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FINAL REPORT

VOLUME 1 OF 3
(Text and Summary Tables)

STUDY TITLE

A 4-WEEK INHALATION TOXICITY STUDY
OF METHANE SULFONIC ACID IN ALBINO RATS
CAS Registry Number 75-75-2

PROJECT NUMBER

WIL-160033

PERFORMING LABORATORY

WIL Research Laboratories, Inc.
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STUDY DIRECTOR

Charles E. Ulrich, B.S.

STUDY INITIATED ON

November 14, 1995

STUDY COMPLETION DATE

December 17, 1996

SPONSOR

Elf Atochem North America, Inc.
2000 Market Street
Philadelphia, PA 19103

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WIL-160033
Elf Atochem

A 4-Week Inhalation Toxicity Study
of Methane Sulfonic Acid in Albino Rats

COMPLIANCE STATEMENT

This study, designated WIL-160033, was conducted in compliance with the United States Environmental Protection Agency (EPA) Good Laboratory Practice Regulations (40 CFR Part 792), September 18, 1989, the Organization for Economic Cooperation and Development (OECD) Good Laboratory Practices C(81)30 (Final) Annex 2, the Standard Operating Procedures of WIL Research Laboratories, Inc., and the protocol as approved by the sponsor. The protocol was designed and the study was conducted in accordance with the OECD Guidelines for Testing of Chemicals, Health Effects Test Guidelines, Section 412, adopted May 12, 1981, the European Community (EC) Testing Guidelines, method B8 (29.12.92) and in general accordance with the U.S. Toxic Substances Control Act (TSCA) Health Effects Test Guideline, 40 CFR Part 798.2450.

C.E. Ulrich — Dec. 17, 96

Charles E. Ulrich, B.S.
Study Director

Date

A 4-Week Inhalation Toxicity Study
of Methane Sulfonic Acid in Albino Rats

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A 4-Week Inhalation Toxicity Study
of Methane Sulfonic Acid in Albino Rats

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A 4-Week Inhalation Toxicity Study of Methane Sulfonic Acid in Albino Rats

I. SUMMARY

Potential subchronic toxic effects of the test article, methane sulfonic acid (MSA), were evaluated in this 4-week study in albino rats. The test article was administered as an aerosol mist via nose-only inhalation to three groups, each comprised of 15 male and 15 female Crl:CD®BR rats, for a period of six hours per day, five days per week, for four consecutive weeks (minimum of 20 total exposures). The targeted exposure concentrations were 0.025, 0.075 and 0.25 mg/L MSA (active ingredient) for the low-, mid- and high-exposure groups, respectively. The test atmosphere concentrations were monitored by ion exchange chromatography from discrete samples collected on Teflon® filters and were found to be 0.026, 0.073 and 0.242 mg/L. The aerosol was characterized by a mass median aerodynamic diameter of 1.1 microns with a geometric standard deviation of 1.8. A concurrent control group of identical design received only filtered air, on a comparable regimen. The animals were observed for clinical signs and effects on body weight, food consumption and clinical pathology parameters. Data from detailed physical examinations, including Functional Observational Battery data (handling and open field observations), were recorded during the pretest period and during study weeks 0 through 3. After completion of four weeks of exposure, 10 rats/sex/group were euthanized; necropsies were performed, and selected organs were weighed. The remaining 5 rats/sex/group were maintained for an approximate two-week (nonexposure) recovery period, after which they were also euthanized and necropsied. A microscopic examination was conducted on selected tissues from all groups.

During the exposure phase of the study, 4, 1, 1 and 5 animals in the control, low-, mid- and high-exposure groups, respectively, were found dead. All deaths were attributed to confinement in the restraint tubes and none of the deaths were considered related to exposure to the test article. All other animals survived to the scheduled necropsies. Exposure-related clinical signs consisted of rales in the high-exposure group animals and an increased incidence of yellow matting on various body surfaces in the mid-exposure group males and the high-exposure group males and females. No significant clinical findings were noted in any animals during the recovery period.

Test article exposure had no adverse effects on Functional Observational Battery findings, hematology or urinalysis parameters, organ weight data or at the macroscopic examination.

The high-exposure group males experienced slightly decreased food consumption means throughout the exposure period and a transient reduction in mean body weight gain during the first week of exposure to MSA.

Statistically significant increases in BUN and aspartate aminotransferase means in the high-exposure group males and females, respectively, at the study week 4 evaluation were not considered to be of toxicological significance; BUN and aspartate aminotransferase means in these groups were comparable to the control group after the two-week recovery period.

Test article-related microscopic findings were observed in the nasal turbinates of the high-exposure group rats that were found dead and in all treated groups at the study week 4 and 6 evaluations; however, the severity of some of the findings observed after the two-week recovery period suggested at least partial recovery from the irritative effects of the test article.

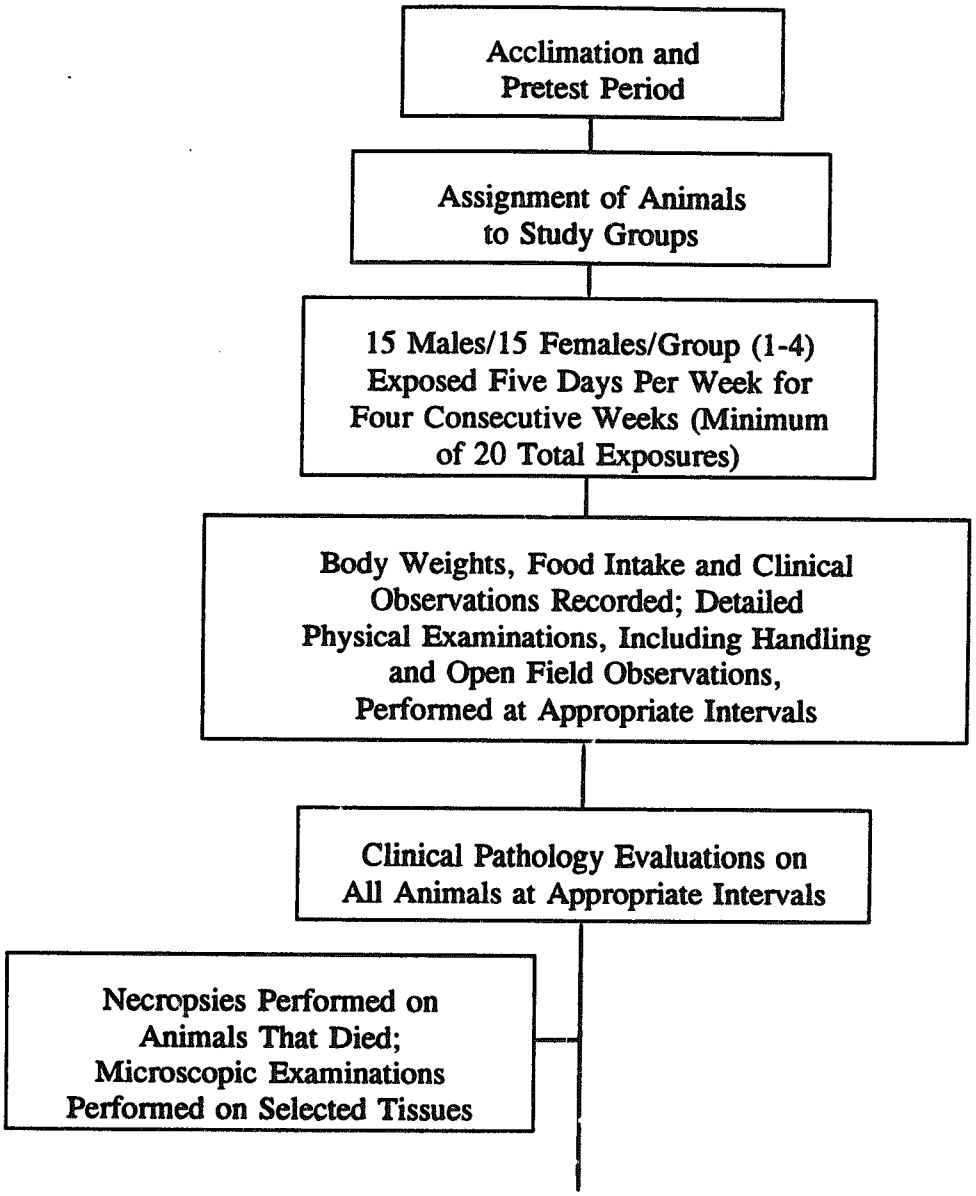
In conclusion, exposure of rats to an aerosol of methane sulfonic acid resulted in changes in the clinical conditions of the animals at exposure levels

of 0.073 and 0.242 mg/L, a transient reduced mean body weight gain in the 0.242 mg/L exposure level males, slightly reduced food consumption means in the 0.242 mg/L exposure level males and histopathologic lesions in the nasal turbinates of all exposed groups. Based on the data obtained during the two-week recovery (nonexposure) period, the effects on the clinical conditions of the animals and body weight gains were completely reversible; histopathological lesions in the nasal turbinates were observed in all groups at the end of the recovery period. Based on the compound-induced lesions observed in the nasal turbinates, the no observed effect level (NOEL) for local irritation was considered to be less than 0.026 mg/L. The NOEL for systemic toxicity was considered to be 0.026 mg/L.

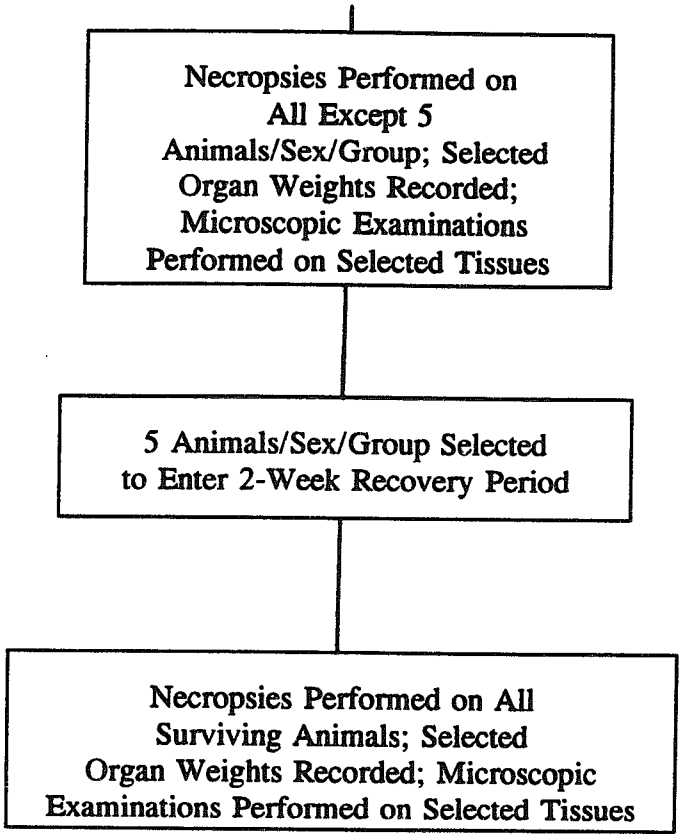
II. OBJECTIVE

The objective of the study was to evaluate the potential subchronic toxic effects of methane sulfonic acid when administered to rats via inhalation for a minimum of 20 days (four weeks). The selected route of administration was inhalation exposure because this is an anticipated route of exposure for the general population. The nose-only method was employed to minimize potential oral and dermal exposure. The animal model, the Sprague-Dawley Crl:CD®BR rat, is recognized as appropriate for subchronic inhalation studies.

III. STUDY DESIGN



III. STUDY DESIGN (continued)



IV. EXPERIMENTAL PROCEDURES

A. INTRODUCTION

This report presents the data from "A 4-Week Inhalation Toxicity Study of Methane Sulfonic Acid in Albino Rats". The experimental start date, initiating with test article administration, was November 16, 1995 (week 0). The last necropsy was on December 28, 1995 (week 6). The experimental termination date, concluding with the last histopathological examination, was May 13, 1996. Due to spacing constraints, the study title is presented as "A 4-Week Inhalation Tox Study of Methane Sulfonic Acid in Rats" on the report tables.

B. TEST AND CONTROL ARTICLES

1. TEST ARTICLE IDENTIFICATION

The test article, methane sulfonic acid (MSA), was received from Elf Atochem North America, Inc., Riverview, Michigan, on July 12, 1995, as follows:

Identification	No. of Containers Received	Description
Product: PF1759 Lot No.: M-12-E Methane Sulfonic Acid 70% Code 1759 CAS Number 7575-2 Expiration Date 4-8-96 Concentration 69.9% Storage - room temperature [WIL Log No.: 2846A]	3 bottles Total gross weight: 3864.2 g	Clear, colorless liquid

The purity and stability of the bulk test article were the responsibility of the sponsor. The test article was 69.86% pure based on analytical data supplied by the sponsor. The bulk test article was considered stable when stored in a sealed container under ambient conditions. A retention sample of the test article was taken from each of the bottles and stored in the Archives at WIL Research Laboratories, Inc.

2. TEST ATMOSPHERE MONITORING

Exposure concentrations within each chamber were measured by ion chromatographic analysis. Test atmosphere sampling for concentration analysis was performed at approximate 150 minute intervals during the exposure periods. Air flow, temperature and humidity within the exposure units were monitored continuously and recorded at least every 30 minutes. Nominal chamber concentrations were determined. Test atmosphere homogeneity was demonstrated during the method development phase prior to the initiation of the animal exposures. The methodology and results of these analyses are presented in Appendix A.

The mean achieved concentrations of MSA in air for the 0.00, 0.025, 0.075 and 0.25 mg/L target levels were 0.001, 0.026, 0.073 and 0.242 mg/L, respectively. The average mass median aerodynamic diameters ± mean geometric standard deviations of the samples taken for the low-, mid- and high-exposure levels were 0.9 ± 1.7, 1.2 ± 1.9 and 1.2 ± 1.9 microns, respectively.

3. EXPOSURE METHODS

The test atmospheres were generated for exposure in the form of an aerosol. Periodic particle sizing was performed prior to the

initiation of exposures and after completion of all exposures to characterize the aerosols to which the rats were exposed. Atmospheres of aerosolized MSA were generated using an Inspiron® Model 002305-A nebulizer (Intertech Resources, Inc., Lincolnshire, IL). A detailed description of the test atmosphere generation method is presented in Appendix A.

All animals were exposed in four In-Tox Products, Inc. nose-only exposure units operated under dynamic conditions. Each exposure unit was dedicated for one group. The exposure period was six hours per day, five days per week, for four consecutive weeks (minimum of 20 total exposures). The rats were removed from their home cages in the animal room and were transported to the exposure units for exposure to the test article. The animals were then returned to their home cages following exposure. The control group was exposed to clean, filtered air under conditions identical to those used for the groups exposed to the test article. Food and water were withheld during each daily exposure period. Controls were set to maintain temperature inside the exposure chamber at approximately 22°C (±2°C) and humidity at approximately 40-60%, respectively. Daily mean temperature ranged from 23°C to 25°C, and daily mean relative humidity ranged from 27% to 49%. The deviations from the protocol-defined temperature and humidity levels would not be expected to have an adverse impact on the scientific integrity or the outcome of the study. The following deviation from the exposure methods occurred. Replacement male no. 44089 (high-exposure group) only received 19 exposures to the test article (see section IV.G.). As the difference in the number of exposures was small (19 exposures instead of 20), this deviation would

not be expected to have an adverse effect on the scientific validity or outcome of the study. Exposure methods and conditions are detailed in Appendix A.

After completion of exposure (4 weeks), five rats per group were selected to enter an approximate two-week (nonexposure) recovery period and were later euthanized and necropsied. The remainder of the rats surviving through the exposure period were euthanized and necropsied following the exposure period.

The following table presents the study group assignment:

Group Number	Test Article	Target Exposure Level (mg/L)	Number of Animals Males	Number of Animals Females
1	Filtered Air	0	15	15
2	MSA	0.025	15	15
3	MSA	0.075	15	15
4	MSA	0.25	15	15

C. ANIMAL RECEIPT AND ACCLIMATION/PRETEST PERIOD

Sixty male and sixty female Crl:CD®BR rats were received in good health on November 2, 1995, from Charles River Breeding Laboratories, Inc., Portage, Michigan. An additional ten male and ten female Crl:CD®BR rats were received in good health on November 9, 1995 from the same supplier. The animals in the first and second shipments were 36 and 43 days old, respectively, upon receipt. Animals were uniquely identified by Monel metal eartags displaying the permanent identification number. Each animal was inspected by a qualified technician upon receipt. All animals were housed for a minimum 7-day acclimation and pretest period; observations were made twice daily for mortality and general

changes in appearance or behavior. The animals were conditioned to the exposure restraint tubes on an incremental basis prior to randomization.

Pretest data collection began on November 9, 1995. Individual body weights were recorded and detailed physical examinations were performed on the first and last days of pretest week -1 (November 9 and 15, 1995, respectively). Individual food consumption was measured for the interval week -1 to week 0. For computer entry, some pretest data were assigned to computer protocol numbers WIL-160033P and WIL-160033Q. Pretest clinical observations are presented in Appendix B.

D. ANIMAL HOUSING

Upon arrival, all animals were housed individually in an environmentally-controlled room in clean wire-mesh cages suspended above cage-board that was changed at least three times per week. All animals were maintained by the animal husbandry staff in accordance with the National Institutes of Health "Guide for the Care and Use of Laboratory Animals"[1]. The animal facilities at WIL Research Laboratories, Inc., are accredited by the American Association for Accreditation of Laboratory Animal Care (AAALAC).

E. DIET, DRINKING WATER AND MAINTENANCE

The basal ration used in this study was Purina® Certified Rodent Chow® #5002. The diet utilized at WIL Research Laboratories, Inc., is a certified feed with appropriate analyses performed by the manufacturer and provided to WIL Research Laboratories, Inc. Tap water supplying the facility is sampled and analyzed for contaminants according to Standard Operating Procedures. The results of these analyses are maintained at WIL Research Laboratories, Inc. Contaminants were not present in animal feed or water at levels sufficient to interfere with the objectives of this study. The basal

diet and drinking water delivered by an automatic watering system were provided *ad libitum* throughout the study period except during the exposure periods, when both food and water were withheld, and during the period of fasting prior to blood collection when food but not water was withheld.

F. ENVIRONMENTAL CONDITIONS

Except during exposure, all animals were housed throughout the acclimation period and during the study in an environmentally-controlled room. Controls were set to maintain temperature at 72° ± 4°F and a relative humidity of approximately 30-70%. Room temperature and relative humidity were recorded daily. Actual recorded ranges for temperature and humidity were 71.2° to 73.0°F and 28.8% to 66%, respectively, during the study period. The occasional slight variations from the set relative humidity levels would not be expected to have an effect on the outcome of the study. Light timers were set to provide a 12-hour light/12-hour dark photoperiod.

G. ASSIGNMENT OF ANIMALS TO TREATMENT GROUPS

On November 15, 1995 (the day prior to initiation of exposure to the test article), all available rats were weighed and examined in detail for physical abnormalities. Animals judged suitable for testing, as decided by the study director, were selected for use in the computer randomization procedure. The individual body weights were entered into the WIL Toxicology Data Management System (WTDMS™). A printout containing the animal numbers, corresponding body weights and individual group assignments was generated based on body weight stratification in a block design. The animals then were arranged according to the printout. The control and three test groups each consisted of 15 males and 15 females. The selected animals were seven weeks old at initiation of exposure; body weight values ranged from 175 to 295 grams for the males and from 155

to 235 grams for the females. The body weights of nine males and two females were outside of the protocol-specified range of ± 20% of the mean for each sex at randomization; however, the animals were within the protocol-specified and guideline-specified age range. This deviation would not be expected to have an adverse impact on the outcome or validity of the study. After randomization into study groups, the animals were randomized into two replicates (Appendix C) to allow for the reasonable conduct of the Functional Observational Battery (FOB) assessments. Each exposure group and sex was approximately equally represented within each FOB assessment replicate.

On November 17, 1995 (study day 1, the second day of exposure), high-exposure group male no. 44106 died during exposure, presumably as a result of restraint tube-related stress. This animal was replaced with male no. 44089 on November 20, 1995 (study day 4, the third day of exposure). As a result, food consumption data, FOB observations and nonexposure day clinical observations are not available for this animal for the first week of exposure (study week 0).

H. CLINICAL OBSERVATIONS AND SURVIVAL

On days of exposure, a clinical examination was performed twice daily for all animals, once prior to placement in the tubes and once approximately 1-2 hours after completion of exposure (designated 1-hour post-exposure for report writing purposes). On nonexposure days, including the recovery period, clinical examinations were performed once daily. Detailed physical examinations, which included Functional Observational Batteries (see Section IV.I.), were performed weekly, beginning one week prior to initiation of test article exposure, and just prior to the scheduled necropsy. The following exception occurred. Detailed physical examinations were not

performed on animals during the recovery period. However, all animals were given daily clinical examinations throughout the recovery period. Thus, this deviation from the protocol would not be expected to have a negative impact on the scientific integrity or the outcome of the study.

I. FUNCTIONAL OBSERVATIONAL BATTERY (FOB)

Observations for each animal were made weekly, beginning one week prior to initiation of test article exposure, and prior to the study week 4 primary necropsy. As no test article-related effects were observed during the exposure phase of the study, FOB evaluations were not performed during the recovery period. Testing was performed by the same technicians, whenever possible, without knowledge of the animal group assignment. The FOB was performed in a sound-deadened room equipped with a white noise generator set to operate at 70 ± 10 db. All animals were observed for the following parameters as described below (refer to Appendix D for a detailed description of the scoring criteria used for each observation):

1. HANDLING OBSERVATIONS

Ease of removal from cage	Ease of handling animal in hand
Lacrimation/Chromodacryorrhea	Salivation
Piloerection	Fur appearance
Palpebral closure	Respiratory rate/character
Red/Crusty deposits	Mucous membranes/Eye/Skin color
Eye prominence	Muscle tone

2. OPEN FIELD OBSERVATIONS (evaluated over a 2-minute observation period)

Time to first step (seconds)	Tremors
Rearing	Gait score
Mobility	Arousal
Backing	Bizarre/Stereotypic behavior
Grooming	Urination
Gait	Defecation
Convulsions	

J. BODY WEIGHTS

Individual body weights were recorded weekly, beginning one week prior to initiation of test article exposure, and prior to terminal necropsy. Mean body weight changes were calculated for each study week with the following exception. Body weights were inadvertently not collected during the final week of the recovery period (study week 6). A final body weight was recorded for each animal on the day of necropsy.

K. FOOD CONSUMPTION

Individual food consumption was recorded weekly, beginning one week prior to initiation of test article exposure with the following exception. Food consumption data was inadvertently not collected during the final week of the recovery period (study week 6). Food intake was calculated as g/animal/day for the corresponding body weight intervals. When food consumption could not be measured for a given interval (due to spillage, weighing error, obvious erroneous value, etc.), the appropriate interval was footnoted as "NA" (Not Applicable) on the individual tables. This is reflected in a lower number of animals/sex/group used in the computation of the mean.

L. CLINICAL PATHOLOGY

Blood samples for clinical pathology evaluations were taken from all surviving animals at the study week 4 primary and study week 6 recovery necropsies. The animals were fasted overnight prior to necropsy and the collection of blood samples. Blood was taken from a lateral tail vein with one exception. Due to an inability to collect blood from the lateral tail vein, low-exposure group female no. 44349 had blood collected from the retro-orbital sinus at the study week 6 recovery necropsy. As blood was collected from all females at this evaluation, this deviation from the protocol-specified route of collection would not be expected to impact on the scientific validity or the outcome of the study. Clinical pathology methods, procedures and references are presented in Appendix E.

1. HEMATOLOGY

The following hematologic evaluations were conducted on blood samples collected from all animals at the week 4 primary necropsy:

Total Leukocyte Count (White Cell)	Differential Leukocyte Count[b]
Erythrocyte Count (Red Cells)	-Neutrophil
Hemoglobin	-Lymphocyte
Hematocrit	-Monocyte
Mean Corpuscular Volume (MCV)	-Eosinophil
Mean Corpuscular Hemoglobin (MCH)	-Basophil
Mean Corpuscular Hemoglobin Concentration (MCHC)[a]	
Platelet Count (Platelet)	

( ) = Designates tabular abbreviation
[a] = Also evaluated for all females at study week 6
[b] = Evaluated for all animals

2. BLOOD CHEMISTRY

The following serum chemistry evaluations were conducted on blood samples collected from all animals at the study week 4 primary necropsy:

Albumin
Total Protein
Globulin
Albumin/Globulin Ratio (A/G Ratio)
Total Bilirubin (Total Bili)
Urea Nitrogen[a]
Creatinine
Serum Alkaline Phosphatase (Alkaline Phos'tse)
Serum Alanine Aminotransferase (Alanine Transfer)
Serum Aspartate Aminotransferase (Aspartat Transfer)[b]
Gamma Glutamyltransferase (Glutamyl Transfer)[c]
Glucose
Total Cholesterol (Cholesterol)
Calcium
Chloride
Phosphorus
Potassium
Sodium
Bile Acids[d]

( ) = Designates tabular abbreviation
[a] = Also evaluated for all males at study week 6
[b] = Also evaluated for all females at study week 6
[c] = Formerly gamma glutamyl transpeptidase
[d] = Presented on special chemistry tables

3. URINALYSIS

The following urinalysis evaluations were conducted on urine samples collected from all animals prior to the week 4 primary necropsy. The animals were placed in metabolism cages overnight (for approximately 16 hours) for collection of urine. The animals were fasted during the collection of urine.

Volume
Urobilinogen
Color (CLOR)
Appearance (APP)
Specific Gravity (SG)
pH
Protein (PRO)
Glucose (GLU)
Ketones (KET)
Bilirubin (BIL)
Occult Blood (BLD)
Nitrites (NIT)
Leukocytes (WBC)
Microscopy of Sediment [Tabular abbreviations appear on individual tables]

( ) = Designates tabular abbreviation

M. PATHOLOGY

1. MACROSCOPIC EXAMINATION

A complete necropsy was conducted on all animals dying spontaneously or at each scheduled euthanization. At the scheduled necropsies, all animals were euthanized with an intravenous injection of sodium pentobarbital and exsanguinated. The necropsy included, but was not limited to, examination of the external surface, all orifices and the cranial, thoracic, abdominal and pelvic cavities including viscera. At the time of necropsy, the following tissues and organs were collected and preserved in 10% neutral buffered formalin:

Adrenals (2)
Aorta
Bone with marrow (sternebrae)
Brain (forebrain, midbrain, hindbrain)
Eyes with optic nerve (2)
Gastrointestinal tract
  Esophagus
  Stomach
  Duodenum
  Jejunum
  Ileum
  Cecum
  Colon
  Rectum
Heart
Kidneys (2)
Liver (sections of two lobes)
Lungs [including bronchi, fixed by inflation with fixative (2)]
Lymph node
  Bronchial
  Mesenteric
  Suprapharyngeal
Mammary gland[a] (females only)
Nasal turbinates[b]
Ovaries with oviducts (2)
Pancreas
Parathyroids (if present)
Peripheral nerve (sciatic)
Pituitary
Prostate
Salivary glands [submaxillary (2)]
Seminal vesicles (2)
Skeletal muscle (vastus medialis)
Skin
Spinal cord (cervical, midthoracic, lumbar)
Spleen
Testes with epididymides (2)
Thymus
Thyroids
Trachea
Urinary bladder
Uterus with vagina
All gross lesions

[a] = Also examined in the control and high-exposure group males at the study week 4 and 6 necropsies.
[b] = The entire head, after removal of other appropriate specified tissues, was preserved in 10% neutral buffered formalin.

2. <u>ORGAN WEIGHTS</u>

The following organs from all animals euthanized at the study week 4 and 6 necropsies were weighed:

Adrenals	Lungs
Brain	Ovaries
Heart	Spleen
Kidneys	Testes with epididymides
Liver	Thymus

Paired organs were weighed together. Organ to final body weight ratios were calculated.

3. MICROSCOPIC EXAMINATION

Microscopic examination of the nasal cavities was performed on all animals. Following fixation, the skulls were decalcified until soft. Six cross sections of the nasal cavities were prepared for microscopic examination in accordance with the method described by Morgan[2].

After fixation, all other tissues listed in Section IV.M.1. were trimmed as described by Thompson[3]. Trimmed specimens were placed into properly labeled and numbered cassettes. The fixed tissue samples were processed into paraffin blocks. The labeled paraffin blocks were sectioned at 5-8 microns, and the paraffin ribbons of the sectioned tissue were placed on clean glass microscope slides labeled with the appropriate study, animal, group and cassette numbers. Upon completion of staining with hematoxylin and eosin (AFIP Manual of Histologic Staining Methods[4]), coverslips were placed on the slides. All tissues listed in Section IV.M.1. were examined microscopically from all animals in the control and high-exposure groups at the scheduled necropsies (study weeks 4 and 6) and from all animals that were found dead. The nasal turbinates, lungs, trachea, kidneys, liver and gross lesions were examined from all animals in the low- and mid-exposure groups at the scheduled necropsies.

Microscopic examinations were performed by Carney B. Jackson, D.V.M., Diplomate A.C.V.P., Assistant Director of Pathology and Veterinary Medicine, WIL Research Laboratories, Inc.

N. STATISTICAL METHODS

All analyses were conducted using two-tailed tests for minimum significance levels of 1% and 5% comparing the treatment groups to the vehicle control group by sex. All means were presented with standard deviations (S.D.) and the numbers of sampling units (N) used to calculate the means. All statistical tests were performed by a Digital® MicroVAX® 3400 computer with appropriate programming. Body weight, body weight change, food consumption, clinical laboratory and absolute and relative organ weight data were subjected to a one-way analysis of variance (ANOVA) followed by Dunnett's test[5]. Continuous Functional Observational Battery (FOB) data were analyzed using a one-way ANOVA. If significant differences were indicated by the ANOVA, Dunnetts' test[5] was used to compare the control and treated groups. Discontinuous (ordinal or descriptive) FOB data were analyzed using Fisher's Exact test[5] to determine significant treatment differences from the control group.

Clinical laboratory values for leukocytes that occur at a low incidence (monocytes, eosinophils, basophils, unsegmented neutrophils) were not subjected to statistical analyses.

O. DATA RETENTION

The sponsor will have title to all documentation records, raw data, specimens or other work product generated during the performance of the study. All work product including raw paper data and specimens will be retained in the archives at WIL Research Laboratories, Inc., as specified in the protocol.

Raw data in magnetic form, retention sample(s) of the test article and the original final report will be retained in the archives at WIL Research Laboratories, Inc., in compliance with regulatory requirements.

V. RESULTS

A. CLINICAL OBSERVATIONS AND SURVIVAL

Summary Data: Tables 1, 2, 3, 4, 5, 6

Individual Data: Table 47, Appendix F

Four animals in the control group (male nos. 44125 and 44335 and female nos. 44157 and 44166), one female in the low-exposure group (no. 44194), one female in the mid-exposure group (no. 44148) and five animals in the high-exposure group (male no. 44120 and female nos. 44163, 44173, 44188 and 44348) were found dead during the exposure phase of the study. Of these, six animals (control group nos. 44125, 44335 and 44157, mid-exposure group no. 44148 and high-exposure group nos. 44120 and 44163) were found dead during the first week of exposure (study days 5 and 6), two animals (control group no. 44166 and high-exposure group no. 44188) were found dead during the second week of exposure (study days 12 and 8, respectively), one animal (low-exposure group no. 44194) was found dead on study day 14 (the third week of exposure) and two animals (high-exposure group nos. 44173 and 44348) were found dead during the final week of exposure (study day 25). The cause of death for six of these animals (nos. 44125, 44335, 44157, 44166, 44194 and 44163) was attributed to mechanical trauma related to confinement in the nose-only restraint tubes. A cause of death was not determined for the remaining five animals that were found dead; however, a relationship to MSA exposure was not apparent. Clinical observations noted for these animals (including the control group) within 24 hours of death included generally unkempt appearance, rales, wet yellow matting on various body surfaces, brown matting on the urogenital or anal areas and/or soft stool. The following table summarizes these deaths:

Group No.	Target Exposure Levels (mg/L)	Males	Females
1	0	2	2
2	0.025	0	1
3	0.075	0	1
4	0.25	1	4

All other animals survived to the scheduled necropsies. Exposure-related clinical signs noted in these animals one hour following exposure included rales in the high-exposure group animals and an increased incidence of wet and dried yellow matting on various body surfaces in the mid-exposure group males and the high-exposure group males and females. In general, males tended to be more affected than females. Low incidences of rales were observed in the high-exposure group animals before each day's exposure and on nondosing days. No other test article-related clinical findings were observed throughout the exposure phase of the study. Rales were observed sporadically in the low- and mid-exposure group males and/or females one hour following exposure and before daily exposure; however, as rales occurred in these groups at a very low incidence and a dose-related response was not apparent, this finding was not considered to be toxicologically significant in the low- and mid-exposure groups. No clinical signs were noted in animals at any exposure level during the recovery period.

B. FUNCTIONAL OBSERVATIONAL BATTERY (FOB)

1. HANDLING OBSERVATIONS

Summary Data: Tables 7 through 16

Individual Data: Tables 48, 49, 50, 51, 52

During the handling observations made during study weeks 0-3, no test article-related findings were noted. Observations in the treated groups were similar to those in the control group or occurred infrequently, generally in single animals.

2. OPEN FIELD OBSERVATIONS

Summary Data: Tables 17 through 26

Individual Data: Tables 53, 54, 55, 56, 57

During the open field observations made during study weeks 0-3, no test article-related findings were noted. Observations in the treated groups were similar to those in the control group or occurred infrequently, generally in single animals. The only statistically significant ($p<0.05$) differences from the control group were an increase in the time to the first step in the mid-exposure group females at the study week 2 evaluation and an increase in urination in the low-exposure group females at the study week 3 evaluation. These differences were considered to be due to biological variation, not the test article, as similar differences were not observed in males, a dose-related response was not apparent and the differences were not large.

C. BODY WEIGHTS

Summary Data: Tables 27, 28

Individual Data: Tables 58, 59

A reduced mean body weight occurred in the high-exposure group males during the first week of exposure (study week 0-1). The difference from the

control group was statistically significant at $p<0.01$. Throughout the remainder of the exposure period (study weeks 1-2 through 3-4), mean body weight gains in the high-exposure group males were either comparable to or slightly lower than the control group values; none of the differences were statistically significant. By the end of the exposure period (study week 4), the mean body weight in the high-exposure group males was 12% lower than the control group value; the difference was statistically significant at $p<0.01$. Mean body weight gain in this group was comparable to that in the control group during the first week of the recovery period (study week 4-5) and the mean body weight in this group was within 8% of the control group value. Mean body weights and body weight gains in the low- and mid-exposure group males and females and the high-exposure group females were unaffected by exposure to the test article.

D. FOOD CONSUMPTION

Summary Data: Table 29

Individual Data: Table 60

Food consumption was slightly decreased in the high-exposure group males throughout the exposure phase of the study; the differences from the control group were statistically significant during study weeks 0-1 and 3-4 ($p<0.01$ and $p<0.05$, respectively). During the recovery period, food consumption in the high-exposure group males was similar to the control group. Food consumption in the group males and females and in the high-exposure group females was comparable to the control group throughout the study.

E. CLINICAL PATHOLOGY

1. HEMATOLOGY

Summary Data: Tables 30, 30A, 31, 32

Individual Data: Tables 61, 62, 63, 64

No test article-related effects were noted in hematology parameters at any exposure level of MSA. The only statistically significant ($p<0.05$) difference from the control group was a decreased MCHC value in the mid-exposure group females at the study week 4 evaluation. However, the difference was slight and a dose-related decrease in MCHC did not occur in the high-exposure group females. Therefore, this difference was not considered to be related to MSA exposure. No other remarkable differences were observed in hematology parameters.

2. BLOOD CHEMISTRY

Summary Data: Tables 33, 33A, 34

Individual Data: Tables 65, 66, 67

Statistically significant ($p<0.05$) differences between the control and treated groups were noted in blood urea nitrogen (BUN) and aspartate aminotransferase means at the study week 4 evaluation. The BUN mean was increased in the high-exposure group males (20 vs. 16.2 mg/dL). The mean aspartate aminotransferase value in the high-exposure group females was increased (148 vs. 116 U/L). No other differences in blood chemistry parameters between the control and treated groups were observed at any exposure level at the week 4 evaluation.

At the recovery evaluation (study week 6), BUN and aspartate aminotransferase means in the high-exposure group males and females, respectively, were similar to the control group values.

3. URINALYSIS

Summary Data: Tables 35, 36

Individual Data: Tables 68, 69

No test article-related changes in urinalysis parameters were noted at any exposure level of MSA.

F. PATHOLOGY

1. MACROSCOPIC EXAMINATION

Summary Data: Tables 37, 38, 39

Individual Data: Tables 70, 71, 72

No test article-related findings were noted at the necropsy of animals that were found dead during the study. Gross findings in the animals that were found dead during the study (dark red contents of the ileum, dark red lungs, reddened and/or enlarged lymph nodes, etc.) were seen at a similar incidence in the control group or are not uncommon findings in rats.

At the study week 4 primary necropsy, no exposure-related internal findings were observed. Dark red and/or mottled lungs were observed in various animals at all exposure levels; however, these findings were observed at a comparable incidence in the control group or were not observed in a dose-related manner. Thus, macroscopic pulmonary findings were not considered to be related to exposure to MSA. Other changes observed in the treated groups (red fluid contents in the trachea, clear fluid contents in the uterus, reddened and/or enlarged lymph nodes, etc.) were those commonly seen in laboratory rats and/or occurred infrequently, typically in single animals.

No test article-related internal findings were observed at the study week 6 recovery necropsy. Findings observed in the treated groups

(reddened and/or enlarged lymph nodes, epididymal abscess, dark red lungs, etc.) were not noted in an exposure-related manner and/or were observed similarly in the control group.

2. ORGAN WEIGHTS

Summary Data: Tables 40, 41, 42, 43

Individual Data: Tables 73, 74, 75, 76

No test article-related changes were noted in organ weight data at either necropsy. However, some statistically significant ($p<0.05$ or $p<0.01$) differences were observed between the control and the high-exposure group. At the study week 4 primary necropsy, the high-exposure group males had decreased mean absolute liver, kidney and testicular/epididymal weights and an increased heart weight relative to final body weight. However, the respective mean absolute (for heart) and relative to final body weight (for liver, kidney and testes/epididymides) organ weights were comparable to the control group values. Therefore, these differences were considered to be functions of the decreased final body weight in this group (14% lower than the control group and statistically significant at $p<0.01$), and not related to the test article. No other remarkable differences in organ weight data were observed at any exposure level of the test article.

No exposure-related changes in organ weight data were observed at the study week 6 recovery necropsy.

3. MICROSCOPIC EXAMINATION

Summary Data: Tables 44, 45, 46

Individual Data: Tables 70, 71, 72

Test article-related microscopic findings were observed in the nasal turbinates of the treated rats and consisted of degeneration of the olfactory

epithelium, goblet cell hyperplasia, squamous and respiratory epithelial metaplasia, dysplasia and various forms of inflammation. Degeneration of the olfactory epithelium was typically observed in sections 3, 4 and 5, while goblet cell hyperplasia was usually observed in sections 1 and 2.

In those animals that were found dead, test article-related lesions were observed in the nasal turbinates of the high-exposure group animals. Degeneration of the olfactory epithelium was observed in a single female. Three females had goblet cell hyperplasia and a single male had goblet cell hyperplasia and squamous metaplasia. Neutrophilic inflammation was noted in two females. Other microscopic findings in the animals that were found dead (cytoplasmic vacuolation of the liver, histiocytosis and/or plasmacytosis of various lymph nodes, renal tubular degeneration, etc.) were observed at a similar incidence in the control group, are not uncommon findings in laboratory rats, and/or were seen at low incidence, typically in single animals.

Microscopic evaluation at the study week 4 primary necropsy revealed exposure-related findings in the nasal turbinates of all treated groups. Degeneration of the olfactory epithelium was observed in 2/10, 4/10 and 2/9 males and 1/9, 2/9 and 3/6 females in the low-, mid- and high-exposure groups, respectively. Goblet cell hyperplasia was noted in 5/10, 5/10 and 7/9 males and 5/9, 4/9 and 6/6 females in the same groups, respectively. Squamous metaplasia occurred in five males and one female in the high-exposure group, and respiratory metaplasia was seen in one female in each of the low-, mid- and high-exposure groups. Dysplasia was observed in one and three males in the mid- and high-exposure groups, respectively. Various forms of inflammation (neutrophilic, nonsuppurative, etc.) were noted in the nasal cavities of many of the

treated animals and suggested a response to the mucosal irritation/degeneration caused by the test article. Similar findings were not observed in the control group. No other MSA-related microscopic findings were observed at the study week 4 evaluation. Glandular hyperplasia of the mammary gland was observed in five males and one female in the high-exposure group; however, as this finding was also observed in the control group males at the study week 6 recovery evaluation, this finding could not be considered to be a test article-related effect. Other findings in the treated animals (nonsuppurative inflammation of various organs, centrolobular hepatic necrosis, renal tubular mineralization, histiocytosis and/or plasmacytosis of various lymph nodes, etc.) were observed at a similar incidence in the control group, were probably related to abdominal compression during the confinement in the nose-only tubes and/or were not observed in a dose-related manner.

