

**Experiment Number:** 60311 - 03

**Test Type:** 90-DAY

**Route:** RESPIRATORY EXPOSURE WHOLE BODY

**Species/Strain:** RATS/F 344/N

**P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)**

Cobalt

**CAS Number:** 7440-48-4

**Date Report Requested:** 08/16/2012

**Time Report Requested:** 08:59:19

**First Dose M/F:** 03/08/05 / 03/07/05

**Lab:** BNW

F2\_R2

**NTP Study Number:** C60311  
**Lock Date:** 11/29/2005  
**Cage Range:** ALL  
**Date Range:** ALL  
**Reasons For Removal:** ALL  
**Removal Date Range:** ALL  
**Treatment Groups:** Include ALL  
**Study Gender:** Both  
**TDMSE Version:** 2.6.0.0\_007  
**PWG Approval Date:** NONE

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| FISCHER 344 RATS MALE | control | 0.625 MG/M3 | 1.25 MG/M3 | 2.5 MG/M3 | 5.0 MG/M3 |
|-----------------------|---------|-------------|------------|-----------|-----------|
|-----------------------|---------|-------------|------------|-----------|-----------|

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**Disposition Summary**

|   |           |           |           |           |           |
|---|-----------|-----------|-----------|-----------|-----------|
| <b>Animals Initially In Study</b>       | <b>10</b> | <b>10</b> | <b>10</b> | <b>10</b> | <b>10</b> |
| <b>Early Deaths</b>                     |           |           |           |           |           |
| <b>Survivors</b>                        |           |           |           |           |           |
| <b>Terminal Sacrifice</b>               | <b>10</b> | <b>10</b> | <b>10</b> | <b>10</b> | <b>10</b> |
| <b>Animals Examined Microscopically</b> | <b>10</b> | <b>10</b> | <b>10</b> | <b>10</b> | <b>10</b> |

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ALIMENTARY SYSTEM

|                            |         |     |     |          |         |
|----------------------------|---------|-----|-----|----------|---------|
| Esophagus                  | (10)    | (0) | (0) | (0)      | (10)    |
| Intestine Large, Cecum     | (10)    | (0) | (0) | (0)      | (10)    |
| Intestine Large, Colon     | (10)    | (0) | (0) | (0)      | (10)    |
| Intestine Large, Rectum    | (10)    | (0) | (0) | (0)      | (10)    |
| Intestine Small, Duodenum  | (10)    | (0) | (0) | (0)      | (10)    |
| Intestine Small, Ileum     | (10)    | (0) | (0) | (0)      | (10)    |
| Intestine Small, Jejunum   | (10)    | (0) | (0) | (0)      | (10)    |
| Liver                      | (10)    | (0) | (0) | (1)      | (10)    |
| Hepatodiaphragmatic Nodule | 1 (10%) |     |     | 1 (100%) |         |
| Pancreas                   | (10)    | (0) | (0) | (0)      | (10)    |
| Duct, Cyst                 | 1 (10%) |     |     |          |         |
| Salivary Glands            | (10)    | (0) | (0) | (0)      | (10)    |
| Inflammation, Acute        |         |     |     |          | 1 (10%) |
| Stomach, Forestomach       | (10)    | (0) | (0) | (0)      | (10)    |
| Hyperplasia, Squamous      | 1 (10%) |     |     |          |         |
| Stomach, Glandular         | (10)    | (0) | (0) | (0)      | (10)    |

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CARDIOVASCULAR SYSTEM

|                |         |     |     |     |         |
|----------------|---------|-----|-----|-----|---------|
| Heart          | (10)    | (0) | (0) | (0) | (10)    |
| Cardiomyopathy | 8 (80%) |     |     |     | 5 (50%) |

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ENDOCRINE SYSTEM

|                |      |     |     |     |      |
|----------------|------|-----|-----|-----|------|
| Adrenal Cortex | (10) | (0) | (0) | (0) | (10) |
|----------------|------|-----|-----|-----|------|

a - Number of animals examined microscopically at site and number of animals with lesion

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|-----------------------|---------|-------------|------------|-----------|-----------|
| Adrenal Medulla       | (10)    | (0)         | (0)        | (0)       | (10)      |
| Islets, Pancreatic    | (10)    | (0)         | (0)        | (0)       | (10)      |
| Parathyroid Gland     | (10)    | (0)         | (0)        | (0)       | (7)       |
| Pituitary Gland       | (10)    | (0)         | (0)        | (0)       | (10)      |
| Thyroid Gland         | (10)    | (0)         | (0)        | (0)       | (10)      |

