 1                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | 2                |  |           |                      |
| Infiltration Cellular, Mixed Cell                     |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |  |           |                      |
| Thrombosis                                            |                  |                  |                  |                  |                  |                  |                  | 3                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |  |           |                      |
| Alveolar Epithelium, Hyperplasia                      | 3                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | 1                |  |           |                      |
| Bronchiole, Hyperplasia                               | 1                | 1                | 1                |                  | 1                | 1                | 1                |                  | 1                | 1                |                  | 1                | 1                |                  | 1                | 1                | 1                |                  | 1                | 1                | 1                | 1                |                  |                  |  |           |                      |
| Interstitial, Inflammation, Chronic Active            |                  |                  |                  |                  |                  |                  |                  |                  | 2                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |  |           |                      |
| Perivascular, Inflammation, Chronic Active            |                  |                  |                  |                  |                  |                  |                  |                  |                  | 1                |                  | 2                |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | 1                |  |           |                      |
| Nose                                                  | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                |  |           |                      |
| Inflammation, Chronic Active                          |                  |                  |                  |                  |                  |                  |                  |                  | 1                |                  | 2                |                  |                  |                  |                  | 1                |                  |                  |                  |                  |                  |                  |                  | 1                |  |           |                      |
| Necrosis                                              |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |  |           |                      |
| Olfactory Epithelium, Accumulation, Hyaline Droplet   | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 3                |                  | 3                | 3                | 3                | 3                | 3                | 3                |  |           |                      |
| Olfactory Epithelium, Atrophy                         |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | 3                |                  |                  |                  |                  |                  |  |           |                      |
| Olfactory Epithelium, Metaplasia, Respiratory         | 1                | 1                | 1                |                  |                  |                  |                  |                  |                  |                  |                  | 2                |                  |                  |                  |                  |                  | 2                |                  | 2                | 1                | 1                |                  | 2                |  |           |                      |
| Respiratory Epithelium, Accumulation, Hyaline Droplet | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 3                | 3                |  |           |                      |
| Respiratory Epithelium, Hyperplasia                   | 2                | 1                | 2                | 1                | 1                |                  | 1                |                  | 2                | 2                |                  | 1                | 1                | 1                | 1                | 1                | 1                | 1                | 2                | 2                | 1                |                  | 1                | 2                |  |           |                      |
| Respiratory Epithelium, Metaplasia, Squamous          |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | 1                |                  |                  |                  |  |           |                      |
| Trachea                                               | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                | +                |  |           |                      |

**SPECIAL SENSES SYSTEM**

|                                      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|--------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Eye                                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Cornea, Inflammation, Chronic Active |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Lens, Degeneration                   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2 |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
**CAS Number: CIMSTAR3800**

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

|                                |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                              |   |
|--------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|------------------------------|---|
| <b>B6C3F1 MICE FEMALE</b>      | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <b>females<br/>(cont...)</b> |   |
|                                |             | 7 | 7 | 7 | 5 | 7 | 7 | 4 | 2 | 5 | 6 | 5 | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 7 | 5 | 7 | 7 |                              | 5 |
|                                |             | 3 | 3 | 3 | 9 | 3 | 3 | 3 | 5 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 9 | 1 | 1 | 3 | 6 | 3 | 3 |                              | 7 |
|                                |             | 3 | 1 | 2 | 6 | 3 | 2 | 3 | 0 | 6 | 4 | 6 | 3 | 3 | 2 | 1 | 3 | 2 | 1 | 2 | 3 | 2 | 3 | 3 |                              | 4 |
| <b>100 mg/m3</b>               | ANIMAL ID   | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <b>females<br/>(cont...)</b> |   |
|                                |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |                              |   |
|                                |             | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |                              |   |
|                                |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |                              |   |
|                                | 1           | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5                            |   |
| Harderian Gland                |             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |                              |   |
| <b>URINARY SYSTEM</b>          |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                              |   |
| Kidney                         |             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |                              |   |
| Infarct                        |             | 3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                              |   |
| Inflammation, Suppurative      |             |   |   |   |   |   |   |   | 2 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                              |   |
| Metaplasia, Osseous            |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 |   |   |   |   |   |   |   |                              |   |
| Nephropathy                    |             | 1 | 2 | 1 | 1 |   | 1 | 1 |   | 2 | 1 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 1                            |   |
| Glomerulus, Amyloid Deposition |             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |                              |   |
| Urinary Bladder                |             | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |                              |   |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically                              M .. Missing tissue  
 X .. Lesion present                                                      A .. Autolysis precludes evaluation  
 I .. Insufficient tissue                                                      BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:  
 1) Minimal    3) Moderate  
 2) Mild      4) Marked