Microscopic findings observed at the study week 6 recovery evaluation were similar to those observed at the study week 4 primary evaluation. Degeneration of the olfactory epithelium was only observed in two low-exposure group males and one mid-exposure group female, indicating at least partial recovery from the effects of the test article. Goblet cell hyperplasia was noted in 3/5, 3/5 and 4/5 males and 1/5, 4/5 and 2/5 females in the low-, mid- and high-exposure groups, respectively. Squamous metaplasia was seen in one low-exposure group female, two males and one female in the mid-exposure group and four males and four females in the high-exposure group. Respiratory epithelial metaplasia was observed in a single high-exposure group male. Various forms of inflammation were noted in the nasal cavities of many of the treated animals, indicating continued response to the mucosal

irritation/degeneration caused by the test article. No other test article-related microscopic findings were observed at the study week 6 recovery evaluation. The only other histopathological finding, glandular hyperplasia of the mammary glands in the high-exposure group males, was observed at a similar incidence in the control group.

VI. DISCUSSION AND CONCLUSIONS

There were no exposure-related deaths during the study.

Exposure-related clinical signs were observed one hour following exposure and included rales in the high-exposure group animals and an increased incidence of yellow matting (wet and dried) on various body surfaces in the mid-exposure group males and the high-exposure group males and females. Low incidences of rales were also noted in the high-exposure group animals prior to exposure and on nondosing days. No clinical signs were noted in animals at any exposure level during the recovery period.

No test article-related findings were noted during the Functional Observational Battery (FOB) evaluations.

The mean body weight gain in the high-exposure group males was decreased and statistically significant during study week 0-1; mean body weight gains in the high-exposure group males were comparable to or slightly lower than the control group throughout the rest of the exposure period. At the end of the exposure phase, the mean body weight in the high-exposure group males was 12% lower the control group value. During the first week of the recovery period, the mean body weight gain in this group was higher than the control group value and the mean body weight in this group was similar to the control group value. No other test article-related differences in mean body weights or body weight gains were observed during the exposure or recovery phases of the study.

Food consumption means in the high-exposure group males were slightly decreased throughout the exposure phase of the study; the differences were statistically significant during the first and last weeks of the exposure period. No other test article-related differences in food consumption data were observed.

At the study week 4 evaluation, increased BUN and aspartate aminotransferase means were observed in the high-exposure group males and

females, respectively; the differences were statistically significant. However, these differences were quite small and there was no abnormal organ pathology that suggested a relationship to MSA exposure. At the study week 6 recovery evaluation, BUN and aspartate aminotransferase means in the high-exposure group were comparable to the control group values. No other changes in blood chemistry parameters were noted at any exposure level.

No test article-related changes were observed in hematology or urinalysis parameters at any exposure level of MSA. No test article-related gross lesions were observed in the animals that were found dead, at the study week 4 primary necropsy or at the study week 6 recovery necropsy. No MSA-related changes were noted in organ weight data at either necropsy.

Test article-related microscopic findings (degeneration of the olfactory epithelium, goblet cell hyperplasia, squamous and respiratory epithelial metaplasia, dysplasia and various forms of inflammation) were observed in the nasal turbinates of the treated rats and were indicative of a mucosal protective response to the irritative effects of the test article. In those animals that were found dead, test article-related lesions were limited to the high-exposure group animals. At the study week 4 and 6 evaluations, histopathologic lesions were observed in the low-, mid- and high-exposure groups; however, the incidence, and especially the severity, of some of the lesions observed at the study week 6 evaluation suggested at least partial recovery from the irritative effects of the test article.

In conclusion, exposure of rats to an aerosol of methane sulfonic acid resulted in changes in the clinical conditions of the animals at exposure levels of 0.073 and 0.242 mg/L, a transient reduced mean body weight gain in the 0.242 mg/L exposure level males, slightly reduced food consumption means in the 0.242 mg/L exposure level males and histopathologic lesions in the nasal turbinates of

all exposed groups. Based on the data obtained during the two-week recovery (nonexposure) period, the effects on the clinical conditions of the animals and body weight gains were completely reversible; histopathological lesions in the nasal turbinates were observed in all groups at the end of the recovery period. Based on the compound-induced lesions observed in the nasal turbinates, the no observed effect level (NOEL) for local irritation was considered to be less than 0.026 mg/L. The NOEL for systemic toxicity was considered to be 0.026 mg/L.

C.E. Ulrich — Dec. 17, 86

Charles E. Ulrich, B.S.
Study Director

Date

VII. KEY PERSONNEL AND REPORT SUBMISSION

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* = Signed for the late Dr. Dahlgren

VII. KEY PERSONNEL AND REPORT SUBMISSION (continued)

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Dec. 17, 96
Date

VIII. QUALITY ASSURANCE UNIT STATEMENT

Date(s) of Inspection(s)	Phase Inspected	Date(s) Findings Reported to Study Director	Date(s) Findings Reported to Management
11/16/95	Clinical Observations	11/16/95	12/27/95
11/16/95	Test Material Exposure	11/16/95	12/27/95
11/21/95	Animal Care/Equipment	11/21/95	12/27/95
12/14/95	Blood Collection/Analysis	12/14/95	1/29/96
12/14/95	Necropsy	12/14/95	1/29/96
2/14/96	Trimming	2/14/96	3/27/96
3/19, 22, 25 and 4/1, 3, 29/96	Study Records (I-1)	4/30/96	5/28/96
3/22, 25, 29 and 4/3, 29/96	Study Records (I-2)	4/29/96	5/28/96
3/25-26 and 4/30/96	Study Records (I-3)	4/30/96	5/28/96
3/27-28/96	Study Records (I-4)	4/26/96	5/28/96
3/28 and 4/26/96	Study Records (I-5)	4/26/96	5/28/96
3/29 and 4/26/96	Study Records (N-1)	4/29/96	5/28/96
4/2-4, 8, 26/96	Study Records (A-6)	4/30/96	5/28/96
4/3, 4, 8, 26/96	Study Records (A-5)	4/30/96	5/28/96
4/8, 26/96	Study Records (A-1, A-2)	4/29/96	5/28/96
4/9, 29/96	Study Records (C-1, C-2, C-3)	4/29/96	5/28/96
4/12/96	Study Records (A-3)	4/12/96	5/28/96
4/30/96	Study Records (N-1 Supplemental)	4/30/96	5/28/96
5/16/96	Study Records (H-1/P-1)	5/16/96	6/20/96
5/27-29, 31 and 6/3-7, 11-12/96	Draft Report (without Appendix A)	6/12/96	7/30/96
5/30-31/96	Study Records (I-6)	5/31/96	6/20/96
6/4/96	Study Records (I-5 Supplemental)	6/4/96	7/30/96
6/6/96	Study Records (I-1 Supplemental)	6/6/96	7/30/96
6/11-13, 17-18/96	Draft Report (Appendix A)	6/18/96	7/30/96

The study was conducted and inspected in accordance with the United States EPA Good Laboratory Practice Regulations, the OECD Good Laboratory Practices, the Standard Operating Procedures of WIL Research Laboratories, Inc., and the

sponsor's protocol and protocol amendments. Quality Assurance inspections, derived from the inspections during the conduct of the study and from the inspections of the raw data and draft report, are documented and have been reported to the study director. A status report is submitted to management monthly.

The raw data, the retention sample(s), if applicable, and the final report will be stored in the Archives at WIL Research Laboratories, Inc., or another location specified by the sponsor.

Deborah L. Little
Manager of Quality Assurance

12/17/96
Date

IX. REFERENCES

1. NIH (1985) Guide for the Care and Use of Laboratory Animals, United States Department of Health and Human Services, Public Health Service, National Institutes of Health, NIH Publication No. 86-23, 83 pages.

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5. BMDP (1979) Biomedical Computer Programs. (Dixon, W.J. and Brown, M.B., eds.) University of California Press, Berkeley, California, pp. 612, 780-781.

A 4-Week Inhalation Toxicity Study of Methane Sulfonic Acid in Albino Rats

SUMMARY TABLES 1 - 46

TABLE 1

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. SUMMARY OF SURVIVAL AND DISPOSITION

MALES

GROUP :	1				2				3				4			
WEEK	LIVE	FD	EE	SE	LIVE	FD	EE	SE	LIVE	FD	EE	SE	LIVE	FD	EE	SE
0	13	2	0	0	15	0	0	0	15	0	0	0	14	1	0	0
1	13	0	0	0	15	0	0	0	15	0	0	0	14	0	0	0
2	13	0	0	0	15	0	0	0	15	0	0	0	14	0	0	0
3	13	0	0	0	15	0	0	0	15	0	0	0	14	0	0	0
4	5	0	0	8	5	0	0	10	5	0	0	10	5	0	0	9
5	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
6	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5

WEEK = WEEK OF STUDY FD = FOUND DEAD EE = EUTHANIZED IN EXTREMIS SE = SCHEDULED EUTHANIZATION

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 1

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. SUMMARY OF SURVIVAL AND DISPOSITION

FEMALES

GROUP :	1				2				3				4			
WEEK	LIVE	FD	EE	SE	LIVE	FD	EE	SE	LIVE	FD	EE	SE	LIVE	FD	EE	SE
0	14	1	0	0	15	0	0	0	14	1	0	0	14	1	0	0
1	13	1	0	0	15	0	0	0	14	0	0	0	13	1	0	0
2	13	0	0	0	14	1	0	0	14	0	0	0	13	0	0	0
3	13	0	0	0	14	0	0	0	14	0	0	0	11	2	0	0
4	5	0	0	8	5	0	0	9	5	0	0	9	5	0	0	6
5	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
6	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5

WEEK = WEEK OF STUDY FD = FOUND DEAD EE = EUTHANIZED IN EXTREMIS SE = SCHEDULED EUTHANIZATION

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 2 (WEEKLY PHYSICAL EXAMINATIONS/DISPOSITIONS)

PROJECT NO.:WIL-160033 — A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS — PAGE 1

SPONSOR:ELF ATOCHEM INC. — SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE: 11-16-95 TO 12-28-95

GROUP:	1	2	3	4
DISPOSITION				
-FOUND DEAD	2/ 2	0/ 0	0/ 0	1/ 1
-PRIMARY NECROPSY	8/ 8	10/ 10	10/ 10	9/ 9
-RECOVERY NECROPSY	5/ 5	5/ 5	5/ 5	5/ 5

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 2 (WEEKLY PHYSICAL EXAMINATIONS/DISPOSITIONS)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE: 11-16-95 TO 12-28-95

GROUP:	1	2	3	4
DISPOSITION				
-FOUND DEAD	2/ 2	1/ 1	1/ 1	4/ 4
-PRIMARY NECROPSY	8/ 8	9/ 9	9/ 9	6/ 6
-RECOVERY NECROPSY	5/ 5	5/ 5	5/ 5	5/ 5

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 3 (PRIOR TO EXPOSURE)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE: 11-16-95 TO 12-14-95

GROUP:	1	2	3	4
CARDIO-PULMONARY				
-RALES	0/ 0	2/ 2	1/ 1	8/ 7
EXCRETA				
-SOFT STOOL	1/ 1	0/ 0	1/ 1	0/ 0
-WET YELLOW UROGENITAL AREA MATTING	4/ 4	3/ 3	4/ 4	6/ 6
-WET YELLOW VENTRAL ABDOMINAL AREA MATTING	2/ 2	0/ 0	0/ 0	1/ 1
-DRIED YELLOW UROGENITAL AREA MATTING	0/ 0	0/ 0	2/ 1	1/ 1
-DRIED YELLOW VENTRAL ABDOMINAL AREA MATTING	0/ 0	0/ 0	0/ 0	1/ 1
-DRIED YELLOW VENTRAL THORACIC AREA MATTING	0/ 0	0/ 0	0/ 0	1/ 1
-WET YELLOW DORSAL POSTERIOR AREA MATTING	0/ 0	1/ 1	2/ 2	2/ 2
-WET BROWN UROGENITAL AREA MATTING	0/ 0	0/ 0	1/ 1	1/ 1
-WET YELLOW DORSAL ABDOMINAL AREA MATTING	0/ 0	0/ 0	1/ 1	0/ 0
-BROWN MATTING AROUND ANUS	2/ 2	0/ 0	3/ 2	3/ 2
-DRIED YELLOW DORSAL ABDOMINAL AREA MATTING	0/ 0	0/ 0	0/ 0	1/ 1
ORAL/DENTAL				
-DRIED YELLOW CRANIAL AREA MATTING	0/ 0	2/ 2	0/ 0	0/ 0
BODY/INTEGUMENT				
-DRIED GREEN CRANIAL AREA MATTING	0/ 0	0/ 0	0/ 0	3/ 1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 3 (PRIOR TO EXPOSURE)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE:	11-16-95 TO 12-14-95			
GROUP:	1	2	3	4
CARDIO-PULMONARY				
-RALES	0/ 0	0/ 0	0/ 0	3/ 1
EXCRETA				
-WET YELLOW UROGENITAL AREA MATTING	3/ 3	3/ 3	1/ 1	1/ 1
-WET YELLOW VENTRAL ABDOMINAL AREA MATTING	1/ 1	1/ 1	2/ 2	0/ 0
-WET YELLOW VENTRAL THORACIC AREA MATTING	0/ 0	0/ 0	1/ 1	0/ 0
-DRIED YELLOW UROGENITAL AREA MATTING	2/ 2	1/ 1	4/ 3	4/ 4
-DRIED YELLOW VENTRAL ABDOMINAL AREA MATTING	0/ 0	0/ 0	0/ 0	3/ 3
-DRIED YELLOW VENTRAL THORACIC AREA MATTING	0/ 0	0/ 0	0/ 0	1/ 1
-WET YELLOW DORSAL POSTERIOR AREA MATTING	1/ 1	3/ 3	1/ 1	2/ 2
-WET BROWN UROGENITAL AREA MATTING	1/ 1	1/ 1	2/ 2	2/ 2
-WET BROWN DORSAL POSTERIOR MATTING	1/ 1	1/ 1	1/ 1	2/ 2
-WET YELLOW DORSAL ABDOMINAL AREA MATTING	1/ 1	0/ 0	2/ 1	0/ 0
-WET YELLOW DORSAL THORACIC AREA MATTING	0/ 0	0/ 0	1/ 1	0/ 0
-WET BROWN VENTRAL ABDOMINAL AREA MATTING	0/ 0	0/ 0	0/ 0	1/ 1
-BROWN MATTING AROUND ANUS	1/ 1	0/ 0	5/ 3	0/ 0
-DRIED YELLOW DORSAL ABDOMINAL AREA MATTING	0/ 0	0/ 0	2/ 2	0/ 0

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 4 (1-HOUR POST-EXPOSURE)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE:	11-16-95 TO 12-14-95			
GROUP:	1	2	3	4
BEHAVIOR/CNS				
-GENERALLY UNKEMPT APPEARANCE	3/ 3	0/ 0	0/ 0	0/ 0
CARDIO-PULMONARY				
-RALES	0/ 0	2/ 2	3/ 1	35/ 11
EXCRETA				
-SOFT STOOL	1/ 1	0/ 0	1/ 1	0/ 0
-WET YELLOW UROGENITAL AREA MATTING	70/ 13	84/ 13	135/ 15	165/ 15
-WET YELLOW VENTRAL ABDOMINAL AREA MATTING	16/ 6	14/ 7	27/ 10	39/ 14
-WET YELLOW VENTRAL THORACIC AREA MATTING	5/ 3	2/ 2	8/ 5	17/ 7
-WET YELLOW MATTING VENTRAL NECK	1/ 1	0/ 0	0/ 0	4/ 3
-DRIED YELLOW UROGENITAL AREA MATTING	1/ 1	0/ 0	0/ 0	0/ 0
-DRIED YELLOW VENTRAL ABDOMINAL AREA MATTING	0/ 0	2/ 2	0/ 0	1/ 1
-WET YELLOW DORSAL POSTERIOR AREA MATTING	16/ 9	16/ 7	55/ 15	50/ 13
-WET BROWN UROGENITAL AREA MATTING	6/ 4	1/ 1	15/ 8	12/ 7
-WET BROWN DORSAL POSTERIOR MATTING	3/ 3	3/ 3	1/ 1	5/ 3
-WET YELLOW DORSAL ABDOMINAL AREA MATTING	8/ 7	7/ 5	33/ 13	19/ 8
-WET YELLOW DORSAL THORACIC AREA MATTING	6/ 6	3/ 3	15/ 10	10/ 5
-WET BROWN VENTRAL ABDOMINAL AREA MATTING	1/ 1	0/ 0	0/ 0	1/ 1
-BROWN MATTING AROUND ANUS	1/ 1	0/ 0	1/ 1	0/ 0
ORAL/DENTAL				
-WET YELLOW FACIAL AREA MATTING	0/ 0	0/ 0	0/ 0	2/ 1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 4 (1-HOUR POST-EXPOSURE)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE:	11-16-95 TO 12-14-95			
GROUP:	1	2	3	4
ORAL/DENTAL				
-WET YELLOW CRANIAL AREA MATTING	3/ 3	2/ 2	8/ 7	6/ 4
-DRIED YELLOW CRANIAL AREA MATTING	0/ 0	0/ 0	0/ 0	1/ 1
-WET RED CRANIAL AREA MATTING	0/ 0	1/ 1	0/ 0	0/ 0
BODY/INTEGUMENT				
-DRIED GREEN CRANIAL AREA MATTING	0/ 0	0/ 0	0/ 0	2/ 1
-WET GREEN CRANIAL AREA MATTING	0/ 0	0/ 0	0/ 0	4/ 2

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 4 (1-HOUR POST-EXPOSURE)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE:	11-16-95 TO 12-14-95			
GROUP:	1	2	3	4
BEHAVIOR/CNS				
-GENERALLY UNKEMPT APPEARANCE	2/ 2	1/ 1	0/ 0	0/ 0
CARDIO-PULMONARY				
-RALES	0/ 0	0/ 0	3/ 3	18/ 8
EXCRETA				
-SOFT STOOL	0/ 0	0/ 0	1/ 1	1/ 1
-WET YELLOW UROGENITAL AREA MATTING	80/ 14	79/ 15	55/ 11	98/ 15
-WET YELLOW VENTRAL ABDOMINAL AREA MATTING	31/ 10	35/ 11	29/ 10	25/ 9
-WET YELLOW VENTRAL THORACIC AREA MATTING	12/ 6	20/ 9	18/ 7	14/ 7
-WET YELLOW MATTING VENTRAL NECK	0/ 0	4/ 2	3/ 3	0/ 0
-DRIED YELLOW UROGENITAL AREA MATTING	1/ 1	2/ 2	0/ 0	1/ 1
-DRIED YELLOW VENTRAL ABDOMINAL AREA MATTING	1/ 1	4/ 3	2/ 2	4/ 3
-DRIED YELLOW VENTRAL THORACIC AREA MATTING	0/ 0	2/ 2	1/ 1	2/ 2
-WET YELLOW DORSAL POSTERIOR AREA MATTING	17/ 9	26/ 10	29/ 9	29/ 12
-WET BROWN UROGENITAL AREA MATTING	31/ 8	45/ 11	75/ 11	42/ 12
-WET BROWN DORSAL POSTERIOR MATTING	7/ 4	11/ 4	42/ 9	31/ 8
-WET YELLOW DORSAL ABDOMINAL AREA MATTING	0/ 0	13/ 7	5/ 4	8/ 6
-WET YELLOW DORSAL THORACIC AREA MATTING	2/ 2	11/ 7	4/ 2	3/ 3
-WET BROWN VENTRAL ABDOMINAL AREA MATTING	4/ 3	4/ 4	15/ 6	13/ 4
-WET BROWN VENTRAL THORACIC AREA MATTING	0/ 0	3/ 3	6/ 2	6/ 3

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 4 (1-HOUR POST-EXPOSURE)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE:	11-16-95 TO 12-14-95			
GROUP:	1	2	3	4
EXCRETA				
-BROWN MATTING AROUND ANUS	0/ 0	1/ 1	2/ 2	3/ 3
-DRIED YELLOW DORSAL ABDOMINAL AREA MATTING	0/ 0	1/ 1	0/ 0	0/ 0
-DRIED BROWN DORSAL POSTERIOR AREA MATTING	0/ 0	0/ 0	1/ 1	0/ 0
-DRIED YELLOW DORSAL POSTERIOR AREA MATTING	0/ 0	1/ 1	0/ 0	0/ 0
ORAL/DENTAL				
-WET YELLOW FACIAL AREA MATTING	0/ 0	2/ 2	0/ 0	0/ 0
-WET YELLOW CRANIAL AREA MATTING	6/ 6	14/ 7	9/ 4	5/ 5
-WET RED CRANIAL AREA MATTING	1/ 1	0/ 0	0/ 0	0/ 0
BODY/INTEGUMENT				
-WET GREEN DORSAL ABDOMINAL AREA MATTING	0/ 0	0/ 0	0/ 0	1/ 1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 5 (NONEXPOSURE DAYS)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE:	11-16-95 TO 12-14-95			
GROUP:	1	2	3	4
BEHAVIOR/CNS				
-GENERALLY UNKEMPT APPEARANCE	0/ 0	0/ 0	0/ 0	1/ 1
CARDIO-PULMONARY				
-RALES	0/ 0	0/ 0	0/ 0	2/ 2
EYES/EARS/NOSE				
-DRIED RED MATERIAL AROUND NOSE	1/ 1	0/ 0	0/ 0	0/ 0
ORAL/DENTAL				
-DRIED RED CRANIAL AREA MATTING	0/ 0	0/ 0	0/ 0	1/ 1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 5 (NONEXPOSURE DAYS)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE:	11-16-95 TO 12-14-95			
GROUP:	1	2	3	4
EYES/EARS/NOSE				
-DRIED RED MATERIAL AROUND NOSE	0/ 0	1/ 1	0/ 0	0/ 0

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 6 (DAILY EXAMINATIONS - RECOVERY PERIOD)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE:	12-15-95 TO 12-27-95			
GROUP:	1	2	3	4

NO SIGNIFICANT CLINICAL FINDINGS WERE OBSERVED

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 6 (DAILY EXAMINATIONS - RECOVERY PERIOD)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE:	12-15-95 TO 12-27-95			
GROUP:	1	2	3	4
NO SIGNIFICANT CLINICAL FINDINGS WERE OBSERVED				

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 7 (PRETEST EVALUATION)

PROJECT NO.:WIL-160033 — A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS — PAGE 1

SPONSOR:ELF ATOCHEM INC. — FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE — PRETEST

HANDLING OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	15
EASE OF REMOVAL				
VERY EASY: ANIMAL SITS QUIETLY, ALLOWS INVESTIGATOR TO PICK IT UP	13	13	11	12
EASY: WITH/WITHOUT VOCALIZATION, WITHOUT RESISTANCE OR SLIGHT RESISTANCE	2	0	3	3
DIFFICULT: RUNS AROUND CAGE, IS HARD TO GRAB, WITH/WITHOUT VOCALIZATION	0	2	1	0
EASE OF HANDLING IN HAND				
LOW: NO RESISTANCE, ANIMAL IS EASY TO HANDLE	14	13	11	13
MODERATELY LOW: SLIGHT RESISTANCE TO BEING HANDLED, WITH/WITHOUT VOCALIZATION	1	2	4	2
LACRIMATION				
NONE	15	15	15	15
CHROMODACRYORRHEA				
ABSENT	15	15	15	15
SALIVATION				
NONE	15	15	15	15
PILOERECTION				
NONE	15	15	15	15
FUR APPEARANCE				
NORMAL: CLEAN AND GROOMED	15	15	15	15
PALPEBRAL CLOSURE				
EYELIDS WIDE OPEN	15	15	15	15

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 7 (PRETEST EVALUATION)

PROJECT NO.:WIL-160033 — A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS — PAGE 2

SPONSOR:ELF ATOCHEM INC. — FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE — PRETEST

HANDLING OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	15
RESPIRATORY RATE				
NORMAL: BY OBSERVATION (80-110/MIN.)	15	15	15	15
RESPIRATORY CHARACTER				
NORMAL	15	15	15	15
RED DEPOSITS - eyes				
ABSENT	15	15	15	15
RED DEPOSITS - nose				
PRESENT	1	2	2	3
ABSENT	14	13	13	12
RED DEPOSITS - mouth				
ABSENT	15	15	15	15
CRUSTY DEPOSITS - eyes				
ABSENT	15	15	15	15
CRUSTY DEPOSITS - nose				
ABSENT	15	15	15	15
CRUSTY DEPOSITS - mouth				
ABSENT	15	15	15	15
MUCOUS MEMBRANES - color				
PINK	15	15	15	15

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 7 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	15
EYES - color				
PINK	15	15	15	15
SKIN - color				
PINK	15	15	15	15
EYE PROMINENCE				
NORMAL	15	15	15	15
MUSCLE TONE				
MUSCLE IS FIRM BUT NOT HARD (NORMAL)	15	15	15	15

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 7 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	15
EASE OF REMOVAL				
VERY EASY: ANIMAL SITS QUIETLY, ALLOWS INVESTIGATOR TO PICK IT UP	12	14	14	11
EASY: WITH/WITHOUT VOCALIZATION, WITHOUT RESISTANCE OR SLIGHT RESISTANCE	3	0	1	3
FREEZES: WITH/WITHOUT VOCALIZATION	0	0	0	1
DIFFICULT: RUNS AROUND CAGE, IS HARD TO GRAB, WITH/WITHOUT VOCALIZATION	0	1	0	0
EASE OF HANDLING IN HAND				
LOW: NO RESISTANCE, ANIMAL IS EASY TO HANDLE	14	12	13	11
MODERATELY LOW: SLIGHT RESISTANCE TO BEING HANDLED, WITH/WITHOUT VOCALIZATION	1	3	2	4
LACRIMATION				
NONE	15	15	15	15
CHROMODACRYORRHEA				
ABSENT	15	15	15	15
SALIVATION				
NONE	15	15	15	15
PILOERECTION				
NONE	15	15	15	15
FUR APPEARANCE				
NORMAL: CLEAN AND GROOMED	15	15	15	15
PALPEBRAL CLOSURE				
EYELIDS WIDE OPEN	15	15	15	15

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 7 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	15
RESPIRATORY RATE				
NORMAL: BY OBSERVATION (80-110/MIN.)	15	15	15	15
RESPIRATORY CHARACTER				
NORMAL	15	15	15	15
RED DEPOSITS - eyes				
PRESENT	0	1	0	0
ABSENT	15	14	15	15
RED DEPOSITS - nose				
PRESENT	0	1	1	0
ABSENT	15	14	14	15
RED DEPOSITS - mouth				
ABSENT	15	15	15	15
CRUSTY DEPOSITS - eyes				
ABSENT	15	15	15	15
CRUSTY DEPOSITS - nose				
ABSENT	15	15	15	15
CRUSTY DEPOSITS - mouth				
PRESENT	0	0	1	0
ABSENT	15	15	14	15

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 7 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	15
MUCOUS MEMBRANES - color				
PINK	15	15	15	15
EYES - color				
PINK	15	15	15	15
SKIN - color				
PINK	15	15	15	15
EYE PROMINENCE				
NORMAL	15	15	15	15
MUSCLE TONE				
MUSCLE IS FIRM BUT NOT HARD (NORMAL)	15	15	15	15

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 8 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
MALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	15
EASE OF REMOVAL				
VERY EASY: ANIMAL SITS QUIETLY, ALLOWS INVESTIGATOR TO PICK IT UP	86.7	86.7	73.3	80.0
EASY: WITH/WITHOUT VOCALIZATION, WITHOUT RESISTANCE OR SLIGHT RESISTANCE	13.3	0.	20.0	20.0
DIFFICULT: RUNS AROUND CAGE, IS HARD TO GRAB, WITH/WITHOUT VOCALIZATION	0.	13.3	6.7	0.
EASE OF HANDLING IN HAND				
LOW: NO RESISTANCE, ANIMAL IS EASY TO HANDLE	93.3	86.7	73.3	86.7
MODERATELY LOW: SLIGHT RESISTANCE TO BEING HANDLED, WITH/WITHOUT VOCALIZATION	6.7	13.3	26.7	13.3
LACRIMATION				
NONE	100.	100.	100.	100.
CHROMODACRYORRHEA				
ABSENT	100.	100.	100.	100.
SALIVATION				
NONE	100.	100.	100.	100.
PILOERECTION				
NONE	100.	100.	100.	100.
FUR APPEARANCE				
NORMAL: CLEAN AND GROOMED	100.	100.	100.	100.
PALPEBRAL CLOSURE				
EYELIDS WIDE OPEN	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 8 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
MALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	15
RESPIRATORY RATE				
NORMAL: BY OBSERVATION (80-110/MIN.)	100.	100.	100.	100.
RESPIRATORY CHARACTER				
NORMAL	100.	100.	100.	100.
RED DEPOSITS - eyes				
ABSENT	100.	100.	100.	100.
RED DEPOSITS - nose				
PRESENT	6.7	13.3	13.3	20.0
ABSENT	93.3	86.7	86.7	80.0
RED DEPOSITS - mouth				
ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - eyes				
ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - nose				
ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - mouth				
ABSENT	100.	100.	100.	100.
MUCOUS MEMBRANES - color				
PINK	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 8 (PRETEST EVALUATION)

PROJECT NO.:WIL-160033 | A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS | PAGE 3

SPONSOR:ELF ATOCHEM INC. | FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE | PRETEST

HANDLING OBSERVATIONS
MALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	15
EYES - color				
PINK	100.	100.	100.	100.
SKIN - color				
PINK	100.	100.	100.	100.
EYE PROMINENCE				
NORMAL	100.	100.	100.	100.
MUSCLE TONE				
MUSCLE IS FIRM BUT NOT HARD (NORMAL)	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 8 (PRETEST EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE PRETEST

HANDLING OBSERVATIONS
FEMALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	15
EASE OF REMOVAL				
VERY EASY: ANIMAL SITS QUIETLY, ALLOWS INVESTIGATOR TO PICK IT UP	80.0	93.3	93.3	73.3
EASY: WITH/WITHOUT VOCALIZATION, WITHOUT RESISTANCE OR SLIGHT RESISTANCE	20.0	0.	6.7	20.0
FREEZES: WITH/WITHOUT VOCALIZATION	0.	0.	0.	6.7
DIFFICULT: RUNS AROUND CAGE, IS HARD TO GRAB, WITH/WITHOUT VOCALIZATION	0.	6.7	0.	0.
EASE OF HANDLING IN HAND				
LOW: NO RESISTANCE, ANIMAL IS EASY TO HANDLE	93.3	80.0	86.7	73.3
MODERATELY LOW: SLIGHT RESISTANCE TO BEING HANDLED, WITH/WITHOUT VOCALIZATION	6.7	20.0	13.3	26.7
LACRIMATION				
NONE	100.	100.	100.	100.
CHROMODACRYORRHEA				
ABSENT	100.	100.	100.	100.
SALIVATION				
NONE	100.	100.	100.	100.
PILOERECTION				
NONE	100.	100.	100.	100.
FUR APPEARANCE				
NORMAL: CLEAN AND GROOMED	100.	100.	100.	100.
PALPEBRAL CLOSURE				
EYELIDS WIDE OPEN	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 8 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
FEMALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	15
RESPIRATORY RATE				
NORMAL: BY OBSERVATION (80-110/MIN.)	100.	100.	100.	100.
RESPIRATORY CHARACTER				
NORMAL	100.	100.	100.	100.
RED DEPOSITS - eyes				
PRESENT	0.	6.7	0.	0.
ABSENT	100.	93.3	100.	100.
RED DEPOSITS - nose				
PRESENT	0.	6.7	6.7	0.
ABSENT	100.	93.3	93.3	100.
RED DEPOSITS - mouth				
ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - eyes				
ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - nose				
ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - mouth				
PRESENT	0.	0.	6.7	0.
ABSENT	100.	100.	93.3	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 8 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
FEMALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	15
MUCOUS MEMBRANES - color				
PINK	100.	100.	100.	100.
EYES - color				
PINK	100.	100.	100.	100.
SKIN - color				
PINK	100.	100.	100.	100.
EYE PROMINENCE				
NORMAL	100.	100.	100.	100.
MUSCLE TONE				
MUSCLE IS FIRM BUT NOT HARD (NORMAL)	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 9 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	14
EASE OF REMOVAL				
VERY EASY: ANIMAL SITS QUIETLY, ALLOWS INVESTIGATOR TO PICK IT UP	6	7	9	4
EASY: WITH/WITHOUT VOCALIZATION, WITHOUT RESISTANCE OR SLIGHT RESISTANCE	7	7	5	8
MODERATELY DIFFICULT: ANIMAL REARS, OFTEN FOLLOWING INVESTIGATOR'S HAND	0	1	0	0
FREEZES: WITH/WITHOUT VOCALIZATION	2	0	1	2
EASE OF HANDLING IN HAND				
LOW: NO RESISTANCE, ANIMAL IS EASY TO HANDLE	15	15	15	13
MODERATELY LOW: SLIGHT RESISTANCE TO BEING HANDLED, WITH/WITHOUT VOCALIZATION	0	0	0	1
LACRIMATION				
NONE	15	15	15	14
CHROMODACRYORRHEA				
ABSENT	15	15	15	14
SALIVATION				
NONE	15	15	15	14
PILOERECTION				
NONE	15	15	15	14
FUR APPEARANCE				
NORMAL: CLEAN AND GROOMED	15	15	15	11
SLIGHTLY SOILED	0	0	0	3
PALPEBRAL CLOSURE				
EYELIDS WIDE OPEN	15	15	15	14

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 9 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	14
RESPIRATORY RATE				
NORMAL: BY OBSERVATION (80-110/MIN.)	15	15	15	14
RESPIRATORY CHARACTER				
NORMAL	15	15	15	13
RALES: ABNORMAL SOUND ACCOMPANYING BREATHING	0	0	0	1
RED DEPOSITS - eyes				
ABSENT	15	15	15	14
RED DEPOSITS - nose				
ABSENT	15	15	15	14
RED DEPOSITS - mouth				
ABSENT	15	15	15	14
CRUSTY DEPOSITS - eyes				
ABSENT	15	15	15	14
CRUSTY DEPOSITS - nose				
ABSENT	15	15	15	14
CRUSTY DEPOSITS - mouth				
ABSENT	15	15	15	14
MUCOUS MEMBRANES - color				
PINK	15	15	15	14

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 9 (WEEK 0 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE WEEK 0

HANDLING OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	14
EYES - color				
PINK	15	15	15	14
SKIN - color				
PINK	15	15	15	14
EYE PROMINENCE				
NORMAL	15	15	15	14
MUSCLE TONE				
MUSCLE IS FIRM BUT NOT HARD (NORMAL)	15	15	15	14

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 9 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	15
EASE OF REMOVAL				
VERY EASY: ANIMAL SITS QUIETLY, ALLOWS INVESTIGATOR TO PICK IT UP	8	10	10	5
EASY: WITH/WITHOUT VOCALIZATION, WITHOUT RESISTANCE OR SLIGHT RESISTANCE	6	5	2	8
MODERATELY DIFFICULT: ANIMAL REARS, OFTEN FOLLOWING INVESTIGATOR'S HAND	0	0	3	1
FREEZES: WITH/WITHOUT VOCALIZATION	1	0	0	0
DIFFICULT: RUNS AROUND CAGE, IS HARD TO GRAB, WITH/WITHOUT VOCALIZATION	0	0	0	1
EASE OF HANDLING IN HAND				
LOW: NO RESISTANCE, ANIMAL IS EASY TO HANDLE	14	15	15	14
MODERATELY LOW: SLIGHT RESISTANCE TO BEING HANDLED, WITH/WITHOUT VOCALIZATION	1	0	0	1
LACRIMATION				
NONE	15	15	15	15
CHROMODACRYORRHEA				
ABSENT	15	15	15	15
SALIVATION				
NONE	15	15	15	15
PILOERECTION				
NONE	15	15	15	15
FUR APPEARANCE				
NORMAL: CLEAN AND GROOMED	15	15	15	14
SLIGHTLY SOILED	0	0	0	1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 9 (WEEK 0 EVALUATION)

PROJECT NO.:WIL-160033 — A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS — PAGE 5

SPONSOR:ELF ATOCHEM INC. — FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE — WEEK 0

HANDLING OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	15
PALPEBRAL CLOSURE				
EYELIDS WIDE OPEN	15	15	15	15
RESPIRATORY RATE				
NORMAL: BY OBSERVATION (80-110/MIN.)	15	15	15	15
RESPIRATORY CHARACTER				
NORMAL	15	15	15	15
RED DEPOSITS - eyes				
ABSENT	15	15	15	15
RED DEPOSITS - nose				
PRESENT	0	0	0	1
ABSENT	15	15	15	14
RED DEPOSITS - mouth				
ABSENT	15	15	15	15
CRUSTY DEPOSITS - eyes				
ABSENT	15	15	15	15
CRUSTY DEPOSITS - nose				
ABSENT	15	15	15	15
CRUSTY DEPOSITS - mouth				
ABSENT	15	15	15	15

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 9 (WEEK 0 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE WEEK 0

HANDLING OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	15
MUCOUS MEMBRANES - color				
PINK	15	15	15	15
EYES - color				
PINK	15	15	15	15
SKIN - color				
PINK	15	15	15	15
EYE PROMINENCE				
NORMAL	15	15	15	15
MUSCLE TONE				
MUSCLE IS FIRM BUT NOT HARD (NORMAL)	15	15	15	15

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 10 (WEEK 0 EVALUATION)

PROJECT NO.:WIL-160033 — A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS — PAGE 1

SPONSOR:ELF ATOCHEM INC. — FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE — WEEK 0

HANDLING OBSERVATIONS
MALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	14
EASE OF REMOVAL				
VERY EASY: ANIMAL SITS QUIETLY, ALLOWS INVESTIGATOR TO PICK IT UP	40.0	46.7	60.0	28.6
EASY: WITH/WITHOUT VOCALIZATION, WITHOUT RESISTANCE OR SLIGHT RESISTANCE	46.7	46.7	33.3	57.1
MODERATELY DIFFICULT: ANIMAL REARS, OFTEN FOLLOWING INVESTIGATOR'S HAND	0.	6.7	0.	0.
FREEZES: WITH/WITHOUT VOCALIZATION	13.3	0.	6.7	14.3
EASE OF HANDLING IN HAND				
LOW: NO RESISTANCE, ANIMAL IS EASY TO HANDLE	100.	100.	100.	92.9
MODERATELY LOW: SLIGHT RESISTANCE TO BEING HANDLED, WITH/WITHOUT VOCALIZATION	0.	0.	0.	7.1
LACRIMATION				
NONE	100.	100.	100.	100.
CHROMODACRYORRHEA				
ABSENT	100.	100.	100.	100.
SALIVATION				
NONE	100.	100.	100.	100.
PILOERECTION				
NONE	100.	100.	100.	100.
FUR APPEARANCE				
NORMAL: CLEAN AND GROOMED	100.	100.	100.	78.6
SLIGHTLY SOILED	0.	0.	0.	21.4
PALPEBRAL CLOSURE				
EYELIDS WIDE OPEN	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 10 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
MALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	14
RESPIRATORY RATE				
NORMAL: BY OBSERVATION (80-110/MIN.)	100.	100.	100.	100.
RESPIRATORY CHARACTER				
NORMAL	100.	100.	100.	92.9
RALES: ABNORMAL SOUND ACCOMPANYING BREATHING	0.	0.	0.	7.1
RED DEPOSITS - eyes				
ABSENT	100.	100.	100.	100.
RED DEPOSITS - nose				
ABSENT	100.	100.	100.	100.
RED DEPOSITS - mouth				
ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - eyes				
ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - nose				
ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - mouth				
ABSENT	100.	100.	100.	100.
MUCOUS MEMBRANES - color				
PINK	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 10 (WEEK 0 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE WEEK 0

HANDLING OBSERVATIONS

MALES

PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	14
EYES - color				
PINK	100.	100.	100.	100.
SKIN - color				
PINK	100.	100.	100.	100.
EYE PROMINENCE				
NORMAL	100.	100.	100.	100.
MUSCLE TONE				
MUSCLE IS FIRM BUT NOT HARD (NORMAL)	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 10 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
FEMALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	15
EASE OF REMOVAL				
VERY EASY: ANIMAL SITS QUIETLY, ALLOWS INVESTIGATOR TO PICK IT UP	53.3	66.7	66.7	33.3
EASY: WITH/WITHOUT VOCALIZATION, WITHOUT RESISTANCE OR SLIGHT RESISTANCE	40.0	33.3	13.3	53.3
MODERATELY DIFFICULT: ANIMAL REARS, OFTEN FOLLOWING INVESTIGATOR'S HAND	0.	0.	20.0	6.7
FREEZES: WITH/WITHOUT VOCALIZATION	6.7	0.	0.	0.
DIFFICULT: RUNS AROUND CAGE, IS HARD TO GRAB, WITH/WITHOUT VOCALIZATION	0.	0.	0.	6.7
EASE OF HANDLING IN HAND				
LOW: NO RESISTANCE, ANIMAL IS EASY TO HANDLE	93.3	100.	100.	93.3
MODERATELY LOW: SLIGHT RESISTANCE TO BEING HANDLED, WITH/WITHOUT VOCALIZATION	6.7	0.	0.	6.7
LACRIMATION				
NONE	100.	100.	100.	100.
CHROMODACRYORRHEA				
ABSENT	100.	100.	100.	100.
SALIVATION				
NONE	100.	100.	100.	100.
PILOERECTION				
NONE	100.	100.	100.	100.
FUR APPEARANCE				
NORMAL: CLEAN AND GROOMED	100.	100.	100.	93.3
SLIGHTLY SOILED	0.	0.	0.	6.7