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GENERAL BODY SYSTEM

None

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GENITAL SYSTEM

|                 |      |      |      |      |      |
|-----------------|------|------|------|------|------|
| Epididymis      | (10) | (10) | (10) | (10) | (10) |
| Preputial Gland | (10) | (0)  | (0)  | (0)  | (10) |
| Prostate        | (10) | (0)  | (1)  | (0)  | (9)  |
| Seminal Vesicle | (10) | (0)  | (0)  | (0)  | (10) |
| Testes          | (10) | (10) | (10) | (10) | (10) |

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HEMATOPOIETIC SYSTEM

|                          |      |     |     |     |          |
|--------------------------|------|-----|-----|-----|----------|
| Bone Marrow              | (10) | (0) | (0) | (0) | (10)     |
| Lymph Node               | (0)  | (0) | (0) | (0) | (1)      |
| Pancreatic, Pigmentation |      |     |     |     | 1 (100%) |
| Lymph Node, Mandibular   | (0)  | (0) | (0) | (0) | (1)      |
| Lymph Node, Mediastinal  | (9)  | (0) | (0) | (0) | (7)      |
| Lymph Node, Mesenteric   | (10) | (0) | (0) | (0) | (10)     |
| Spleen                   | (10) | (0) | (0) | (0) | (10)     |
| Thymus                   | (10) | (0) | (0) | (0) | (10)     |

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INTEGUMENTARY SYSTEM

|               |      |     |     |     |      |
|---------------|------|-----|-----|-----|------|
| Mammary Gland | (7)  | (0) | (0) | (0) | (7)  |
| Skin          | (10) | (0) | (0) | (0) | (10) |

a - Number of animals examined microscopically at site and number of animals with lesion

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 Species/Strain: RATS/F 344/N

**P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)**  
 Cobalt  
 CAS Number: 7440-48-4

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 First Dose M/F: 03/08/05 / 03/07/05  
 Lab: BNW

| FISCHER 344 RATS MALE                        | control | 0.625 MG/M3 | 1.25 MG/M3 | 2.5 MG/M3 | 5.0 MG/M3 |
|--|---------|-------------|------------|-----------|-----------|
| <b>MUSCULOSKELETAL SYSTEM</b>                |         |             |            |           |           |
| Bone   | (10)    | (0)         | (0)        | (0)       | (10)      |
| <b>NERVOUS SYSTEM</b>                        |         |             |            |           |           |
| Brain  | (10)    | (0)         | (0)        | (0)       | (10)      |
| <b>RESPIRATORY SYSTEM</b>                    |         |             |            |           |           |
| Larynx                                       | (10)    | (0)         | (0)        | (0)       | (10)      |
| Lung   | (10)    | (10)        | (10)       | (10)      | (10)      |
| Inflammation, Chronic Active                 |         | 10 (100%)   | 10 (100%)  | 10 (100%) | 10 (100%) |
| Alveolar Epithelium, Hyperplasia             |         |             |            |           | 2 (20%)   |
| Alveolus, Hemorrhage                         | 2 (20%) |             | 2 (20%)    | 4 (40%)   | 4 (40%)   |
| Alveolus, Proteinosis                        |         | 10 (100%)   | 10 (100%)  | 10 (100%) | 10 (100%) |
| Bronchiole, Epithelium, Hyperplasia          |         |             | 10 (100%)  | 10 (100%) | 10 (100%) |
| Nose   | (10)    | (10)        | (10)       | (10)      | (10)      |
| Olfactory Epithelium, Degeneration           |         |             | 2 (20%)    | 9 (90%)   | 10 (100%) |
| Olfactory Epithelium, Hyperplasia            |         |             | 2 (20%)    | 6 (60%)   | 10 (100%) |
| Respiratory Epithelium, Hyperplasia          |         |             | 3 (30%)    | 9 (90%)   | 10 (100%) |
| Respiratory Epithelium, Metaplasia, Squamous |         |             |            |           | 1 (10%)   |
| Turbinates, Atrophy                          |         |             |            | 3 (30%)   | 9 (90%)   |
| Trachea                                      | (10)    | (0)         | (0)        | (0)       | (10)      |
| <b>SPECIAL SENSES SYSTEM</b>                 |         |             |            |           |           |
| Eye  | (10)    | (0)         | (0)        | (0)       | (10)      |
| Retina, Atrophy                              | 1 (10%) |             |            |           |           |
| Harderian Gland                              | (10)    | (0)         | (0)        | (0)       | (10)      |
| Inflammation, Chronic Active                 | 1 (10%) |             |            |           |           |