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

| B6C3F1 MICE FEMALE<br><br>100 mg/m3 | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | * TOTALS |   |
|-------------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|---|
|                                     | ANIMAL ID   | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 6 | 7 | 7 | 6 |          | 7 |
|                                     |             | 3 | 3 | 3 | 3 | 6 | 8 | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 9 | 3 | 3 | 3 | 8 | 3        |   |
|                                     |             | 2 | 3 | 2 | 1 | 3 | 8 | 9 | 3 | 2 | 2 | 1 | 2 | 2 | 3 | 3 | 4 | 1 | 2 | 9 | 3 | 2 | 2 | 8 | 1        |   |
|                                     |             | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0        |   |
|                                     |             | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7        |   |
|                                     |             | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5        |   |
|                                     |             | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9        |   |

**ALIMENTARY SYSTEM**

|                                                         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |       |       |
|---------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-------|-------|
| Esophagus                                               | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50    |       |
| Gallbladder                                             | + | + | + | + | + | + | M | + | + | + | + | + | M | M | M | + | + | M | + | + | + | M | + | + | 41    |       |
| Intestine Large, Cecum                                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50    |       |
| Intestine Large, Colon                                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50    |       |
| Intestine Large, Rectum<br>Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50    | 1 2.0 |
| Intestine Small, Duodenum                               | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49    |       |
| Intestine Small, Ileum                                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49    |       |
| Intestine Small, Jejunum                                | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48    |       |
| Liver                                                   | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50    |       |
| Amyloid Deposition                                      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2 |   | 1 2.0 |       |
| Angiectasis                                             |   |   |   |   |   |   |   |   |   |   | 2 |   |   |   |   |   |   |   |   |   |   |   |   |   | 2 2.0 |       |
| Basophilic Focus                                        |   |   |   | X |   |   |   |   |   |   |   |   |   |   | X | X |   |   |   |   |   |   |   |   | 4     |       |
| Cyst                                                    |   |   |   |   | X |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1     |       |
| Eosinophilic Focus                                      |   |   |   | X | X |   | X |   | X |   | X |   | X |   |   |   | X |   |   |   | X | X |   |   | 13    |       |
| Fatty Change                                            |   |   |   |   |   |   |   | 4 | 1 |   |   |   |   |   | 2 |   |   |   |   | 2 |   |   |   |   | 5 2.4 |       |
| Infiltration Cellular, Lymphocyte                       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 |   |   | 1 1.0 |       |
| Necrosis                                                |   |   |   |   |   |   | 1 |   |   |   |   |   | 3 |   |   |   |   |   |   |   |   |   |   |   | 4 2.3 |       |
| Tension Lipidosis                                       |   |   |   |   |   |   |   |   |   | 1 | 1 |   |   |   |   |   |   |   |   | 1 |   |   |   |   | 6 1.3 |       |
| Mesentery                                               |   |   |   | + |   |   |   |   |   |   |   |   | + | + |   | + |   |   |   |   |   | + |   | + | 15    |       |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically  
 1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