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 10 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
FEMALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	15
PALPEBRAL CLOSURE				
EYELIDS WIDE OPEN	100.	100.	100.	100.
RESPIRATORY RATE				
NORMAL: BY OBSERVATION (80-110/MIN.)	100.	100.	100.	100.
RESPIRATORY CHARACTER				
NORMAL	100.	100.	100.	100.
RED DEPOSITS - eyes				
ABSENT	100.	100.	100.	100.
RED DEPOSITS - nose				
PRESENT	0.	0.	0.	6.7
ABSENT	100.	100.	100.	93.3
RED DEPOSITS - mouth				
ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - eyes				
ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - nose				
ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - mouth				
ABSENT	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 10 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
FEMALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	15
MUCOUS MEMBRANES - color				
PINK	100.	100.	100.	100.
EYES - color				
PINK	100.	100.	100.	100.
SKIN - color				
PINK	100.	100.	100.	100.
EYE PROMINENCE				
NORMAL	100.	100.	100.	100.
MUSCLE TONE				
MUSCLE IS FIRM BUT NOT HARD (NORMAL)	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 11 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	15	15	14
EASE OF REMOVAL				
VERY EASY: ANIMAL SITS QUIETLY, ALLOWS INVESTIGATOR TO PICK IT UP	13	13	12	13
EASY: WITH/WITHOUT VOCALIZATION, WITHOUT RESISTANCE OR SLIGHT RESISTANCE	0	2	3	1
EASE OF HANDLING IN HAND				
LOW: NO RESISTANCE, ANIMAL IS EASY TO HANDLE	13	15	13	14
MODERATELY LOW: SLIGHT RESISTANCE TO BEING HANDLED, WITH/WITHOUT VOCALIZATION	0	0	2	0
LACRIMATION				
NONE	13	15	15	14
CHROMODACRYORRHEA				
ABSENT	13	15	15	14
SALIVATION				
NONE	13	15	15	14
PILOERECTION				
NONE	13	15	15	14
FUR APPEARANCE				
NORMAL: CLEAN AND GROOMED	13	15	15	14
PALPEBRAL CLOSURE				
EYELIDS WIDE OPEN	13	15	15	14
RESPIRATORY RATE				
NORMAL: BY OBSERVATION (80-110/MIN.)	13	15	15	14

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 11 (WEEK 1 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE WEEK 1

HANDLING OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	15	15	14
RESPIRATORY CHARACTER				
NORMAL	13	15	15	14
RED DEPOSITS - eyes				
ABSENT	13	15	15	14
RED DEPOSITS - nose				
ABSENT	13	15	15	14
RED DEPOSITS - mouth				
ABSENT	13	15	15	14
CRUSTY DEPOSITS - eyes				
ABSENT	13	15	15	14
CRUSTY DEPOSITS - nose				
ABSENT	13	15	15	14
CRUSTY DEPOSITS - mouth				
ABSENT	13	15	15	14
MUCOUS MEMBRANES - color				
PINK	13	15	15	14
EYES - color				
PINK	13	15	15	14

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 11 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	15	15	14
SKIN - color				
PINK	13	15	15	14
EYE PROMINENCE				
NORMAL	13	15	15	14
MUSCLE TONE				
MUSCLE IS FIRM BUT NOT HARD (NORMAL)	13	15	15	14

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 11 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	14	15	14	13
EASE OF REMOVAL				
VERY EASY: ANIMAL SITS QUIETLY, ALLOWS INVESTIGATOR TO PICK IT UP	11	14	14	10
EASY: WITH/WITHOUT VOCALIZATION, WITHOUT RESISTANCE OR SLIGHT RESISTANCE	3	1	0	3
EASE OF HANDLING IN HAND				
LOW: NO RESISTANCE, ANIMAL IS EASY TO HANDLE	14	12	13	11
MODERATELY LOW: SLIGHT RESISTANCE TO BEING HANDLED, WITH/WITHOUT VOCALIZATION	0	3	1	2
LACRIMATION				
NONE	14	15	14	13
CHRONOCACRYORRHEA				
ABSENT	14	15	14	13
SALIVATION				
NONE	14	15	14	13
PILOERECTION				
NONE	14	15	14	13
FUR APPEARANCE				
NORMAL: CLEAN AND GROOMED	14	15	14	13
PALPEBRAL CLOSURE				
EYELIDS WIDE OPEN	14	15	14	13
RESPIRATORY RATE				
NORMAL: BY OBSERVATION (80-110/MIN.)	14	15	14	13

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 11 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	14	15	14	13
RESPIRATORY CHARACTER				
NORMAL	14	15	14	13
RED DEPOSITS - eyes				
ABSENT	14	15	14	13
RED DEPOSITS - nose				
ABSENT	14	15	14	13
RED DEPOSITS - mouth				
ABSENT	14	15	14	13
CRUSTY DEPOSITS - eyes				
ABSENT	14	15	14	13
CRUSTY DEPOSITS - nose				
ABSENT	14	15	14	13
CRUSTY DEPOSITS - mouth				
ABSENT	14	15	14	13
MUCOUS MEMBRANES - color				
PINK	14	15	14	13
EYES - color				
PINK	14	15	14	13

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 11 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	14	15	14	13
SKIN - color				
PINK	14	15	14	13
EYE PROMINENCE				
NORMAL	14	15	14	13
MUSCLE TONE				
MUSCLE IS FIRM BUT NOT HARD (NORMAL)	14	15	14	13

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 12 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
MALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	15	15	14
EASE OF REMOVAL				
VERY EASY: ANIMAL SITS QUIETLY, ALLOWS INVESTIGATOR TO PICK IT UP	100.	86.7	80.0	92.9
EASY: WITH/WITHOUT VOCALIZATION, WITHOUT RESISTANCE OR SLIGHT RESISTANCE	0.	13.3	20.0	7.1
EASE OF HANDLING IN HAND				
LOW: NO RESISTANCE, ANIMAL IS EASY TO HANDLE	100.	100.	86.7	100.
MODERATELY LOW: SLIGHT RESISTANCE TO BEING HANDLED, WITH/WITHOUT VOCALIZATION	0.	0.	13.3	0.
LACRIMATION				
NONE	100.	100.	100.	100.
CHROMODACRYORRHEA				
ABSENT	100.	100.	100.	100.
SALIVATION				
NONE	100.	100.	100.	100.
PILOERECTION				
NONE	100.	100.	100.	100.
FUR APPEARANCE				
NORMAL: CLEAN AND GROOMED	100.	100.	100.	100.
PALPEBRAL CLOSURE				
EYELIDS WIDE OPEN	100.	100.	100.	100.
RESPIRATORY RATE				
NORMAL: BY OBSERVATION (80-110/MIN.)	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 12 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
MALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	15	15	14
RESPIRATORY CHARACTER NORMAL	100.	100.	100.	100.
RED DEPOSITS - eyes ABSENT	100.	100.	100.	100.
RED DEPOSITS - nose ABSENT	100.	100.	100.	100.
RED DEPOSITS - mouth ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - eyes ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - nose ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - mouth ABSENT	100.	100.	100.	100.
MUCOUS MEMBRANES - color PINK	100.	100.	100.	100.
EYES - color PINK	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 12 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
MALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	15	15	14
SKIN - color				
PINK	100.	100.	100.	100.
EYE PROMINENCE				
NORMAL	100.	100.	100.	100.
MUSCLE TONE				
MUSCLE IS FIRM BUT NOT HARD (NORMAL)	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 12 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
FEMALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	14	15	14	13
EASE OF REMOVAL				
VERY EASY: ANIMAL SITS QUIETLY, ALLOWS INVESTIGATOR TO PICK IT UP	78.6	93.3	100.	76.9
EASY: WITH/WITHOUT VOCALIZATION, WITHOUT RESISTANCE OR SLIGHT RESISTANCE	21.4	6.7	0.	23.1
EASE OF HANDLING IN HAND				
LOW: NO RESISTANCE, ANIMAL IS EASY TO HANDLE	100.	80.0	92.9	84.6
MODERATELY LOW: SLIGHT RESISTANCE TO BEING HANDLED, WITH/WITHOUT VOCALIZATION	0.	20.0	7.1	15.4
LACRIMATION				
NONE	100.	100.	100.	100.
CHROMODACRYORRHEA				
ABSENT	100.	100.	100.	100.
SALIVATION				
NONE	100.	100.	100.	100.
PILOERECTION				
NONE	100.	100.	100.	100.
FUR APPEARANCE				
NORMAL: CLEAN AND GROOMED	100.	100.	100.	100.
PALPEBRAL CLOSURE				
EYELIDS WIDE OPEN	100.	100.	100.	100.
RESPIRATORY RATE				
NORMAL: BY OBSERVATION (80-110/MIN.)	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 12 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
FEMALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	14	15	14	13
RESPIRATORY CHARACTER				
NORMAL	100.	100.	100.	100.
RED DEPOSITS - eyes				
ABSENT	100.	100.	100.	100.
RED DEPOSITS - nose				
ABSENT	100.	100.	100.	100.
RED DEPOSITS - mouth				
ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - eyes				
ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - nose				
ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - mouth				
ABSENT	100.	100.	100.	100.
MUCOUS MEMBRANES - color				
PINK	100.	100.	100.	100.
EYES - color				
PINK	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 12 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
FEMALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	14	15	14	13
SKIN - color				
PINK	100.	100.	100.	100.
EYE PROMINENCE				
NORMAL	100.	100.	100.	100.
MUSCLE TONE				
MUSCLE IS FIRM BUT NOT HARD (NORMAL)	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 13 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	15	15	14
EASE OF REMOVAL				
VERY EASY: ANIMAL SITS QUIETLY, ALLOWS INVESTIGATOR TO PICK IT UP	12	12	10	11
EASY: WITH/WITHOUT VOCALIZATION, WITHOUT RESISTANCE OR SLIGHT RESISTANCE	1	3	5	3
EASE OF HANDLING IN HAND				
LOW: NO RESISTANCE, ANIMAL IS EASY TO HANDLE	13	15	14	14
MODERATELY LOW: SLIGHT RESISTANCE TO BEING HANDLED, WITH/WITHOUT VOCALIZATION	0	0	1	0
LACRIMATION				
NONE	13	15	15	14
CHROMODACRYORRHEA				
ABSENT	13	15	15	14
SALIVATION				
NONE	13	14	15	14
SLIGHT	0	1	0	0
PILOERECTION				
NONE	13	15	15	14
FUR APPEARANCE				
NORMAL: CLEAN AND GROOMED	13	15	15	14
PALPEBRAL CLOSURE				
EYELIDS WIDE OPEN	13	15	15	14

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 13 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	15	15	14
RESPIRATORY RATE				
NORMAL: BY OBSERVATION (80-110/MIN.)	13	15	15	14
RESPIRATORY CHARACTER				
NORMAL	13	15	14	14
RALES: ABNORMAL SOUND ACCOMPANYING BREATHING	0	0	1	0
RED DEPOSITS - eyes				
PRESENT	0	1	0	0
ABSENT	13	14	15	14
RED DEPOSITS - nose				
ABSENT	13	15	15	14
RED DEPOSITS - mouth				
ABSENT	13	15	15	14
CRUSTY DEPOSITS - eyes				
ABSENT	13	15	15	14
CRUSTY DEPOSITS - nose				
ABSENT	13	15	15	14
CRUSTY DEPOSITS - mouth				
ABSENT	13	15	15	14
MUCOUS MEMBRANES - color				
PINK	12	15	15	14

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 13 (WEEK 2 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	15	15	14
MUCOUS MEMBRANES - color (CONTINUED)				
PALE	1	0	0	0
EYES - color				
PINK	13	15	15	14
SKIN - color				
PINK	13	15	15	14
EYE PROMINENCE				
NORMAL	13	15	15	14
MUSCLE TONE				
MUSCLE IS FIRM BUT NOT HARD (NORMAL)	13	15	15	14

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 13 (WEEK 2 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE WEEK 2

HANDLING OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	14	14	13
EASE OF REMOVAL				
VERY EASY: ANIMAL SITS QUIETLY, ALLOWS INVESTIGATOR TO PICK IT UP	8	11	8	11
EASY: WITH/WITHOUT VOCALIZATION, WITHOUT RESISTANCE OR SLIGHT RESISTANCE	5	3	5	2
MODERATELY DIFFICULT: ANIMAL REARS, OFTEN FOLLOWING INVESTIGATOR'S HAND	0	0	1	0
EASE OF HANDLING IN HAND				
LOW: NO RESISTANCE, ANIMAL IS EASY TO HANDLE	11	12	13	11
MODERATELY LOW: SLIGHT RESISTANCE TO BEING HANDLED, WITH/WITHOUT VOCALIZATION	2	2	1	2
LACRIMATION				
NONE	13	14	14	13
CHROMODACRYORRHEA				
ABSENT	13	14	14	13
SALIVATION				
NONE	13	13	14	13
SLIGHT	0	1	0	0
PILOERECTION				
NONE	13	14	14	13
FUR APPEARANCE				
NORMAL: CLEAN AND GROOMED	13	14	13	13
SLIGHTLY SOILED	0	0	1	0
PALPEBRAL CLOSURE				
EYELIDS WIDE OPEN	13	14	14	13

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 13 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	14	14	13
RESPIRATORY RATE				
NORMAL: BY OBSERVATION (80-110/MIN.)	13	14	14	13
RESPIRATORY CHARACTER				
NORMAL	13	14	14	13
RED DEPOSITS - eyes				
ABSENT	13	14	14	13
RED DEPOSITS - nose				
ABSENT	13	14	14	13
RED DEPOSITS - mouth				
PRESENT	0	0	0	1
ABSENT	13	14	14	12
CRUSTY DEPOSITS - eyes				
ABSENT	13	14	14	13
CRUSTY DEPOSITS - nose				
ABSENT	13	14	14	13
CRUSTY DEPOSITS - mouth				
ABSENT	13	14	14	13
MUCOUS MEMBRANES - color				
PINK	13	14	14	13

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 13 (WEEK 2 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE WEEK 2

HANDLING OBSERVATIONS

FEMALES

NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	14	14	13
EYES - color				
PINK	13	14	14	13
SKIN - color				
PINK	13	14	14	13
EYE PROMINENCE				
NORMAL	13	14	14	13
MUSCLE TONE				
MUSCLE IS FIRM BUT NOT HARD (NORMAL)	13	14	14	13

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 14 (WEEK 2 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
MALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	15	15	14
EASE OF REMOVAL				
VERY EASY: ANIMAL SITS QUIETLY, ALLOWS INVESTIGATOR TO PICK IT UP	92.3	80.0	66.7	78.6
EASY: WITH/WITHOUT VOCALIZATION, WITHOUT RESISTANCE OR SLIGHT RESISTANCE	7.7	20.0	33.3	21.4
EASE OF HANDLING IN HAND				
LOW: NO RESISTANCE, ANIMAL IS EASY TO HANDLE	100.	100.	93.3	100.
MODERATELY LOW: SLIGHT RESISTANCE TO BEING HANDLED, WITH/WITHOUT VOCALIZATION	0.	0.	6.7	0.
LACRIMATION				
NONE	100.	100.	100.	100.
CHROMODACRYORRHEA				
ABSENT	100.	100.	100.	100.
SALIVATION				
NONE	100.	93.3	100.	100.
SLIGHT	0.	6.7	0.	0.
PILOERECTION				
NONE	100.	100.	100.	100.
FUR APPEARANCE				
NORMAL: CLEAN AND GROOMED	100.	100.	100.	100.
PALPEBRAL CLOSURE				
EYELIDS WIDE OPEN	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 14 (WEEK 2 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE WEEK 2

HANDLING OBSERVATIONS

MALES

PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	15	15	14
RESPIRATORY RATE				
NORMAL: BY OBSERVATION (80-110/MIN.)	100.	100.	100.	100.
RESPIRATORY CHARACTER				
NORMAL	100.	100.	93.3	100.
RALES: ABNORMAL SOUND ACCOMPANYING BREATHING	0.	0.	6.7	0.
RED DEPOSITS - eyes				
PRESENT	0.	6.7	0.	0.
ABSENT	100.	93.3	100.	100.
RED DEPOSITS - nose				
ABSENT	100.	100.	100.	100.
RED DEPOSITS - mouth				
ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - eyes				
ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - nose				
ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - mouth				
ABSENT	100.	100.	100.	100.
MUCOUS MEMBRANES - color				
PINK	92.3	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 14 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
MALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	15	15	14
MUCOUS MEMBRANES - color (CONTINUED)				
PALE	7.7	0.	0.	0.
EYES - color				
PINK	100.	100.	100.	100.
SKIN - color				
PINK	100.	100.	100.	100.
EYE PROMINENCE				
NORMAL	100.	100.	100.	100.
MUSCLE TONE				
MUSCLE IS FIRM BUT NOT HARD (NORMAL)	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 14 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
FEMALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	14	14	13
EASE OF REMOVAL				
VERY EASY: ANIMAL SITS QUIETLY, ALLOWS INVESTIGATOR TO PICK IT UP	61.5	78.6	57.1	84.6
EASY: WITH/WITHOUT VOCALIZATION, WITHOUT RESISTANCE OR SLIGHT RESISTANCE	38.5	21.4	35.7	15.4
MODERATELY DIFFICULT: ANIMAL REARS, OFTEN FOLLOWING INVESTIGATOR'S HAND	0.	0.	7.1	0.
EASE OF HANDLING IN HAND				
LOW: NO RESISTANCE, ANIMAL IS EASY TO HANDLE	84.6	85.7	92.9	84.6
MODERATELY LOW: SLIGHT RESISTANCE TO BEING HANDLED, WITH/WITHOUT VOCALIZATION	15.4	14.3	7.1	15.4
LACRIMATION				
NONE	100.	100.	100.	100.
CHROMODACRYORRHEA				
ABSENT	100.	100.	100.	100.
SALIVATION				
NONE	100.	92.9	100.	100.
SLIGHT	0.	7.1	0.	0.
PILOERECTION				
NONE	100.	100.	100.	100.
FUR APPEARANCE				
NORMAL: CLEAN AND GROOMED	100.	100.	92.9	100.
SLIGHTLY SOILED	0.	0.	7.1	0.
PALPEBRAL CLOSURE				
EYELIDS WIDE OPEN	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 14 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
FEMALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	14	14	13
RESPIRATORY RATE				
NORMAL: BY OBSERVATION (80-110/MIN.)	100.	100.	100.	100.
RESPIRATORY CHARACTER				
NORMAL	100.	100.	100.	100.
RED DEPOSITS - eyes				
ABSENT	100.	100.	100.	100.
RED DEPOSITS - nose				
ABSENT	100.	100.	100.	100.
RED DEPOSITS - mouth				
PRESENT	0.	0.	0.	7.7
ABSENT	100.	100.	100.	92.3
CRUSTY DEPOSITS - eyes				
ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - nose				
ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - mouth				
ABSENT	100.	100.	100.	100.
MUCOUS MEMBRANES - color				
PINK	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 14 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
FEMALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	14	14	13
EYES - color				
PINK	100.	100.	100.	100.
SKIN - color				
PINK	100.	100.	100.	100.
EYE PROMINENCE				
NORMAL	100.	100.	100.	100.
MUSCLE TONE				
MUSCLE IS FIRM BUT NOT HARD (NORMAL)	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 15 (WEEK 3 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	15	15	14
EASE OF REMOVAL				
VERY EASY: ANIMAL SITS QUIETLY, ALLOWS INVESTIGATOR TO PICK IT UP	11	12	12	10
EASY: WITH/WITHOUT VOCALIZATION, WITHOUT RESISTANCE OR SLIGHT RESISTANCE	2	3	3	4
EASE OF HANDLING IN HAND				
LOW: NO RESISTANCE, ANIMAL IS EASY TO HANDLE	13	15	15	14
LACRIMATION				
NONE	13	15	15	14
CHROMODACRYORRHEA				
ABSENT	13	15	15	13
PRESENT	0	0	0	1
SALIVATION				
NONE	13	15	15	14
PILOERECTION				
NONE	13	15	15	14
FUR APPEARANCE				
NORMAL: CLEAN AND GROOMED	12	15	15	13
SLIGHTLY SOILED	1	0	0	1
PALPEBRAL CLOSURE				
EYELIDS WIDE OPEN	13	15	15	14

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 15 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	15	15	14
RESPIRATORY RATE NORMAL: BY OBSERVATION (80-110/MIN.)	13	15	15	14
RESPIRATORY CHARACTER NORMAL	13	15	15	14
RED DEPOSITS - eyes ABSENT	13	15	15	14
RED DEPOSITS - nose ABSENT	13	15	15	14
RED DEPOSITS - mouth ABSENT	13	15	15	14
CRUSTY DEPOSITS - eyes ABSENT	13	15	15	14
CRUSTY DEPOSITS - nose ABSENT	13	15	15	14
CRUSTY DEPOSITS - mouth ABSENT	13	15	15	14
MUCOUS MEMBRANES - color PINK	13	15	15	14

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 15 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	15	15	14
EYES - color				
PINK	13	15	15	14
SKIN - color				
PINK	13	15	15	14
EYE PROMINENCE				
NORMAL	13	15	15	14
MUSCLE TONE				
MUSCLE IS FIRM BUT NOT HARD (NORMAL)	13	15	15	14

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 15 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	14	14	13
EASE OF REMOVAL				
VERY EASY: ANIMAL SITS QUIETLY, ALLOWS INVESTIGATOR TO PICK IT UP	10	11	13	12
EASY: WITH/WITHOUT VOCALIZATION, WITHOUT RESISTANCE OR SLIGHT RESISTANCE	3	3	1	1
EASE OF HANDLING IN HAND				
LOW: NO RESISTANCE, ANIMAL IS EASY TO HANDLE	13	14	14	13
LACRIMATION				
NONE	13	14	14	13
CHROMODACRYORRHEA				
ABSENT	13	14	14	13
SALIVATION				
NONE	13	14	14	13
PILOERECTION				
NONE	13	14	14	13
FUR APPEARANCE				
NORMAL: CLEAN AND GROOMED	13	14	13	12
SLIGHTLY SOILED	0	0	1	1
PALPEBRAL CLOSURE				
EYELIDS WIDE OPEN	13	14	14	13
RESPIRATORY RATE				
NORMAL: BY OBSERVATION (80-110/MIN.)	13	14	14	13

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 15 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	14	14	13
RESPIRATORY CHARACTER NORMAL	13	14	14	13
RED DEPOSITS - eyes ABSENT	13	14	14	13
RED DEPOSITS - nose ABSENT	13	14	14	13
RED DEPOSITS - mouth ABSENT	13	14	14	13
CRUSTY DEPOSITS - eyes ABSENT	13	14	14	13
CRUSTY DEPOSITS - nose ABSENT	13	14	14	13
CRUSTY DEPOSITS - mouth ABSENT	13	14	14	13
MUCOUS MEMBRANES - color PINK	13	14	14	13
EYES - color PINK	13	14	14	13

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 15 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	14	14	13
SKIN - color				
PINK	13	14	14	13
EYE PROMINENCE				
NORMAL	13	14	14	13
MUSCLE TONE				
MUSCLE IS FIRM BUT NOT HARD (NORMAL)	13	14	14	13

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 16 (WEEK 3 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS PAGE 1

SPONSOR:ELF ATOCHEM INC. FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE WEEK 3

HANDLING OBSERVATIONS

MALES

PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	15	15	14
EASE OF REMOVAL				
VERY EASY: ANIMAL SITS QUIETLY, ALLOWS INVESTIGATOR TO PICK IT UP	84.6	80.0	80.0	71.4
EASY: WITH/WITHOUT VOCALIZATION, WITHOUT RESISTANCE OR SLIGHT RESISTANCE	15.4	20.0	20.0	28.6
EASE OF HANDLING IN HAND				
LOW: NO RESISTANCE, ANIMAL IS EASY TO HANDLE	100.	100.	100.	100.
LACRIMATION				
NONE	100.	100.	100.	100.
CHROMODACRYORRHEA				
ABSENT	100.	100.	100.	92.9
PRESENT	0.	0.	0.	7.1
SALIVATION				
NONE	100.	100.	100.	100.
PILOERECTION				
NONE	100.	100.	100.	100.
FUR APPEARANCE				
NORMAL: CLEAN AND GROOMED	92.3	100.	100.	92.9
SLIGHTLY SOILED	7.7	0.	0.	7.1
PALPEBRAL CLOSURE				
EYELIDS WIDE OPEN	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 16 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
MALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	15	15	14
RESPIRATORY RATE NORMAL: BY OBSERVATION (80-110/MIN.)	100.	100.	100.	100.
RESPIRATORY CHARACTER NORMAL	100.	100.	100.	100.
RED DEPOSITS - eyes ABSENT	100.	100.	100.	100.
RED DEPOSITS - nose ABSENT	100.	100.	100.	100.
RED DEPOSITS - mouth ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - eyes ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - nose ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - mouth ABSENT	100.	100.	100.	100.
MUCOUS MEMBRANES - color PINK	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 16 (WEEK 3 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE WEEK 3

HANDLING OBSERVATIONS

MALES

PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	15	15	14
EYES - color				
PINK	100.	100.	100.	100.
SKIN - color				
PINK	100.	100.	100.	100.
EYE PROMINENCE				
NORMAL	100.	100.	100.	100.
MUSCLE TONE				
MUSCLE IS FIRM BUT NOT HARD (NORMAL)	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 16 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
FEMALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	14	14	13
EASE OF REMOVAL				
VERY EASY: ANIMAL SITS QUIETLY, ALLOWS INVESTIGATOR TO PICK IT UP	76.9	78.6	92.9	92.3
EASY: WITH/WITHOUT VOCALIZATION, WITHOUT RESISTANCE OR SLIGHT RESISTANCE	23.1	21.4	7.1	7.7
EASE OF HANDLING IN HAND				
LOW: NO RESISTANCE, ANIMAL IS EASY TO HANDLE	100.	100.	100.	100.
LACRIMATION				
NONE	100.	100.	100.	100.
CHRONODACRYORRHEA				
ABSENT	100.	100.	100.	100.
SALIVATION				
NONE	100.	100.	100.	100.
PILOERECTION				
NONE	100.	100.	100.	100.
FUR APPEARANCE				
NORMAL: CLEAN AND GROOMED	100.	100.	92.9	92.3
SLIGHTLY SOILED	0.	0.	7.1	7.7
PALPEBRAL CLOSURE				
EYELIDS WIDE OPEN	100.	100.	100.	100.
RESPIRATORY RATE				
NORMAL: BY OBSERVATION (80-110/MIN.)	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 16 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

HANDLING OBSERVATIONS
FEMALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	14	14	13
RESPIRATORY CHARACTER				
NORMAL	100.	100.	100.	100.
RED DEPOSITS - eyes				
ABSENT	100.	100.	100.	100.
RED DEPOSITS - nose				
ABSENT	100.	100.	100.	100.
RED DEPOSITS - mouth				
ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - eyes				
ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - nose				
ABSENT	100.	100.	100.	100.
CRUSTY DEPOSITS - mouth				
ABSENT	100.	100.	100.	100.
MUCOUS MEMBRANES - color				
PINK	100.	100.	100.	100.
EYES - color				
PINK	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 16 (WEEK 3 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE WEEK 3

HANDLING OBSERVATIONS
FEMALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	14	14	13
SKIN - color				
PINK	100.	100.	100.	100.
EYE PROMINENCE				
NORMAL	100.	100.	100.	100.
MUSCLE TONE				
MUSCLE IS FIRM BUT NOT HARD (NORMAL)	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 17 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	15
TIME TO FIRST STEP (seconds) : MEAN	0.4	0.3	0.3	0.3
S.D.	0.18	0.16	0.07	0.10
MOBILITY				
NORMAL	15	15	15	15
GAIT				
NORMAL	15	15	15	15
CONVULSIONS - CLONIC				
ABSENT	15	15	15	15
CONVULSIONS - TONIC				
ABSENT	15	15	15	15
TREMORS				
NONE	15	15	15	15
GAIT SCORE				
NORMAL	15	15	15	15
AROUSAL				
NORMAL: ALERT, EXPLORATORY MOVEMENTS	15	15	15	15
BIZARRE/STEREOTYPIC BEHAVIOR				
NONE	15	15	15	15

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING DUNNETT'S TEST

TABLE 17 (PRETEST EVALUATION)

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		15	15	15	15
REARING	: MEAN	6.9	6.9	8.9	6.9
	S.D.	4.50	4.15	2.77	2.66
BACKING	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00
GROOMING	: MEAN	0.5	0.1	0.1	0.1
	S.D.	0.74	0.35	0.26	0.26
URINATION	: MEAN	0.8	0.7	0.6	0.5
	S.D.	0.56	0.88	0.51	0.64
DEFECATION	: MEAN	0.7	0.7	0.2	0.3
	S.D.	1.23	1.49	0.56	0.62

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING DUNNETT'S TEST

TABLE 17 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	15
TIME TO FIRST STEP (seconds) : MEAN	0.3	0.3	0.3	0.3
S.D.	0.09	0.08	0.13	0.08
MOBILITY				
NORMAL	15	15	15	15
GAIT				
NORMAL	15	15	15	15
CONVULSIONS - CLONIC				
ABSENT	15	15	15	15
CONVULSIONS - TONIC				
ABSENT	15	15	15	15
TREMORS				
NONE	15	15	15	15
GAIT SCORE				
NORMAL	15	15	15	15
AROUSAL				
NORMAL: ALERT, EXPLORATORY MOVEMENTS	15	15	15	15
BIZARRE/STEREOTYPIC BEHAVIOR				
NONE	14	15	15	15
SPATIAL DISORIENTATION: WALKING OR STUMBLING INTO OBJECTS	1	0	0	0

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING DUNNETT'S TEST

TABLE 17 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		15	15	15	15
REARING	: MEAN	7.2	6.7	10.1	7.1
	S.D.	3.38	4.25	4.04	3.45
BACKING	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00
GROOMING	: MEAN	0.1	0.2	0.2	0.1
	S.D.	0.26	0.41	0.56	0.35
URINATION	: MEAN	0.3	0.3	0.3	0.5
	S.D.	0.49	0.46	0.49	0.74
DEFECATION	: MEAN	0.0	0.2	0.0	0.1
	S.D.	0.00	0.56	0.00	0.26

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 18 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
MALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	15
TIME TO FIRST STEP (seconds) : MEAN	0.4	0.3	0.3	0.3
S.D.	0.18	0.16	0.07	0.10
MOBILITY				
NORMAL	100.	100.	100.	100.
GAIT				
NORMAL	100.	100.	100.	100.
CONVULSIONS - CLONIC				
ABSENT	100.	100.	100.	100.
CONVULSIONS - TONIC				
ABSENT	100.	100.	100.	100.
TREMORS				
NONE	100.	100.	100.	100.
GAIT SCORE				
NORMAL	100.	100.	100.	100.
AROUSAL				
NORMAL: ALERT, EXPLORATORY MOVEMENTS	100.	100.	100.	100.
BIZARRE/STEREOTYPIC BEHAVIOR				
NONE	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 18 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
MALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		15	15	15	15
REARING	: MEAN	6.9	6.9	8.9	6.9
	S.D.	4.50	4.15	2.77	2.66
BACKING	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00
GROOMING	: MEAN	0.5	0.1	0.1	0.1
	S.D.	0.74	0.35	0.26	0.26
URINATION	: MEAN	0.8	0.7	0.6	0.5
	S.D.	0.56	0.88	0.51	0.64
DEFECATION	: MEAN	0.7	0.7	0.2	0.3
	S.D.	1.23	1.49	0.56	0.62

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 18 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
FEMALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	15
TIME TO FIRST STEP (seconds) : MEAN	0.3	0.3	0.3	0.3
S.D.	0.09	0.08	0.13	0.08
MOBILITY				
NORMAL	100.	100.	100.	100.
GAIT				
NORMAL	100.	100.	100.	100.
CONVULSIONS - CLONIC				
ABSENT	100.	100.	100.	100.
CONVULSIONS - TONIC				
ABSENT	100.	100.	100.	100.
TREMORS				
NONE	100.	100.	100.	100.
GAIT SCORE				
NORMAL	100.	100.	100.	100.
AROUSAL				
NORMAL: ALERT, EXPLORATORY MOVEMENTS	100.	100.	100.	100.
BIZARRE/STEREOTYPIC BEHAVIOR				
NONE	93.3	100.	100.	100.
SPATIAL DISORIENTATION: WALKING OR STUMBLING INTO OBJECTS	6.7	0.	0.	0.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 18 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
FEMALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		15	15	15	15
REARING	: MEAN	7.2	6.7	10.1	7.1
	S.D.	3.38	4.25	4.04	3.45
BACKING	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00
GROOMING	: MEAN	0.1	0.2	0.2	0.1
	S.D.	0.26	0.41	0.56	0.35
URINATION	: MEAN	0.3	0.3	0.3	0.5
	S.D.	0.49	0.46	0.49	0.74
DEFECATION	: MEAN	0.0	0.2	0.0	0.1
	S.D.	0.00	0.56	0.00	0.26

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 19 (WEEK 0 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE WEEK 0

OPEN FIELD OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	14
TIME TO FIRST STEP (seconds) : MEAN	0.6	0.5	0.4	0.5
S.D.	0.33	0.20	0.12	0.19
MOBILITY				
NORMAL	15	15	15	14
GAIT				
NORMAL	15	15	15	14
CONVULSIONS - CLONIC				
ABSENT	15	15	15	14
CONVULSIONS - TONIC				
ABSENT	15	15	15	14
TREMORS				
NONE	15	15	15	14
GAIT SCORE				
NORMAL	15	15	15	14
AROUSAL				
NORMAL: ALERT, EXPLORATORY MOVEMENTS	15	15	15	14
BIZARRE/STEREOTYPIC BEHAVIOR				
NONE	15	15	15	14

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING DUNNETT'S TEST

TABLE 19 (WEEK 0 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE WEEK 0

OPEN FIELD OBSERVATIONS

MALES

NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		15	15	15	14
REARING	: MEAN	8.1	8.9	9.9	7.1
	S.D.	2.90	4.06	3.62	2.71
BACKING	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00
GROOMING	: MEAN	1.2	1.3	0.9	1.4
	S.D.	1.01	1.59	0.92	1.34
URINATION	: MEAN	4.1	1.9	4.1	4.0
	S.D.	4.05	2.26	4.11	7.52
DEFECATION	: MEAN	0.5	0.1	0.5	0.2
	S.D.	0.92	0.26	0.83	0.58

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING DUNNETT'S TEST

TABLE 19 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	15
TIME TO FIRST STEP (seconds) : MEAN	0.5	0.5	0.4	0.4
S.D.	0.13	0.19	0.10	0.13
MOBILITY				
NORMAL	15	15	15	15
GAIT				
NORMAL	15	15	15	15
CONVULSIONS - CLONIC				
ABSENT	15	15	15	15
CONVULSIONS - TONIC				
ABSENT	15	15	15	15
TREMORS				
NONE	15	15	15	15
GAIT SCORE				
NORMAL	15	15	15	15
AROUSAL				
NORMAL: ALERT, EXPLORATORY MOVEMENTS	15	15	15	15
BIZARRE/STEREOTYPIC BEHAVIOR				
NONE	15	15	15	15

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING DUNNETT'S TEST

TABLE 19 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		15	15	15	15
REARING	: MEAN	9.9	10.5	11.7	9.8
	S.D.	3.10	3.02	3.73	2.46
BACKING	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00
GROOMING	: MEAN	1.0	0.8	0.7	0.8
	S.D.	0.76	0.77	0.62	0.86
URINATION	: MEAN	1.3	1.1	1.3	0.9
	S.D.	2.91	1.68	2.09	1.10
DEFECATION	: MEAN	0.0	0.1	0.1	0.1
	S.D.	0.00	0.26	0.26	0.35

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 20 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
MALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP	1	2	3	4
NUMBER TESTED:	15	15	15	14
TIME TO FIRST STEP (seconds) : MEAN	0.6	0.5	0.4	0.5
S.D.	0.33	0.20	0.12	0.19
MOBILITY NORMAL	100.	100.	100.	100.
GAIT NORMAL	100.	100.	100.	100.
CONVULSIONS - CLONIC ABSENT	100.	100.	100.	100.
CONVULSIONS - TONIC ABSENT	100.	100.	100.	100.
TREMORS NONE	100.	100.	100.	100.
GAIT SCORE NORMAL	100.	100.	100.	100.
AROUSAL NORMAL: ALERT, EXPLORATORY MOVEMENTS	100.	100.	100.	100.
BIZARRE/STEREOTYPIC BEHAVIOR NONE	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 20 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
MALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		15	15	15	14
REARING	: MEAN	8.1	8.9	9.9	7.1
	S.D.	2.90	4.06	3.62	2.71
BACKING	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00
GROOMING	: MEAN	1.2	1.3	0.9	1.4
	S.D.	1.01	1.59	0.92	1.34
URINATION	: MEAN	4.1	1.9	4.1	4.0
	S.D.	4.05	2.26	4.11	7.52
DEFECATION	: MEAN	0.5	0.1	0.5	0.2
	S.D.	0.92	0.26	0.83	0.58

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 20 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
FEMALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	15	15	15	15
TIME TO FIRST STEP (seconds) : MEAN	0.5	0.5	0.4	0.4
S.D.	0.13	0.19	0.10	0.13
MOBILITY				
NORMAL	100.	100.	100.	100.
GAIT				
NORMAL	100.	100.	100.	100.
CONVULSIONS - CLONIC				
ABSENT	100.	100.	100.	100.
CONVULSIONS - TONIC				
ABSENT	100.	100.	100.	100.
TREMORS				
NONE	100.	100.	100.	100.
GAIT SCORE				
NORMAL	100.	100.	100.	100.
AROUSAL				
NORMAL: ALERT, EXPLORATORY MOVEMENTS	100.	100.	100.	100.
BIZARRE/STEREOTYPIC BEHAVIOR				
NONE	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 20 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
FEMALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		15	15	15	15
REARING	: MEAN	9.9	10.5	11.7	9.8
	S.D.	3.10	3.02	3.73	2.46
BACKING	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00
GROOMING	: MEAN	1.0	0.8	0.7	0.8
	S.D.	0.76	0.77	0.62	0.86
URINATION	: MEAN	1.3	1.1	1.3	0.9
	S.D.	2.91	1.68	2.09	1.10
DEFECATION	: MEAN	0.0	0.1	0.1	0.1
	S.D.	0.00	0.26	0.26	0.35

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 21 (WEEK 1 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE WEEK 1

OPEN FIELD OBSERVATIONS

MALES

NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	15	15	14
TIME TO FIRST STEP (seconds) : MEAN	0.3	0.4	0.5	0.3
S.D.	0.18	0.23	0.71	0.09
MOBILITY				
NORMAL	13	15	15	14
GAIT				
NORMAL	13	15	15	14
CONVULSIONS - CLONIC				
ABSENT	13	15	15	14
CONVULSIONS - TONIC				
ABSENT	13	15	15	14
TREMORS				
NONE	13	15	15	14
GAIT SCORE				
NORMAL	13	15	15	14
AROUSAL				
NORMAL: ALERT, EXPLORATORY MOVEMENTS	13	15	15	14
BIZARRE/STEREOTYPIC BEHAVIOR				
NONE	13	15	15	14

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING DUNNETT'S TEST

TABLE 21 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		13	15	15	14
REARING	: MEAN	2.9	4.7	3.8	3.6
	S.D.	2.14	3.56	2.57	1.91
BACKING	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00
GROOMING	: MEAN	0.5	0.5	0.4	0.6
	S.D.	0.88	0.74	0.63	0.76
URINATION	: MEAN	1.2	1.7	0.8	0.4
	S.D.	1.17	3.83	1.21	0.65
DEFECATION	: MEAN	0.7	1.1	0.4	0.2
	S.D.	1.70	1.58	1.12	0.80

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING DUNNETT'S TEST

TABLE 21 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	14	15	14	13
TIME TO FIRST STEP (seconds) : MEAN	0.3	0.3	0.4	0.4
S.D.	0.19	0.18	0.26	0.18
MOBILITY				
NORMAL	14	15	14	13
GAIT				
NORMAL	14	15	14	13
CONVULSIONS - CLONIC				
ABSENT	14	15	14	13
CONVULSIONS - TONIC				
ABSENT	14	15	14	13
TREMORS				
NONE	14	15	14	13
GAIT SCORE				
NORMAL	14	15	14	13
AROUSAL				
NORMAL: ALERT, EXPLORATORY MOVEMENTS	14	15	14	13
BIZARRE/STEREOTYPIC BEHAVIOR				
NONE	14	15	14	13

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING DUNNETT'S TEST

TABLE 21 (WEEK 1 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVAT ON

GROUP:		1	2	3	4
NUMBER TESTED:		14	15	14	13
REARING	: MEAN	7.1	5.5	5.5	5.1
	S.D.	3.71	4.02	3.44	2.60
BACKING	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00
GROOMING	: MEAN	0.4	0.9	0.8	0.2
	S.D.	0.51	1.19	1.05	0.60
URINATION	: MEAN	0.3	1.1	0.8	0.1
	S.D.	0.61	2.00	1.89	0.28
DEFECATION	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING DUNNETT'S TEST

TABLE 22 (WEEK 1 EVALUATION)

PROJECT NO.:WIL-160033 — A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS — PAGE 1

SPONSOR:ELF ATOCHEM INC. — FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE — WEEK 1

OPEN FIELD OBSERVATIONS
MALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	15	15	14
TIME TO FIRST STEP (seconds) : MEAN	0.3	0.4	0.5	0.3
S.D.	0.18	0.23	0.71	0.09
MOBILITY				
NORMAL	100.	100.	100.	100.
GAIT				
NORMAL	100.	100.	100.	100.
CONVULSIONS - CLONIC				
ABSENT	100.	100.	100.	100.
CONVULSIONS - TONIC				
ABSENT	100.	100.	100.	100.
TREMORS				
NONE	100.	100.	100.	100.
GAIT SCORE				
NORMAL	100.	100.	100.	100.
AROUSAL				
NORMAL: ALERT, EXPLORATORY MOVEMENTS	100.	100.	100.	100.
BIZARRE/STEREOTYPIC BEHAVIOR				
NONE	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 22 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
MALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		13	15	15	14
REARING	: MEAN	2.9	4.7	3.8	3.6
	S.D.	2.14	3.56	2.57	1.91
BACKING	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00
GROOMING	: MEAN	0.5	0.5	0.4	0.6
	S.D.	0.88	0.74	0.63	0.76
URINATION	: MEAN	1.2	1.7	0.8	0.4
	S.D.	1.17	3.83	1.21	0.65
DEFECATION	: MEAN	0.7	1.1	0.4	0.2
	S.D.	1.70	1.58	1.12	0.80