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Cobalt

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First Dose M/F: 03/08/05 / 03/07/05

Lab: BNW

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| FISCHER 344 RATS MALE | control | 0.625 MG/M3 | 1.25 MG/M3 | 2.5 MG/M3 | 5.0 MG/M3 |
|-----------------------|---------|-------------|------------|-----------|-----------|
| URINARY SYSTEM        |         |             |            |           |           |
| Kidney                | (9)     | (0)         | (0)        | (0)       | (10)      |
| Nephropathy           | 4 (44%) |             |            |           | 1 (10%)   |
| Urinary Bladder       | (10)    | (0)         | (0)        | (0)       | (10)      |

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

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 Lab: BNW

| FISCHER 344 RATS FEMALE          | control | 0.625 MG/M3 | 1.25 MG/M3 | 2.5 MG/M3 | 5.0 MG/M3 |
|----------------------------------|---------|-------------|------------|-----------|-----------|
| <b>Disposition Summary</b>       |         |             |            |           |           |
| Animals Initially In Study       | 10      | 10          | 10         | 10        | 10        |
| Early Deaths                     |         |             |            |           |           |
| Survivors                        |         |             |            |           |           |
| Terminal Sacrifice               | 10      | 10          | 10         | 10        | 10        |
| Animals Examined Microscopically | 10      | 10          | 10         | 10        | 10        |
| <b>ALIMENTARY SYSTEM</b>         |         |             |            |           |           |
| Esophagus                        | (10)    | (0)         | (0)        | (0)       | (10)      |
| Intestine Large, Cecum           | (10)    | (0)         | (0)        | (0)       | (10)      |
| Intestine Large, Colon           | (10)    | (0)         | (0)        | (0)       | (10)      |
| Intestine Large, Rectum          | (10)    | (0)         | (0)        | (0)       | (10)      |
| Intestine Small, Duodenum        | (10)    | (0)         | (0)        | (0)       | (10)      |
| Intestine Small, Ileum           | (10)    | (0)         | (0)        | (0)       | (10)      |
| Intestine Small, Jejunum         | (10)    | (0)         | (0)        | (0)       | (10)      |
| Liver                            | (10)    | (1)         | (0)        | (0)       | (10)      |
| Hepatodiaphragmatic Nodule       |         | 1 (100%)    |            |           | 1 (10%)   |
| Pancreas                         | (10)    | (0)         | (0)        | (0)       | (10)      |
| Salivary Glands                  | (10)    | (0)         | (0)        | (0)       | (10)      |
| Stomach, Forestomach             | (10)    | (0)         | (0)        | (0)       | (10)      |
| Stomach, Glandular               | (10)    | (0)         | (0)        | (0)       | (10)      |
| <b>CARDIOVASCULAR SYSTEM</b>     |         |             |            |           |           |
| Heart                            | (10)    | (0)         | (0)        | (0)       | (10)      |
| Cardiomyopathy                   | 2 (20%) |             |            |           | 3 (30%)   |
| <b>ENDOCRINE SYSTEM</b>          |         |             |            |           |           |
| Adrenal Cortex                   | (10)    | (0)         | (0)        | (0)       | (10)      |
| Adrenal Medulla                  | (10)    | (0)         | (0)        | (0)       | (10)      |
| Islets, Pancreatic               | (10)    | (0)         | (0)        | (0)       | (10)      |
| Parathyroid Gland                | (7)     | (0)         | (0)        | (0)       | (8)       |

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| FISCHER 344 RATS FEMALE | control | 0.625 MG/M3 | 1.25 MG/M3 | 2.5 MG/M3 | 5.0 MG/M3 |
|-------------------------|---------|-------------|------------|-----------|-----------|
| Pituitary Gland         | (10)    | (0)         | (0)        | (0)       | (10)      |
| Thyroid Gland           | (10)    | (0)         | (0)        | (0)       | (10)      |