| B6C3F1 MICE FEMALE<br>100 mg/m3    | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS |       |       |       |       |
|------------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|-------|
|                                    | 0732        | 0733  | 0732  | 0731  | 0733  | 0738  | 0736  | 0739  | 0733  | 0732  | 0731  | 0732  | 0732  | 0733  | 0733  | 0733  | 0733  | 0733  | 0734  | 0731  | 0732  | 0739  | 0733  | 0732  |          | 0732  | 0738  | 0737  | 0733  |
| ANIMAL ID                          | 00726       | 00707 | 00700 | 00700 | 00707 | 00707 | 00707 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700    | 00700 | 00700 | 00700 | 00700 |
| Fat, Necrosis                      |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       |       |
| Vein, Inflammation, Chronic Active |             | 3     |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       |       |
| Pancreas                           |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       |       |
| Inflammation, Chronic Active       | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | +     | +     |
| Lipomatosis                        |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       |       |
| Acinus, Atrophy                    |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       |       |
| Acinus, Hyperplasia                |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       |       |
| Acinus, Hypertrophy                |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       |       |
| Salivary Glands                    | M           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | +     | +     |
| Stomach, Forestomach               | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | +     | +     |
| Hyperplasia, Squamous              |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       |       |
| Inflammation, Chronic Active       |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       |       |
| Ulcer                              |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       |       |
| Stomach, Glandular                 | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +        | +     | +     | +     | +     |
| Ulcer                              |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       |       |
| Glands, Mineralization             |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       |       |
| Tooth                              |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       |       |
| Dysplasia                          |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       |       |
| Inflammation, Chronic Active       |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |          |       |       |       |       |

**CARDIOVASCULAR SYSTEM**

|                                  |   |   |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------------------|---|---|---|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Blood Vessel                     | + | + | M | I |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Aorta, Embolus Bacterial         |   |   |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Aorta, Inflammation, Suppurative |   |   |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

| B6C3F1 MICE FEMALE<br>100 mg/m3     | DAY ON TEST           |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | * TOTALS              |                       |                       |                       |                       |    |
|-------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----|
|                                     | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>1      | 0<br>6<br>6<br>3      | 0<br>6<br>8<br>8      | 0<br>6<br>6<br>9      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>2      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>3      | 0<br>7<br>3<br>3      | 0<br>6<br>3<br>4      | 0<br>7<br>3<br>1      | 0<br>7<br>3<br>2      | 0<br>6<br>3<br>3      | 0<br>7<br>3<br>2      |                       | 0<br>7<br>3<br>2      | 0<br>6<br>8<br>8      | 0<br>7<br>3<br>1      |                       |    |
| ANIMAL ID                           | 0<br>0<br>7<br>2<br>6 | 0<br>0<br>7<br>2<br>7 | 0<br>0<br>7<br>2<br>8 | 0<br>0<br>7<br>2<br>9 | 0<br>0<br>7<br>3<br>0 | 0<br>0<br>7<br>3<br>1 | 0<br>0<br>7<br>3<br>2 | 0<br>0<br>7<br>3<br>3 | 0<br>0<br>7<br>3<br>4 | 0<br>0<br>7<br>3<br>5 | 0<br>0<br>7<br>3<br>6 | 0<br>0<br>7<br>3<br>7 | 0<br>0<br>7<br>3<br>8 | 0<br>0<br>7<br>3<br>9 | 0<br>0<br>7<br>4<br>0 | 0<br>0<br>7<br>4<br>1 | 0<br>0<br>7<br>4<br>2 | 0<br>0<br>7<br>4<br>3 | 0<br>0<br>7<br>4<br>4 | 0<br>0<br>7<br>4<br>5 | 0<br>0<br>7<br>4<br>6 | 0<br>0<br>7<br>4<br>7 | 0<br>0<br>7<br>4<br>8 | 0<br>0<br>7<br>4<br>9 | 0<br>0<br>7<br>5<br>0 |    |
| Heart                               | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | 50                    |    |
| Cardiomyopathy                      |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 5 2.0                 |    |
| Congestion                          |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1 2.0                 |    |
| Necrosis                            |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1 3.0                 |    |
| <b>ENDOCRINE SYSTEM</b>             |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |    |
| Adrenal Cortex                      | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | 50                    |    |
| Atrophy                             |                       |                       |                       |                       |                       | 2                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1 2.0                 |    |
| Hyperplasia                         |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1                     |                       | 1                     |                       |                       |                       |                       |                       |                       | 1                     |                       |                       |                       |                       | 6 1.2                 |    |
| Vacuolization Cytoplasmic           |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 4                     |                       |                       |                       |                       |                       |                       |                       |                       | 2 4.0                 |    |
| Adrenal Medulla                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | 50                    |    |
| Hyperplasia                         |                       |                       | 4                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 4 1.8                 |    |
| Islets, Pancreatic                  | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | 49                    |    |
| Parathyroid Gland                   | M                     | +                     | +                     | M                     | +                     | +                     | +                     | +                     | M                     | M                     | M                     | M                     | M                     | M                     | +                     | +                     | M                     | +                     | M                     | M                     | M                     | +                     | +                     | M                     | M                     | 25 |
| Pituitary Gland                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | 50                    |    |
| Angiectasis                         |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 3                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 4 3.0                 |    |
| Pars Distalis, Cyst                 |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1 2.0                 |    |
| Pars Distalis, Hyperplasia          |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 3                     | 2                     |                       | 1                     |                       | 2                     |                       |                       |                       | 1                     |                       | 1                     | 3                     | 3                     | 24 2.3                |    |
| Pars Intermedia, Pars Nervosa, Cyst |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1 2.0                 |    |
| Thyroid Gland                       | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | +                     | 50                    |    |
| Inflammation, Chronic Active        |                       |                       |                       |                       |                       |                       |                       | 2                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 1                     |                       | 2 1.5                 |    |
| Follicular Cell, Hyperplasia        |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 2                     |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       | 2                     |                       |                       | 3 2.3                 |    |