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 22 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
FEMALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	14	15	14	13
TIME TO FIRST STEP (seconds) : MEAN	0.3	0.3	0.4	0.4
S.D.	0.19	0.18	0.26	0.18
MOBILITY				
NORMAL	100.	100.	100.	100.
GAIT				
NORMAL	100.	100.	100.	100.
CONVULSIONS - CLONIC				
ABSENT	100.	100.	100.	100.
CONVULSIONS - TONIC				
ABSENT	100.	100.	100.	100.
TREMORS				
NONE	100.	100.	100.	100.
GAIT SCORE				
NORMAL	100.	100.	100.	100.
AROUSAL				
NORMAL: ALERT, EXPLORATORY MOVEMENTS	100.	100.	100.	100.
BIZARRE/STEREOTYPIC BEHAVIOR				
NONE	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 22 (WEEK 1 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE WEEK 1

OPEN FIELD OBSERVATIONS
FEMALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		14	15	14	13
REARING	: MEAN	7.1	5.5	5.5	5.1
	S.D.	3.71	4.02	3.44	2.60
BACKING	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00
GROOMING	: MEAN	0.4	0.9	0.8	0.2
	S.D.	0.51	1.19	1.05	0.60
URINATION	: MEAN	0.3	1.1	0.8	0.1
	S.D.	0.61	2.00	1.89	0.28
DEFECATION	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 23 (WEEK 2 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE WEEK 2

OPEN FIELD OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		13	15	15	14
TIME TO FIRST STEP (seconds)	: MEAN	0.5	0.5	0.5	0.5
	S.D.	0.38	0.21	0.24	0.54
MOBILITY					
NORMAL		13	15	15	14
GAIT					
NORMAL		13	15	15	14
CONVULSIONS - CLONIC					
ABSENT		13	15	15	14
CONVULSIONS - TONIC					
ABSENT		13	15	15	14
TREMORS					
NONE		13	15	15	14
GAIT SCORE					
NORMAL		13	15	15	14
AROUSAL					
NORMAL: ALERT, EXPLORATORY MOVEMENTS		13	15	15	14
BIZARRE/STEREOTYPIC BEHAVIOR					
NONE		13	15	15	14

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING DUNNETT'S TEST

TABLE 23 (WEEK 2 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		13	15	15	14
REARING	: MEAN	6.4	5.6	7.5	7.3
	S.D.	4.23	4.75	4.47	4.34
BACKING	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00
GROOMING	: MEAN	0.3	0.6	0.3	0.4
	S.D.	0.48	1.06	0.46	0.65
URINATION	: MEAN	1.2	0.9	2.7	1.7
	S.D.	1.34	1.16	4.12	1.98
DEFECATION	: MEAN	0.7	0.9	0.5	0.0
	S.D.	1.49	2.10	0.99	0.00

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING DUNNETT'S TEST

TABLE 23 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	14	14	13
TIME TO FIRST STEP (seconds) : MEAN	0.3	0.3	0.5+	0.4
S.D.	0.12	0.16	0.18	0.21
MOBILITY				
NORMAL	13	14	14	13
GAIT				
NORMAL	13	14	14	13
CONVULSIONS - CLONIC				
ABSENT	13	14	14	13
CONVULSIONS - TONIC				
ABSENT	13	14	14	13
TREMORS				
NONE	13	14	14	13
GAIT SCORE				
NORMAL	13	14	14	13
AROUSAL				
NORMAL: ALERT, EXPLORATORY MOVEMENTS	11	11	14	12
SOMEWHAT HIGH: SLIGHT EXCITEMENT, TENSE, SUDDEN DARTING OR FREEZING	1	3	0	1
VERY HIGH: HYPERALERT, EXCITED, SUDDEN BOUTS OF RUNNING OR BODY MOVEMENTS	1	0	0	0
BIZARRE/STEREOTYPIC BEHAVIOR				
NONE	13	14	14	13

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST
+ = SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING DUNNETT'S TEST

TABLE 23 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		13	14	14	13
REARING	: MEAN	10.7	10.5	8.7	7.7
	S.D.	6.36	6.02	6.90	4.21
BACKING	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00
GROOMING	: MEAN	0.4	0.5	0.6	0.9
	S.D.	0.65	0.65	0.84	0.86
URINATION	: MEAN	0.3	0.9	0.1	0.3
	S.D.	1.11	2.38	0.36	0.63
DEFECATION	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING DUNNETT'S TEST

TABLE 24 (WEEK 2 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE WEEK 2

OPEN FIELD OBSERVATIONS

MALES

PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	15	15	14
TIME TO FIRST STEP (seconds) : MEAN	0.5	0.5	0.5	0.5
S.D.	0.38	0.21	0.24	0.54
MOBILITY				
NORMAL	100.	100.	100.	100.
GAIT				
NORMAL	100.	100.	100.	100.
CONVULSIONS - CLONIC				
ABSENT	100.	100.	100.	100.
CONVULSIONS - TONIC				
ABSENT	100.	100.	100.	100.
TREMORS				
NONE	100.	100.	100.	100.
GAIT SCORE				
NORMAL	100.	100.	100.	100.
AROUSAL				
NORMAL: ALERT, EXPLORATORY MOVEMENTS	100.	100.	100.	100.
BIZARRE/STEREOTYPIC BEHAVIOR				
NONE	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 24 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
MALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		13	15	15	14
REARING	: MEAN	6.4	5.6	7.5	7.3
	S.D.	4.23	4.75	4.47	4.34
BACKING	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00
GROOMING	: MEAN	0.3	0.6	0.3	0.4
	S.D.	0.48	1.06	0.46	0.65
URINATION	: MEAN	1.2	0.9	2.7	1.7
	S.D.	1.34	1.16	4.12	1.98
DEFECATION	: MEAN	0.7	0.9	0.5	0.0
	S.D.	1.49	2.10	0.99	0.00

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 24 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
FEMALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	14	14	13
TIME TO FIRST STEP (seconds) : MEAN	0.3	0.3	0.5	0.4
S.D.	0.12	0.16	0.18	0.21
MOBILITY				
NORMAL	100.	100.	100.	100.
GAIT				
NORMAL	100.	100.	100.	100.
CONVULSIONS - CLONIC				
ABSENT	100.	100.	100.	100.
CONVULSIONS - TONIC				
ABSENT	100.	100.	100.	100.
TREMORS				
NONE	100.	100.	100.	100.
GAIT SCORE				
NORMAL	100.	100.	100.	100.
AROUSAL				
NORMAL: ALERT, EXPLORATORY MOVEMENTS	84.6	78.6	100.	92.3
SOMEWHAT HIGH: SLIGHT EXCITEMENT, TENSE, SUDDEN DARTING OR FREEZING	7.7	21.4	0.	7.7
VERY HIGH: HYPERALERT, EXCITED, SUDDEN BOUTS OF RUNNING OR BODY MOVEMENTS	7.7	0.	0.	0.
BIZARRE/STEREOTYPIC BEHAVIOR				
NONE	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 24 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
FEMALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		13	14	14	13
REARING	: MEAN	10.7	10.5	8.7	7.7
	S.D.	6.36	6.02	6.90	4.21
BACKING	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00
GROOMING	: MEAN	0.4	0.5	0.6	0.9
	S.D.	0.65	0.65	0.84	0.86
URINATION	: MEAN	0.3	0.9	0.1	0.3
	S.D.	1.11	2.38	0.36	0.63
DEFECATION	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 25 (WEEK 3 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE WEEK 3

OPEN FIELD OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	15	15	14
TIME TO FIRST STEP (seconds) : MEAN	0.4	0.5	0.5	0.5
S.D.	0.11	0.18	0.19	0.22
MOBILITY				
NORMAL	13	15	15	14
GAIT				
NORMAL	13	15	15	14
CONVULSIONS - CLONIC				
ABSENT	13	15	15	14
CONVULSIONS - TONIC				
ABSENT	13	15	15	14
TREMORS				
NONE	13	15	15	14
GAIT SCORE				
NORMAL	13	15	15	14
AROUSAL				
NORMAL: ALERT, EXPLORATORY MOVEMENTS	13	15	15	14
BIZARRE/STEREOTYPIC BEHAVIOR				
NONE	13	15	15	14

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 25 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
MALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		13	15	15	14
REARING	: MEAN	5.9	6.5	7.6	5.6
	S.D.	3.28	3.78	4.37	3.57
BACKING	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00
GROOMING	: MEAN	1.0	1.1	0.9	1.2
	S.D.	1.08	1.22	1.03	0.97
URINATION	: MEAN	2.2	2.7	2.9	2.9
	S.D.	2.09	3.43	3.44	3.84
DEFECATION	: MEAN	0.1	0.0	0.0	0.0
	S.D.	0.28	0.00	0.00	0.00

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING DUNNETT'S TEST

TABLE 25 (WEEK 3 EVALUATION)

PROJECT NO.:WIL-160033 — A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS — PAGE 3

SPONSOR:ELF ATOCHEM INC. — FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE — WEEK 3

OPEN FIELD OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		13	14	14	13
TIME TO FIRST STEP (seconds)	: MEAN	0.4	0.4	0.4	0.4
	S.D.	0.25	0.11	0.15	0.13
MOBILITY					
NORMAL		13	14	14	13
GAIT					
NORMAL		13	14	14	13
CONVULSIONS - CLONIC					
ABSENT		13	14	14	13
CONVULSIONS - TONIC					
ABSENT		13	14	14	13
TREMORS					
NONE		13	14	14	13
GAIT SCORE					
NORMAL		13	14	14	13
AROUSAL					
NORMAL: ALERT, EXPLORATORY MOVEMENTS		12	14	13	12
SOMEWHAT HIGH: SLIGHT EXCITEMENT, TENSE, SUDDEN DARTING OR FREEZING		0	0	1	1
VERY HIGH: HYPERALERT, EXCITED, SUDDEN BOUTS OF RUNNING OR BODY MOVEMENTS		1	0	0	0
BIZARRE/STEREOTYPIC BEHAVIOR					
NONE		13	13	14	13

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS USING DUNNETT'S TEST

TABLE 25 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
FEMALES
NUMBER OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		13	14	14	13
BIZARRE/STEREOTYPIC BEHAVIOR (CONTINUED)					
RETROPULSION: ANIMAL WALKS BACKWARDS		0	1	0	0
REARING	: MEAN	12.3	12.5	10.4	9.7
	S.D.	5.71	3.96	7.06	4.11
BACKING	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00
GROOMING	: MEAN	1.4	0.9	1.2	1.5
	S.D.	1.19	1.10	1.42	1.20
URINATION	: MEAN	0.5	2.4+	0.2	0.5
	S.D.	1.13	3.44	0.58	0.97
DEFECATION	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
+ = SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING DUNNETT'S TEST
NONE SIGNIFICANTLY DIFFERENT FROM THE CONTROLS AT THE 0.05 LEVEL USING FISHER'S EXACT TEST

TABLE 26 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
MALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	15	15	14
TIME TO FIRST STEP (seconds) : MEAN	0.4	0.5	0.5	0.5
S.D.	0.11	0.18	0.19	0.22
MOBILITY				
NORMAL	100.	100.	100.	100.
GAIT				
NORMAL	100.	100.	100.	100.
CONVULSIONS - CLONIC				
ABSENT	100.	100.	100.	100.
CONVULSIONS - TONIC				
ABSENT	100.	100.	100.	100.
TREMORS				
NONE	100.	100.	100.	100.
GAIT SCORE				
NORMAL	100.	100.	100.	100.
AROUSAL				
NORMAL: ALERT, EXPLORATORY MOVEMENTS	100.	100.	100.	100.
BIZARRE/STEREOTYPIC BEHAVIOR				
NONE	100.	100.	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 26 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
MALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		13	15	15	14
REARING	: MEAN	5.9	6.5	7.6	5.6
	S.D.	3.28	3.78	4.37	3.57
BACKING	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00
GROOMING	: MEAN	1.0	1.1	0.9	1.2
	S.D.	1.08	1.22	1.03	0.97
URINATION	: MEAN	2.2	2.7	2.9	2.9
	S.D.	2.09	3.43	3.44	3.84
DEFECATION	: MEAN	0.1	0.0	0.0	0.0
	S.D.	0.28	0.00	0.00	0.00

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 26 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
FEMALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:	1	2	3	4
NUMBER TESTED:	13	14	14	13
TIME TO FIRST STEP (seconds) : MEAN	0.4	0.4	0.4	0.4
S.D.	0.25	0.11	0.15	0.13
MOBILITY				
NORMAL	100.	100.	100.	100.
GAIT				
NORMAL	100.	100.	100.	100.
CONVULSIONS - CLONIC				
ABSENT	100.	100.	100.	100.
CONVULSIONS - TONIC				
ABSENT	100.	100.	100.	100.
TREMORS				
NONE	100.	100.	100.	100.
GAIT SCORE				
NORMAL	100.	100.	100.	100.
AROUSAL				
NORMAL: ALERT, EXPLORATORY MOVEMENTS	92.3	100.	92.9	92.3
SOMEWHAT HIGH: SLIGHT EXCITEMENT, TENSE, SUDDEN DARTING OR FREEZING	0.	0.	7.1	7.7
VERY HIGH: HYPERALERT, EXCITED, SUDDEN BOUTS OF RUNNING OR BODY MOVEMENTS	7.7	0.	0.	0.
BIZARRE/STEREOTYPIC BEHAVIOR				
NONE	100.	92.9	100.	100.

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 26 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
FUNCTIONAL OBSERVATIONAL BATTERY SUMMARY INCIDENCE

OPEN FIELD OBSERVATIONS
FEMALES
PERCENTAGE OF ANIMALS SHOWING EACH OBSERVATION

GROUP:		1	2	3	4
NUMBER TESTED:		13	14	14	13
BIZARRE/STEREOTYPIC BEHAVIOR (CONTINUED)					
RETROPULSION: ANIMAL WALKS BACKWARDS		0.	7.1	0.	0.
REARING	: MEAN	12.3	12.5	10.4	9.7
	S.D.	5.71	3.96	7.06	4.11
BACKING	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00
GROOMING	: MEAN	1.4	0.9	1.2	1.5
	S.D.	1.19	1.10	1.42	1.20
URINATION	: MEAN	0.5	2.4	0.2	0.5
	S.D.	1.13	3.44	0.58	0.97
DEFECATION	: MEAN	0.0	0.0	0.0	0.0
	S.D.	0.00	0.00	0.00	0.00

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
STATISTICAL ANALYSIS NOT CONDUCTED ON THIS DATA SET

TABLE 27

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. BODY WEIGHTS (GRAMS) - SUMMARY OF MEANS

		----- MALE -----			
	GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
WEEK -1					
	MEAN	192.	191.	192.	192.
	S.D.	28.4	30.4	29.1	25.7
	N	15	15	15	15
0					
	MEAN	235.	234.	234.	233.
	S.D.	29.4	32.0	26.0	27.8
	N	15	15	15	15
1					
	MEAN	275.	271.	266.	250.
	S.D.	31.0	34.1	29.3	30.2
	N	14	15	15	14
2					
	MEAN	309.	304.	294.	277.*
	S.D.	28.6	36.8	31.1	30.0
	N	13	15	15	14
3					
	MEAN	338.	329.	319.	301.*
	S.D.	27.8	39.5	31.5	30.2
	N	13	15	15	14

* = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 1 AT 0.05 LEVEL USING DUNNETT'S TEST

TABLE 27

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. BODY WEIGHTS (GRAMS) - SUMMARY OF MEANS

		----- M A L E -----			
	GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
WEEK 4					
	MEAN	360.	347.	335.	317.**
	S.D.	25.7	41.2	32.6	28.7
	N	13	15	15	14
5					
	MEAN	394.	403.	378.	363.
	S.D.	37.7	45.1	26.8	33.6
	N	5	5	5	5

** = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 1 AT 0.01 LEVEL USING DUNNETT'S TEST

TABLE 27
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
BODY WEIGHTS (GRAMS) - SUMMARY OF MEANS

		----- F E M A L E -----			
	GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
WEEK -1					
	MEAN	168.	167.	166.	167.
	S.D.	19.6	19.7	20.6	18.5
	N	15	15	15	15
0					
	MEAN	188.	188.	188.	188.
	S.D.	16.9	18.9	19.2	18.6
	N	15	15	15	15
1					
	MEAN	207.	209.	206.	206.
	S.D.	21.2	19.4	23.0	15.0
	N	15	15	15	15
2					
	MEAN	220.	220.	218.	219.
	S.D.	20.6	16.8	24.4	17.7
	N	13	15	14	13
3					
	MEAN	230.	232.	233.	230.
	S.D.	22.5	19.9	29.7	17.2
	N	13	14	14	13

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

TABLE 27

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. BODY WEIGHTS (GRAMS) - SUMMARY OF MEANS

		----- F E M A L E -----			
	GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
WEEK 4					
	MEAN	237.	244.	240.	243.
	S.D.	21.2	19.3	31.3	16.5
	N	13	14	14	11
5					
	MEAN	240.	231.	233.	241.
	S.D.	25.9	18.6	21.0	18.0
	N	5	5	5	5

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

TABLE 28

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. BODY WEIGHT GAINS (GRAMS) - SUMMARY OF MEANS

	----- M A L E -----			
GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
WEEK -1 TO 0				
MEAN	43.	43.	42.	40.
S.D.	6.3	10.4	7.3	5.9
N	15	15	15	15
0 TO 1				
MEAN	39.	37.	32.	20.**
S.D.	8.9	7.7	8.1	12.3
N	14	15	15	14
1 TO 2				
MEAN	28.	33.	28.	27.
S.D.	16.6	6.1	6.8	7.7
N	13	15	15	14
2 TO 3				
MEAN	30.	25.	25.	24.
S.D.	11.9	5.1	3.5	5.6
N	13	15	15	14
3 TO 4				
MEAN	21.	18.	16.	16.
S.D.	8.5	5.6	5.1	5.6
N	13	15	15	14

** = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 1 AT 0.01 LEVEL USING DUNNETT'S TEST

TABLE 28

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. BODY WEIGHT GAINS (GRAMS) - SUMMARY OF MEANS

	----- MALE -----			
GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
WEEK 4 TO 5				
MEAN	29.	27.	33.	34.
S.D.	3.9	7.3	9.9	8.8
N	5	5	5	5

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

TABLE 28

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. BODY WEIGHT GAINS (GRAMS) - SUMMARY OF MEANS

	----- F E M A L E -----			
GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
WEEK -1 TO 0				
MEAN	20.	22.	22.	21.
S.D.	7.3	6.6	5.1	8.0
N	15	15	15	15
0 TO 1				
MEAN	19.	21.	18.	18.
S.D.	12.4	7.9	5.6	7.9
N	15	15	15	15
1 TO 2				
MEAN	15.	10.	12.	14.
S.D.	6.6	7.6	8.6	4.9
N	13	15	14	13
2 TO 3				
MEAN	10.	13.	15.	12.
S.D.	3.8	7.1	8.0	5.0
N	13	14	14	13
3 TO 4				
MEAN	8.	11.	7.	8.
S.D.	5.2	7.2	4.7	4.7
N	13	14	14	11

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

TABLE 28

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. BODY WEIGHT GAINS (GRAMS) - SUMMARY OF MEANS

	----- F E M A L E -----			
GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
WEEK 4 TO 5				
MEAN	3.	1.	3.	7.
S.D.	8.2	6.6	8.4	6.4
N	5	5	5	5

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

TABLE 29

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
WEEKLY FOOD CONSUMPTION (GRAMS/ANIMAL/DAY) - SUMMARY OF MEANS

	----- MALE -----			
GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
WEEK -1 TO 0				
MEAN	22.	21.	21.	21.
S.D.	1.9	2.4	1.7	1.6
N	15	15	15	15
0 TO 1				
MEAN	22.	22.	21.	19.**
S.D.	1.9	2.8	1.9	1.6
N	14	15	15	13
1 TO 2				
MEAN	23.	23.	22.	21.
S.D.	2.4	2.8	2.6	2.1
N	13	15	15	14
2 TO 3				
MEAN	24.	23.	23.	22.
S.D.	1.8	2.9	2.0	1.3
N	13	15	15	14
3 TO 4				
MEAN	25.	23.	23.	23.*
S.D.	1.8	2.5	2.0	1.5
N	13	15	15	14

* = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 1 AT 0.05 LEVEL USING DUNNETT'S TEST
** = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 1 AT 0.01 LEVEL USING DUNNETT'S TEST

TABLE 29

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. WEEKLY FOOD CONSUMPTION (GRAMS/ANIMAL/DAY) - SUMMARY OF MEANS

	----- M A L E -----			
GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
WEEK 4 TO 5				
MEAN	27.	26.	25.	25.
S.D.	2.6	1.9	1.4	2.2
N	5	5	5	5

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

TABLE 29

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. WEEKLY FOOD CONSUMPTION (GRAMS/ANIMAL/DAY) - SUMMARY OF MEANS

	----- F E M A L E -----			
GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
WEEK -1 TO 0				
MEAN	17.	17.	17.	17.
S.D.	1.5	1.2	1.6	1.8
N	15	15	15	15
0 TO 1				
MEAN	18.	18.	17.	17.
S.D.	2.1	1.6	1.9	1.3
N	15	15	15	15
1 TO 2				
MEAN	18.	18.	18.	18.
S.D.	1.6	1.3	1.6	1.0
N	12	15	14	13
2 TO 3				
MEAN	18.	18.	18.	18.
S.D.	1.6	1.4	1.6	1.4
N	13	14	13	13
3 TO 4				
MEAN	18.	18.	19.	19.
S.D.	1.5	1.2	1.9	2.4
N	13	14	14	11

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

TABLE 29

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. WEEKLY FOOD CONSUMPTION (GRAMS/ANIMAL/DAY) - SUMMARY OF MEANS

	----- F E M A L E -----			
GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
WEEK 4 TO 5				
MEAN	17.	17.	19.	18.
S.D.	1.8	1.3	1.1	1.2
N	5	5	5	5

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

TABLE 30 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. HEMATOLOGY VALUES -- SUMMARY OF MEANS WEEK 4

ANALYSIS GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
	----- M A L E -----			
WHITE CELL (thous/uL)				
MEAN	12.0	11.4	14.0	13.8
S.D.	1.76	3.83	2.87	2.55
N	8	10	10	9
RED CELLS (mil/uL)				
MEAN	8.38	8.29	8.38	8.49
S.D.	0.399	0.449	0.295	0.330
N	8	10	10	9
HEMOGLOBIN (g/dL)				
MEAN	16.5	16.2	16.4	16.5
S.D.	0.43	0.70	0.54	0.49
N	8	10	10	9
HEMATOCRIT (%)				
MEAN	47.4	46.7	46.9	47.3
S.D.	1.52	2.15	1.88	1.72
N	8	10	10	9
MCV (u 3)				
MEAN	56.6	56.3	56.0	55.7
S.D.	1.68	1.32	1.12	1.12
N	8	10	10	9

g/dL = GRAMS/DECILITER, thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, uug = PICOGRAMS,
u 3 = CUBIC MICRONS

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

TABLE 30 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS PAGE 2

SPONSOR:ELF ATOCHEM INC. HEMATOLOGY VALUES -- SUMMARY OF MEANS WEEK 4

ANALYSIS	GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
		----- M A L E -----			
MCH (uug)					
	MEAN	19.7	19.6	19.6	19.5
	S.D.	0.60	0.74	0.44	0.41
	N	8	10	10	9
MCHC (g/dL)					
	MEAN	34.8	34.7	35.0	34.9
	S.D.	0.54	0.65	0.46	0.35
	N	8	10	10	9
PLATELET (thous/uL)					
	MEAN	1155.	1144.	1169.	1195.
	S.D.	62.4	128.6	118.6	136.1
	N	8	10	10	9

g/dL = GRAMS/DECILITER, thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, uug = PICOGRAMS,
u 3 = CUBIC MICRONS

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

TABLE 30 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. HEMATOLOGY VALUES -- SUMMARY OF MEANS WEEK 4

ANALYSIS GROUP:	-----F E M A L E----- 0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
WHITE CELL (thous/uL)				
MEAN	11.7	10.6	9.1	10.8
S.D.	2.80	5.19	1.74	2.62
N	8	9	9	6
RED CELLS (mil/uL)				
MEAN	7.84	7.77	8.01	7.95
S.D.	0.405	0.356	0.397	0.293
N	8	9	9	6
HEMOGLOBIN (g/dL)				
MEAN	15.9	15.6	15.8	16.1
S.D.	0.58	0.59	0.48	0.31
N	8	9	9	6
HEMATOCRIT (%)				
MEAN	45.6	45.0	46.1	46.8
S.D.	1.88	1.71	1.56	1.12
N	8	9	9	6
MCV (u 3)				
MEAN	58.3	57.9	57.5	58.9
S.D.	1.22	0.80	1.80	1.73
N	8	9	9	6

g/dL = GRAMS/DECILITER, thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, uug = PICOGRAMS,
u 3 = CUBIC MICRONS

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

TABLE 30 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS PAGE 4

SPONSOR:ELF ATOCHEM INC. HEMATOLOGY VALUES -- SUMMARY OF MEANS WEEK 4

ANALYSIS	GROUP:	-----F E M A L E----- 0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
MCH (uug)					
	MEAN	20.3	20.1	19.8	20.3
	S.D.	0.52	0.29	0.65	0.69
	N	8	9	9	6
MCHC (g/dL)					
	MEAN	34.8	34.6	34.4*	34.5
	S.D.	0.36	0.20	0.47	0.42
	N	8	9	9	6
PLATELET (thous/uL)					
	MEAN	1147.	1162.	1121.	1119.
	S.D.	230.5	117.3	146.0	104.7
	N	8	9	9	6

g/dL = GRAMS/DECILITER, thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, uug = PICOGRAMS,
u 3 = CUBIC MICRONS

* = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 1 AT 0.05 LEVEL USING DUNNETT'S TEST

TABLE 30A (WEEK 6 RECOVERY EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS PAGE 1

SPONSOR:ELF ATOCHEM INC. HEMATOLOGY VALUES -- SUMMARY OF MEANS WEEK 6

ANALYSIS	GROUP:	-----F E M A L E----- 0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
MCHC (g/dL)					
	MEAN	35.3	35.3	35.0	35.3
	S.D.	0.26	0.66	0.53	0.69
	N	5	5	5	5

g/dL = GRAMS/DECILITER

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

TABLE 31 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 — A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS — PAGE 1

SPONSOR:ELF ATOCHEM INC. — LEUKOCYTE DIFFERENTIAL COUNT (%) -- SUMMARY OF MEANS — WEEK 4

ANALYSIS	GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
		----- MALE -----			
NEUTROPHIL					
	MEAN	16	21	18	20
	S.D.	6.1	9.6	4.1	9.1
	N	8	10	10	9
LYMPHOCYTE					
	MEAN	75	70	73	70
	S.D.	4.9	9.9	4.4	7.9
	N	8	10	10	9
MONOCYTE					
	MEAN	7	7	7	8
	S.D.	2.3	1.9	2.4	1.5
	N	8	10	10	9
EOSINOPHIL					
	MEAN	2	2	2	2
	S.D.	0.6	0.5	0.8	1.1
	N	8	10	10	9
BASOPHIL					
	MEAN	0	0	0	0
	S.D.	0.5	0.3	0.3	0.3
	N	8	10	10	9

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

TABLE 31 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 — A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS — PAGE 2

SPONSOR:ELF ATOCHEM INC. — LEUKOCYTE DIFFERENTIAL COUNT (%) -- SUMMARY OF MEANS — WEEK 4

ANALYSIS	GROUP:	-----F E M A L E----- 0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
NEUTROPHIL					
	MEAN	19	22	15	21
	S.D.	5.8	8.9	5.8	13.0
	N	8	9	9	6
LYMPHOCYTE					
	MEAN	74	71	77	73
	S.D.	6.0	8.3	6.2	13.1
	N	8	9	9	6
MONOCYTE					
	MEAN	5	5	5	5
	S.D.	1.1	2.0	1.5	0.8
	N	8	9	9	6
EOSINOPHIL					
	MEAN	2	2	2	2
	S.D.	0.5	0.5	1.0	0.5
	N	8	9	9	6
BASOPHIL					
	MEAN	0	0	0	0
	S.D.	0.0	0.0	0.0	0.4
	N	8	9	9	6

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

TABLE 32 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 — A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS — PAGE 1

SPONSOR:ELF ATOCHEM INC. — LEUKOCYTE COUNTS - SUMMARY OF MEANS — WEEK 4

ANALYSIS GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
	----- M A L E -----			
NEUTROPHIL (thous/uL)				
MEAN	1.8	2.6	2.5	2.9
S.D.	0.60	2.10	0.78	1.65
N	8	10	10	9
LYMPHOCYTE (thous/uL)				
MEAN	9.1	7.8	10.2	9.6
S.D.	1.63	2.07	2.32	1.69
N	8	10	10	9
MONOCYTE (thous/uL)				
MEAN	0.9	0.8	1.0	1.0
S.D.	0.30	0.31	0.30	0.28
N	8	10	10	9
EOSINOPHIL (thous/uL)				
MEAN	0.3	0.2	0.3	0.2
S.D.	0.06	0.07	0.16	0.15
N	8	10	10	9
BASOPHIL (thous/uL)				
MEAN	0.0	0.0	0.0	0.0
S.D.	0.06	0.04	0.04	0.05
N	8	10	10	9

thous/uL = THOUSANDS/MICROLITER

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 32 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
LEUKOCYTE COUNTS - SUMMARY OF MEANS

ANALYSIS GROUP:	-----FEMALE----- 0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
NEUTROPHIL (thous/uL)				
MEAN	2.1	2.5	1.4	2.1
S.D.	0.65	1.78	0.62	1.06
N	8	9	9	6
LYMPHOCYTE (thous/uL)				
MEAN	8.8	7.4	7.1	8.1
S.D.	2.34	3.33	1.53	3.06
N	8	9	9	6
MONOCYTE (thous/uL)				
MEAN	0.6	0.6	0.5	0.5
S.D.	0.25	0.34	0.19	0.09
N	8	9	9	6
EOSINOPHIL (thous/uL)				
MEAN	0.2	0.1	0.2	0.2
S.D.	0.08	0.05	0.09	0.07
N	8	9	9	6
BASOPHIL (thous/uL)				
MEAN	0.0	0.0	0.0	0.0
S.D.	0.00	0.00	0.00	0.05
N	8	9	9	6

thous/uL = THOUSANDS/MICROLITER

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 33 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
SERUM CHEMISTRY VALUES -- SUMMARY OF MEANS

ANALYSIS GROUP:	----- M A L E ----- 0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
ALBUMIN (g/dL)				
MEAN	4.5	4.6	4.5	4.4
S.D.	0.14	0.25	0.21	0.17
N	8	10	10	9
TOTAL PROTEIN (g/dL)				
MEAN	6.6	6.6	6.6	6.7
S.D.	0.12	0.33	0.19	0.35
N	8	10	10	9
GLOBULIN (g/dL)				
MEAN	2.2	2.1	2.1	2.2
S.D.	0.12	0.25	0.27	0.38
N	8	10	10	9
A/G RATIO				
MEAN	2.08	2.24	2.13	2.04
S.D.	0.164	0.308	0.317	0.418
N	8	10	10	9
TOTAL BILI (mg/dL)				
MEAN	0.1	0.2	0.2	0.1
S.D.	0.05	0.05	0.05	0.05
N	8	10	10	9

U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mg/dL = MILLIGRAMS/DECILITER,
mEq/L = milliEquivalents/Liter

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

TABLE 33 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 — A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS — PAGE 2

SPONSOR:ELF ATOCHEM INC. — SERUM CHEMISTRY VALUES -- SUMMARY OF MEANS — WEEK 4

	----- M A L E -----			
ANALYSIS GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	[illegible]
UREA NITROGEN (mg/dL)				
MEAN	16.2			
S.D.	1.48			
N	8	[illegible]	10	9
CREATININE (mg/dL)				
MEAN	[illegible]	0.3	0.3	0.3
S.D.		0.07	0.05	0.09
N	8	10	10	9
ALKALINEPHOS'TSE (U/L)				
MEAN	184.	193.	203.	185.
S.D.	34.0	30.3	28.8	26.0
N	8	10	10	9
ALANINE TRANSFER (U/L)				
MEAN	44.	44.	48.	50.
S.D.	6.3	8.4	6.4	11.6
N	8	10	10	9
ASPARTATTRANSFER (U/L)				
MEAN	142.		143.	136.
S.D.	22.7	33.2	[illegible]	13.9
N	8			9

U/L = INTERNATIONAL [illegible] [illegible]/DECILITER

mEq/L = milli[illegible]

* = SIGNIF[illegible] [illegible] 1 AT 0.05 LEVEL USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 33 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
SERUM CHEMISTRY VALUES -- SUMMARY OF MEANS

ANALYSIS GROUP:	----- MALE ----- 0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
GLUTAMYLTRANSFER (U/L)				
MEAN	0.	0.	0.	0.
S.D.	0.4	0.7	0.3	0.4
N	8	10	10	9
GLUCOSE (mg/dL)				
MEAN	82.	81.	82.	83.
S.D.	13.4	9.2	9.8	14.1
N	8	10	10	9
CHOLESTEROL (mg/dL)				
MEAN	58.	50.	60.	57.
S.D.	10.1	7.9	11.3	10.3
N	8	10	10	9
CALCIUM (mg/dL)				
MEAN	9.4	9.5	9.6	9.5
S.D.	0.15	0.22	0.18	0.13
N	8	10	10	9
CHLORIDE (mEq/L)				
MEAN	101.	102.	101.	101.
S.D.	6.2	6.2	6.1	5.9
N	8	10	10	9

U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mg/dL = MILLIGRAMS/DECILITER,
mEq/L = milliEquivalents/Liter

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 33 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
SERUM CHEMISTRY VALUES -- SUMMARY OF MEANS

ANALYSIS GROUP:	----- MALE ----- 0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
PHOSPHORUS (mg/dL)				
MEAN	8.4	8.3	8.2	8.6
S.D.	0.61	0.72	0.74	1.04
N	8	10	10	9
POTASSIUM (mEq/L)				
MEAN	5.82	5.78	5.60	5.56
S.D.	0.847	0.631	0.618	0.709
N	8	10	10	9
SODIUM (mEq/L)				
MEAN	147.	147.	148.	148.
S.D.	1.5	1.1	1.6	1.8
N	8	10	10	9

U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mg/dL = MILLIGRAMS/DECILITER,
mEq/L = milliEquivalents/Liter

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 33 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
SERUM CHEMISTRY VALUES -- SUMMARY OF MEANS

ANALYSIS GROUP:	-----F E M A L E----- 0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
ALBUMIN (g/dL)				
MEAN	4.6	4.5	4.5	4.5
S.D.	0.27	0.27	0.23	0.22
N	8	9	9	6
TOTAL PROTEIN (g/dL)				
MEAN	6.8	6.9	6.8	6.7
S.D.	0.30	0.19	0.26	0.21
N	8	9	9	6
GLOBULIN (g/dL)				
MEAN	2.2	2.4	2.3	2.3
S.D.	0.35	0.31	0.23	0.27
N	8	9	9	6
A/G RATIO				
MEAN	2.13	1.90	1.98	2.02
S.D.	0.431	0.376	0.237	0.285
N	8	9	9	6
TOTAL BILI (mg/dL)				
MEAN	0.2	0.2	0.1	0.2
S.D.	0.05	0.05	0.05	0.05
N	8	9	9	6

U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mg/dL = MILLIGRAMS/DECILITER,
mEq/L = milliEquivalents/Liter

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 33 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
SERUM CHEMISTRY VALUES -- SUMMARY OF MEANS

ANALYSIS GROUP:	-----F E M A L E----- 0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
UREA NITROGEN (mg/dL)				
MEAN	18.8	17.9	18.9	20.7
S.D.	2.35	1.91	3.13	3.66
N	8	9	9	6
CREATININE (mg/dL)				
MEAN	0.3	0.3	0.3	0.3
S.D.	0.04	0.04	0.05	0.05
N	8	9	9	6
ALKALINEPHOS'TSE (U/L)				
MEAN	137.	129.	127.	152.
S.D.	23.4	29.4	31.3	41.9
N	8	9	9	6
ALANINE TRANSFER (U/L)				
MEAN	39.	40.	39.	50.
S.D.	4.6	12.4	9.5	11.6
N	8	9	9	6
ASPARTATTRANSFER (U/L)				
MEAN	116.	125.	134.	148.*
S.D.	19.6	14.2	14.2	32.5
N	8	9	9	6

U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mg/dL = MILLIGRAMS/DECILITER,
mEq/L = milliEquivalents/Liter

* = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 1 AT 0.05 LEVEL USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 33 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
SERUM CHEMISTRY VALUES -- SUMMARY OF MEANS

ANALYSIS GROUP:	-----F E M A L E----- 0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
GLUTAMYLTRANSFER (U/L)				
MEAN	1.	0.	0.	0.
S.D.	0.7	0.3	0.5	0.0
N	8	9	9	6
GLUCOSE (mg/dL)				
MEAN	95.	97.	88.	94.
S.D.	8.0	9.6	6.9	13.5
N	8	9	9	6
CHOLESTEROL (mg/dL)				
MEAN	62.	66.	67.	53.
S.D.	10.3	11.9	14.9	5.0
N	8	9	9	6
CALCIUM (mg/dL)				
MEAN	9.5	9.5	9.4	9.5
S.D.	0.16	0.21	0.25	0.33
N	8	9	9	6
CHLORIDE (mEq/L)				
MEAN	103.	103.	104.	102.
S.D.	4.8	5.1	5.3	5.9
N	8	9	9	6

U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mg/dL = MILLIGRAMS/DECILITER,
mEq/L = milliEquivalents/Liter

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 33 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
SERUM CHEMISTRY VALUES -- SUMMARY OF MEANS

ANALYSIS GROUP:	-----F E M A L E----- 0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
PHOSPHORUS (mg/dL)				
MEAN	7.2	7.1	7.0	7.6
S.D.	0.80	0.86	0.75	0.96
N	8	9	9	6
POTASSIUM (mEq/L)				
MEAN	5.45	5.47	5.35	5.64
S.D.	0.551	0.690	0.530	0.724
N	8	9	9	6
SODIUM (mEq/L)				
MEAN	146.	146.	147.	146.
S.D.	2.4	2.0	2.2	1.2
N	8	9	9	6

U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mg/dL = MILLIGRAMS/DECILITER,
mEq/L = milliEquivalents/Liter

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 33A (WEEK 6 RECOVERY EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
SERUM CHEMISTRY VALUES -- SUMMARY OF MEANS

ANALYSIS GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
	----- M A L E -----			
UREA NITROGEN (mg/dL)				
MEAN	14.5	13.7	14.9	14.2
S.D.	1.94	1.26	0.85	1.56
N	5	5	5	5

U/L = INTERNATIONAL UNIT/LITER, mg/dL = MILLIGRAMS/DECILITER

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 33A (WEEK 6 RECOVERY EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
SERUM CHEMISTRY VALUES -- SUMMARY OF MEANS

ANALYSIS GROUP:	-----FEMALE----- 0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
ASPARTATTRANSFER (U/L)				
MEAN	95.	119.	101.	102.
S.D.	13.6	32.5	48.4	33.2
N	5	5	5	5

U/L = INTERNATIONAL UNIT/LITER, mg/dL = MILLIGRAMS/DECILITER

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 34 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
SPECIAL CHEMISTRY VALUES -- SUMMARY OF MEANS

ANALYSIS GROUP:	----- M A L E ----- 0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
BILE ACIDS (umol/L)				
MEAN	35.1	86.7	45.9	53.5
S.D.	25.84	130.82	19.76	15.76
N	8	10	10	9

umol/L = micromoles/Liter

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 34 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
SPECIAL CHEMISTRY VALUES -- SUMMARY OF MEANS

ANALYSIS GROUP:	-----F E M A L E----- 0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
BILE ACIDS (umol/L)				
MEAN	40.1	25.8	24.7	25.8
S.D.	32.75	13.53	11.58	18.34
N	8	9	9	6

umol/L = micromoles/Liter

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 35 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
URINE VOLUMES AND CHEMISTRY VALUES - SUMMARY OF MEANS

ANALYSIS GROUP:	----- M A L E ----- 0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
TOTAL VOLUME (mL)				
MEAN	9.5	7.2	5.1	7.5
S.D.	7.61	5.92	3.96	7.79
N	8	10	10	9
UROBILINOGEN (mg/dL)				
MEAN	0.	0.	0.	0.
S.D.	0.0	0.0	0.0	0.0
N	8	10	10	9

mL = MILLILITER, mg/dL = MILLIGRAMS/DECILITER

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 35 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
URINE VOLUMES AND CHEMISTRY VALUES - SUMMARY OF MEANS

ANALYSIS GROUP:	-----F E M A L E----- 0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
TOTAL VOLUME (mL)				
MEAN	4.8	6.3	5.4	4.6
S.D.	3.03	4.33	2.59	2.65
N	8	9	9	6
UROBILINOGEN (mg/dL)				
MEAN	0.	0.	0.	0.
S.D.	0.0	0.0	0.0	0.0
N	8	9	9	6

mL = MILLILITER, mg/dL = MILLIGRAMS/DECILITER

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 36 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
URINE SPECIFIC GRAVITY AND pH - SUMMARY OF MEANS