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GENERAL BODY SYSTEM

None

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GENITAL SYSTEM

|                |      |     |     |          |      |
|----------------|------|-----|-----|----------|------|
| Clitoral Gland | (10) | (0) | (0) | (0)      | (10) |
| Ovary          | (10) | (0) | (0) | (1)      | (10) |
| Cyst           |      |     |     | 1 (100%) |      |
| Uterus         | (10) | (0) | (0) | (0)      | (10) |

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HEMATOPOIETIC SYSTEM

|                         |      |     |     |     |      |
|-------------------------|------|-----|-----|-----|------|
| Bone Marrow             | (10) | (0) | (0) | (0) | (10) |
| Lymph Node, Mediastinal | (8)  | (0) | (0) | (0) | (8)  |
| Lymph Node, Mesenteric  | (10) | (0) | (0) | (0) | (10) |
| Spleen                  | (10) | (0) | (0) | (0) | (10) |
| Thymus                  | (10) | (0) | (0) | (0) | (10) |

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INTEGUMENTARY SYSTEM

|               |      |     |     |     |      |
|---------------|------|-----|-----|-----|------|
| Mammary Gland | (10) | (0) | (0) | (0) | (10) |
| Skin          | (10) | (0) | (0) | (0) | (10) |

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MUSCULOSKELETAL SYSTEM

|      |      |     |     |     |      |
|------|------|-----|-----|-----|------|
| Bone | (10) | (0) | (0) | (0) | (10) |
|------|------|-----|-----|-----|------|

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| FISCHER 344 RATS FEMALE             | control | 0.625 MG/M3 | 1.25 MG/M3 | 2.5 MG/M3 | 5.0 MG/M3 |
|-------------------------------------|---------|-------------|------------|-----------|-----------|
| <b>NERVOUS SYSTEM</b>               |         |             |            |           |           |
| Brain                               | (10)    | (0)         | (0)        | (0)       | (10)      |
| <b>RESPIRATORY SYSTEM</b>           |         |             |            |           |           |
| Larynx                              | (10)    | (0)         | (0)        | (0)       | (10)      |
| Lung                                | (10)    | (10)        | (10)       | (10)      | (10)      |
| Inflammation, Chronic Active        | 2 (20%) | 10 (100%)   | 10 (100%)  | 10 (100%) | 10 (100%) |
| Alveolar Epithelium, Hyperplasia    |         |             |            |           | 1 (10%)   |
| Alveolus, Hemorrhage                |         |             | 3 (30%)    | 1 (10%)   | 2 (20%)   |
| Alveolus, Proteinosis               |         | 10 (100%)   | 10 (100%)  | 10 (100%) | 10 (100%) |
| Bronchiole, Epithelium, Hyperplasia |         |             | 10 (100%)  | 10 (100%) | 10 (100%) |
| Nose                                | (10)    | (10)        | (10)       | (10)      | (10)      |
| Olfactory Epithelium, Degeneration  |         |             | 5 (50%)    | 10 (100%) | 10 (100%) |
| Olfactory Epithelium, Hyperplasia   |         |             |            | 3 (30%)   | 10 (100%) |
| Respiratory Epithelium, Hyperplasia |         | 1 (10%)     |            | 9 (90%)   | 10 (100%) |
| Respiratory Epithelium, Necrosis    |         |             | 1 (10%)    |           |           |
| Turbinate, Atrophy                  |         |             |            | 4 (40%)   | 6 (60%)   |
| Trachea                             | (10)    | (0)         | (0)        | (0)       | (10)      |
| <b>SPECIAL SENSES SYSTEM</b>        |         |             |            |           |           |
| Eye                                 | (10)    | (0)         | (0)        | (0)       | (10)      |
| Harderian Gland                     | (10)    | (0)         | (0)        | (0)       | (10)      |
| <b>URINARY SYSTEM</b>               |         |             |            |           |           |
| Kidney                              | (10)    | (0)         | (0)        | (0)       | (10)      |
| Nephropathy                         |         |             |            |           | 2 (20%)   |
| Urinary Bladder                     | (10)    | (0)         | (0)        | (0)       | (10)      |

a - Number of animals examined microscopically at site and number of animals with lesion



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**FISCHER 344 RATS FEMALE**

**control**

**0.625 MG/M3**

**1.25 MG/M3**

**2.5 MG/M3**

**5.0 MG/M3**

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\*\*\* END OF REPORT \*\*\*

a - Number of animals examined microscopically at site and number of animals with lesion