**GENERAL BODY SYSTEM**

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

|                    |             |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |          |   |  |
|--------------------|-------------|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|---|--|
| B6C3F1 MICE FEMALE | DAY ON TEST |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | * TOTALS |   |  |
|                    | ANIMAL ID   |  | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 6 | 7 | 7 | 7 | 6 | 7 | 6 | 7 | 6 |          | 7 |  |
| 100 mg/m3          |             |  | 3 | 3 | 3 | 3 | 6 | 8 | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 9 | 3 | 3 | 3 | 3 | 8 | 3 | 8 | 3 | 8 | 3 | 1        |   |  |
|                    |             |  | 2 | 3 | 2 | 1 | 3 | 8 | 9 | 3 | 2 | 2 | 1 | 2 | 2 | 3 | 3 | 4 | 1 | 2 | 9 | 3 | 2 | 2 | 8 | 8 | 1 |   |   |          |   |  |
|                    |             |  | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0        | 0 |  |
|                    |             |  | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7        | 7 |  |
|                    |             |  | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5        | 0 |  |
|                    |             |  | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |   |   |          |   |  |

NONE

**GENITAL SYSTEM**

|                                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |    |    |    |     |     |     |  |  |
|-------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----|----|----|-----|-----|-----|--|--|
| Clitoral Gland<br>Hyperplasia, Basal Cell | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | M | + | M |   | 44 |    |    |    |     | 1   | 1.0 |  |  |
| Ovary                                     | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |    | 50 |    |    |     |     |     |  |  |
| Angiectasis                               |   |   | 4 |   |   |   |   |   |   |   |   |   |   | 3 |   |   |   |   |   |   |   |   |   |   |   |   |    |    |    |    | 3   | 3.3 |     |  |  |
| Cyst                                      |   |   |   | 4 |   |   |   | 1 |   | 2 |   |   |   |   | 1 |   | 2 |   |   | 1 |   | 4 |   |   |   |   |    |    |    |    | 16  | 1.8 |     |  |  |
| Hemorrhage                                |   |   |   | 1 | 1 |   |   |   | 1 |   | 1 |   |   |   | 1 |   | 1 |   |   |   |   | 1 |   | 1 |   | 1 |    |    |    |    | 15  | 1.1 |     |  |  |
| Inflammation, Chronic Active              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |    |    |    | 2   | 3.0 |     |  |  |
| Mineralization                            |   |   | 3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |    |    |    | 1   | 3.0 |     |  |  |
| Thrombosis                                |   |   |   |   |   |   |   |   |   |   |   |   |   | 3 |   |   |   |   |   |   |   |   |   |   |   |   |    |    |    |    | 1   | 3.0 |     |  |  |
| Uterus                                    | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | +  |    | 50 |    |     |     |     |  |  |
| Angiectasis                               |   |   |   |   |   |   |   |   |   |   |   | 3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |    |    |    |     | 1   | 3.0 |  |  |
| Dilatation                                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 |   |   |   |   |   |   |   | 2 |    |    |    |    | 6   | 2.7 |     |  |  |
| Hemorrhage                                |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |    |    |    |     | 1   | 2.0 |  |  |
| Inflammation, Chronic Active              |   |   |   |   |   |   |   |   |   |   | 3 |   |   |   |   |   |   |   |   |   |   |   | 1 |   |   | 3 |    |    |    |    | 4   | 2.3 |     |  |  |
| Endometrium, Hyperplasia, Cystic          | 1 | 3 | 1 | 2 |   | 2 |   | 2 |   | 2 |   |   |   | 3 | 3 | 3 | 2 |   | 3 | 3 |   | 3 | 2 | 4 |   | 1 |    |    |    | 34 | 2.4 |     |     |  |  |