ANALYSIS GROUP:	----- MALE ----- 0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
SPECIFIC GRAVITY				
MEAN	1.035	1.036	1.051	1.047
S.D.	0.0104	0.0121	0.0195	0.0253
N	8	10	10	9
pH				
MEAN	5.8	5.9	5.7	5.5
S.D.	0.37	0.32	0.41	0.35
N	8	10	10	9

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 36 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
URINE SPECIFIC GRAVITY AND pH - SUMMARY OF MEANS

ANALYSIS GROUP:	-----F E M A L E----- 0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
SPECIFIC GRAVITY				
MEAN	1.046	1.039	1.039	1.045
S.D.	0.0177	0.0164	0.0161	0.0152
N	8	9	9	6
pH				
MEAN	5.6	5.5	5.6	5.1
S.D.	0.42	0.50	0.39	0.20
N	8	9	9	6

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 37 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS NECROPSY OBSERVATIONS INCIDENCE SUMMARY

FOUND DEAD OR EUTHANIZED MORIBUND OR IN EXTREMIS

GROUP:	MALE 1	MALE 2	MALE 3	MALE 4	FEMALE 1	FEMALE 2	FEMALE 3	FEMALE 4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15	15	15	15	15
NUMBER OF ANIMALS EXAMINED	2	0	0	1	2	1	1	4
LYMPH NODE, SUPR								
-REDDENED	1	0	0	0	0	0	1	1
-ENLARGED	0	0	0	0	0	0	0	2
ILEUM								
-DARK RED CONTENTS	0	0	0	0	0	0	0	1
LUNGS								
-DARK RED	0	0	0	1	2	0	1	1
-DARK RED AREA(S)	1	0	0	0	0	0	0	0
SALIVARY GLANDS								
-REDDENED	0	0	0	0	0	0	0	1
THYROID GLANDS								
-REDDENED	0	0	0	0	0	0	0	1
CAUSE DEATH/MORB								
-MECHANICAL TRAUMA	2	0	0	0	2	1	0	1
LYMPH NODE								
-CERVICAL- REDDENED	1	0	0	0	1	0	0	1
-CERVICAL- ENLARGED	1	0	0	0	0	1	0	0
-MEDIASTINAL- REDDENED	0	0	0	0	0	0	0	1
EXTERNAL SURFACE								
-BROWN MATTING	2	0	0	0	0	1	0	3

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 37 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS NECROPSY OBSERVATIONS INCIDENCE SUMMARY

FOUND DEAD OR EUTHANIZED MORIBUND OR IN EXTREMIS

	MALE				FEMALE			
GROUP:	1	2	3	4	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15	15	15	15	15
NUMBER OF ANIMALS EXAMINED	2	0	0	1	2	1	1	4
EXTERNAL SURFACE - CONTINUED								
-RED MATTING	0	0	0	0	0	0	1	0
-HAIR LOSS	1	0	0	0	0	0	0	0
-SCABBING	0	0	0	0	0	0	0	1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 38 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS NECROPSY OBSERVATIONS INCIDENCE SUMMARY

SCHEDULED NECROPSY

GROUP:	MALE 1	MALE 2	MALE 3	MALE 4	FEMALE 1	FEMALE 2	FEMALE 3	FEMALE 4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 4	8	10	10	9	8	9	9	6
LYMPH NODE, SUPR								
-ENLARGED	0	3	0	0	2	1	1	1
LYMPH NODE, MES								
-REDDENED	1	0	0	0	0	0	0	0
LUNGS								
-DARK RED	0	1	0	0	1	2	0	1
-MOTTLED	0	0	2	0	3	2	5	0
SPLEEN								
-CAPSULAR SCARRING	0	0	0	1	0	0	0	0
TRACHEA								
-RED FLUID CONTENTS	0	0	1	0	0	0	0	0
UTERUS								
-CLEAR FLUID CONTENTS	NA	NA	NA	NA	0	0	0	1
LYMPH NODE								
-CERVICAL- REDDENED	0	1	0	0	1	0	0	0
-CERVICAL- ENLARGED	0	0	1	0	1	2	0	0
-ILIAC- ENLARGED	0	0	0	0	1	0	0	0
-MEDIASTINAL- ENLARGED	0	0	1	0	0	0	1	0
NO SIGNIFICANT CHANGES OBSERVED - ALL EXAMINED TISSUES	7	6	7	8	3	4	4	4

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 39 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS NECROPSY OBSERVATIONS INCIDENCE SUMMARY

SCHEDULED NECROPSY

GROUP:	MALE 1	MALE 2	MALE 3	MALE 4	FEMALE 1	FEMALE 2	FEMALE 3	FEMALE 4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 6	5	5	5	5	5	5	5	5
EPIDIDYMIDES								
-ABSENT	1	0	0	0	NA	NA	NA	NA
-ABSCESS(ES)	0	0	0	1	NA	NA	NA	NA
LYMPH NODE, SUPR								
-REDDENED	1	1	0	0	0	1	0	0
-ENLARGED	1	1	0	0	0	0	2	1
KIDNEYS								
-ABSENT	1	0	0	0	0	0	0	0
LUNGS								
-DARK RED	0	0	0	0	0	0	2	0
-MOTTLED	0	0	0	0	0	1	0	0
SEMINAL VESICLES								
-SMALL	1	0	0	0	NA	NA	NA	NA
SPLEEN								
-CAPSULAR SCARRING	1	0	0	0	0	0	0	0
TESTES								
-PALE	1	0	0	0	NA	NA	NA	NA
LYMPH NODE								
-CERVICAL- REDDENED	3	1	1	1	0	1	0	0

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 39 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS NECROPSY OBSERVATIONS INCIDENCE SUMMARY

SCHEDULED NECROPSY

GROUP:	MALE 1	MALE 2	MALE 3	MALE 4	FEMALE 1	FEMALE 2	FEMALE 3	FEMALE 4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 6	5	5	5	5	5	5	5	5
LYMPH NODE - CONTINUED								
-CERVICAL- ENLARGED	0	0	0	2	0	1	1	1
-ILIAC- ENLARGED	0	0	0	1	0	0	0	0
EXTERNAL SURFACE								
-SCABBING	0	0	1	0	0	0	0	0
URETER(S)								
-ABSENT	1	0	0	0	0	0	0	0
COAGULATING GL								
-SMALL	1	0	0	0	0	0	0	0
NO SIGNIFICANT CHANGES OBSERVED - ALL EXAMINED TISSUES	2	3	3	3	5	2	2	4

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 40 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS (GRAMS) - SUMMARY OF MEANS

GROUP:		0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
		----- M A L E -----			
BRAIN					
	MEAN	1.97	1.92	1.87	1.86
	S.D.	0.056	0.136	0.093	0.095
	N	8	10	10	9
LIVER					
	MEAN	10.59	9.39	10.19	8.39*
	S.D.	1.727	1.668	1.923	1.231
	N	8	10	10	9
KIDNEYS					
	MEAN	2.86	2.58	2.52	2.33**
	S.D.	0.239	0.438	0.340	0.281
	N	8	10	10	9
HEART					
	MEAN	1.22	1.22	1.19	1.26
	S.D.	0.103	0.126	0.183	0.225
	N	8	10	10	9
SPLEEN					
	MEAN	0.67	0.66	0.62	0.55
	S.D.	0.081	0.136	0.115	0.077
	N	8	10	10	9

* = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 1 AT 0.05 LEVEL USING DUNNETT'S TEST
** = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 1 AT 0.01 LEVEL USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 40 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS (GRAMS) - SUMMARY OF MEANS

GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
	----- MALE -----			
LUNGS				
MEAN	2.00	1.77	2.02	1.60
S.D.	0.506	0.417	0.665	0.264
N	8	10	10	9
TESTES/EPIDID.				
MEAN	4.75	4.36	4.33	4.16*
S.D.	0.523	0.349	0.438	0.385
N	8	10	10	9
THYMUS GLAND				
MEAN	0.4149	0.4341	0.3888	0.3371
S.D.	0.15810	0.16969	0.08341	0.06511
N	8	10	10	9
ADRENAL GLANDS				
MEAN	0.0722	0.0662	0.0653	0.0637
S.D.	0.00737	0.01151	0.01384	0.00643
N	8	10	10	9

* = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 1 AT 0.05 LEVEL USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 40 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS (GRAMS) - SUMMARY OF MEANS

GROUP:		----- F E M A L E ----- 0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
BRAIN					
	MEAN	1.80	1.85	1.88	1.82
	S.D.	0.080	0.101	0.194	0.050
	N	8	9	9	6
LIVER					
	MEAN	7.52	8.08	8.46	7.20
	S.D.	1.164	1.172	2.010	0.441
	N	8	9	9	6
KIDNEYS					
	MEAN	1.85	1.89	2.08	1.93
	S.D.	0.213	0.207	0.397	0.108
	N	8	9	9	6
HEART					
	MEAN	0.91	0.94	0.98	0.95
	S.D.	0.113	0.108	0.212	0.132
	N	8	9	9	6
SPLEEN					
	MEAN	0.53	0.58	0.57	0.55
	S.D.	0.186	0.096	0.165	0.063
	N	8	9	9	6

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 40 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS (GRAMS) - SUMMARY OF MEANS

GROUP:		----- F E M A L E ----- 0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
LUNGS					
	MEAN	1.95	1.94	2.34	1.67
	S.D.	0.679	0.597	0.522	0.549
	N	8	9	9	6
OVARIES					
	MEAN	0.1356	0.1368	0.1549	0.1464
	S.D.	0.02072	0.01746	0.04526	0.03042
	N	8	9	9	6
THYMUS GLAND					
	MEAN	0.3531	0.3978	0.3822	0.3707
	S.D.	0.07770	0.07262	0.10528	0.02330
	N	8	9	9	6
ADRENAL GLANDS					
	MEAN	0.0818	0.0843	0.0867	0.0865
	S.D.	0.01904	0.01141	0.01769	0.00551
	N	8	9	9	6

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 41 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS (GRAMS) - SUMMARY OF MEANS

GROUP:		0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
		----- M A L E -----			
BRAIN					
	MEAN	1.98	1.99	1.99	1.98
	S.D.	0.076	0.105	0.113	0.065
	N	5	5	5	5
LIVER					
	MEAN	12.03	12.17	12.39	12.05
	S.D.	1.948	1.401	0.904	0.974
	N	5	5	5	5
KIDNEYS					
	MEAN	3.07	3.39	3.16	3.13
	S.D.	0.567	0.373	0.114	0.535
	N	4	5	5	5
HEART					
	MEAN	1.35	1.48	1.49	1.42
	S.D.	0.147	0.145	0.196	0.094
	N	5	5	5	5
SPLEEN					
	MEAN	0.81	0.75	0.79	0.84
	S.D.	0.067	0.099	0.126	0.096
	N	5	5	5	5

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 41 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS (GRAMS) - SUMMARY OF MEANS

GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
	----- M A L E -----			
LUNGS				
MEAN	1.78	1.69	1.76	1.90
S.D.	0.470	0.166	0.176	0.559
N	5	5	5	5
TESTES/EPIDID.				
MEAN	4.63	4.82	4.65	4.59
S.D.	0.552	0.138	0.592	0.361
N	4	5	5	5
THYMUS GLAND				
MEAN	0.5484	0.4536	0.5290	0.4776
S.D.	0.07326	0.10830	0.10761	0.13906
N	5	5	5	5
ADRENAL GLANDS				
MEAN	0.0655	0.0637	0.0667	0.0667
S.D.	0.01294	0.00963	0.00859	0.00440
N	5	5	5	5

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 41 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS (GRAMS) - SUMMARY OF MEANS

		----- F E M A L E -----			
	GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
BRAIN					
	MEAN	1.79	1.79	1.79	1.80
	S.D.	0.072	0.083	0.077	0.016
	N	5	5	5	5
LIVER					
	MEAN	7.81	7.79	8.43	7.51
	S.D.	1.604	0.705	1.029	1.000
	N	5	5	5	5
KIDNEYS					
	MEAN	1.78	1.91	1.88	1.84
	S.D.	0.253	0.234	0.159	0.125
	N	5	5	5	5
HEART					
	MEAN	0.98	0.89	0.88	0.86
	S.D.	0.366	0.204	0.107	0.100
	N	5	5	5	5
SPLEEN					
	MEAN	0.55	0.56	0.52	0.59
	S.D.	0.050	0.169	0.042	0.089
	N	5	5	5	5

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 41 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS (GRAMS) - SUMMARY OF MEANS

GROUP:		----- F E M A L E ----- 0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
LUNGS					
	MEAN	1.47	1.51	2.17	1.53
	S.D.	0.227	0.432	0.551	0.433
	N	5	5	5	5
OVARIES					
	MEAN	0.1458	0.1394	0.1327	0.1520
	S.D.	0.01574	0.03021	0.01532	0.02397
	N	5	5	5	5
THYMUS GLAND					
	MEAN	0.4525	0.4302	0.3935	0.3068
	S.D.	0.10960	0.11440	0.07827	0.14041
	N	5	5	5	5
ADRENAL GLANDS					
	MEAN	0.0744	0.0809	0.0827	0.0729
	S.D.	0.01082	0.00956	0.01452	0.00698
	N	5	5	5	5

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 42 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS RELATIVE TO FINAL BODY WEIGHTS (GRAMS/100 GRAMS)

GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
	----- M A L E -----			
FINAL BODY WT				
MEAN	323.	301.	296.	278.**
S.D.	16.0	29.0	33.9	26.6
N	8	10	10	9
BRAIN				
MEAN	0.613	0.640	0.638	0.672
S.D.	0.0400	0.0547	0.0787	0.0426
N	8	10	10	9
LIVER				
MEAN	3.285	3.110	3.444	3.022
S.D.	0.5347	0.3379	0.4987	0.3641
N	8	10	10	9
KIDNEYS				
MEAN	0.886	0.855	0.851	0.841
S.D.	0.0637	0.0995	0.0516	0.0757
N	8	10	10	9
HEART				
MEAN	0.377	0.406	0.401	0.451**
S.D.	0.0373	0.0297	0.0304	0.0575
N	8	10	10	9

** = SIGNIFICANTLY DIFFERENT FROM CONTROL GROUP 1 AT 0.01 LEVEL USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 42 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS RELATIVE TO FINAL BODY WEIGHTS (GRAMS/100 GRAMS)

GROUP:	0.00 MG/L	----- MALE ----- 0.025 MG/L	0.075 MG/L	0.25 MG/L
SPLEEN				
MEAN	0.207	0.218	0.211	0.200
S.D.	0.0210	0.0397	0.0297	0.0238
N	8	10	10	9
LUNGS				
MEAN	0.616	0.593	0.692	0.579
S.D.	0.1411	0.1448	0.2548	0.1011
N	8	10	10	9
TESTES/EPIDID.				
MEAN	1.471	1.458	1.466	1.500
S.D.	0.1622	0.1360	0.0785	0.0931
N	8	10	10	9
THYMUS GLAND				
MEAN	0.130	0.146	0.133	0.124
S.D.	0.0554	0.0611	0.0335	0.0356
N	8	10	10	9
ADRENAL GLANDS				
MEAN	0.023	0.022	0.022	0.023
S.D.	0.0026	0.0040	0.0050	0.0023
N	8	10	10	9

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 42 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS RELATIVE TO FINAL BODY WEIGHTS (GRAMS/100 GRAMS)

	----- F E M A L E -----			
GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
FINAL BODY WT				
MEAN	211.	222.	213.	218.
S.D.	22.8	16.2	34.1	8.4
N	8	9	9	6
BRAIN				
MEAN	0.862	0.837	0.893	0.832
S.D.	0.0894	0.0458	0.1059	0.0136
N	8	9	9	6
LIVER				
MEAN	3.578	3.643	3.938	3.304
S.D.	0.4686	0.4036	0.4857	0.2612
N	8	9	9	6
KIDNEYS				
MEAN	0.881	0.857	0.975	0.882
S.D.	0.0903	0.0987	0.0781	0.0470
N	8	9	9	6
HEART				
MEAN	0.435	0.427	0.459	0.436
S.D.	0.0304	0.0496	0.0718	0.0566
N	8	9	9	6

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 42 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS RELATIVE TO FINAL BODY WEIGHTS (GRAMS/100 GRAMS)

GROUP:		----- F E M A L E ----- 0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
SPLEEN					
	MEAN	0.249	0.261	0.261	0.249
	S.D.	0.0723	0.0396	0.0412	0.0259
	N	8	9	9	6
LUNGS					
	MEAN	0.918	0.871	1.099	0.767
	S.D.	0.2961	0.2439	0.2237	0.2662
	N	8	9	9	6
OVARIES					
	MEAN	0.064	0.062	0.072	0.067
	S.D.	0.0061	0.0084	0.0129	0.0129
	N	8	9	9	6
THYMUS GLAND					
	MEAN	0.168	0.181	0.177	0.170
	S.D.	0.0354	0.0371	0.0302	0.0148
	N	8	9	9	6
ADRENAL GLANDS					
	MEAN	0.039	0.038	0.041	0.040
	S.D.	0.0056	0.0051	0.0075	0.0026
	N	8	9	9	6

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 43 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS RELATIVE TO FINAL BODY WEIGHTS (GRAMS/100 GRAMS)

GROUP:		0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
		----- M A L E -----			
FINAL BODY WT					
	MEAN	401.	403.	382.	371.
	S.D.	42.1	36.0	23.1	27.0
	N	5	5	5	5
BRAIN					
	MEAN	0.498	0.497	0.521	0.536
	S.D.	0.0591	0.0423	0.0346	0.0324
	N	5	5	5	5
LIVER					
	MEAN	2.990	3.022	3.249	3.250
	S.D.	0.1632	0.3211	0.2836	0.1993
	N	5	5	5	5
KIDNEYS					
	MEAN	0.756	0.842	0.830	0.841
	S.D.	0.0461	0.0845	0.0471	0.1061
	N	4	5	5	5
HEART					
	MEAN	0.338	0.370	0.391	0.382
	S.D.	0.0180	0.0575	0.0638	0.0192
	N	5	5	5	5

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 43 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS RELATIVE TO FINAL BODY WEIGHTS (GRAMS/100 GRAMS)

GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
	----- MALE -----			
SPLEEN				
MEAN	0.203	0.186	0.208	0.228
S.D.	0.0218	0.0222	0.0409	0.0316
N	5	5	5	5
LUNGS				
MEAN	0.449	0.421	0.462	0.509
S.D.	0.1316	0.0446	0.0515	0.1319
N	5	5	5	5
TESTES/EPIDID.				
MEAN	1.146	1.201	1.216	1.241
S.D.	0.0332	0.0847	0.1187	0.1230
N	4	5	5	5
THYMUS GLAND				
MEAN	0.137	0.112	0.139	0.130
S.D.	0.0165	0.0232	0.0326	0.0418
N	5	5	5	5
ADRENAL GLANDS				
MEAN	0.016	0.016	0.017	0.018
S.D.	0.0042	0.0030	0.0023	0.0019
N	5	5	5	5

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 43 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS RELATIVE TO FINAL BODY WEIGHTS (GRAMS/100 GRAMS)

GROUP:		----- F E M A L E ----- 0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
FINAL BODY WT					
	MEAN	232.	229.	225.	234.
	S.D.	21.0	18.9	14.3	21.0
	N	5	5	5	5
BRAIN					
	MEAN	0.775	0.783	0.797	0.773
	S.D.	0.0664	0.0513	0.0408	0.0589
	N	5	5	5	5
LIVER					
	MEAN	3.355	3.401	3.752	3.202
	S.D.	0.5265	0.0837	0.4230	0.2466
	N	5	5	5	5
KIDNEYS					
	MEAN	0.765	0.833	0.836	0.787
	S.D.	0.0734	0.0562	0.0842	0.0493
	N	5	5	5	5
HEART					
	MEAN	0.422	0.390	0.390	0.369
	S.D.	0.0337	0.0807	0.0385	0.0161
	N	5	5	5	5

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 43 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS RELATIVE TO FINAL BODY WEIGHTS (GRAMS/100 GRAMS)

GROUP:		0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
		----- F E M A L E -----			
SPLEEN					
	MEAN	0.239	0.244	0.232	0.254
	S.D.	0.0161	0.0612	0.0237	0.0281
	N	5	5	5	5
LUNGS					
	MEAN	0.632	0.662	0.975	0.660
	S.D.	0.0682	0.2002	0.2924	0.2182
	N	5	5	5	5
OVARIES					
	MEAN	0.063	0.061	0.059	0.065
	S.D.	0.0014	0.0102	0.0070	0.0092
	N	5	5	5	5
THYMUS GLAND					
	MEAN	0.193	0.189	0.176	0.132
	S.D.	0.0349	0.0515	0.0426	0.0608
	N	5	5	5	5
ADRENAL GLANDS					
	MEAN	0.032	0.035	0.037	0.031
	S.D.	0.0037	0.0024	0.0056	0.0028
	N	5	5	5	5

NONE SIGNIFICANTLY DIFFERENT USING DUNNETT'S TEST

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 44 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED	2	0	0	1
ADRENAL GLANDS				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	2	0	0	1
AORTA				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	2	0	0	1
STERNEBRAE				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	2	0	0	1
LYMPH NODE, BRON				
TOTAL NUMBER EXAMINED	1	0	0	1
EXAMINED, UNREMARKABLE	1	0	0	1
NOT EXAMINED	1	0	0	0
BRAIN				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	2	0	0	1
CECUM				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	1	0	0	0

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 44 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED	2	0	0	1
CECUM - CONTINUED				
-AUTOLYTIC	1	0	0	1
MINIMAL	1	NONE	NONE	1
COLON				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	2	0	0	0
-AUTOLYTIC	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
DUODENUM				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	1	0	0	0
-AUTOLYTIC	1	0	0	1
MINIMAL	1	NONE	NONE	1
NASAL TURBINATES				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	2	0	0	0
-HYPERPLASIA, GOBLET CELL, PHARYNGEAL DUCT- SECTION 5	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
-METAPLASIA, SQUAMOUS	0	0	0	1
MINIMAL	NONE	NONE	NONE	1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 44 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED	2	0	0	1
EPIDIDYMIDES				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	2	0	0	1
ESOPHAGUS				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	2	0	0	1
EYES/OPTIC N.				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	2	0	0	0
-AUTOLYTIC	0	0	0	1
MILD	NONE	NONE	NONE	1
LYMPH NODE, SUPR				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	0	0	0	0
-HISTIOCYTOSIS, SINUS	2	0	0	1
MINIMAL	2	NONE	NONE	1
HEART				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	2	0	0	1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 44 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED	2	0	0	1
ILEUM				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	1	0	0	0
-AUTOLYTIC	1	0	0	1
MINIMAL	1	NONE	NONE	1
JEJUNUM				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	1	0	0	0
-AUTOLYTIC	1	0	0	1
MINIMAL	1	NONE	NONE	1
KIDNEYS				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	0	0	0	1
-INFLAMMATION, NONSUPPURATIVE	1	0	0	0
MINIMAL	1	NONE	NONE	NONE
-DEGENERATION, TUBULAR	1	0	0	0
MINIMAL	1	NONE	NONE	NONE
LIVER				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	0	0	0	0
-INFLAMMATION, NONSUPPURATIVE	2	0	0	0
MINIMAL	2	NONE	NONE	NONE

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 44 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED	2	0	0	1
LIVER - CONTINUED				
-VACUOLATION, CYTOPLASMIC	0	0	0	1
MILD	NONE	NONE	NONE	1
-CONGESTION	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
LYMPH NODE, MES				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	0	0	0	0
-HYPERPLASIA, LYMPHOID	2	0	0	0
MINIMAL	2	NONE	NONE	NONE
-AUTOLYTIC	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
LUNGS				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	1	0	0	0
-RBC EXTRAVASATION	1	0	0	0
MILD	1	NONE	NONE	NONE
-EDEMA, PERIVASCULAR	1	0	0	0
MILD	1	NONE	NONE	NONE
-INFLAMMATION, GRANULOCYTIC	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
-CONGESTION	1	0	0	1
MINIMAL	NONE	NONE	NONE	1
MILD	1	NONE	NONE	NONE

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 44 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED	2	0	0	1
LUNGS - CONTINUED				
-EDEMA, ALVEOLAR	1	0	0	1
MINIMAL	1	NONE	NONE	1
-INFLAMMATION, NONSUPPURATIVE, INTRA-ALVEOLAR	0	0	0	1
MILD	NONE	NONE	NONE	1
NERVE,SCIATIC				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	2	0	0	1
PANCREAS				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	2	0	0	1
PARATHYROID				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	2	0	0	1
RECTUM				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	2	0	0	0
-AUTOLYTIC	0	0	0	1
MINIMAL	NONE	NONE	NONE	1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 44 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED	2	0	0	1
PITUITARY				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	2	0	0	1
PROSTATE				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	1	0	0	0
-AUTOLYTIC	1	0	0	1
MINIMAL	NONE	NONE	NONE	1
MILD	1	NONE	NONE	NONE
SALIVARY GLANDS				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	2	0	0	0
-AUTOLYTIC	0	0	0	1
MILD	NONE	NONE	NONE	1
SEMINAL VESICLES				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	1	0	0	0
-AUTOLYTIC	1	0	0	1
MINIMAL	NONE	NONE	NONE	1
MILD	1	NONE	NONE	NONE

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 44 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED	2	0	0	1
SKELETAL MUSCLE				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	2	0	0	1
SKIN				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	2	0	0	1
SPINAL CORD				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	2	0	0	1
SPLEEN				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	2	0	0	1
STOMACH				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	1	0	0	0
-INFILTRATE, MONONUCLEAR	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
-AUTOLYTIC	1	0	0	1
MINIMAL	1	NONE	NONE	1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 44 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED	2	0	0	1
TESTES				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	2	0	0	0
-AUTOLYTIC	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
THYMUS GLAND				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	2	0	0	1
THYROID GLANDS				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	0	0	0	0
-AUTOLYTIC	2	0	0	1
MILD	2	NONE	NONE	1
TRACHEA				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	2	0	0	1
URINARY BLADDER				
TOTAL NUMBER EXAMINED	2	0	0	1
EXAMINED, UNREMARKABLE	2	0	0	1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 44 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED	2	0	0	1
LYMPH NODE				
TOTAL NUMBER EXAMINED	1	NA	NA	NA
EXAMINED, UNREMARKABLE	0	NA	NA	NA
-HISTIOCYTOSIS, SINUS- CERVICAL	1	NA	NA	NA
MINIMAL	1	NA	NA	NA

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 44 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED	2	1	1	4
ADRENAL GLANDS				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	2	1	1	3
-CONGESTION	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
AORTA				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	2	1	1	4
STERNEBRAE				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	1	1	1	4
-AUTOLYTIC	1	0	0	0
MINIMAL	1	NONE	NONE	NONE
OVIDUCTS				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	2	1	0	4
-AUTOLYTIC	0	0	1	0
MINIMAL	NONE	NONE	1	NONE

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 44 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED	2	1	1	4
LYMPH NODE, BRON				
TOTAL NUMBER EXAMINED	1	0	1	3
EXAMINED, UNREMARKABLE	0	0	0	0
NOT EXAMINED	1	1	0	1
-HYPERPLASIA, LYMPHOID	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
-HISTIOCYTOSIS, SINUS	1	0	1	3
MINIMAL	1	NONE	1	NONE
MILD	NONE	NONE	NONE	2
MODERATE	NONE	NONE	NONE	1
BRAIN				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	2	1	1	4
CECUM				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	0	1	0	1
-AUTOLYTIC	2	0	1	3
MINIMAL	1	NONE	NONE	NONE
MILD	1	NONE	NONE	1
MODERATE	NONE	NONE	1	2

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 44 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED	2	1	1	4
COLON				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	1	1	0	1
-AUTOLYTIC	1	0	1	3
MINIMAL	1	NONE	NONE	1
MILD	NONE	NONE	NONE	2
MODERATE	NONE	NONE	1	NONE
DUODENUM				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	0	0	0	1
-AUTOLYTIC	2	1	1	3
MINIMAL	1	1	NONE	NONE
MILD	1	NONE	NONE	2
MODERATE	NONE	NONE	NONE	1
SEVERE	NONE	NONE	1	NONE
NASAL TURBINATES				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	0	1	0	0
-INFLAMMATION, NONSUPPURATIVE	1	0	0	0
MINIMAL	1	NONE	NONE	NONE
-AUTOLYTIC	2	0	1	3
MINIMAL	1	NONE	NONE	1
MILD	NONE	NONE	NONE	1
MODERATE	NONE	NONE	NONE	1
SEVERE	1	NONE	1	NONE

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 44 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED	2	1	1	4
NASAL TURBINATES - CONTINUED				
-HYPERPLASIA, GOBLET CELL- SECTION 1	0	0	0	3
MINIMAL	NONE	NONE	NONE	3
-DEGENERATION, OLFACTORY EPITHELIUM- SECTION 5	0	0	0	1
MILD	NONE	NONE	NONE	1
-DEGENERATION, OLFACTORY EPITHELIUM- SECTION 4	0	0	0	1
MILD	NONE	NONE	NONE	1
-HYPERPLASIA, GOBLET CELL- SECTION 2	0	0	0	2
MINIMAL	NONE	NONE	NONE	2
-INFLAMMATION, NEUTROPHILIC	0	0	0	2
MINIMAL	NONE	NONE	NONE	1
MILD	NONE	NONE	NONE	1
ESOPHAGUS				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	2	1	1	4
EYES/OPTIC N.				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	1	1	0	4
-AUTOLYTIC	1	0	1	0
MINIMAL	1	NONE	NONE	NONE
MILD	NONE	NONE	1	NONE

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 44 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED	2	1	1	4
LYMPH NODE, SUPR				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	0	0	0	0
-HISTIOCYTOSIS, SINUS	2	1	1	4
MINIMAL	1	NONE	NONE	1
MILD	1	1	1	1
MODERATE	NONE	NONE	NONE	2
-HYPERPLASIA, LYMPHOID	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
-PLASMACYTOSIS	0	1	1	0
MINIMAL	NONE	1	1	NONE
-AUTOLYTIC	0	0	1	2
MINIMAL	NONE	NONE	1	NONE
MILD	NONE	NONE	NONE	2
HEART				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	1	1	1	4
-INFLAMMATION, NONSUPPURATIVE	1	0	0	0
MINIMAL	1	NONE	NONE	NONE
ILEUM				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	0	0	0	1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 44 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED	2	1	1	4
ILEUM - CONTINUED				
-AUTOLYTIC	2	1	1	3
MINIMAL	1	1	NONE	NONE
MILD	1	NONE	NONE	2
MODERATE	NONE	NONE	NONE	1
SEVERE	NONE	NONE	1	NONE
JEJUNUM				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	1	0	0	1
-AUTOLYTIC	1	1	1	3
MINIMAL	1	1	NONE	NONE
MILD	NONE	NONE	NONE	2
MODERATE	NONE	NONE	NONE	1
SEVERE	NONE	NONE	1	NONE
KIDNEYS				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	0	0	0	0
-DEGENERATION, TUBULAR	2	1	0	3
MINIMAL	2	1	NONE	2
MILD	NONE	NONE	NONE	1
-MINERALIZATION, TUBULAR	0	0	1	1
MINIMAL	NONE	NONE	NONE	1
MILD	NONE	NONE	1	NONE

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 44 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED	2	1	1	4
KIDNEYS - CONTINUED				
-AUTOLYTIC	0	0	1	0
MINIMAL	NONE	NONE	1	NONE
-NEPHROPATHY	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
LIVER				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	0	0	0	1
-INFLAMMATION, NONSUPPURATIVE	1	1	1	3
MINIMAL	1	1	1	2
MILD	NONE	NONE	NONE	1
-VACUOLATION, CYTOPLASMIC	1	1	1	2
MINIMAL	1	NONE	1	1
MILD	NONE	1	NONE	1
-CONGESTION	0	1	1	0
MINIMAL	NONE	NONE	1	NONE
MILD	NONE	1	NONE	NONE
LYMPH NODE, MES				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	0	0	0	0
-HYPERPLASIA, LYMPHOID	0	1	0	2
MINIMAL	NONE	NONE	NONE	1
MILD	NONE	1	NONE	1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 44 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED	2	1	1	4
LYMPH NODE, MES - CONTINUED				
-HISTIOCYTOSIS, SINUS	2	1	1	1
MINIMAL	1	NONE	1	NONE
MILD	1	NONE	NONE	1
MODERATE	NONE	1	NONE	NONE
-AUTOLYTIC	0	0	1	2
MINIMAL	NONE	NONE	1	NONE
MILD	NONE	NONE	NONE	2
LUNGS				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	0	1	0	2
-EDEMA, PERIVASCULAR	1	0	0	0
MILD	1	NONE	NONE	NONE
-INFLAMMATION, GRANULOCYTIC	2	0	1	0
MINIMAL	2	NONE	1	NONE
-CONGESTION	2	0	1	1
MILD	NONE	NONE	1	1
MODERATE	2	NONE	NONE	NONE
-EDEMA, ALVEOLAR	2	0	0	2
MINIMAL	NONE	NONE	NONE	1
MILD	1	NONE	NONE	1
MODERATE	1	NONE	NONE	NONE
-INFLAMMATION, ACUTE	0	0	0	1
MINIMAL	NONE	NONE	NONE	1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 44 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED	2	1	1	4
MAMMARY GLAND				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	2	1	1	4
NERVE,SCIATIC				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	2	1	1	4
OVARIES				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	1	1	0	2
-AUTOLYTIC	1	0	1	2
MINIMAL	1	NONE	NONE	2
MILD	NONE	NONE	1	NONE
PANCREAS				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	2	1	1	3
-AUTOLYTIC	0	0	0	1
MILD	NONE	NONE	NONE	1
PARATHYROID				
TOTAL NUMBER EXAMINED	2	1	1	3
EXAMINED, UNREMARKABLE	1	1	1	3
NOT EXAMINED	0	0	0	1
-AUTOLYTIC	1	0	0	0
MINIMAL	1	NONE	NONE	NONE

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 44 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED	2	1	1	4
RECTUM				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	2	1	0	2
-AUTOLYTIC	0	0	1	2
MINIMAL	NONE	NONE	NONE	1
MILD	NONE	NONE	NONE	1
MODERATE	NONE	NONE	1	NONE
PITUITARY				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	2	1	1	4
SALIVARY GLANDS				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	1	1	0	4
-AUTOLYTIC	1	0	1	0
MINIMAL	1	NONE	1	NONE
SKELETAL MUSCLE				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	2	1	1	4

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 44 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED	2	1	1	4
SKIN				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	2	1	1	4
SPINAL CORD				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	2	1	1	4
SPLEEN				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	2	1	0	4
-AUTOLYTIC	0	0	1	0
MINIMAL	NONE	NONE	1	NONE
STOMACH				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	0	0	0	1
-INFILTRATE, MONONUCLEAR	1	1	0	3
MINIMAL	1	1	NONE	3
-AUTOLYTIC	2	0	1	2
MINIMAL	2	NONE	1	2

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 44 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED	2	1	1	4
THYMUS GLAND				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	2	1	0	4
-AUTOLYTIC	0	0	1	0
MILD	NONE	NONE	1	NONE
THYROID GLANDS				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	0	0	0	1
-AUTOLYTIC	2	1	1	3
MINIMAL	1	NONE	NONE	NONE
MILD	NONE	1	NONE	1
MODERATE	1	NONE	1	2
TRACHEA				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	1	0	0	1
-AUTOLYTIC	1	0	1	2
MILD	1	NONE	1	1
MODERATE	NONE	NONE	NONE	1
-ECTASIA, SUBMUCOSAL GLANDS	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
-INFLAMMATION, NONSUPPURATIVE	0	1	0	0
MINIMAL	NONE	1	NONE	NONE

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 44 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED	2	1	1	4
URINARY BLADDER				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	1	1	0	3
-INFLAMMATION, NONSUPPURATIVE	1	0	0	1
MILD	1	NONE	NONE	1
-AUTOLYTIC	0	0	1	0
MINIMAL	NONE	NONE	1	NONE
UTERUS				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	0	1	0	2
-INFLAMMATION, ACUTE	1	0	0	0
MINIMAL	1	NONE	NONE	NONE
-AUTOLYTIC	1	0	1	1
MINIMAL	1	NONE	1	NONE
MILD	NONE	NONE	NONE	1
-INFLAMMATION, NONSUPPURATIVE	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
VAGINA				
TOTAL NUMBER EXAMINED	2	1	1	4
EXAMINED, UNREMARKABLE	2	1	1	3
-INFLAMMATION, ACUTE	0	0	0	1
MILD	NONE	NONE	NONE	1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 44 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED	2	1	1	4
LYMPH NODE				
TOTAL NUMBER EXAMINED.	NA	1	NA	NA
EXAMINED, UNREMARKABLE	NA	0	NA	NA
-PLASMACYTOSIS- CERVICAL	NA	1	NA	NA
MODERATE	NA	1	NA	NA

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 45 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 4	8	10	10	9
ADRENAL GLANDS				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	6	NA	NA	9
-HYPERTROPHY, CORTICAL	2	NA	NA	0
MINIMAL	2	NA	NA	NONE
AORTA				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	8	NA	NA	9
STERNEBRAE				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	8	NA	NA	9
LYMPH NODE, BRON				
TOTAL NUMBER EXAMINED	6	NA	NA	7
EXAMINED, UNREMARKABLE	5	NA	NA	3
NOT EXAMINED	2	NA	NA	2
-HYPERPLASIA, LYMPHOID	0	NA	NA	1
MINIMAL	NONE	NA	NA	1
-HISTIOCYTOSIS, SINUS	1	NA	NA	3
MINIMAL	1	NA	NA	2
MILD	NONE	NA	NA	1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 45 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 4	8	10	10	9
BRAIN				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	8	NA	NA	9
CECUM				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	7	NA	NA	9
-INFILTRATE, MONONUCLEAR	1	NA	NA	0
MINIMAL	1	NA	NA	NONE
COLON				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	7	NA	NA	9
-INFILTRATE, MONONUCLEAR	1	NA	NA	0
MINIMAL	1	NA	NA	NONE
DUODENUM				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	5	NA	NA	9
-INFILTRATE, MONONUCLEAR	3	NA	NA	0
MINIMAL	3	NA	NA	NONE

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 45 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 4	8	10	10	9
NASAL TURBINATES				
TOTAL NUMBER EXAMINED	8	10	10	9
EXAMINED, UNREMARKABLE	7	1	0	0
-INFLAMMATION, NONSUPPURATIVE	1	1	0	1
MINIMAL	1	1	NONE	1
-INFLAMMATION, NONSUPPURATIVE- SKIN SECTION 1	0	1	0	2
MINIMAL	NONE	1	NONE	2
-ECTASIA, MUCOSAL GLAND- SECTION 2	0	1	0	0
MINIMAL	NONE	1	NONE	NONE
-HYPERPLASIA, GOBLET CELL- SECTION 1	0	5	5	4
MINIMAL	NONE	4	5	4
MODERATE	NONE	1	NONE	NONE
-HYPERPLASIA, LYMPHOID- SECTION 4	0	1	1	0
MINIMAL	NONE	1	1	NONE
-DEGENERATION, OLFACTORY EPITHELIUM- SECTION 5	0	1	4	0
MINIMAL	NONE	NONE	3	NONE
MILD	NONE	1	1	NONE
-DEGENERATION, OLFACTORY EPITHELIUM- SECTION 3	0	1	0	1
MINIMAL	NONE	1	NONE	1
-DEGENERATION, OLFACTORY EPITHELIUM- SECTION 4	0	0	4	1
MINIMAL	NONE	NONE	4	NONE
MILD	NONE	NONE	NONE	1
-HYPERPLASIA, GOBLET CELL- SECTION 2	0	0	0	6
MINIMAL	NONE	NONE	NONE	5
MILD	NONE	NONE	NONE	1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 45 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 4	8	10	10	9
NASAL TURBINATES - CONTINUED				
-HYPERPLASIA, GOBLET CELL- SECTION 3	0	0	1	1
MINIMAL	NONE	NONE	1	1
-INFLAMMATION, NEUTROPHILIC- SECTION 4	0	0	5	0
MINIMAL	NONE	NONE	5	NONE
-INFLAMMATION, NEUTROPHILIC	0	0	2	0
MINIMAL	NONE	NONE	2	NONE
-DYSPLASIA	0	0	1	3
MINIMAL	NONE	NONE	1	3
-HYPERPLASIA, GOBLET CELL, PHARYNGEAL DUCT- SECTION 6	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
-EDEMA, NASAL TURBINATE- SECTION 1	0	0	1	0
MINIMAL	NONE	NONE	1	NONE
-EDEMA, MAXILLOTURBINATE- SECTION 1	0	0	1	0
MINIMAL	NONE	NONE	1	NONE
-INFLAMMATION, NEUTROPHILIC, MAX. TURBINATE SECTION 1	0	0	1	0
MINIMAL	NONE	NONE	1	NONE
-INFLAMMATION, NONSUPPURATIVE- SECTION 1	0	0	1	0
MINIMAL	NONE	NONE	1	NONE
-EDEMA, SUBMUCOSA, BILATERAL, VENTRAL/MAX. TURBINATE	0	0	1	0
MINIMAL	NONE	NONE	1	NONE
-EDEMA, VENTRAL TURBINATES	0	0	1	0
MINIMAL	NONE	NONE	1	NONE
-METAPLASIA, SQUAMOUS	0	0	0	5
MINIMAL	NONE	NONE	NONE	4
MILD	NONE	NONE	NONE	1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 45 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 4	8	10	10	9
EPIDIDYMIDES				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	7	NA	NA	9
-INFLAMMATION, NONSUPPURATIVE	1	NA	NA	0
MINIMAL	1	NA	NA	NONE
ESOPHAGUS				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	8	NA	NA	9
EYES/OPTIC N.				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	8	NA	NA	9
LYMPH NODE, SUPR				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	1	NA	NA	0
-HISTIOCYTOSIS, SINUS	7	NA	NA	9
MINIMAL	6	NA	NA	2
MILD	NONE	NA	NA	5
MODERATE	1	NA	NA	2
-HYPERPLASIA, LYMPHOID	2	NA	NA	0
MINIMAL	2	NA	NA	NONE
-PLASMACYTOSIS	1	NA	NA	1
MINIMAL	1	NA	NA	1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 45 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 4	8	10	10	9
HEART				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	6	NA	NA	4
-INFLAMMATION, NONSUPPURATIVE	2	NA	NA	5
MINIMAL	2	NA	NA	4
MILD	NONE	NA	NA	1
ILEUM				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	5	NA	NA	9
-INFILTRATE, MONONUCLEAR	3	NA	NA	0
MINIMAL	3	NA	NA	NONE
JEJUNUM				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	5	NA	NA	9
-INFILTRATE, MONONUCLEAR	3	NA	NA	0
MINIMAL	3	NA	NA	NONE
KIDNEYS				
TOTAL NUMBER EXAMINED	8	10	10	9
EXAMINED, UNREMARKABLE	7	9	6	8
-INFLAMMATION, NONSUPPURATIVE	1	1	3	1
MINIMAL	1	1	3	NONE
MILD	NONE	NONE	NONE	1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 45 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 4	8	10	10	9
KIDNEYS - CONTINUED				
-MINERALIZATION, TUBULAR	0	0	1	0
MINIMAL	NONE	NONE	1	NONE
-CYST(S), CORTICAL	0	0	1	0
MINIMAL	NONE	NONE	1	NONE
-MINERALIZATION, MEDULLARY PAPILLA TUBULES	0	0	1	0
MINIMAL	NONE	NONE	1	NONE
LIVER				
TOTAL NUMBER EXAMINED	8	10	10	9
EXAMINED, UNREMARKABLE	2	1	0	0
-INFLAMMATION, NONSUPPURATIVE	6	8	9	9
MINIMAL	6	7	8	8
MILD	NONE	1	1	1
-NECROSIS, CENTROLOBULAR	0	1	3	0
MINIMAL	NONE	NONE	2	NONE
MILD	NONE	1	NONE	NONE
MODERATE	NONE	NONE	1	NONE
-CONGESTION	0	0	5	2
MINIMAL	NONE	NONE	1	1
MILD	NONE	NONE	3	1
MODERATE	NONE	NONE	1	NONE
-DEGENERATION/NECROSIS, CENTRAL VEIN	0	0	1	0
MILD	NONE	NONE	1	NONE

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 45 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 4	8	10	10	9
LYMPH NODE, MES				
TOTAL NUMBER EXAMINED	8	NA	NA	8
EXAMINED, UNREMARKABLE	0	NA	NA	0
NOT EXAMINED	0	NA	NA	1
-HYPERPLASIA, LYMPHOID	4	NA	NA	2
MINIMAL	4	NA	NA	2
-HISTIOCYTOSIS, SINUS	7	NA	NA	8
MINIMAL	5	NA	NA	2
MILD	2	NA	NA	5
MODERATE	NONE	NA	NA	1
LUNGS				
TOTAL NUMBER EXAMINED	8	10	10	9
EXAMINED, UNREMARKABLE	5	6	3	6
-EDEMA, PERIVASCULAR	0	1	2	0
MINIMAL	NONE	NONE	1	NONE
MILD	NONE	1	1	NONE
-INFLAMMATION, GRANULOCYTIC	0	3	5	0
MINIMAL	NONE	3	5	NONE
-CONGESTION	3	3	0	2
MINIMAL	NONE	1	NONE	2
MILD	NONE	1	NONE	NONE
MODERATE	1	1	NONE	NONE
SEVERE	2	NONE	NONE	NONE

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 45 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 4	8	10	10	9
LUNGS - CONTINUED				
-HISTIOCYTOSIS, ALVEOLAR	0	2	0	0
MINIMAL	NONE	2	NONE	NONE
-EDEMA, ALVEOLAR	3	3	3	1
MINIMAL	2	2	NONE	1
MILD	1	NONE	2	NONE
MODERATE	NONE	1	1	NONE
-INFLAMMATION, NONSUPPURATIVE	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
NERVE,SCIATIC				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	8	NA	NA	9
PANCREAS				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	8	NA	NA	9
PARATHYROID				
TOTAL NUMBER EXAMINED	8	NA	NA	7
EXAMINED, UNREMARKABLE	8	NA	NA	7
NOT EXAMINED	0	NA	NA	2

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 45 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 4	8	10	10	9
RECTUM				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	7	NA	NA	9
-INFILTRATE, MONONUCLEAR	1	NA	NA	0
MINIMAL	1	NA	NA	NONE
PITUITARY				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	8	NA	NA	7
-CRANIOPHARYNGEAL DUCT REMNANT	0	NA	NA	2
PRESENT	NONE	NA	NA	2
PROSTATE				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	8	NA	NA	9
SALIVARY GLANDS				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	8	NA	NA	9
SEMINAL VESICLES				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	8	NA	NA	9

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 45 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 4	8	10	10	9
SKELETAL MUSCLE				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	8	NA	NA	9
SKIN				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	8	NA	NA	8
-INFLAMMATION, NONSUPPURATIVE-DERMIS	0	NA	NA	1
MINIMAL	NONE	NA	NA	1
SPINAL CORD				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	8	NA	NA	9
SPLEEN				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	8	NA	NA	9
STOMACH				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	0	NA	NA	0
-INFILTRATE, MONONUCLEAR	8	NA	NA	9
MINIMAL	7	NA	NA	9
MILD	1	NA	NA	NONE

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 45 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 4	8	10	10	9
TESTES				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	8	NA	NA	9
THYMUS GLAND				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	8	NA	NA	9
THYROID GLANDS				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	8	NA	NA	9
TRACHEA				
TOTAL NUMBER EXAMINED	8	10	10	9
EXAMINED, UNREMARKABLE	8	8	10	8
-ECTASIA, SUBMUCOSAL GLANDS	0	1	0	0
MINIMAL	NONE	1	NONE	NONE
-DEGENERATION,EPITHELIAL	0	1	0	0
MINIMAL	NONE	1	NONE	NONE
-INFLAMMATION, NONSUPPURATIVE	0	0	0	1
MINIMAL	NONE	NONE	NONE	1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 45 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 4	8	10	10	9
URINARY BLADDER				
TOTAL NUMBER EXAMINED	8	NA	NA	9
EXAMINED, UNREMARKABLE	8	NA	NA	9
LYMPH NODE				
TOTAL NUMBER EXAMINED	NA	3	1	NA
EXAMINED, UNREMARKABLE	NA	0	0	NA
-HISTIOCYTOSIS, SINUS- CERVICAL	NA	0	1	NA
MILD	NA	NA	1	NA
-HYPERPLASIA, LYMPHOID- CERVICAL	NA	0	1	NA
MILD	NA	NA	1	NA
-PLASMACYTOSIS- CERVICAL	NA	0	1	NA
MILD	NA	NA	1	NA
-HISTIOCYTOSIS, SINUS- SUPRAPHARYNGEAL	NA	3	0	NA
MINIMAL	NA	1	NA	NA
MILD	NA	2	NA	NA
-PLASMACYTOSIS- SUPRAPHARYNGEAL	NA	2	0	NA
MILD	NA	2	NA	NA
THYMUS				
TOTAL NUMBER EXAMINED	NA	NA	1	NA
EXAMINED, UNREMARKABLE	NA	NA	0	NA
-WITHIN NORMAL LIMITS	NA	NA	1	NA
PRESENT	NA	NA	1	NA

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 45 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 4	8	10	10	9
MAMMARY GLAND				
TOTAL NUMBER EXAMINED	NA	NA	NA	5
EXAMINED, UNREMARKABLE	NA	NA	NA	0
-HYPERPLASIA, GLANDULAR	NA	NA	NA	5
MINIMAL	NA	NA	NA	2
MILD	NA	NA	NA	3

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 45 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 4	8	9	9	6
ADRENAL GLANDS				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	8	NA	NA	6
AORTA				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	8	NA	NA	6
STERNEBRAE				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	8	NA	NA	6
OVIDUCTS				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	8	NA	NA	6
LYMPH NODE, BRON				
TOTAL NUMBER EXAMINED	7	NA	NA	4
EXAMINED, UNREMARKABLE	5	NA	NA	2
NOT EXAMINED	1	NA	NA	2
-HISTIOCYTOSIS, SINUS	2	NA	NA	2
MINIMAL	2	NA	NA	1
MODERATE	NONE	NA	NA	1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 45 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 4	8	9	9	6
BRAIN				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	8	NA	NA	6
CECUM				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	7	NA	NA	6
-HYPERPLASIA, LYMPHOID	1	NA	NA	0
MINIMAL	1	NA	NA	NONE
COLON				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	8	NA	NA	6
DUODENUM				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	8	NA	NA	6
NASAL TURBINATES				
TOTAL NUMBER EXAMINED	8	9	9	6
EXAMINED, UNREMARKABLE	6	2	0	0
-INFLAMMATION, NONSUPPURATIVE	1	0	0	0
MINIMAL	1	NONE	NONE	NONE
-INFLAMMATION, NONSUPPURATIVE- SKIN SECTION 1	1	1	0	0
MINIMAL	NONE	1	NONE	NONE
MILD	1	NONE	NONE	NONE

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 45 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 4	8	9	9	6
NASAL TURBINATES - CONTINUED				
-HYPERPLASIA, GOBLET CELL- SECTION 1	0	4	3	6
MINIMAL	NONE	1	2	3
MILD	NONE	3	1	3
-HYPERPLASIA, LYMPHOID- SECTION 4	0	0	1	0
MINIMAL	NONE	NONE	1	NONE
-DEGENERATION, OLFACTORY EPITHELIUM- SECTION 5	0	0	1	0
MINIMAL	NONE	NONE	1	NONE
-METAPLASIA, RESPIRATORY	0	1	1	1
MINIMAL	NONE	1	1	1
-DEGENERATION, OLFACTORY EPITHELIUM- SECTION 4	0	1	2	3
MINIMAL	NONE	1	1	3
MILD	NONE	NONE	1	NONE
-HYPERPLASIA, GOBLET CELL- SECTION 2	0	1	1	4
MINIMAL	NONE	1	1	3
MILD	NONE	NONE	NONE	1
-HYPERPLASIA, GOBLET CELL- SECTION 3	0	0	1	0
MINIMAL	NONE	NONE	1	NONE
-INFLAMMATION, NEUTROPHILIC- SECTION 4	0	0	1	0
MINIMAL	NONE	NONE	1	NONE
-HYPERPLASIA, GOBLET CELL, PHARYNGEAL DUCT- SECTION 6	0	0	2	0
MINIMAL	NONE	NONE	2	NONE
-HYPERPLASIA	0	0	1	0
MINIMAL	NONE	NONE	1	NONE

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 45 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 4	8	9	9	6
NASAL TURBINATES - CONTINUED				
-EDEMA, LAMINA PROPRIA,.NASAL TURBINATE- SECTION 2	0	0	1	0
MINIMAL	NONE	NONE	1	NONE
-INFLAMMATION, NEUTROPHILIC NASAL TURBINATE- SECTION 2	0	0	1	0
MINIMAL	NONE	NONE	1	NONE
-EDEMA, NASAL TURBINATE- SECTION 3	0	0	1	0
MINIMAL	NONE	NONE	1	NONE
-INFLAMMATION, NEUTROPHILIC- SECTION 3	0	0	2	0
MINIMAL	NONE	NONE	2	NONE
-INFLAMMATION, NONSUPP. VOMERONASAL ORGAN- SECTION 1	0	0	1	0
MINIMAL	NONE	NONE	1	NONE
-METAPLASIA, SQUAMOUS	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
ESOPHAGUS				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	8	NA	NA	6
EYES/OPTIC N.				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	8	NA	NA	6

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 45 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 4	8	9	9	6
LYMPH NODE, SUPR				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	0	NA	NA	0
-HISTIOCYTOSIS, SINUS	8	NA	NA	5
MINIMAL	5	NA	NA	1
MILD	2	NA	NA	4
MODERATE	1	NA	NA	NONE
-HYPERPLASIA, LYMPHOID	0	NA	NA	1
MODERATE	NONE	NA	NA	1
-PLASMACYTOSIS	2	NA	NA	2
MINIMAL	1	NA	NA	1
MILD	1	NA	NA	1
HEART				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	8	NA	NA	5
-INFLAMMATION, NONSUPPURATIVE	0	NA	NA	1
MINIMAL	NONE	NA	NA	1
ILEUM				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	8	NA	NA	6

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 45 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 4	8	9	9	6
JEJUNUM				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	8	NA	NA	6
KIDNEYS				
TOTAL NUMBER EXAMINED	8	9	9	6
EXAMINED, UNREMARKABLE	7	4	4	4
-MINERALIZATION, TUBULAR	1	4	5	1
MINIMAL	1	4	3	1
MILD	NONE	NONE	2	NONE
-AUTOLYTIC	0	1	0	0
MINIMAL	NONE	1	NONE	NONE
-NEPHROPATHY	0	0	0	2
MINIMAL	NONE	NONE	NONE	2
LIVER				
TOTAL NUMBER EXAMINED	8	9	9	6
EXAMINED, UNREMARKABLE	1	0	1	1
-INFLAMMATION, NONSUPPURATIVE	7	8	7	5
MINIMAL	7	7	5	5
MILD	NONE	1	2	NONE
-NECROSIS, CENTROLOBULAR	0	2	2	0
MINIMAL	NONE	NONE	1	NONE
MILD	NONE	1	1	NONE
MODERATE	NONE	1	NONE	NONE

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 45 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 4	8	9	9	6
LIVER - CONTINUED				
-CONGESTION	0	0	1	0
MILD	NONE	NONE	1	NONE
-VASCULITIS	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
LYMPH NODE, MES				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	0	NA	NA	0
-HYPERPLASIA, LYMPHOID	3	NA	NA	3
MINIMAL	3	NA	NA	3
-HISTIOCYTOSIS, SINUS	8	NA	NA	5
MINIMAL	6	NA	NA	1
MILD	1	NA	NA	3
MODERATE	1	NA	NA	1
LUNGS				
TOTAL NUMBER EXAMINED	8	9	9	6
EXAMINED, UNREMARKABLE	3	3	1	4
-EDEMA, PERIVASCULAR	2	2	3	0
MINIMAL	NONE	1	NONE	NONE
MILD	2	1	3	NONE
-INFLAMMATION, GRANULOCYTIC	2	5	3	0
MINIMAL	2	5	3	NONE

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 45 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 4	8	9	9	6
LUNGS - CONTINUED				
-CONGESTION	4	3	3	1
MINIMAL	1	2	3	1
MILD	3	1	NONE	NONE
-EDEMA, ALVEOLAR	5	5	7	2
MINIMAL	1	2	3	1
MILD	1	2	NONE	1
MODERATE	3	1	4	NONE
-INFLAMMATION, NONSUPPURATIVE	0	0	1	0
MINIMAL	NONE	NONE	1	NONE
-INFLAMMATION, ACUTE	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
MAMMARY GLAND				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	8	NA	NA	5
-HYPERPLASIA, GLANDULAR	0	NA	NA	1
MINIMAL	NONE	NA	NA	1
NERVE,SCIATIC				
TOTAL NUMBER EXAMINED	8	NA	NA	5
EXAMINED, UNREMARKABLE	8	NA	NA	5
NOT EXAMINED	0	NA	NA	1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 45 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 4	8	9	9	6
OVARIES				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	8	NA	NA	6
PANCREAS				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	8	NA	NA	6
PARATHYROID				
TOTAL NUMBER EXAMINED	4	NA	NA	5
EXAMINED, UNREMARKABLE	4	NA	NA	5
NOT EXAMINED	4	NA	NA	1
RECTUM				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	8	NA	NA	6
PITUITARY				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	8	NA	NA	6
SALIVARY GLANDS				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	8	NA	NA	6

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 45 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 4	8	9	9	6
SKELETAL MUSCLE				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	8	NA	NA	5
-DEGENERATION	0	NA	NA	1
MINIMAL	NONE	NA	NA	1
SKIN				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	8	NA	NA	6
SPINAL CORD				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	8	NA	NA	6
SPLEEN				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	8	NA	NA	6
STOMACH				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	0	NA	NA	1
-INFILTRATE, MONONUCLEAR	8	NA	NA	5
MINIMAL	8	NA	NA	5
-AUTOLYTIC	1	NA	NA	0
MINIMAL	1	NA	NA	NONE

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 45 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 4	8	9	9	6
THYMUS GLAND				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	8	NA	NA	6
THYROID GLANDS				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	8	NA	NA	5
-AUTOLYTIC	0	NA	NA	1
MINIMAL	NONE	NA	NA	1
TRACHEA				
TOTAL NUMBER EXAMINED	8	9	9	6
EXAMINED, UNREMARKABLE	8	9	9	5
-INFLAMMATION, ACUTE	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
URINARY BLADDER				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	8	NA	NA	6
UTERUS				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	8	NA	NA	3
-INFLAMMATION, ACUTE	0	NA	NA	3
MINIMAL	NONE	NA	NA	3

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 45 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 4	8	9	9	6
VAGINA				
TOTAL NUMBER EXAMINED	8	NA	NA	6
EXAMINED, UNREMARKABLE	8	NA	NA	4
-INFLAMMATION, ACUTE	0	NA	NA	1
MINIMAL	NONE	NA	NA	1
-INFLAMMATION, NONSUPPURATIVE	0	NA	NA	1
MINIMAL	NONE	NA	NA	1
LYMPH NODE				
TOTAL NUMBER EXAMINED	1	2	NA	NA
EXAMINED, UNREMARKABLE	0	0	NA	NA
-HISTIOCYTOSIS, SINUS- CERVICAL	1	0	NA	NA
MINIMAL	1	NA	NA	NA
-HYPERPLASIA, LYMPHOID- CERVICAL	1	2	NA	NA
MODERATE	1	2	NA	NA
-PLASMACYTOSIS- CERVICAL	1	0	NA	NA
MILD	1	NA	NA	NA
-HISTIOCYTOSIS, SINUS- ILIAC	1	0	NA	NA
MILD	1	NA	NA	NA
-HISTIOCYTOSIS, SINUS- SUPRAPHARYNGEAL	0	1	NA	NA
MINIMAL	NA	1	NA	NA
-HYPERPLASIA, LYMPHOID- SUPRAPHARYNGEAL	0	1	NA	NA
MODERATE	NA	1	NA	NA

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 45 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 4	8	9	9	6
MAMMARY GLAND				
TOTAL NUMBER EXAMINED	NA	NA	NA	1
EXAMINED, UNREMARKABLE	NA	NA	NA	0
-HYPERPLASIA, GLANDULAR	NA	NA	NA	1
MINIMAL	NA	NA	NA	1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 46 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 6	5	5	5	5
LYMPH NODE, BRON				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
BRAIN				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
CECUM				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
COLON				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
DUODENUM				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
NASAL TURBINATES				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	0	2	0
-INFLAMMATION, NONSUPPURATIVE	0	0	0	1
MINIMAL	NONE	NONE	NONE	1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 46 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 6	5	5	5	5
NASAL TURBINATES - CONTINUED				
-AUTOLYTIC	0	1	0	0
MINIMAL	NONE	1	NONE	NONE
-HYPERPLASIA, GOBLET CELL- SECTION 1	0	3	3	4
MINIMAL	NONE	2	3	4
MILD	NONE	1	NONE	NONE
-HYPERPLASIA, LYMPHOID- SECTION 4	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
-DEGENERATION, OLFACTORY EPITHELIUM- SECTION 5	0	1	0	0
MINIMAL	NONE	1	NONE	NONE
-DEGENERATION, OLFACTORY EPITHELIUM- SECTION 3	0	1	0	0
MINIMAL	NONE	1	NONE	NONE
-METAPLASIA, RESPIRATORY	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
-DEGENERATION, OLFACTORY EPITHELIUM- SECTION 4	0	1	0	0
MINIMAL	NONE	1	NONE	NONE
-HYPERPLASIA, GOBLET CELL- SECTION 2	0	2	2	1
MINIMAL	NONE	2	2	1
-INFLAMMATION, NEUTROPHILIC	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
-INFLAMMATION, NEUTROPHILIC, MAX. TURBINATE SECTION 1	0	0	0	2
MINIMAL	NONE	NONE	NONE	1
MILD	NONE	NONE	NONE	1
-INFLAMMATION, NONSUPPURATIVE- SECTION 1	0	2	0	0
MINIMAL	NONE	2	NONE	NONE

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 46 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 6	5	5	5	5
NASAL TURBINATES - CONTINUED				
-HYPERPLASIA	0	2	0	0
MINIMAL	NONE	2	NONE	NONE
-METAPLASIA, SQUAMOUS	0	0	2	4
MINIMAL	NONE	NONE	2	4
EPIDIDYMIDES				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
ESOPHAGUS				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
EYES/OPTIC N.				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
LYMPH NODE, SUPR				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 46 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 6	5	5	5	5
HEART				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
ILEUM				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
JEJUNUM				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
KIDNEYS				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	5
LIVER				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	5
LYMPH NODE, MES				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 46 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 6	5	5	5	5
LUNGS				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	5
NERVE,SCIATIC				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
PANCREAS				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
PARATHYROID				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
RECTUM				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
PITUITARY				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 46 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 6	5	5	5	5
PROSTATE				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
SALIVARY GLANDS				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
SEMINAL VESICLES				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
SKELETAL MUSCLE				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
SKIN				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
SPINAL CORD				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 46 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 6	5	5	5	5
SPLEEN				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
STOMACH				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
TESTES				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
THYMUS GLAND				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
THYROID GLANDS				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
TRACHEA				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	5

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 46 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 6	5	5	5	5
URINARY BLADDER				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
MAMMARY GLAND				
TOTAL NUMBER EXAMINED	4	NA	NA	5
EXAMINED, UNREMARKABLE	0	NA	NA	0
-HYPERPLASIA, GLANDULAR	4	NA	NA	5
MINIMAL	3	NA	NA	2
MILD	NA	NA	NA	3
PRESENT	1	NA	NA	NA

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 46 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 6	5	5	5	5
OVIDUCTS				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
LYMPH NODE, BRON				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
BRAIN				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
CECUM				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
COLON				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
DUODENUM				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 46 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 6	5	5	5	5
NASAL TURBINATES				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	3	1	0
-INFLAMMATION, NONSUPPURATIVE	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
-HYPERPLASIA, GOBLET CELL- SECTION 1	0	0	4	2
MINIMAL	NONE	NONE	4	2
-HYPERPLASIA, LYMPHOID- SECTION 4	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
-DEGENERATION, OLFACTORY EPITHELIUM- SECTION 5	0	0	1	0
MINIMAL	NONE	NONE	1	NONE
-HYPERPLASIA, GOBLET CELL- SECTION 2	0	1	2	1
MINIMAL	NONE	1	2	1
-INFLAMMATION, NEUTROPHILIC	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
-INFLAMMATION, NEUTROPHILIC, MAX. TURBINATE SECTION 1	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
-INFLAMMATION, NONSUPPURATIVE- SECTION 1	0	1	1	0
MINIMAL	NONE	1	1	NONE
-EDEMA, NASAL TURBINATE- SECTION 3	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
-INFLAMMATION, NONSUPP. VOMERONASAL ORGAN- SECTION 1	0	1	0	0
MINIMAL	NONE	1	NONE	NONE
-METAPLASIA, SQUAMOUS	0	1	1	4
MINIMAL	NONE	1	1	4

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L

TABLE 46 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 6	5	5	5	5
ESOPHAGUS				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
EYES/OPTIC N.				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
LYMPH NODE, SUPR				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
HEART				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
ILEUM				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
JEJUNUM				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 46 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 6	5	5	5	5
KIDNEYS				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	5
LIVER				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	5
LYMPH NODE, MES				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
LUNGS				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	5
MAMMARY GLAND				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
NERVE,SCIATIC				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 46 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 6	5	5	5	5
OVARIES				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
PANCREAS				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
PARATHYROID				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
RECTUM				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
PITUITARY				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
SALIVARY GLANDS				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 46 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 6	5	5	5	5
SKELETAL MUSCLE				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
SKIN				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
SPINAL CORD				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
SPLEEN				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
STOMACH				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
THYMUS GLAND				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

TABLE 46 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
HISTOMORPHOLOGICAL DIAGNOSIS -- SUMMARY INCIDENCE

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15
NUMBER OF ANIMALS EXAMINED WEEK 6	5	5	5	5
THYROID GLANDS				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
TRACHEA				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	5
URINARY BLADDER				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
UTERUS				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5
VAGINA				
TOTAL NUMBER EXAMINED	5	NA	NA	5
EXAMINED, UNREMARKABLE	5	NA	NA	5

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
NA = NOT APPLICABLE

FINAL REPORT

VOLUME 2 OF 3
(Individual Tables 47-69)

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STUDY TITLE

A 4-WEEK INHALATION TOXICITY STUDY
OF METHANE SULFONIC ACID IN ALBINO RATS
CAS Registry Number 75-75-2

PROJECT NUMBER

WIL-160033

PERFORMING LABORATORY

WIL Research Laboratories, Inc.
1407 George Road
Ashland, OH 44805-9281

STUDY DIRECTOR

Charles E. Ulrich, B.S.

STUDY INITIATED ON

November 14, 1995

STUDY COMPLETION DATE

December 17, 1996

SPONSOR

Elf Atochem North America, Inc.
2000 Market Street
Philadelphia, PA 19103

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 47
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL SURVIVAL AND DISPOSITION

ANIMAL	SEX	GROUP	TYPE OF DEATH	AGE IN WEEKS A	DATE OF DEATH	DAYS ON STUDY
44091	M	0.00 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44099	M	0.00 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44103	M	0.00 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44108	M	0.00 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44114	M	0.00 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44115	M	0.00 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44121	M	0.00 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44125	M	0.00 MG/L	FOUND DEAD	7	21-NOV-95	5
44131	M	0.00 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44132	M	0.00 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44135	M	0.00 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44137	M	0.00 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44141	M	0.00 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44335	M	0.00 MG/L	FOUND DEAD	7	22-NOV-95	6
44337	M	0.00 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44092	M	0.025 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44093	M	0.025 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44098	M	0.025 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44101	M	0.025 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44110	M	0.025 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44113	M	0.025 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44119	M	0.025 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44126	M	0.025 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44128	M	0.025 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44138	M	0.025 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44143	M	0.025 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44144	M	0.025 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44147	M	0.025 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44339	M	0.025 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29

A = CALCULATED TO THE NEAREST WHOLE WEEK USING THE MEAN AGE IN WEEKS AT INITIATION OF DOSING (7)

TABLE 47
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL SURVIVAL AND DISPOSITION

ANIMAL	SEX	GROUP	TYPE OF DEATH	AGE IN WEEKS A	DATE OF DEATH	DAYS ON STUDY
44342	M	0.025 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44094	M	0.075 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44096	M	0.075 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44100	M	0.075 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44107	M	0.075 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44111	M	0.075 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44116	M	0.075 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44118	M	0.075 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44124	M	0.075 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44129	M	0.075 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44134	M	0.075 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44140	M	0.075 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44142	M	0.075 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44145	M	0.075 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44333	M	0.075 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44340	M	0.075 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44097	M	0.25 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44102	M	0.25 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44104	M	0.25 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44089	M	0.25 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44109	M	0.25 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44112	M	0.25 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44120	M	0.25 MG/L	FOUND DEAD	7	21-NOV-95	5
44123	M	0.25 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44130	M	0.25 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44133	M	0.25 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44136	M	0.25 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44139	M	0.25 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28

A = CALCULATED TO THE NEAREST WHOLE WEEK USING THE MEAN AGE IN WEEKS AT INITIATION OF DOSING (7)

TABLE 47
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL SURVIVAL AND DISPOSITION

ANIMAL	SEX	GROUP	TYPE OF DEATH	AGE IN WEEKS A	DATE OF DEATH	DAYS ON STUDY
44146	M	0.25 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44334	M	0.25 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44338	M	0.25 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29

A = CALCULATED TO THE NEAREST WHOLE WEEK USING THE MEAN AGE IN WEEKS AT INITIATION OF DOSING (7)

TABLE 47
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL SURVIVAL AND DISPOSITION

ANIMAL	SEX	GROUP	TYPE OF DEATH	AGE IN WEEKS A	DATE OF DEATH	DAYS ON STUDY
44149	F	0.00 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44151	F	0.00 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44154	F	0.00 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44156	F	0.00 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44157	F	0.00 MG/L	FOUND DEAD	7	22-NOV-95	6
44164	F	0.00 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44166	F	0.00 MG/L	FOUND DEAD	8	28-NOV-95	12
44176	F	0.00 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44178	F	0.00 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44180	F	0.00 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44181	F	0.00 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44204	F	0.00 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44207	F	0.00 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44346	F	0.00 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44352	F	0.00 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44159	F	0.025 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44160	F	0.025 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44162	F	0.025 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44170	F	0.025 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44172	F	0.025 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44179	F	0.025 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44183	F	0.025 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44187	F	0.025 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44191	F	0.025 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44192	F	0.025 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44194	F	0.025 MG/L	FOUND DEAD	9	30-NOV-95	14
44195	F	0.025 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44201	F	0.025 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44349	F	0.025 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42

A = CALCULATED TO THE NEAREST WHOLE WEEK USING THE MEAN AGE IN WEEKS AT INITIATION OF DOSING (7)

TABLE 47
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL SURVIVAL AND DISPOSITION

ANIMAL	SEX	GROUP	TYPE OF DEATH	AGE IN WEEKS A	DATE OF DEATH	DAYS ON STUDY
44350	F	0.025 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44148	F	0.075 MG/L	FOUND DEAD	7	22-NOV-95	6
44150	F	0.075 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44152	F	0.075 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44161	F	0.075 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44165	F	0.075 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44169	F	0.075 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44171	F	0.075 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44186	F	0.075 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44196	F	0.075 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44197	F	0.075 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44200	F	0.075 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44202	F	0.075 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44206	F	0.075 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44344	F	0.075 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44347	F	0.075 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44155	F	0.25 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44163	F	0.25 MG/L	FOUND DEAD	7	22-NOV-95	6
44167	F	0.25 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44168	F	0.25 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44173	F	0.25 MG/L	FOUND DEAD	10	11-DEC-95	25
44175	F	0.25 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44182	F	0.25 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44184	F	0.25 MG/L	SCHEDULED EUTHANIZATION	11	15-DEC-95	29
44188	F	0.25 MG/L	FOUND DEAD	8	24-NOV-95	8
44189	F	0.25 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44190	F	0.25 MG/L	SCHEDULED EUTHANIZATION	11	14-DEC-95	28
44198	F	0.25 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42

A = CALCULATED TO THE NEAREST WHOLE WEEK USING THE MEAN AGE IN WEEKS AT INITIATION OF DOSING (7)

TABLE 47
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL SURVIVAL AND DISPOSITION

ANIMAL	SEX	GROUP	TYPE OF DEATH	AGE IN WEEKS A	DATE OF DEATH	DAYS ON STUDY
44205	F	0.25 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44345	F	0.25 MG/L	SCHEDULED EUTHANIZATION	13	28-DEC-95	42
44348	F	0.25 MG/L	FOUND DEAD	10	11-DEC-95	25

A = CALCULATED TO THE NEAREST WHOLE WEEK USING THE MEAN AGE IN WEEKS AT INITIATION OF DOSING (7)

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 48 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44091	1	1	1	1	1
44099	1	1	1	1	1
44103	2	1	1	1	1
44108	1	1	1	1	1
44114	1	1	1	1	1
44115	1	1	1	1	1
44121	1	1	1	1	1
44125	1	1	1	1	1
44131	1	1	1	1	1
44132	1	1	1	1	1
44135	1	1	1	1	1
44137	1	1	1	1	1
44141	1	2*	1	1	1
44335	1	1	1	1	1
44337	2	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 48 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
TEST PERIOD: PRETEST

SEX: MALES

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44091	1	1	1	1	1	2	2	2
44099	1	1	1	1	1	2	2	2
44103	1	1	1	1	1	2	1	2
44108	1	1	1	1	1	2	2	2
44114	1	1	1	1	1	2	2	2
44115	1	1	1	1	1	2	2	2
44121	1	1	1	1	1	2	2	2
44125	1	1	1	1	1	2	2	2
44131	1	1	1	1	1	2	2	2
44132	1	1	1	1	1	2	2	2
44135	1	1	1	1	1	2	2	2
44137	1	1	1	1	1	2	2	2
44141	1	1	1	1	1	2	2	2
44335	1	1	1	1	1	2	2	2
44337	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 48 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44091	2	2	2	1	1	1	1	1
44099	2	2	2	1	1	1	1	1
44103	2	2	2	1	1	1	1	1
44108	2	2	2	1	1	1	1	1
44114	2	2	2	1	1	1	1	1
44115	2	2	2	1	1	1	1	1
44121	2	2	2	1	1	1	1	1
44125	2	2	2	1	1	1	1	1
44131	2	2	2	1	1	1	1	1
44132	2	2	2	1	1	1	1	1
44135	2	2	2	1	1	1	1	1
44137	2	2	2	1	1	1	1	1
44141	2	2	2	1	1	1	1	1
44335	2	2	2	1	1	1	1	1
44337	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 48 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
TEST PERIOD: PRETEST

SEX: MALES

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44092	1	1	1	1	1
44093	1	1	1	1	1
44098	1	1	1	1	1
44101	1	2	1	1	1
44110	1	1	1	1	1
44113	1	1	1	1	1
44119	1	1	1	1	1
44126	1	1	1	1	1
44128	1	1	1	1	1
44138	1	2	1	1	1
44143	1	1	1	1	1
44144	1	1	1	1	1
44147	1	1	1	1	1
44339	5	1	1	1	1
44342	5	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 48 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
TEST PERIOD: PRETEST

SEX: MALES

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44092	1	1	1	1	1	2	1	2
44093	1	1	1	1	1	2	2	2
44098	1	1	1	1	1	2	2	2
44101	1	1	1	1	1	2	2	2
44110	1	1	1	1	1	2	2	2
44113	1	1	1	1	1	2	2	2
44119	1	1	1	1	1	2	2	2
44126	1	1	1	1	1	2	2	2
44128	1	1	1	1	1	2	2	2
44138	1	1	1	1	1	2	2	2
44143	1	1	1	1	1	2	2	2
44144	1	1	1	1	1	2	2	2
44147	1	1	1	1	1	2	1	2
44339	1	1	1	1	1	2	2	2
44342	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 48 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
TEST PERIOD: PRETEST

SEX: MALES

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44092	2	2	2	1	1	1	1	1
44093	2	2	2	1	1	1	1	1
44098	2	2	2	1	1	1	1	1
44101	2	2	2	1	1	1	1	1
44110	2	2	2	1	1	1	1	1
44113	2	2	2	1	1	1	1	1
44119	2	2	2	1	1	1	1	1
44126	2	2	2	1	1	1	1	1
44128	2	2	2	1	1	1	1	1
44138	2	2	2	1	1	1	1	1
44143	2	2	2	1	1	1	1	1
44144	2	2	2	1	1	1	1	1
44147	2	2	2	1	1	1	1	1
44339	2	2	2	1	1	1	1	1
44342	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 48 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
TEST PERIOD: PRETEST

SEX: MALES

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44094	1	1	1	1	1
44096	1	1	1	1	1
44100	1	2	1	1	1
44107	1	1	1	1	1
44111	2*	1	1	1	1
44116	1	1	1	1	1
44118	1	1	1	1	1
44124	1	2	1	1	1
44129	1	1	1	1	1
44134	2	1	1	1	1
44140	1	1	1	1	1
44142	1	2*	1	1	1
44145	1	1	1	1	1
44333	5	2	1	1	1
44340	2	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

TABLE 48 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44094	1	1	1	1	1	2	2	2
44096	1	1	1	1	1	2	1	2
44100	1	1	1	1	1	2	2	2
44107	1	1	1	1	1	2	2	2
44111	1	1	1	1	1	2	2	2
44116	1	1	1	1	1	2	2	2
44118	1	1	1	1	1	2	1	2
44124	1	1	1	1	1	2	2	2
44129	1	1	1	1	1	2	2	2
44134	1	1	1	1	1	2	2	2
44140	1	1	1	1	1	2	2	2
44142	1	1	1	1	1	2	2	2
44145	1	1	1	1	1	2	2	2
44333	1	1	1	1	1	2	2	2
44340	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 48 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44094	2	2	2	1	1	1	1	1
44096	2	2	2	1	1	1	1	1
44100	2	2	2	1	1	1	1	1
44107	2	2	2	1	1	1	1	1
44111	2	2	2	1	1	1	1	1
44116	2	2	2	1	1	1	1	1
44118	2	2	2	1	1	1	1	1
44124	2	2	2	1	1	1	1	1
44129	2	2	2	1	1	1	1	1
44134	2	2	2	1	1	1	1	1
44140	2	2	2	1	1	1	1	1
44142	2	2	2	1	1	1	1	1
44145	2	2	2	1	1	1	1	1
44333	2	2	2	1	1	1	1	1
44340	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 48 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44097	1	2	1	1	1
44102	1	1	1	1	1
44104	1	1	1	1	1
44089	1	1	1	1	1
44109	1	1	1	1	1
44112	1	1	1	1	1
44120	2*	1	1	1	1
44123	1	1	1	1	1
44130	1	1	1	1	1
44133	1	1	1	1	1
44136	1	1	1	1	1
44139	1	1	1	1	1
44146	2	2*	1	1	1
44334	1	1	1	1	1
44338	2	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

TABLE 48 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44097	1	1	1	1	1	2	2	2
44102	1	1	1	1	1	2	1	2
44104	1	1	1	1	1	2	2	2
44089	1	1	1	1	1	2	1	2
44109	1	1	1	1	1	2	1	2
44112	1	1	1	1	1	2	2	2
44120	1	1	1	1	1	2	2	2
44123	1	1	1	1	1	2	2	2
44130	1	1	1	1	1	2	2	2
44133	1	1	1	1	1	2	2	2
44136	1	1	1	1	1	2	2	2
44139	1	1	1	1	1	2	2	2
44146	1	1	1	1	1	2	2	2
44334	1	1	1	1	1	2	2	2
44338	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 48 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44097	2	2	2	1	1	1	1	1
44102	2	2	2	1	1	1	1	1
44104	2	2	2	1	1	1	1	1
44089	2	2	2	1	1	1	1	1
44109	2	2	2	1	1	1	1	1
44112	2	2	2	1	1	1	1	1
44120	2	2	2	1	1	1	1	1
44123	2	2	2	1	1	1	1	1
44130	2	2	2	1	1	1	1	1
44133	2	2	2	1	1	1	1	1
44136	2	2	2	1	1	1	1	1
44139	2	2	2	1	1	1	1	1
44146	2	2	2	1	1	1	1	1
44334	2	2	2	1	1	1	1	1
44338	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 48 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
TEST PERIOD: PRETEST

SEX: FEMALES

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44149	1	1	1	1	1
44151	1	1	1	1	1
44154	1	1	1	1	1
44156	1	1	1	1	1
44157	2	1	1	1	1
44164	1	1	1	1	1
44166	1	1	1	1	1
44176	1	1	1	1	1
44178	1	1	1	1	1
44180	1	1	1	1	1
44181	2*	1	1	1	1
44204	1	1	1	1	1
44207	1	1	1	1	1
44346	2*	2*	1	1	1
44352	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

TABLE 48 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
TEST PERIOD: PRETEST

SEX: FEMALES

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44149	1	1	1	1	1	2	2	2
44151	1	1	1	1	1	2	2	2
44154	1	1	1	1	1	2	2	2
44156	1	1	1	1	1	2	2	2
44157	1	1	1	1	1	2	2	2
44164	1	1	1	1	1	2	2	2
44166	1	1	1	1	1	2	2	2
44176	1	1	1	1	1	2	2	2
44178	1	1	1	1	1	2	2	2
44180	1	1	1	1	1	2	2	2
44181	1	1	1	1	1	2	2	2
44204	1	1	1	1	1	2	2	2
44207	1	1	1	1	1	2	2	2
44346	1	1	1	1	1	2	2	2
44352	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 48 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44149	2	2	2	1	1	1	1	1
44151	2	2	2	1	1	1	1	1
44154	2	2	2	1	1	1	1	1
44156	2	2	2	1	1	1	1	1
44157	2	2	2	1	1	1	1	1
44164	2	2	2	1	1	1	1	1
44166	2	2	2	1	1	1	1	1
44176	2	2	2	1	1	1	1	1
44178	2	2	2	1	1	1	1	1
44180	2	2	2	1	1	1	1	1
44181	2	2	2	1	1	1	1	1
44204	2	2	2	1	1	1	1	1
44207	2	2	2	1	1	1	1	1
44346	2	2	2	1	1	1	1	1
44352	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 48 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
TEST PERIOD: PRETEST

SEX: FEMALES

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44159	1	1	1	1	1
44160	1	1	1	1	1
44162	1	1	1	1	1
44170	1	1	1	1	1
44172	1	2*	1	1	1
44179	1	1	1	1	1
44183	1	1	1	1	1
44187	1	1	1	1	1
44191	1	1	1	1	1
44192	1	2*	1	1	1
44194	1	1	1	1	1
44195	1	1	1	1	1
44201	1	1	1	1	1
44349	1	1	1	1	1
44350	5*	2*	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