**HEMATOPOIETIC SYSTEM**

|                                 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |     |
|---------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----|
| Bone Marrow                     | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |   | 50  |
| Lymph Node                      | + |   | + | + | + | + |   |   |   | + |   |   |   |   | + |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 10  |
| Ectasia                         |   |   |   | 4 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 | 4.0 |
| Iliac, Hyperplasia, Plasma Cell |   |   |   |   |   |   |   |   |   |   | 2 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 | 2.0 |
| Lumbar, Hyperplasia, Lymphoid   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 | 1.0 |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue

M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

| B6C3F1 MICE FEMALE<br>100 mg/m3                                                                | DAY ON TEST |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | * TOTALS                |      |
|------------------------------------------------------------------------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------------------------|------|
|                                                                                                | 0732        | 0733  | 0732  | 0731  | 0738  | 0736  | 0739  | 0733  | 0732  | 0732  | 0731  | 0732  | 0732  | 0733  | 0733  | 0733  | 0733  | 0734  | 0731  | 0732  | 0733  | 0733  | 0732  | 0732  |                         | 0731 |
| ANIMAL ID                                                                                      | 00726       | 00707 | 00708 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 | 00700 |                         |      |
| Lymph Node, Bronchial Infiltration Cellular, Histiocyte                                        | M           | M     | M     | M     | +     | +     | M     | M     | +     | M     | M     | M     | +     | M     | M     | +     | +     | M     | M     | +     | M     | +     | M     | M     | 27                      |      |
|                                                                                                |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1 2.0                   |      |
| Lymph Node, Mandibular                                                                         | M           | +     | +     | M     | +     | +     | +     | M     | +     | +     | +     | +     | M     | +     | +     | M     | +     | M     | M     | +     | +     | M     | M     | +     | M                       | 35   |
| Lymph Node, Mediastinal Hyperplasia, Lymphoid Infiltration Cellular, Mixed Cell                | +           | +     | +     | +     | +     | +     | +     | +     | M     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 47                      |      |
|                                                                                                |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 2 2.0<br>1 3.0          |      |
| Lymph Node, Mesenteric Angiectasis                                                             | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 49                      |      |
|                                                                                                |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1 4.0                   |      |
| Spleen Hematopoietic Cell Proliferation Hyperplasia, Lymphoid Infiltration Cellular, Mast Cell | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 49                      |      |
|                                                                                                |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 2 2.5<br>1 2.0<br>1 3.0 |      |
| Thymus Atrophy Necrosis                                                                        | +           | +     | +     | +     | +     | M     | M     | +     | +     | I     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | M     | +                       | 45   |
|                                                                                                |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1 3.0<br>1 3.0          |      |
| <b>INTEGUMENTARY SYSTEM</b>                                                                    |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |                         |      |
| Mammary Gland Hyperplasia                                                                      | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50                      |      |
|                                                                                                |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1 1.0                   |      |
| Skin Infiltration Cellular, Mast Cell Inflammation, Chronic Active Ulcer                       | +           | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | +     | 50                      |      |
|                                                                                                |             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | 1 1.0<br>2 2.5<br>3 3.3 |      |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically  
 1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04  
 Test Type: CHRONIC  
 Route: RESPIRATORY EXPOSURE WHOLE BODY  
 Species/Strain: MICE/B6C3F1

**P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL**  
 Metal working fluids (CIMSTAR 3800)  
 CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013  
 Time Report Requested: 14:13:47  
 First Dose M/F: 05/05/08 / 05/05/08  
 Lab: BNW

| B6C3F1 MICE FEMALE | DAY ON TEST | 0 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | * TOTALS |   |   |   |   |   |
|--------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|---|---|---|---|---|
|                    |             | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 6 |          | 7 | 7 | 7 | 6 | 7 |
| 100 mg/m3          | ANIMAL ID   | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0        | 0 | 0 | 0 | 0 |   |
|                    |             | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 6 | 7        | 7 | 7 | 6 | 7 |   |
|                    |             | 2 | 3 | 3 | 3 | 6 | 8 | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 9 | 3 | 3        | 3 | 8 | 3 |   |   |
|                    |             | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6        | 7 | 8 | 9 | 0 |   |