TABLE 48 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44159	1	1	1	1	1	2	2	2
44160	1	1	1	1	1	2	2	2
44162	1	1	1	1	1	2	2	2
44170	1	1	1	1	1	2	2	2
44172	1	1	1	1	1	2	2	2
44179	1	1	1	1	1	2	2	2
44183	1	1	1	1	1	2	1	2
44187	1	1	1	1	1	2	2	2
44191	1	1	1	1	1	2	2	2
44192	1	1	1	1	1	1	2	2
44194	1	1	1	1	1	2	2	2
44195	1	1	1	1	1	2	2	2
44201	1	1	1	1	1	2	2	2
44349	1	1	1	1	1	2	2	2
44350	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 48 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
TEST PERIOD: PRETEST

SEX: FEMALES

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44159	2	2	2	1	1	1	1	1
44160	2	2	2	1	1	1	1	1
44162	2	2	2	1	1	1	1	1
44170	2	2	2	1	1	1	1	1
44172	2	2	2	1	1	1	1	1
44179	2	2	2	1	1	1	1	1
44183	2	2	2	1	1	1	1	1
44187	2	2	2	1	1	1	1	1
44191	2	2	2	1	1	1	1	1
44192	2	2	2	1	1	1	1	1
44194	2	2	2	1	1	1	1	1
44195	2	2	2	1	1	1	1	1
44201	2	2	2	1	1	1	1	1
44349	2	2	2	1	1	1	1	1
44350	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 48 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44148	1	1	1	1	1
44150	1	1	1	1	1
44152	1	1	1	1	1
44161	1	1	1	1	1
44165	1	1	1	1	1
44169	2*	2	1	1	1
44171	1	1	1	1	1
44186	1	1	1	1	1
44196	1	1	1	1	1
44197	1	1	1	1	1
44200	1	1	1	1	1
44202	1	2	1	1	1
44206	1	1	1	1	1
44344	1	1	1	1	1
44347	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

TABLE 48 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44148	1	1	1	1	1	2	2	2
44150	1	1	1	1	1	2	2	2
44152	1	1	1	1	1	2	2	2
44161	1	1	1	1	1	2	1	2
44165	1	1	1	1	1	2	2	2
44169	1	1	1	1	1	2	2	2
44171	1	1	1	1	1	2	2	2
44186	1	1	1	1	1	2	2	2
44196	1	1	1	1	1	2	2	2
44197	1	1	1	1	1	2	2	2
44200	1	1	1	1	1	2	2	2
44202	1	1	1	1	1	2	2	2
44206	1	1	1	1	1	2	2	2
44344	1	1	1	1	1	2	2	2
44347	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 48 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
TEST PERIOD: PRETEST

SEX: FEMALES

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44148	2	2	2	1	1	1	1	1
44150	2	2	2	1	1	1	1	1
44152	2	2	2	1	1	1	1	1
44161	2	2	2	1	1	1	1	1
44165	2	2	2	1	1	1	1	1
44169	2	2	2	1	1	1	1	1
44171	2	2	2	1	1	1	1	1
44186	2	2	1	1	1	1	1	1
44196	2	2	2	1	1	1	1	1
44197	2	2	2	1	1	1	1	1
44200	2	2	2	1	1	1	1	1
44202	2	2	2	1	1	1	1	1
44206	2	2	2	1	1	1	1	1
44344	2	2	2	1	1	1	1	1
44347	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 48 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44155	2	1	1	1	1
44163	1	1	1	1	1
44167	1	1	1	1	1
44168	1	1	1	1	1
44173	1	1	1	1	1
44175	2*	1	1	1	1
44182	1	2*	1	1	1
44184	1	1	1	1	1
44188	2	1	1	1	1
44189	1	2	1	1	1
44190	1	2	1	1	1
44198	1	2	1	1	1
44205	1	1	1	1	1
44345	4*	1	1	1	1
44348	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

TABLE 48 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44155	1	1	1	1	1	2	2	2
44163	1	1	1	1	1	2	2	2
44167	1	1	1	1	1	2	2	2
44168	1	1	1	1	1	2	2	2
44173	1	1	1	1	1	2	2	2
44175	1	1	1	1	1	2	2	2
44182	1	1	1	1	1	2	2	2
44184	1	1	1	1	1	2	2	2
44188	1	1	1	1	1	2	2	2
44189	1	1	1	1	1	2	2	2
4 190	1	1	1	1	1	2	2	2
44198	1	1	1	1	1	2	2	2
44205	1	1	1	1	1	2	2	2
44345	1	1	1	1	1	2	2	2
44348	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 48 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
TEST PERIOD: PRETEST

SEX: FEMALES

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44155	2	2	2	1	1	1	1	1
44163	2	2	2	1	1	1	1	1
44167	2	2	2	1	1	1	1	1
44168	2	2	2	1	1	1	1	1
44173	2	2	2	1	1	1	1	1
44175	2	2	2	1	1	1	1	1
44182	2	2	2	1	1	1	1	1
44184	2	2	2	1	1	1	1	1
44188	2	2	2	1	1	1	1	1
44189	2	2	2	1	1	1	1	1
44190	2	2	2	1	1	1	1	1
44198	2	2	2	1	1	1	1	1
44205	2	2	2	1	1	1	1	1
44345	2	2	2	1	1	1	1	1
44348	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 49 (WEEK 0 EVALUATION)

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
SEX: MALES
TEST PERIOD: WEEK 0

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44091	2	1	1	1	1
44099	1	1	1	1	1
44103	2	1	1	1	1
44108	1	1	1	1	1
44114	2	1	1	1	1
44115	4	1	1	1	1
44121	2	1	1	1	1
44125	2	1	1	1	1
44131	4	1	1	1	1
44132	1	1	1	1	1
44135	2	1	1	1	1
44137	1	1	1	1	1
44141	2	1	1	1	1
44335	1	1	1	1	1
44337	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 49 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
SEX: MALES
TEST PERIOD: WEEK 0

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44091	1	1	1	1	1	2	2	2
44099	1	1	1	1	1	2	2	2
44103	1	1	1	1	1	2	2	2
44108	1	1	1	1	1	2	2	2
44114	1	1	1	1	1	2	2	2
44115	1	1	1	1	1	2	2	2
44121	1	1	1	1	1	2	2	2
44125	1	1	1	1	1	2	2	2
44131	1	1	1	1	1	2	2	2
44132	1	1	1	1	1	2	2	2
44135	1	1	1	1	1	2	2	2
44137	1	1	1	1	1	2	2	2
44141	1	1	1	1	1	2	2	2
44335	1	1	1	1	1	2	2	2
44337	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 49 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
TEST PERIOD: WEEK 0

SEX: MALES

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44091	2	2	2	1	1	1	1	1
44099	2	2	2	1	1	1	1	1
44103	2	2	2	1	1	1	1	1
44108	2	2	2	1	1	1	1	1
44114	2	2	2	1	1	1	1	1
44115	2	2	2	1	1	1	1	1
44121	2	2	2	1	1	1	1	1
44125	2	2	2	1	1	1	1	1
44131	2	2	2	1	1	1	1	1
44132	2	2	2	1	1	1	1	1
44135	2	2	2	1	1	1	1	1
44137	2	2	2	1	1	1	1	1
44141	2	2	2	1	1	1	1	1
44335	2	2	2	1	1	1	1	1
44337	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 49 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
SEX: MALES
TEST PERIOD: WEEK 0

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44092	2	1	1	1	1
44093	2	1	1	1	1
44098	1	1	1	1	1
44101	1	1	1	1	1
44110	2	1	1	1	1
44113	2	1	1	1	1
44119	1	1	1	1	1
44126	1	1	1	1	1
44128	1	1	1	1	1
44138	3	1	1	1	1
44143	2	1	1	1	1
44144	2	1	1	1	1
44147	1	1	1	1	1
44339	2	1	1	1	1
44342	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 49 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
TEST PERIOD: WEEK 0

SEX: MALES

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44092	1	1	1	1	1	2	2	2
44093	1	1	1	1	1	2	2	2
44098	1	1	1	1	1	2	2	2
44101	1	1	1	1	1	2	2	2
44110	1	1	1	1	1	2	2	2
44113	1	1	1	1	1	2	2	2
44119	1	1	1	1	1	2	2	2
44126	1	1	1	1	1	2	2	2
44128	1	1	1	1	1	2	2	2
44138	1	1	1	1	1	2	2	2
44143	1	1	1	1	1	2	2	2
44144	1	1	1	1	1	2	2	2
44147	1	1	1	1	1	2	2	2
44339	1	1	1	1	1	2	2	2
44342	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 49 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
SEX: MALES
TEST PERIOD: WEEK 0

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44092	2	2	2	1	1	1	1	1
44093	2	2	2	1	1	1	1	1
44098	2	2	2	1	1	1	1	1
44101	2	2	2	1	1	1	1	1
44110	2	2	2	1	1	1	1	1
44113	2	2	2	1	1	1	1	1
44119	2	2	2	1	1	1	1	1
44126	2	2	2	1	1	1	1	1
44128	2	2	2	1	1	1	1	1
44138	2	2	2	1	1	1	1	1
44143	2	2	2	1	1	1	1	1
44144	2	2	2	1	1	1	1	1
44147	2	2	2	1	1	1	1	1
44339	2	2	2	1	1	1	1	1
44342	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 49 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
SEX: MALES
TEST PERIOD: WEEK 0

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44094	4	1	1	1	1
44096	1	1	1	1	1
44100	1	1	1	1	1
44107	1	1	1	1	1
44111	1	1	1	1	1
44116	1	1	1	1	1
44118	2	1	1	1	1
44124	2	1	1	1	1
44129	2	1	1	1	1
44134	2	1		1	1
44140	1	1	1	1	1
44142	1	1	1	1	1
44145	2	1	1	1	1
44333	1	1	1	1	1
44340	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 49 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
TEST PERIOD: WEEK 0

SEX: MALES

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44094	1	1	1	1	1	2	2	2
44096	1	1	1	1	1	2	2	2
44100	1	1	1	1	1	2	2	2
44107	1	1	1	1	1	2	2	2
44111	1	1	1	1	1	2	2	2
44116	1	1	1	1	1	2	2	2
44118	1	1	1	1	1	2	2	2
44124	1	1	1	1	1	2	2	2
44129	1	1	1	1	1	2	2	2
44134	1	1	1	1	1	2	2	2
44140	1	1	1	1	1	2	2	2
44142	1	1	1	1	1	2	2	2
44145	1	1	1	1	1	2	2	2
44333	1	1	1	1	1	2	2	2
44340	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 49 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
TEST PERIOD: WEEK 0

SEX: MALES

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44094	2	2	2	1	1	1	1	1
44096	2	2	2	1	1	1	1	1
44100	2	2	2	1	1	1	1	1
44107	2	2	2	1	1	1	1	1
44111	2	2	2	1	1	1	1	1
44116	2	2	2	1	1	1	1	1
44118	2	2	2	1	1	1	1	1
44124	2	2	2	1	1	1	1	1
44129	2	2	2	1	1	1	1	1
44134	2	2	2	1	1	1	1	1
44140	2	2	2	1	1	1	1	1
44142	2	2	2	1	1	1	1	1
44145	2	2	2	1	1	1	1	1
44333	2	2	2	1	1	1	1	1
44340	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 49 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
SEX: MALES
TEST PERIOD: WEEK 0

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44097	4	1	1	1	1
44102	2	1	1	1	1
44104	2*	1	1	1	1
44109	2	1	1	1	1
44112	1	1	1	1	1
44120	2*	1	1	1	1
44123	1	1	1	1	1
44130	2	1	1	1	1
44133	4	1	1	1	1
44136	2	1	1	1	1
44139	1	2	1	1	1
44146	2	1	1	1	1
44334	2	1	1	1	1
44338	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

TABLE 49 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
TEST PERIOD: WEEK 0

SEX: MALES

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44097	1	1	1	1	1	2	2	2
44102	1	1	1	1	1	2	2	2
44104	1	1	1	1	1	2	2	2
44109	1	2	1	1	1	2	2	2
44112	1	1	1	1	1	2	2	2
44120	1	2	1	1	2	2	2	2
44123	1	1	1	1	1	2	2	2
44130	1	1	1	1	1	2	2	2
44133	1	1	1	1	1	2	2	2
44136	1	1	1	1	1	2	2	2
44139	1	2	1	1	1	2	2	2
44146	1	1	1	1	1	2	2	2
44334	1	1	1	1	1	2	2	2
44338	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 49 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
SEX: MALES
TEST PERIOD: WEEK 0

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44097	2	2	2	1	1	1	1	1
44102	2	2	2	1	1	1	1	1
44104	2	2	2	1	1	1	1	1
44109	2	2	2	1	1	1	1	1
44112	2	2	2	1	1	1	1	1
44120	2	2	2	1	1	1	1	1
44123	2	2	2	1	1	1	1	1
44130	2	2	2	1	1	1	1	1
44133	2	2	2	1	1	1	1	1
44136	2	2	2	1	1	1	1	1
44139	2	2	2	1	1	1	1	1
44146	2	2	2	1	1	1	1	1
44334	2	2	2	1	1	1	1	1
44338	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 49 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
TEST PERIOD: WEEK 0

SEX: FEMALES

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44149	2	1	1	1	1
44151	1	1	1	1	1
44154	2*	1	1	1	1
44156	1	1	1	1	1
44157	1	2	1	1	1
44164	4	1	1	1	1
44166	1	1	1	1	1
44176	1	1	1	1	1
44178	1	1	1	1	1
44180	1	1	1	1	1
44181	2*	1	1	1	1
44204	2	1	1	1	1
44207	1	1	1	1	1
44346	2	1	1	1	1
44352	2	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

TABLE 49 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L SEX: FEMALES
TEST PERIOD: WEEK 0

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS EYES	RED DEPOSITS NOSE	RED DEPOSITS MOUTH
44149	1	1	1	1	1	2	2	2
44151	1	1	1	1	1	2	2	2
44154	1	1	1	1	1	2	2	2
44156	1	1	1	1	1	2	2	2
44157	1	1	1	1	1	2	2	2
44164	1	1	1	1	1	2	2	2
44166	1	1	1	1	1	2	2	2
44176	1	1	1	1	1	2	2	2
44178	1	1	1	1	1	2	2	2
44180	1	1	1	1	1	2	2	2
44181	1	1	1	1	1	2	2	2
44204	1	1	1	1	1	2	2	2
44207	1	1	1	1	1	2	2	2
44346	1	1	1	1	1	2	2	2
44352	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 49 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
SEX: FEMALES
TEST PERIOD: WEEK 0

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44149	2	2	2	1	1	1	1	1
44151	2	2	2	1	1	1	1	1
44154	2	2	2	1	1	1	1	1
44156	2	2	2	1	1	1	1	1
44157	2	2	2	1	1	1	1	1
44164	2	2	2	1	1	1	1	1
44166	2	2	2	1	1	1	1	1
44176	2	2	2	1	1	1	1	1
44178	2	2	2	1	1	1	1	1
44180	2	2	2	1	1	1	1	1
44181	2	2	2	1	1	1	1	1
44204	2	2	2	1	1	1	1	1
44207	2	2	2	1	1	1	1	1
44346	2	2	2	1	1	1	1	1
44352	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 49 (WEEK 0 EVALUATION)

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
SEX: FEMALES
TEST PERIOD: WEEK 0

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44159	1	1	1	1	1
44160	2	1	1	1	1
44162	1	1	1	1	1
44170	1	1	1	1	1
44172	1	1	1	1	1
44179	1	1	1	1	1
44183	1	1	1	1	1
44187	1	1	1	1	1
44191	2	1	1	1	1
44192	2*	1	1	1	1
44194	1	1	1	1	1
44195	1	1	1	1	1
44201	2	1	1	1	1
44349	1	1	1	1	1
44350	2	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

TABLE 49 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
SEX: FEMALES
TEST PERIOD: WEEK 0

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS EYES	RED DEPOSITS NOSE	RED DEPOSITS MOUTH
44159	1	1	1	1	1	2	2	2
44160	1	1	1	1	1	2	2	2
44162	1	1	1	1	1	2	2	2
44170	1	1	1	1	1	2	2	2
44172	1	1	1	1	1	2	2	2
44179	1	1	1	1	1	2	2	2
44183	1	1	1	1	1	2	2	2
44187	1	1	1	1	1	2	2	2
44191	1	1	1	1	1	2	2	2
44192	1	1	1	1	1	2	2	2
44194	1	1	1	1	1	2	2	2
44195	1	1	1	1	1	2	2	2
44201	1	1	1	1	1	2	2	2
44349	1	1	1	1	1	2	2	2
44350	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 49 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
SEX: FEMALES
TEST PERIOD: WEEK 0

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44159	2	2	2	1	1	1	1	1
44160	2	2	2	1	1	1	1	1
44162	2	2	2	1	1	1	1	1
44170	2	2	2	1	1	1	1	1
44172	2	2	2	1	1	1	1	1
44179	2	2	2	1	1	1	1	1
44183	2	2	2	1	1	1	1	1
44187	2	2	2	1	1	1	1	1
44191	2	2	2	1	1	1	1	1
44192	2	2	2	1	1	1	1	1
44194	2	2	2	1	1	1	1	1
44195	2	2	2	1	1	1	1	1
44201	2	2	2	1	1	1	1	1
44349	2	2	2	1	1	1	1	1
44350	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 49 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
SEX: FEMALES
TEST PERIOD: WEEK 0

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44148	1	1	1	1	1
44150	1	1	1	1	1
44152	1	1	1	1	1
44161	3	1	1	1	1
44165	3	1	1	1	1
44169	2	1	1	1	1
44171	1	1	1	1	1
44186	1	1	1	1	1
44196	1	1	1	1	1
44197	1	1	1	1	1
44200	3	1	1	1	1
44202	2	1	1	1	1
44206	1	1	1	1	1
44344	1	1	1	1	1
44347	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 49 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
SEX: FEMALES
TEST PERIOD: WEEK 0

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44148	1	1	1	1	1	2	2	2
44150	1	1	1	1	1	2	2	2
44152	1	1	1	1	1	2	2	2
44161	1	1	1	1	1	2	2	2
44165	1	1	1	1	1	2	2	2
44169	1	1	1	1	1	2	2	2
44171	1	1	1	1	1	2	2	2
44186	1	1	1	1	1	2	2	2
44196	1	1	1	1	1	2	2	2
44197	1	1	1	1	1	2	2	2
44200	1	1	1	1	1	2	2	2
44202	1	1	1	1	1	2	2	2
44206	1	1	1	1	1	2	2	2
44344	1	1	1	1	1	2	2	2
44347	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 49 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
SEX: FEMALES
TEST PERIOD: WEEK 0

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44148	2	2	2	1	1	1	1	1
44150	2	2	2	1	1	1	1	1
44152	2	2	2	1	1	1	1	1
44161	2	2	2	1	1	1	1	1
44165	2	2	2	1	1	1	1	1
44169	2	2	2	1	1	1	1	1
44171	2	2	2	1	1	1	1	1
44186	2	2	2	1	1	1	1	1
44196	2	2	2	1	1	1	1	1
44197	2	2	2	1	1	1	1	1
44200	2	2	2	1	1	1	1	1
44202	2	2	2	1	1	1	1	1
44206	2	2	2	1	1	1	1	1
44344	2	2	2	1	1	1	1	1
44347	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 49 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
SEX: FEMALES
TEST PERIOD: WEEK 0

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44155	5	1	1	1	1
44163	1	1	1	1	1
44167	1	1	1	1	1
44168	2	1	1	1	1
44173	1	1	1	1	1
44175	2	1	1	1	1
44182	2*	2*	1	1	1
44184	1	1	1	1	1
44188	1	1	1	1	1
44189	2	1	1	1	1
44190	3	1	1	1	1
44198	2	1	1	1	1
44205	2	1	1	1	1
44345	2	1	1	1	1
44348	2	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

TABLE 49 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
TEST PERIOD: WEEK 0

SEX: FEMALES

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44155	1	1	1	1	1	2	2	2
44163	1	2	1	1	1	2	2	2
44167	1	1	1	1	1	2	2	2
44168	1	1	1	1	1	2	2	2
44173	1	1	1	1	1	2	2	2
44175	1	1	1	1	1	2	2	2
44182	1	1	1	1	1	2	2	2
44184	1	1	1	1	1	2	2	2
44188	1	1	1	1	1	2	2	2
44189	1	1	1	1	1	2	1	2
44190	1	1	1	1	1	2	2	2
44198	1	1	1	1	1	2	2	2
44205	1	1	1	1	1	2	2	2
44345	1	1	1	1	1	2	2	2
44348	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 49 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
TEST PERIOD: WEEK 0

SEX: FEMALES

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44155	2	2	2	1	1	1	1	1
44163	2	2	2	1	1	1	1	1
44167	2	2	2	1	1	1	1	1
44168	2	2	2	1	1	1	1	1
44173	2	2	2	1	1	1	1	1
44175	2	2	2	1	1	1	1	1
44182	2	2	2	1	1	1	1	1
44184	2	2	2	1	1	1	1	1
44188	2	2	2	1	1	1	1	1
44189	2	2	2	1	1	1	1	1
44190	2	2	2	1	1	1	1	1
44198	2	2	2	1	1	1	1	1
44205	2	2	2	1	1	1	1	1
44345	2	2	2	1	1	1	1	1
44348	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 50 (WEEK 1 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1

DOSE LEVEL: 0.00 MG/L SEX: MALES

TEST PERIOD: WEEK 1

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44091	1	1	1	1	1
44099	1	1	1	1	1
44103	1	1	1	1	1
44108	1	1	1	1	1
44114	1	1	1	1	1
44115	1	1	1	1	1
44121	1	1	1	1	1
44131	1	1	1	1	1
44132	1	1	1	1	1
44135	1	1	1	1	1
44137	1	1	1	1	1
44141	1	1	1	1	1
44337	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 50 (WEEK 1 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1

DOSE LEVEL: 0.00 MG/L SEX: MALES

TEST PERIOD: WEEK 1

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS EYES	RED DEPOSITS NOSE	RED DEPOSITS MOUTH
44091	1	1	1	1	1	2	2	2
44099	1	1	1	1	1	2	2	2
44103	1	1	1	1	1	2	2	2
44108	1	1	1	1	1	2	2	2
44114	1	1	1	1	1	2	2	2
44115	1	1	1	1	1	2	2	2
44121	1	1	1	1	1	2	2	2
44131	1	1	1	1	1	2	2	2
44132	1	1	1	1	1	2	2	2
44135	1	1	1	1	1	2	2	2
44137	1	1	1	1	1	2	2	2
44141	1	1	1	1	1	2	2	2
44337	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 50 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L SEX: MALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	CRUSTY DEPOSITS EYES	CRUSTY DEPOSITS NOSE	CRUSTY DEPOSITS MOUTH	COLOR MUCOUS MEMBRANES	COLOR EYES	COLOR SKIN	EYE PROMINENCE	MUSCLE TONE
44091	2	2	2	1	1	1	1	1
44099	2	2	2	1	1	1	1	1
44103	2	2	2	1	1	1	1	1
44108	2	2	2	1	1	1	1	1
44114	2	2	2	1	1	1	1	1
44115	2	2	2	1	1	1	1	1
44121	2	2	2	1	1	1	1	1
44131	2	2	2	1	1	1	1	1
44132	2	2	2	1	1	1	1	1
44135	2	2	2	1	1	1	1	1
44137	2	2	2	1	1	1	1	1
44141	2	2	2	1	1	1	1	1
44337	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 50 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L SEX: MALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44092	1	1	1	1	1
44093	1	1	1	1	1
44098	1	1	1	1	1
44101	1	1	1	1	1
44110	1	1	1	1	1
44113	2	1	1	1	1
44119	2	1	1	1	1
44126	1	1	1	1	1
44128	1	1	1	1	1
44138	1	1	1	1	1
44143	1	1	1	1	1
44144	1	1	1	1	1
44147	1	1	1	1	1
44339	1	1	1	1	1
44342	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 50 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L SEX: MALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44092	1	1	1	1	1	2	2	2
44093	1	1	1	1	1	2	2	2
44098	1	1	1	1	1	2	2	2
44101	1	1	1	1	1	2	2	2
44110	1	1	1	1	1	2	2	2
44113	1	1	1	1	1	2	2	2
44119	1	1	1	1	1	2	2	2
44126	1	1	1	1	1	2	2	2
44128	1	1	1	1	1	2	2	2
44138	1	1	1	1	1	2	2	2
44143	1	1	1	1	1	2	2	2
44144	1	1	1	1	1	2	2	2
44147	1	1	1	1	1	2	2	2
44339	1	1	1	1	1	2	2	2
44342	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 50 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L SEX: MALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	CRUSTY DEPOSITS EYES	CRUSTY DEPOSITS NOSE	CRUSTY DEPOSITS MOUTH	COLOR MUCOUS MEMBRANES	COLOR EYES	COLOR SKIN	EYE PROMINENCE	MUSCLE TONE
44092	2	2	2	1	1	1	1	1
44093	2	2	2	1	1	1	1	1
44098	2	2	2	1	1	1	1	1
44101	2	2	2	1	1	1	1	1
44110	2	2	2	1	1	1	1	1
44113	2	2	2	1	1	1	1	1
44119	2	2	2	1	1	1	1	1
44126	2	2	2	1	1	1	1	1
44128	2	2	2	1	1	1	1	1
44138	2	2	2	1	1	1	1	1
44143	2	2	2	1	1	1	1	1
44144	2	2	2	1	1	1	1	1
44147	2	2	2	1	1	1	1	1
44339	2	2	2	1	1	1	1	1
44342	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 50 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
SEX: MALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44094	1	1	1	1	1
44096	1	1	1	1	1
44100	1	1	1	1	1
44107	1	1	1	1	1
44111	1	1	1	1	1
44116	1	1	1	1	1
44118	2	1	1	1	1
44124	1	1	1	1	1
44129	1	1	1	1	1
44134	2	2	1	1	1
44140	1	1	1	1	1
44142	1	1	1	1	1
44145	1	1	1	1	1
44333	1	2	1	1	1
44340	2	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 50 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
TEST PERIOD: WEEK 1

SEX: MALES

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS EYES	RED DEPOSITS NOSE	RED DEPOSITS MOUTH
44094	1	1	1	1	1	2	2	2
44096	1	1	1	1	1	2	2	2
44100	1	1	1	1	1	2	2	2
44107	1	1	1	1	1	2	2	2
44111	1	1	1	1	1	2	2	2
44116	1	1	1	1	1	2	2	2
44118	1	1	1	1	1	2	2	2
44124	1	1	1	1	1	2	2	2
44129	1	1	1	1	1	2	2	2
44134	1	1	1	1	1	2	2	2
44140	1	1	1	1	1	2	2	2
44142	1	1	1	1	1	2	2	2
44145	1	1	1	1	1	2	2	2
44333	1	1	1	1	1	2	2	2
44340	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 50 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
SEX: MALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44094	2	2	2	1	1	1	1	1
44096	2	2	2	1	1	1	1	1
44100	2	2	2	1	1	1	1	1
44107	2	2	2	1	1	1	1	1
44111	2	2	2	1	1	1	1	1
44116	2	2	2	1	1	1	1	1
44118	2	2	2	1	1	1	1	1
44124	2	2	2	1	1	1	1	1
44129	2	2	2	1	1	1	1	1
44134	2	2	2	1	1	1	1	1
44140	2	2	2	1	1	1	1	1
44142	2	2	2	1	1	1	1	1
44145	2	2	2	1	1	1	1	1
44333	2	2	2	1	1	1	1	1
44340	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 50 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L SEX: MALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44097	1	1	1	1	1
44102	1	1	1	1	1
44104	1	1	1	1	1
44089	1	1	1	1	1
44109	2	1	1	1	1
44112	1	1	1	1	1
44123	1	1	1	1	1
44130	1	1	1	1	1
44133	1	1	1	1	1
44136	1	1	1	1	1
44139	1	1	1	1	1
44146	1	1	1	1	1
44334	1	1	1	1	1
44338	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 50 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
SEX: MALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44097	1	1	1	1	1	2	2	2
44102	1	1	1	1	1	2	2	2
44104	1	1	1	1	1	2	2	2
44089	1	1	1	1	1	2	2	2
44109	1	1	1	1	1	2	2	2
44112	1	1	1	1	1	2	2	2
44123	1	1	1	1	1	2	2	2
44130	1	1	1	1	1	2	2	2
44133	1	1	1	1	1	2	2	2
44136	1	1	1	1	1	2	2	2
44139	1	1	1	1	1	2	2	2
44146	1	1	1	1	1	2	2	2
44334	1	1	1	1	1	2	2	2
44338	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 50 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
SEX: MALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44097	2	2	2	1	1	1	1	1
44102	2	2	2	1	1	1	1	1
44104	2	2	2	1	1	1	1	1
44089	2	2	2	1	1	1	1	1
44109	2	2	2	1	1	1	1	1
44112	2	2	2	1	1	1	1	1
44123	2	2	2	1	1	1	1	1
44130	2	2	2	1	1	1	1	1
44133	2	2	2	1	1	1	1	1
44136	2	2	2	1	1	1	1	1
44139	2	2	2	1	1	1	1	1
44146	2	2	2	1	1	1	1	1
44334	2	2	2	1	1	1	1	1
44338	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 50 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
SEX: FEMALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44149	1	1	1	1	1
44151	1	1	1	1	1
44154	1	1	1	1	1
44156	1	1	1	1	1
44164	1	1	1	1	1
44166	2	1	1	1	1
44176	1	1	1	1	1
44178	2	1	1	1	1
44180	1	1	1	1	1
44181	1	1	1	1	1
44204	2	1	1	1	1
44207	1	1	1	1	1
44346	1	1	1	1	1
44352	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 50 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
SEX: FEMALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44149	1	1	1	1	1	2	2	2
44151	1	1	1	1	1	2	2	2
44154	1	1	1	1	1	2	2	2
44156	1	1	1	1	1	2	2	2
44164	1	1	1	1	1	2	2	2
44166	1	1	1	1	1	2	2	2
44176	1	1	1	1	1	2	2	2
44178	1	1	1	1	1	2	2	2
44180	1	1	1	1	1	2	2	2
44181	1	1	1	1	1	2	2	2
44204	1	1	1	1	1	2	2	2
44207	1	1	1	1	1	2	2	2
44346	1	1	1	1	1	2	2	2
44352	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 50 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
SEX: FEMALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44149	2	2	2	1	1	1	1	1
44151	2	2	2	1	1	1	1	1
44154	2	2	2	1	1	1	1	1
44156	2	2	2	1	1	1	1	1
44164	2	2	2	1	1	1	1	1
44166	2	2	2	1	1	1	1	1
44176	2	2	2	1	1	1	1	1
44178	2	2	2	1	1	1	1	1
44180	2	2	2	1	1	1	1	1
44181	2	2	2	1	1	1	1	1
44204	2	2	2	1	1	1	1	1
44207	2	2	2	1	1	1	1	1
44346	2	2	2	1	1	1	1	1
44352	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 50 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L SEX: FEMALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44159	2	1	1	1	1
44160	1	2	1	1	1
44162	1	1	1	1	1
44170	1	1	1	1	1
44172	1	1	1	1	1
44179	1	1	1	1	1
44183	1	1	1	1	1
44187	1	1	1	1	1
44191	1	1	1	1	1
44192	1	1	1	1	1
44194	1	1	1	1	1
44195	1	1	1	1	1
44201	1	2	1	1	1
44349	1	1	1	1	1
44350	1	2	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 50 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L SEX: FEMALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS EYES	RED DEPOSITS NOSE	RED DEPOSITS MOUTH
44159	1	1	1	1	1	2	2	2
44160	1	1	1	1	1	2	2	2
44162	1	1	1	1	1	2	2	2
44170	1	1	1	1	1	2	2	2
44172	1	1	1	1	1	2	2	2
44179	1	1	1	1	1	2	2	2
44183	1	1	1	1	1	2	2	2
44187	1	1	1	1	1	2	2	2
44191	1	1	1	1	1	2	2	2
44192	1	1	1	1	1	2	2	2
44194	1	1	1	1	1	2	2	2
44195	1	1	1	1	1	2	2	2
44201	1	1	1	1	1	2	2	2
44349	1	1	1	1	1	2	2	2
44350	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 50 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
SEX: FEMALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44159	2	2	2	1	1	1	1	1
44160	2	2	2	1	1	1	1	1
44162	2	2	2	1	1	1	1	1
44170	2	2	2	1	1	1	1	1
44172	2	2	2	1	1	1	1	1
44179	2	2	2	1	1	1	1	1
44183	2	2	2	1	1	1	1	1
44187	2	2	2	1	1	1	1	1
44191	2	2	2	1	1	1	1	1
44192	2	2	2	1	1	1	1	1
44194	2	2	2	1	1	1	1	1
44195	2	2	2	1	1	1	1	1
44201	2	2	2	1	1	1	1	1
44349	2	2	2	1	1	1	1	1
44350	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 50 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
TEST PERIOD: WEEK 1

SEX: FEMALES

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44150	1	1	1	1	1
44152	1	1	1	1	1
44161	1	1	1	1	1
44165	1	1	1	1	1
44169	1	1	1	1	1
44171	1	1	1	1	1
44186	1	1	1	1	1
44196	1	1	1	1	1
44197	1	1	1	1	1
44200	1	1	1	1	1
44202	1	2	1	1	1
44206	1	1	1	1	1
44344	1	1	1	1	1
44347	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 50 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
TEST PERIOD: WEEK 1

SEX: FEMALES

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44150	1	1	1	1	1	2	2	2
44152	1	1	1	1	1	2	2	2
44161	1	1	1	1	1	2	2	2
44165	1	1	1	1	1	2	2	2
44169	1	1	1	1	1	2	2	2
44171	1	1	1	1	1	2	2	2
44186	1	1	1	1	1	2	2	2
44196	1	1	1	1	1	2	2	2
44197	1	1	1	1	1	2	2	2
44200	1	1	1	1	1	2	2	2
44202	1	1	1	1	1	2	2	2
44206	1	1	1	1	1	2	2	2
44344	1	1	1	1	1	2	2	2
44347	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 50 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
SEX: FEMALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44150	2	2	2	1	1	1	1	1
44152	2	2	2	1	1	1	1	1
44161	2	2	2	1	1	1	1	1
44165	2	2	2	1	1	1	1	1
44169	2	2	2	1	1	1	1	1
44171	2	2	2	1	1	1	1	1
44186	2	2	2	1	1	1	1	1
44196	2	2	2	1	1	1	1	1
44197	2	2	2	1	1	1	1	1
44200	2	2	2	1	1	1	1	1
44202	2	2	2	1	1	1	1	1
44206	2	2	2	1	1	1	1	1
44344	2	2	2	1	1	1	1	1
44347	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 50 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
SEX: FEMALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44155	1	1	1	1	1
44167	1	1	1	1	1
44168	1	1	1	1	1
44173	1	1	1	1	1
44175	1	1	1	1	1
44182	2	2*	1	1	1
44184	1	2	1	1	1
44189	1	1	1	1	1
44190	2	1	1	1	1
44198	1	1	1	1	1
44205	2	1	1	1	1
44345	1	1	1	1	1
44348	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

TABLE 50 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
SEX: FEMALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44155	1	1	1	1	1	2	2	2
44167	1	1	1	1	1	2	2	2
44168	1	1	1	1	1	2	2	2
44173	1	1	1	1	1	2	2	2
44175	1	1	1	1	1	2	2	2
44182	1	1	1	1	1	2	2	2
44184	1	1	1	1	1	2	2	2
44189	1	1	1	1	1	2	2	2
44190	1	1	1	1	1	2	2	2
44198	1	1	1	1	1	2	2	2
44205	1	1	1	1	1	2	2	2
44345	1	1	1	1	1	2	2	2
44348	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 50 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
SEX: FEMALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44155	2	2	2	1	1	1	1	1
44167	2	2	2	1	1	1	1	1
44168	2	2	2	1	1	1	1	1
44173	2	2	2	1	1	1	1	1
44175	2	2	2	1	1	1	1	1
44182	2	2	2	1	1	1	1	1
44184	2	2	2	1	1	1	1	1
44189	2	2	2	1	1	1	1	1
44190	2	2	2	1	1	1	1	1
44198	2	2	2	1	1	1	1	1
44205	2	2	2	1	1	1	1	1
44345	2	2	2	1	1	1	1	1
44348	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 51 (WEEK 2 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1

DOSE LEVEL: 0.00 MG/L SEX: MALES

TEST PERIOD: WEEK 2

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44091	1	1	1	1	1
44099	1	1	1	1	1
44103	1	1	1	1	1
44108	1	1	1	1	1
44114	1	1	1	1	1
44115	1	1	1	1	1
44121	1	1	1	1	1
44131	2	1	1	1	1
44132	1	1	1	1	1
44135	1	1	1	1	1
44137	1	1	1	1	1
44141	1	1	1	1	1
44337	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 51 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
TEST PERIOD: WEEK 2

SEX: MALES

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44091	1	1	1	1	1	2	2	2
44099	1	1	1	1	1	2	2	2
44103	1	1	1	1	1	2	2	2
44108	1	1	1	1	1	2	2	2
44114	1	1	1	1	1	2	2	2
44115	1	1	1	1	1	2	2	2
44121	1	1	1	1	1	2	2	2
44131	1	1	1	1	1	2	2	2
44132	1	1	1	1	1	2	2	2
44135	1	1	1	1	1	2	2	2
44137	1	1	1	1	1	2	2	2
44141	1	1	1	1	1	2	2	2
44337	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 51 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
SEX: MALES
TEST PERIOD: WEEK 2

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44091	2	2	2	1	1	1	1	1
44099	2	2	2	1	1	1	1	1
44103	2	2	2	1	1	1	1	1
44108	2	2	2	1	1	1	1	1
44114	2	2	2	1	1	1	1	1
44115	2	2	2	1	1	1	1	1
44121	2	2	2	1	1	1	1	1
44131	2	2	2	1	1	1	1	1
44132	2	2	2	1	1	1	1	1
44135	2	2	2	1	1	1	1	1
44137	2	2	2	2	1	1	1	1
44141	2	2	2	1	1	1	1	1
44337	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 51 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
TEST PERIOD: WEEK 2

SEX: MALES

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44092	2	1	1	1	1
44093	1	1	1	1	1
44098	1	1	1	1	1
44101	1	1	1	1	2
44110	1	1	1	1	1
44113	1	1	1	1	1
44119	1	1	1	1	1
44126	1	1	1	1	1
44128	1	1	1	1	1
44138	2	1	1	1	1
44143	1	1	1	1	1
44144	1	1	1	1	1
44147	2	1	1	1	1
44339	1	1	1	1	1
44342	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 51 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
TEST PERIOD: WEEK 2

SEX: MALES

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44092	1	1	1	1	1	2	2	2
44093	1	1	1	1	1	2	2	2
44098	1	1	1	1	1	2	2	2
44101	1	1	1	1	1	2	2	2
44110	1	1	1	1	1	2	2	2
44113	1	1	1	1	1	2	2	2
44119	1	1	1	1	1	2	2	2
44126	1	1	1	1	1	2	2	2
44128	1	1	1	1	1	2	2	2
44138	1	1	1	1	1	2	2	2
44143	1	1	1	1	1	2	2	2
44144	1	1	1	1	1	2	2	2
44147	1	1	1	1	1	2	2	2
44339	1	1	1	1	1	1	2	2
44342	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 51 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
TEST PERIOD: WEEK 2

SEX: MALES

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44092	2	2	2	1	1	1	1	1
44093	2	2	2	1	1	1	1	1
44098	2	2	2	1	1	1	1	1
44101	2	2	2	1	1	1	1	1
44110	2	2	2	1	1	1	1	1
44113	2	2	2	1	1	1	1	1
44119	2	2	2	1	1	1	1	1
44126	2	2	2	1	1	1	1	1
44128	2	2	2	1	1	1	1	1
44138	2	2	2	1	1	1	1	1
44143	2	2	2	1	1	1	1	1
44144	2	2	2	1	1	1	1	1
44147	2	2	2	1	1	1	1	1
44339	2	2	2	1	1	1	1	1
44342	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 51 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
SEX: MALES
TEST PERIOD: WEEK 2

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44094	2	1	1	1	1
44096	1	1	1	1	1
44100	2	1	1	1	1
44107	1	1	1	1	1
44111	1	1	1	1	1
44116	1	1	1	1	1
44118	1	2	1	1	1
44124	1	1	1	1	1
44129	2	1	1	1	1
44134	2*	1	1	1	1
44140	1	1	1	1	1
44142	1	1	1	1	1
44145	2	1	1	1	1
44333	1	1	1	1	1
44340	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 51 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
TEST PERIOD: WEEK 2

SEX: MALES

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS EYES	RED DEPOSITS NOSE	RED DEPOSITS MOUTH
44094	1	1	1	1	1	2	2	2
44096	1	1	1	1	1	2	2	2
44100	1	1	1	1	1	2	2	2
44107	1	1	1	1	1	2	2	2
44111	1	1	1	1	1	2	2	2
44116	1	1	1	1	1	2	2	2
44118	1	1	1	1	1	2	2	2
44124	1	1	1	1	1	2	2	2
44129	1	1	1	1	2	2	2	2
44134	1	1	1	1	1	2	2	2
44140	1	1	1	1	1	2	2	2
44142	1	1	1	1	1	2	2	2
44145	1	1	1	1	1	2	2	2
44333	1	1	1	1	1	2	2	2
44340	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 51 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
SEX: MALES
TEST PERIOD: WEEK 2