**MUSCULOSKELETAL SYSTEM**

|                                          |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           |            |            |          |  |
|------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|------------|------------|----------|--|
| Bone                                     | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | <b>50</b> |            |            |          |  |
| Fibro-Osseous Lesion                     | 2 |   |   | 1 | 1 |   | 2 |   | 2 | 1 |   |   |   |   | 2 | 1 |   |   |   | 1 | 1 | 2 | 2 | 2 |   | <b>23</b> | <b>1.5</b> |            |          |  |
| Cranium, Inflammation, Chronic Active    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>1</b>   | <b>3.0</b> |          |  |
| Femur, Tibia, Arthrosis                  |   |   |   |   |   |   |   |   |   |   |   |   | 2 |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>1</b>   | <b>2.0</b> |          |  |
| Pelvis, Degeneration                     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2 |   |   |   |   |   |           | <b>1</b>   | <b>2.0</b> |          |  |
| Vertebra, Fracture                       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>1</b>   | <b>4.0</b> |          |  |
| Skeletal Muscle                          |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           |            |            | <b>4</b> |  |
| Degeneration                             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>1</b>   | <b>2.0</b> |          |  |
| Infiltration Cellular, Polymorphonuclear |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>1</b>   | <b>2.0</b> |          |  |

**NERVOUS SYSTEM**

|                                        |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           |          |            |          |  |
|----------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|----------|------------|----------|--|
| Brain                                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | <b>50</b> |          |            |          |  |
| Compression                            |   |   |   |   |   | 3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>3</b> | <b>3.0</b> |          |  |
| Meninges, Inflammation, Chronic Active |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>1</b> | <b>1.0</b> |          |  |
| Peripheral Nerve                       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           |          |            | <b>3</b> |  |
| Degeneration                           |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>1</b> | <b>2.0</b> |          |  |
| Spinal Cord                            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           |          |            | <b>3</b> |  |

**RESPIRATORY SYSTEM**

|                              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           |            |            |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|------------|------------|--|--|
| Larynx                       | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | <b>50</b> |            |            |  |  |
| Inflammation, Chronic Active |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>10</b>  | <b>1.2</b> |  |  |
| Metaplasia, Squamous         | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 3 | 3 | 4 | 3 | 4 | 4 | 3 | 3 |   | <b>50</b> | <b>3.5</b> |            |  |  |
| Necrosis                     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |           | <b>4</b>   | <b>1.5</b> |  |  |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
 + .. Tissue examined microscopically  
 X .. Lesion present  
 I .. Insufficient tissue  
 M .. Missing tissue  
 A .. Autolysis precludes evaluation  
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:  
 1) Minimal 3) Moderate  
 2) Mild 4) Marked

Experiment Number: 20515 - 04

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Metal working fluids (CIMSTAR 3800)

CAS Number: CIMSTAR3800

Date Report Requested: 03/08/2013

Time Report Requested: 14:13:47

First Dose M/F: 05/05/08 / 05/05/08

Lab: BNW

| B6C3F1 MICE FEMALE<br>100 mg/m3 |  | DAY ON TEST      |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | * TOTALS |                  |                  |                  |
|---------------------------------|--|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|----------|------------------|------------------|------------------|
|                                 |  | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>3 | 0<br>7<br>3<br>2 | 0<br>7<br>6<br>1 | 0<br>6<br>8<br>3 | 0<br>6<br>8<br>9 | 0<br>6<br>6<br>3 | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>1 | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>3 | 0<br>7<br>3<br>3 | 0<br>7<br>3<br>3 | 0<br>6<br>3<br>4 | 0<br>7<br>3<br>3 | 0<br>6<br>9<br>2 | 0<br>7<br>3<br>2 | 0<br>7<br>3<br>2 | 0<br>6<br>8<br>8 |          | 0<br>7<br>3<br>1 |                  |                  |
| ANIMAL ID                       |  | ANIMAL ID        |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  |                  | * TOTALS |                  |                  |                  |
|                                 |  | 0<br>7<br>2<br>6 | 0<br>0<br>7<br>2 | 0<br>0<br>7<br>2 | 0<br>0<br>7<br>2 | 0<br>0<br>7<br>3 | 0<br>0<br>7<br>3 | 0<br>0<br>7<br>3 | 0<br>0<br>7<br>3 | 0<br>0<br>7<br>3 | 0<br>0<br>7<br>3 | 0<br>0<br>7<br>3 | 0<br>0<br>7<br>3 | 0<br>0<br>7<br>3 | 0<br>0<br>7<br>3 | 0<br>0<br>7<br>4 | 0<br>0<br>7<br>4 | 0<br>0<br>7<br>4 | 0<br>0<br>7<br>4 | 0<br>0<br>7<br>4 | 0<br>0<br>7<br>4 |          | 0<br>0<br>7<br>4 | 0<br>0<br>7<br>5 | 0<br>0<br>7<br>0 |
|                                 |  | 6                | 7                | 8                | 9                | 0                | 1                | 2                | 3                | 4                | 5                | 6                | 7                | 8                | 9                | 0                | 1                | 2                | 3                | 4                | 5                |          | 6                | 7                | 8                |

|                                                       |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |        |        |
|-------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------|--------|
| Lung                                                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50     |        |
| Congestion                                            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 3.0  |        |
| Hemorrhage                                            |   |   |   |   |   |   |   | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2 1.5  |        |
| Infiltration Cellular, Histiocyte                     |   |   |   |   |   |   |   |   |   |   |   |   | 2 |   |   |   |   |   |   | 2 | 1 |   |   |   |   |   | 6 1.5  |        |
| Infiltration Cellular, Mixed Cell                     |   |   |   |   |   |   |   |   | 1 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 1.0  |        |
| Thrombosis                                            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 3.0  |        |
| Alveolar Epithelium, Hyperplasia                      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 2 |   |   |   |   |   |   |   | 2 |   | 4 2.0  |        |
| Bronchiole, Hyperplasia                               | 1 | 1 | 1 | 1 |   | 1 |   | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 41 1.0 |        |
| Interstitial, Inflammation, Chronic Active            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 2.0  |        |
| Perivascular, Inflammation, Chronic Active            |   |   |   |   |   | 2 |   |   |   |   |   | 3 |   |   |   |   | 2 |   |   |   |   | 3 | 2 |   | 2 | 3 |        | 11 2.0 |
| Nose                                                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50     |        |
| Inflammation, Chronic Active                          |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 3      | 5 1.6  |
| Necrosis                                              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 1 |   |   |   |   |   |   |   |   |   |   |        | 1 1.0  |
| Olfactory Epithelium, Accumulation, Hyaline Droplet   | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 49 3.0 |        |
| Olfactory Epithelium, Atrophy                         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |        | 1 3.0  |
| Olfactory Epithelium, Metaplasia, Respiratory         | 1 | 2 |   | 1 |   |   |   |   |   |   |   |   | 2 | 1 | 1 |   |   |   | 2 | 1 |   |   |   | 1 | 2 | 2 | 2      | 23 1.5 |
| Respiratory Epithelium, Accumulation, Hyaline Droplet | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 50 3.0 |        |
| Respiratory Epithelium, Hyperplasia                   | 2 | 2 | 2 | 2 | 1 | 1 | 2 |   | 1 | 2 |   |   | 2 | 2 | 1 | 1 |   |   |   | 2 | 2 |   |   | 2 | 1 | 1 | 2      | 39 1.5 |
| Respiratory Epithelium, Metaplasia, Squamous          |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |        | 1 1.0  |
| Trachea                                               | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50     |        |

SPECIAL SENSES SYSTEM

|                                      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |       |
|--------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|-------|
| Eye                                  | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |       |
| Cornea, Inflammation, Chronic Active |   |   |   |   | 3 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    | 1 3.0 |
| Lens, Degeneration                   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    | 1 2.0 |

\* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade  
+ .. Tissue examined microscopically  
X .. Lesion present  
I .. Insufficient tissue  
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A .. Autolysis precludes evaluation  
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1-4 .. Lesion qualified as:  
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