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44094	2	2	2	1	1	1	1	1
44096	2	2	2	1	1	1	1	1
44100	2	2	2	1	1	1	1	1
44107	2	2	2	1	1	1	1	1
44111	2	2	2	1	1	1	1	1
44116	2	2	2	1	1	1	1	1
44118	2	2	2	1	1	1	1	1
44124	2	2	2	1	1	1	1	1
44129	2	2	2	1	1	1	1	1
44134	2	2	2	1	1	1	1	1
44140	2	2	2	1	1	1	1	1
44142	2	2	2	1	1	1	1	1
44145	2	2	2	1	1	1	1	1
44333	2	2	2	1	1	1	1	1
44340	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 51 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
TEST PERIOD: WEEK 2

SEX: MALES

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44097	1	1	1	1	1
44102	1	1	1	1	1
44104	1	1	1	1	1
44089	2	1	1	1	1
44109	1	1	1	1	1
44112	1	1	1	1	1
44123	2	1	1	1	1
44130	1	1	1	1	1
44133	1	1	1	1	1
44136	1	1	1	1	1
44139	1	1	1	1	1
44146	2	1	1	1	1
44334	1	1	1	1	1
44338	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 51 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
TEST PERIOD: WEEK 2

SEX: MALES

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44097	1	1	1	1	1	2	2	2
44102	1	1	1	1	1	2	2	2
44104	1	1	1	1	1	2	2	2
44089	1	1	1	1	1	2	2	2
44109	1	1	1	1	1	2	2	2
44112	1	1	1	1	1	2	2	2
44123	1	1	1	1	1	2	2	2
44130	1	1	1	1	1	2	2	2
44133	1	1	1	1	1	2	2	2
44136	1	1	1	1	1	2	2	2
44139	1	1	1	1	1	2	2	2
44146	1	1	1	1	1	2	2	2
44334	1	1	1	1	1	2	2	2
44338	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 51 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
TEST PERIOD: WEEK 2

SEX: MALES

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44097	2	2	2	1	1	1	1	1
44102	2	2	2	1	1	1	1	1
44104	2	2	2	1	1	1	1	1
44089	2	2	2	1	1	1	1	1
44109	2	2	2	1	1	1	1	1
44112	2	2	2	1	1	1	1	1
44123	2	2	2	1	1	1	1	1
44130	2	2	2	1	1	1	1	1
44133	2	2	2	1	1	1	1	1
44136	2	2	2	1	1	1	1	1
44139	2	2	2	1	1	1	1	1
44146	2	2	2	1	1	1	1	1
44334	2	2	2	1	1	1	1	1
44338	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 51 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
TEST PERIOD: WEEK 2

SEX: FEMALES

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44149	1	1	1	1	1
44151	1	1	1	1	1
44154	1	1	1	1	1
44156	1	1	1	1	1
44164	1	1	1	1	1
44176	1	1	1	1	1
44178	2*	2	1	1	1
44180	2	1	1	1	1
44181	2*	1	1	1	1
44204	2	2	1	1	1
44207	2	1	1	1	1
44346	1	1	1	1	1
44352	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

TABLE 51 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
TEST PERIOD: WEEK 2

SEX: FEMALES

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44149	1	1	1	1	1	2	2	2
44151	1	1	1	1	1	2	2	2
44154	1	1	1	1	1	2	2	2
44156	1	1	1	1	1	2	2	2
44164	1	1	1	1	1	2	2	2
44176	1	1	1	1	1	2	2	2
44178	1	1	1	1	1	2	2	2
44180	1	1	1	1	1	2	2	2
44181	1	1	1	1	1	2	2	2
44204	1	1	1	1	1	2	2	2
44207	1	1	1	1	1	2	2	2
44346	1	1	1	1	1	2	2	2
44352	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 51 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
TEST PERIOD: WEEK 2

SEX: FEMALES

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44149	2	2	2	1	1	1	1	1
44151	2	2	2	1	1	1	1	1
44154	2	2	2	1	1	1	1	1
44156	2	2	2	1	1	1	1	1
44164	2	2	2	1	1	1	1	1
44176	2	2	2	1	1	1	1	1
44178	2	2	2	1	1	1	1	1
44180	2	2	2	1	1	1	1	1
44181	2	2	2	1	1	1	1	1
44204	2	2	2	1	1	1	1	1
44207	2	2	2	1	1	1	1	1
44346	2	2	2	1	1	1	1	1
44352	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 51 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
TEST PERIOD: WEEK 2

SEX: FEMALES

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44159	2	2*	1	1	1
44160	2	1	1	1	1
44162	1	1	1	1	1
44170	1	1	1	1	1
44172	2	1	1	1	1
44179	1	1	1	1	1
44183	1	2	1	1	1
44187	1	1	1	1	2
44191	1	1	1	1	1
44192	1	1	1	1	1
44195	1	1	1	1	1
44201	1	1	1	1	1
44349	1	1	1	1	1
44350	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

TABLE 51 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
TEST PERIOD: WEEK 2

SEX: FEMALES

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44159	1	1	1	1	1	2	2	2
44160	1	1	1	1	1	2	2	2
44162	1	1	1	1	1	2	2	2
44170	1	1	1	1	1	2	2	2
44172	1	1	1	1	1	2	2	2
44179	1	1	1	1	1	2	2	2
44183	1	1	1	1	1	2	2	2
44187	1	1	1	1	1	2	2	2
44191	1	1	1	1	1	2	2	2
44192	1	1	1	1	1	2	2	2
44195	1	1	1	1	1	2	2	2
44201	1	1	1	1	1	2	2	2
44349	1	1	1	1	1	2	2	2
44350	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 51 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
TEST PERIOD: WEEK 2

SEX: FEMALES

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44159	2	2	2	1	1	1	1	1
44160	2	2	2	1	1	1	1	1
44162	2	2	2	1	1	1	1	1
44170	2	2	2	1	1	1	1	1
44172	2	2	2	1	1	1	1	1
44179	2	2	2	1	1	1	1	1
44183	2	2	2	1	1	1	1	1
44187	2	2	2	1	1	1	1	1
44191	2	2	2	1	1	1	1	1
44192	2	2	2	1	1	1	1	1
44195	2	2	2	1	1	1	1	1
44201	2	2	2	1	1	1	1	1
44349	2	2	2	1	1	1	1	1
44350	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 51 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
TEST PERIOD: WEEK 2

SEX: FEMALES

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44150	1	1	1	1	1
44152	1	1	1	1	1
44161	3	1	1	1	1
44165	1	1	1	1	1
44169	2	1	1	1	1
44171	2*	1	1	1	1
44186	1	1	1	1	1
44196	1	1	1	1	1
44197	2	1	1	1	1
44200	2	2	1	1	1
44202	2	1	1	1	1
44206	1	1	1	1	1
44344	1	1	1	1	1
44347	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

TABLE 51 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
TEST PERIOD: WEEK 2

SEX: FEMALES

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44150	1	1	1	1	1	2	2	2
44152	1	1	1	1	1	2	2	2
44161	1	1	1	1	1	2	2	2
44165	1	1	1	1	1	2	2	2
44169	1	1	1	1	1	2	2	2
44171	1	1	1	1	1	2	2	2
44186	1	1	1	1	1	2	2	2
44196	1	1	1	1	1	2	2	2
44197	1	1	1	1	1	2	2	2
44200	1	2	1	1	1	2	2	2
44202	1	1	1	1	1	2	2	2
44206	1	1	1	1	1	2	2	2
44344	1	1	1	1	1	2	2	2
44347	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 51 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
SEX: FEMALES
TEST PERIOD: WEEK 2

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44150	2	2	2	1	1	1	1	1
44152	2	2	2	1	1	1	1	1
44161	2	2	2	1	1	1	1	1
44165	2	2	2	1	1	1	1	1
44169	2	2	2	1	1	1	1	1
44171	2	2	2	1	1	1	1	1
44186	2	2	2	1	1	1	1	1
44196	2	2	2	1	1	1	1	1
44197	2	2	2	1	1	1	1	1
44200	2	2	2	1	1	1	1	1
44202	2	2	2	1	1	1	1	1
44206	2	2	2	1	1	1	1	1
44344	2	2	2	1	1	1	1	1
44347	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 51 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
TEST PERIOD: WEEK 2

SEX: FEMALES

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44155	1	1	1	1	1
44167	1	1	1	1	1
44168	1	1	1	1	1
44173	1	1	1	1	1
44175	2*	1	1	1	1
44182	1	2*	1	1	1
44184	1	2*	1	1	1
44189	1	1	1	1	1
44190	1	1	1	1	1
44198	1	1	1	1	1
44205	1	1	1	1	1
44345	2	1	1	1	1
44348	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 51 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
TEST PERIOD: WEEK 2

SEX: FEMALES

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44155	1	1	1	1	1	2	2	1
44167	1	1	1	1	1	2	2	2
44168	1	1	1	1	1	2	2	2
44173	1	1	1	1	1	2	2	2
44175	1	1	1	1	1	2	2	2
44182	1	1	1	1	1	2	2	2
44184	1	1	1	1	1	2	2	2
44189	1	1	1	1	1	2	2	2
44190	1	1	1	1	1	2	2	2
44198	1	1	1	1	1	2	2	2
44205	1	1	1	1	1	2	2	2
44345	1	1	1	1	1	2	2	2
44348	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 51 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
SEX: FEMALES
TEST PERIOD: WEEK 2

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44155	2	2	2	1	1	1	1	1
44167	2	2	2	1	1	1	1	1
44168	2	2	2	1	1	1	1	1
44173	2	2	2	1	1	1	1	1
44175	2	2	2	1	1	1	1	1
44182	2	2	2	1	1	1	1	1
44184	2	2	2	1	1	1	1	1
44189	2	2	2	1	1	1	1	1
44190	2	2	2	1	1	1	1	1
44198	2	2	2	1	1	1	1	1
44205	2	2	2	1	1	1	1	1
44345	2	2	2	1	1	1	1	1
44348	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 52 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
TEST PERIOD: WEEK 3

SEX: MALES

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44091	1	1	1	1	1
44099	1	1	1	1	1
44103	1	1	1	1	1
44108	1	1	1	1	1
44114	2	1	1	1	1
44115	1	1	1	1	1
44121	1	1	1	1	1
44131	2	1	1	1	1
44132	1	1	1	1	1
44135	1	1	1	1	1
44137	1	1	1	1	1
44141	1	1	1	1	1
44337	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 52 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
TEST PERIOD: WEEK 3

SEX: MALES

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44091	1	1	1	1	1	2	2	2
44099	1	1	1	1	1	2	2	2
44103	1	1	1	1	1	2	2	2
44108	1	2	1	1	1	2	2	2
44114	1	1	1	1	1	2	2	2
44115	1	1	1	1	1	2	2	2
44121	1	1	1	1	1	2	2	2
44131	1	1	1	1	1	2	2	2
44132	1	1	1	1	1	2	2	2
44135	1	1	1	1	1	2	2	2
44137	1	1	1	1	1	2	2	2
44141	1	1	1	1	1	2	2	2
44337	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 52 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
TEST PERIOD: WEEK 3

SEX: MALES

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44091	2	2	2	1	1	1	1	1
44099	2	2	2	1	1	1	1	1
44103	2	2	2	1	1	1	1	1
44108	2	2	2	1	1	1	1	1
44114	2	2	2	1	1	1	1	1
44115	2	2	2	1	1	1	1	1
44121	2	2	2	1	1	1	1	1
44131	2	2	2	1	1	1	1	1
44132	2	2	2	1	1	1	1	1
44135	2	2	2	1	1	1	1	1
44137	2	2	2	1	1	1	1	1
44141	2	2	2	1	1	1	1	1
44337	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 52 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
TEST PERIOD: WEEK 3

SEX: MALES

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44092	1	1	1	1	1
44093	1	1	1	1	1
44098	1	1	1	1	1
44101	1	1	1	1	1
44110	1	1	1	1	1
44113	1	1	1	1	1
44119	1	1	1	1	1
44126	1	1	1	1	1
44128	1	1	1	1	1
44138	1	1	1	1	1
44143	2	1	1	1	1
44144	2	1	1	1	1
44147	1	1	1	1	1
44339	1	1	1	1	1
44342	2	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 52 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
TEST PERIOD: WEEK 3

SEX: MALES

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44092	1	1	1	1	1	2	2	2
44093	1	1	1	1	1	2	2	2
44098	1	1	1	1	1	2	2	2
44101	1	1	1	1	1	2	2	2
44110	1	1	1	1	1	2	2	2
44113	1	1	1	1	1	2	2	2
44119	1	1	1	1	1	2	2	2
44126	1	1	1	1	1	2	2	2
44128	1	1	1	1	1	2	2	2
44138	1	1	1	1	1	2	2	2
44143	1	1	1	1	1	2	2	2
44144	1	1	1	1	1	2	2	2
44147	1	1	1	1	1	2	2	2
44339	1	1	1	1	1	2	2	2
44342	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 52 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
TEST PERIOD: WEEK 3

SEX: MALES

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44092	2	2	2	1	1	1	1	1
44093	2	2	2	1	1	1	1	1
44098	2	2	2	1	1	1	1	1
44101	2	2	2	1	1	1	1	1
44110	2	2	2	1	1	1	1	1
44113	2	2	2	1	1	1	1	1
44119	2	2	2	1	1	1	1	1
44126	2	2	2	1	1	1	1	1
44128	2	2	2	1	1	1	1	1
44138	2	2	2	1	1	1	1	1
44143	2	2	2	1	1	1	1	1
44144	2	2	2	1	1	1	1	1
44147	2	2	2	1	1	1	1	1
44339	2	2	2	1	1	1	1	1
44342	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 52 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
TEST PERIOD: WEEK 3

SEX: MALES

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44094	2	1	1	1	1
44096	1	1	1	1	1
44100	1	1	1	1	1
44107	1	1	1	1	1
44111	1	1	1	1	1
44116	1	1	1	1	1
44118	1	1	1	1	1
44124	1	1	1	1	1
44129	2	1	1	1	1
44134	1	1	1	1	1
44140	1	1	1	1	1
44142	2	1	1	1	1
44145	1	1	1	1	1
44333	1	1	1	1	1
44340	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 52 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
TEST PERIOD: WEEK 3

SEX: MALES

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44094	1	1	1	1	1	2	2	2
44096	1	1	1	1	1	2	2	2
44100	1	1	1	1	1	2	2	2
44107	1	1	1	1	1	2	2	2
44111	1	1	1	1	1	2	2	2
44116	1	1	1	1	1	2	2	2
44118	1	1	1	1	1	2	2	2
44124	1	1	1	1	1	2	2	2
44129	1	1	1	1	1	2	2	2
44134	1	1	1	1	1	2	2	2
44140	1	1	1	1	1	2	2	2
44142	1	1	1	1	1	2	2	2
44145	1	1	1	1	1	2	2	2
44333	1	1	1	1	1	2	2	2
44340	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 52 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
SEX: MALES
TEST PERIOD: WEEK 3

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44094	2	2	2	1	1	1	1	1
44096	2	2	2	1	1	1	1	1
44100	2	2	2	1	1	1	1	1
44107	2	2	2	1	1	1	1	1
44111	2	2	2	1	1	1	1	1
44116	2	2	2	1	1	1	1	1
44118	2	2	2	1	1	1	1	1
44124	2	2	2	1	1	1	1	1
44129	2	2	2	1	1	1	1	1
44134	2	2	2	1	1	1	1	1
44140	2	2	2	1	1	1	1	1
44142	2	2	2	1	1	1	1	1
44145	2	2	2	1	1	1	1	1
44333	2	2	2	1	1	1	1	1
44340	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 52 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
TEST PERIOD: WEEK 3

SEX: MALES

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44097	2	1	1	1	1
44102	1	1	1	1	1
44104	1	1	1	1	1
44089	2	1	1	1	1
44109	2	1	1	1	1
44112	2	1	1	1	1
44123	1	1	1	2	1
44130	1	1	1	1	1
44133	1	1	1	1	1
44136	1	1	1	1	1
44139	1	1	1	1	1
44146	1	1	1	1	1
44334	1	1	1	1	1
44338	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 52 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
TEST PERIOD: WEEK 3

SEX: MALES

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44097	1	1	1	1	1	2	2	2
44102	1	1	1	1	1	2	2	2
44104	1	1	1	1	1	2	2	2
44089	1	1	1	1	1	2	2	2
44109	1	1	1	1	1	2	2	2
44112	1	1	1	1	1	2	2	2
44123	1	1	1	1	1	2	2	2
44130	1	1	1	1	1	2	2	2
44133	1	1	1	1	1	2	2	2
44136	1	1	1	1	1	2	2	2
44139	1	2	1	1	1	2	2	2
44146	1	1	1	1	1	2	2	2
44334	1	1	1	1	1	2	2	2
44338	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 52 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
SEX: MALES
TEST PERIOD: WEEK 3

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44097	2	2	2	1	1	1	1	1
44102	2	2	2	1	1	1	1	1
44104	2	2	2	1	1	1	1	1
44089	2	2	2	1	1	1	1	1
44109	2	2	2	1	1	1	1	1
44112	2	2	2	1	1	1	1	1
44123	2	2	2	1	1	1	1	1
44130	2	2	2	1	1	1	1	1
44133	2	2	2	1	1	1	1	1
44136	2	2	2	1	1	1	1	1
44139	2	2	2	1	1	1	1	1
44146	2	2	2	1	1	1	1	1
44334	2	2	2	1	1	1	1	1
44338	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 52 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
SEX: FEMALES
TEST PERIOD: WEEK 3

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44149	1	1	1	1	1
44151	2	1	1	1	1
44154	1	1	1	1	1
44156	1	1	1	1	1
44164	1	1	1	1	1
44176	1	1	1	1	1
44178	1	1	1	1	1
44180	1	1	1	1	1
44181	2*	1	1	1	1
44204	2	1	1	1	1
44207	1	1	1	1	1
44346	1	1	1	1	1
44352	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE
* = ANIMAL VOCALIZED

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 52 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
TEST PERIOD: WEEK 3

SEX: FEMALES

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44149	1	1	1	1	1	2	2	2
44151	1	1	1	1	1	2	2	2
44154	1	1	1	1	1	2	2	2
44156	1	1	1	1	1	2	2	2
44164	1	1	1	1	1	2	2	2
44176	1	1	1	1	1	2	2	2
44178	1	1	1	1	1	2	2	2
44180	1	1	1	1	1	2	2	2
44181	1	1	1	1	1	2	2	2
44204	1	1	1	1	1	2	2	2
44207	1	1	1	1	1	2	2	2
44346	1	1	1	1	1	2	2	2
44352	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 52 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
TEST PERIOD: WEEK 3

SEX: FEMALES

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44149	2	2	2	1	1	1	1	1
44151	2	2	2	1	1	1	1	1
44154	2	2	2	1	1	1	1	1
44156	2	2	2	1	1	1	1	1
44164	2	2	2	1	1	1	1	1
44176	2	2	2	1	1	1	1	1
44178	2	2	2	1	1	1	1	1
44180	2	2	2	1	1	1	1	1
44181	2	2	2	1	1	1	1	1
44204	2	2	2	1	1	1	1	1
44207	2	2	2	1	1	1	1	1
44346	2	2	2	1	1	1	1	1
44352	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 52 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
SEX: FEMALES
TEST PERIOD: WEEK 3

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44159	2	1	1	1	1
44160	1	1	1	1	1
44162	1	1	1	1	1
44170	1	1	1	1	1
44172	1	1	1	1	1
44179	2	1	1	1	1
44183	1	1	1	1	1
44187	1	1	1	1	1
44191	1	1	1	1	1
44192	1	1	1	1	1
44195	1	1	1	1	1
44201	2	1	1	1	1
44349	1	1	1	1	1
44350	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 52 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
TEST PERIOD: WEEK 3

SEX: FEMALES

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44159	1	1	1	1	1	2	2	2
44160	1	1	1	1	1	2	2	2
44162	1	1	1	1	1	2	2	2
44170	1	1	1	1	1	2	2	2
44172	1	1	1	1	1	2	2	2
44179	1	1	1	1	1	2	2	2
44183	1	1	1	1	1	2	2	2
44187	1	1	1	1	1	2	2	2
44191	1	1	1	1	1	2	2	2
44192	1	1	1	1	1	2	2	2
44195	1	1	1	1	1	2	2	2
44201	1	1	1	1	1	2	2	2
44349	1	1	1	1	1	2	2	2
44350	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 52 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
TEST PERIOD: WEEK 3

SEX: FEMALES

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44159	2	2	2	1	1	1	1	1
44160	2	2	2	1	1	1	1	1
44162	2	2	2	1	1	1	1	1
44170	2	2	2	1	1	1	1	1
44172	2	2	2	1	1	1	1	1
44179	2	2	2	1	1	1	1	1
44183	2	2	2	1	1	1	1	1
44187	2	2	2	1	1	1	1	1
44191	2	2	2	1	1	1	1	1
44192	2	2	2	1	1	1	1	1
44195	2	2	2	1	1	1	1	1
44201	2	2	2	1	1	1	1	1
44349	2	2	2	1	1	1	1	1
44350	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 52 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
TEST PERIOD: WEEK 3

SEX: FEMALES

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44150	1	1	1	1	1
44152	1	1	1	1	1
44161	1	1	1	1	1
44165	1	1	1	1	1
44169	1	1	1	1	1
44171	2	1	1	1	1
44186	1	1	1	1	1
44196	1	1	1	1	1
44197	1	1	1	1	1
44200	1	1	1	1	1
44202	1	1	1	1	1
44206	1	1	1	1	1
44344	1	1	1	1	1
44347	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 52 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
TEST PERIOD: WEEK 3

SEX: FEMALES

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS		
						EYES	NOSE	MOUTH
44150	1	1	1	1	1	2	2	2
44152	1	1	1	1	1	2	2	2
44161	1	1	1	1	1	2	2	2
44165	1	1	1	1	1	2	2	2
44169	1	1	1	1	1	2	2	2
44171	1	1	1	1	1	2	2	2
44186	1	1	1	1	1	2	2	2
44196	1	1	1	1	1	2	2	2
44197	1	1	1	1	1	2	2	2
44200	1	1	1	1	1	2	2	2
44202	1	2	1	1	1	2	2	2
44206	1	1	1	1	1	2	2	2
44344	1	1	1	1	1	2	2	2
44347	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 52 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
TEST PERIOD: WEEK 3

SEX: FEMALES

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44150	2	2	2	1	1	1	1	1
44152	2	2	2	1	1	1	1	1
44161	2	2	2	1	1	1	1	1
44165	2	2	2	1	1	1	1	1
44169	2	2	2	1	1	1	1	1
44171	2	2	2	1	1	1	1	1
44186	2	2	2	1	1	1	1	1
44196	2	2	2	1	1	1	1	1
44197	2	2	2	1	1	1	1	1
44200	2	2	2	1	1	1	1	1
44202	2	2	2	1	1	1	1	1
44206	2	2	2	1	1	1	1	1
44344	2	2	2	1	1	1	1	1
44347	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 52 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
SEX: FEMALES
TEST PERIOD: WEEK 3

ANIMAL NUMBER	EASE OF REMOVAL FROM CAGE	EASE OF HANDLING ANIMAL IN HAND	LACRIMATION	CHROMODACRYORRHEA	SALIVATION
44155	1	1	1	1	1
44167	1	1	1	1	1
44168	1	1	1	1	1
44173	1	1	1	1	1
44175	1	1	1	1	1
44182	1	1	1	1	1
44184	1	1	1	1	1
44189	1	1	1	1	1
44190	1	1	1	1	1
44198	2	1	1	1	1
44205	1	1	1	1	1
44345	1	1	1	1	1
44348	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 52 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
TEST PERIOD: WEEK 3

SEX: FEMALES

ANIMAL NUMBER	PILOERECTION	FUR APPEARANCE	PALPEBRAL CLOSURE	RESPIRATORY RATE	RESPIRATORY CHARACTER	RED DEPOSITS EYES	RED DEPOSITS NOSE	RED DEPOSITS MOUTH
44155	1	1	1	1	1	2	2	2
44167	1	1	1	1	1	2	2	2
44168	1	1	1	1	1	2	2	2
44173	1	1	1	1	1	2	2	2
44175	1	1	1	1	1	2	2	2
44182	1	2	1	1	1	2	2	2
44184	1	1	1	1	1	2	2	2
44189	1	1	1	1	1	2	2	2
44190	1	1	1	1	1	2	2	2
44198	1	1	1	1	1	2	2	2
44205	1	1	1	1	1	2	2	2
44345	1	1	1	1	1	2	2	2
44348	1	1	1	1	1	2	2	2

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 52 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

HANDLING OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
TEST PERIOD: WEEK 3

SEX: FEMALES

ANIMAL NUMBER	CRUSTY DEPOSITS			COLOR			EYE PROMINENCE	MUSCLE TONE
	EYES	NOSE	MOUTH	MUCOUS MEMBRANES	EYES	SKIN		
44155	2	2	2	1	1	1	1	1
44167	2	2	2	1	1	1	1	1
44168	2	2	2	1	1	1	1	1
44173	2	2	2	1	1	1	1	1
44175	2	2	2	1	1	1	1	1
44182	2	2	2	1	1	1	1	1
44184	2	2	2	1	1	1	1	1
44189	2	2	2	1	1	1	1	1
44190	2	2	2	1	1	1	1	1
44198	2	2	2	1	1	1	1	1
44205	2	2	2	1	1	1	1	1
44345	2	2	2	1	1	1	1	1
44348	2	2	2	1	1	1	1	1

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 53 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

OPEN FIELD OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44091	0.3	1	1	1	1	1	1	3
44099	0.4	1	1	1	1	1	1	3
44103	0.6	1	1	1	1	1	1	3
44108	0.3	1	1	1	1	1	1	3
44114	0.3	1	1	1	1	1	1	3
44115	0.3	1	1	1	1	1	1	3
44121	0.3	1	1	1	1	1	1	3
44125	0.9	1	1	1	1	1	1	3
44131	0.5	1	1	1	1	1	1	3
44132	0.2	1	1	1	1	1	1	3
44135	0.4	1	1	1	1	1	1	3
44137	0.3	1	1	1	1	1	1	3
44141	0.2	1	1	1	1	1	1	3
44335	0.3	1	1	1	1	1	1	3
44337	0.3	1	1	1	1	1	1	3
MEAN	0.4							
S.D.	0.18							
N	15							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 53 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
TEST PERIOD: PRETEST

SEX: MALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44091	1	5.0	0.0	0.0	1.0	0.0
44099	1	11.0	0.0	1.0	0.0	0.0
44103	1	7.0	0.0	0.0	1.0	0.0
44108	1	7.0	0.0	0.0	1.0	1.0
44114	1	2.0	0.0	0.0	1.0	0.0
44115	1	2.0	0.0	0.0	1.0	4.0
44121	1	2.0	0.0	0.0	0.0	0.0
44125	1	7.0	0.0	2.0	0.0	1.0
44131	1	3.0	0.0	0.0	1.0	1.0
44132	1	3.0	0.0	2.0	2.0	0.0
44135	1	12.0	0.0	0.0	0.0	0.0
44137	1	3.0	0.0	0.0	1.0	3.0
44141	1	13.0	0.0	0.0	1.0	0.0
44335	1	11.0	0.0	1.0	1.0	0.0
44337	1	15.0	0.0	1.0	1.0	0.0
MEAN		6.9	0.0	0.5	0.8	0.7
S.D.		4.50	0.00	0.74	0.56	1.23
N		15	15	15	15	15

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 53 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44092	0.3	1	1	1	1	1	1	3
44093	0.2	1	1	1	1	1	1	3
44098	0.2	1	1	1	1	1	1	3
44101	0.5	1	1	1	1	1	1	3
44110	0.2	1	1	1	1	1	1	3
44113	0.3	1	1	1	1	1	1	3
44119	0.2	1	1	1	1	1	1	3
44126	0.5	1	1	1	1	1	1	3
44128	0.4	1	1	1	1	1	1	3
44138	0.6	1	1	1	1	1	1	3
44143	0.2	1	1	1	1	1	1	3
44144	0.3	1	1	1	1	1	1	3
44147	0.2	1	1	1	1	1	1	3
44339	0.4	1	1	1	1	1	1	3
44342	0.7	1	1	1	1	1	1	3
MEAN	0.3							
S.D.	0.16							
N	15							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 53 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44092	1	2.0	0.0	0.0	1.0	0.0
44093	1	9.0	0.0	0.0	0.0	0.0
44098	1	10.0	0.0	0.0	0.0	0.0
44101	1	3.0	0.0	0.0	3.0	0.0
44110	1	12.0	0.0	0.0	2.0	0.0
44113	1	10.0	0.0	0.0	0.0	0.0
44119	1	7.0	0.0	0.0	1.0	0.0
44126	1	0.0	0.0	0.0	0.0	0.0
44128	1	1.0	0.0	0.0	1.0	5.0
44138	1	6.0	0.0	1.0	1.0	0.0
44143	1	5.0	0.0	0.0	0.0	3.0
44144	1	12.0	0.0	0.0	0.0	0.0
44147	1	6.0	0.0	0.0	1.0	0.0
44339	1	13.0	0.0	0.0	1.0	1.0
44342	1	8.0	0.0	1.0	0.0	2.0
MEAN		6.9	0.0	0.1	0.7	0.7
S.D.		4.15	0.00	0.35	0.88	1.49
N		15	15	15	15	15

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 53 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44094	0.3	1	1	1	1	1	1	3
44096	0.2	1	1	1	1	1	1	3
44100	0.3	1	1	1	1	1	1	3
44107	0.2	1	1	1	1	1	1	3
44111	0.3	1	1	1	1	1	1	3
44116	0.3	1	1	1	1	1	1	3
44118	0.4	1	1	1	1	1	1	3
44124	0.4	1	1	1	1	1	1	3
44129	0.3	1	1	1	1	1	1	3
44134	0.3	1	1	1	1	1	1	3
44140	0.3	1	1	1	1	1	1	3
44142	0.2	1	1	1	1	1	1	3
44145	0.2	1	1	1	1	1	1	3
44333	0.2	1	1	1	1	1	1	3
44340	0.3	1	1	1	1	1	1	3
MEAN	0.3							
S.D.	0.07							
N	15							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 53 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
TEST PERIOD: PRETEST

SEX: MALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44094	1	3.0	0.0	0.0	0.0	0.0
44096	1	11.0	0.0	0.0	0.0	0.0
44100	1	13.0	0.0	0.0	1.0	0.0
44107	1	8.0	0.0	0.0	1.0	0.0
44111	1	6.0	0.0	0.0	1.0	1.0
44116	1	13.0	0.0	0.0	0.0	0.0
44118	1	8.0	0.0	0.0	0.0	0.0
44124	1	9.0	0.0	0.0	1.0	0.0
44129	1	13.0	0.0	0.0	1.0	2.0
44134	1	9.0	0.0	0.0	1.0	0.0
44140	1	7.0	0.0	1.0	1.0	0.0
44142	1	7.0	0.0	0.0	0.0	0.0
44145	1	8.0	0.0	0.0	1.0	0.0
44333	1	9.0	0.0	0.0	1.0	0.0
44340	1	9.0	0.0	0.0	0.0	0.0
MEAN		8.9	0.0	0.1	0.6	0.2
S.D.		2.77	0.00	0.26	0.51	0.56
N		15	15	15	15	15

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 53 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
SEX: MALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44097	0.2	1	1	1	1	1	1	3
44102	0.3	1	1	1	1	1	1	3
44104	0.2	1	1	1	1	1	1	3
44089	0.2	1	1	1	1	1	1	3
44109	0.2	1	1	1	1	1	1	3
44112	0.4	1	1	[illegible]	1	1	1	3
44120	0.3	1	1	1	1	1	1	3
44123	0.3	1	1	1	1	1	1	3
44130	0.5	1	1	1	1	1	1	3
44133	0.4	1	1	1	1	1	1	3
44136	0.2	1	1	1	1	1	1	3
44139	0.3	1	1	1	1	1	1	3
44146	0.2	1	1	1	1	1	1	3
44334	0.4	1	1	1	1	1	1	3
44338	0.2	1	1	1	1	1	1	3
MEAN	0.3							
S.D.	0.10							
N	15							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 53 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
TEST PERIOD: PRETEST

SEX: MALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44097	1	8.0	0.0	0.0	1.0	0.0
44102	1	11.0	0.0	0.0	1.0	0.0
44104	1	4.0	0.0	1.0	0.0	0.0
44089	1	5.0	0.0	0.0	0.0	1.0
44109	1	8.0	0.0	0.0	0.0	0.0
44112	1	2.0	0.0	0.0	1.0	0.0
44120	1	3.0	0.0	0.0	0.0	0.0
44123	1	6.0	0.0	0.0	0.0	0.0
44130	1	5.0	0.0	0.0	1.0	1.0
44133	1	8.0	0.0	0.0	0.0	0.0
44136	1	8.0	0.0	0.0	0.0	0.0
44139	1	10.0	0.0	0.0	0.0	0.0
44146	1	10.0	0.0	0.0	1.0	0.0
44334	1	8.0	0.0	0.0	1.0	1.0
44338	1	8.0	0.0	0.0	2.0	2.0
MEAN		6.9	0.0	0.1	0.5	0.3
S.D.		2.66	0.00	0.26	0.64	0.62
N		15	15	15	15	15

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 53 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
TEST PERIOD: PRETEST

SEX: FEMALES

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44149	0.2	1	1	1	1	1	1	3
44151	0.2	1	1	1	1	1	1	3
44154	0.3	1	1	1	1	1	1	3
44156	0.4	1	1	1	1	1	1	3
44157	0.3	1	1	1	1	1	1	3
44164	0.2	1	1	1	1	1	1	3
44166	0.3	1	1	1	1	1	1	3
44176	0.4	1	1	1	1	1	1	3
44178	0.2	1	1	1	1	1	1	3
44180	0.2	1	1	1	1	1	1	3
44181	0.3	1	1	1	1	1	1	3
44204	0.3	1	1	1	1	1	1	3
44207	0.3	1	1	1	1	1	1	3
44346	0.5	1	1	1	1	1	1	3
44352	0.2	1	1	1	1	1	1	3
MEAN	0.3							
S.D.	0.09							
N	15							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 53 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44149	1	7.0	0.0	0.0	1.0	0.0
44151	1	10.0	0.0	0.0	0.0	0.0
44154	1	5.0	0.0	0.0	0.0	0.0
44156	1	6.0	0.0	0.0	1.0	0.0
44157	1	8.0	0.0	0.0	0.0	0.0
44164	1	2.0	0.0	0.0	0.0	0.0
44166	1	13.0	0.0	0.0	0.0	0.0
44176	1	5.0	0.0	0.0	1.0	0.0
44178	1	5.0	0.0	0.0	0.0	0.0
44180	12	2.0	0.0	0.0	0.0	0.0
44181	1	5.0	0.0	0.0	0.0	0.0
44204	1	11.0	0.0	0.0	1.0	0.0
44207	1	11.0	0.0	0.0	1.0	0.0
44346	1	11.0	0.0	1.0	0.0	0.0
44352	1	7.0	0.0	0.0	0.0	0.0
MEAN		7.2	0.0	0.1	0.3	0.0
S.D.		3.38	0.00	0.26	0.49	0.00
N		15	15	15	15	15

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 53 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
TEST PERIOD: PRETEST

SEX: FEMALES

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44159	0.3	1	1	1	1	1	1	3
44160	0.2	1	1	1	1	1	1	3
44162	0.4	1	1	1	1	1	1	3
44170	0.4	1	1	1	1	1	1	3
44172	0.3	1	1	1	1	1	1	3
44179	0.4	1	1	1	1	1	1	3
44183	0.3	1	1	1	1	1	1	3
44187	0.3	1	1	1	1	1	1	3
44191	0.4	1	1	1	1	1	1	3
44192	0.2	1	1	1	1	1	1	3
44194	0.4	1	1	1	1	1	1	3
44195	0.2	1	1	1	1	1	1	3
44201	0.3	1	1	1	1	1	1	3
44349	0.2	1	1	1	1	1	1	3
44350	0.2	1	1	1	1	1	1	3
MEAN	0.3							
S.D.	0.08							
N	15							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 53 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44159	1	2.0	0.0	0.0	0.0	0.0
44160	1	5.0	0.0	0.0	0.0	0.0
44162	1	11.0	0.0	1.0	0.0	0.0
44170	1	8.0	0.0	0.0	0.0	0.0
44172	1	5.0	0.0	0.0	0.0	0.0
44179	1	5.0	0.0	1.0	0.0	0.0
44183	1	1.0	0.0	0.0	1.0	2.0
44187	1	8.0	0.0	0.0	0.0	0.0
44191	1	5.0	0.0	1.0	1.0	1.0
44192	1	5.0	0.0	0.0	0.0	0.0
44194	1	4.0	0.0	0.0	1.0	0.0
44195	1	14.0	0.0	0.0	1.0	0.0
44201	1	3.0	0.0	0.0	0.0	0.0
44349	1	16.0	0.0	0.0	0.0	0.0
44350	1	8.0	0.0	0.0	0.0	0.0
MEAN		6.7	0.0	0.2	0.3	0.2
S.D.		4.25	0.00	0.41	0.46	0.56
N		15	15	15	15	15

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 53 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44148	0.3	1	1	1	1	1	1	3
44150	0.7	1	1	1	1	1	1	3
44152	0.2	1	1	1	1	1	1	3
44161	0.2	1	1	1	1	1	1	3
44165	0.3	1	1	1	1	1	1	3
44169	0.2	1	1	1	1	1	1	3
44171	0.2	1	1	1	1	1	1	3
44186	0.3	1	1	1	1	1	1	3
44196	0.2	1	1	1	1	1	1	3
44197	0.3	1	1	1	1	1	1	3
44200	0.4	1	1	1	1	1	1	3
44202	0.3	1	1	1	1	1	1	3
44206	0.3	1	1	1	1	1	1	3
44344	0.3	1	1	1	1	1	1	3
44347	0.3	1	1	1	1	1	1	3
MEAN	0.3							
S.D.	0.13							
N	15							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 53 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44148	1	15.0	0.0	1.0	0.0	0.0
44150	1	8.0	0.0	2.0	0.0	0.0
44152	1	13.0	0.0	0.0	1.0	0.0
44161	1	18.0	0.0	0.0	0.0	0.0
44165	1	9.0	0.0	0.0	0.0	0.0
44169	1	12.0	0.0	0.0	0.0	0.0
44171	1	9.0	0.0	0.0	1.0	0.0
44186	1	9.0	0.0	0.0	1.0	0.0
44196	1	8.0	0.0	0.0	0.0	0.0
44197	1	0.0	0.0	0.0	0.0	0.0
44200	1	11.0	0.0	0.0	1.0	0.0
44202	1	12.0	0.0	0.0	1.0	0.0
44206	1	9.0	0.0	0.0	0.0	0.0
44344	1	7.0	0.0	0.0	0.0	0.0
44347	1	11.0	0.0	0.0	0.0	0.0
MEAN		10.1	0.0	0.2	0.3	0.0
S.D.		4.04	0.00	0.56	0.49	0.00
N		15	15	15	15	15

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 53 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
SEX: FEMALES
TEST PERIOD: PRETEST

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44155	0.2	1	1	1	1	1	1	3
44163	0.4	1	1	1	1	1	1	3
44167	0.3	1	1	1	1	1	1	3
44168	0.2	1	1	1	1	1	1	3
44173	0.3	1	1	1	1	1	1	3
44175	0.3	1	1	1	1	1	1	3
44182	0.2	1	1	1	1	1	1	3
44184	0.4	1	1	1	1	1	1	3
44188	0.2	1	1	1	1	1	1	3
44189	0.2	1	1	1	1	1	1	3
44190	0.2	1	1	1	1	1	1	3
44198	0.3	1	1	1	1	1	1	3
44205	0.2	1	1	1	1	1	1	3
44345	0.3	1	1	1	1	1	1	3
44348	0.4	1	1	1	1	1	1	3
MEAN	0.3							
S.D.	0.08							
N	15							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 53 (PRETEST EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
TEST PERIOD: PRETEST

SEX: FEMALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44155	1	9.0	0.0	0.0	1.0	0.0
44163	1	0.0	0.0	0.0	1.0	0.0
44167	1	11.0	0.0	0.0	0.0	0.0
44168	1	3.0	0.0	0.0	0.0	0.0
44173	1	4.0	0.0	0.0	2.0	0.0
44175	1	11.0	0.0	0.0	1.0	0.0
44182	1	6.0	0.0	0.0	0.0	0.0
44184	1	6.0	0.0	0.0	0.0	0.0
44188	1	13.0	0.0	0.0	0.0	0.0
44189	1	6.0	0.0	1.0	0.0	0.0
44190	1	5.0	0.0	0.0	0.0	0.0
44198	1	9.0	0.0	0.0	1.0	0.0
44205	1	6.0	0.0	1.0	0.0	0.0
44345	1	10.0	0.0	0.0	2.0	1.0
44348	1	7.0	0.0	0.0	0.0	0.0
MEAN		7.1	0.0	0.1	0.5	0.1
S.D.		3.45	0.00	0.35	0.74	0.26
N		15	15	15	15	15

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 54 (WEEK 0 EVALUATION)

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L SEX: MALES
TEST PERIOD: WEEK 0

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44091	1.2	1	1	1	1	1	1	3
44099	0.4	1	1	1	1	1	1	3
44103	0.8	1	1	1	1	1	1	3
44108	0.5	1	1	1	1	1	1	3
44114	0.8	1	1	1	1	1	1	3
44115	0.3	1	1	1	1	1	1	3
44121	0.5	1	1	1	1	1	1	3
44125	0.5	1	1	1	1	1	1	3
44131	0.3	1	1	1	1	1	1	3
44132	0.3	1	1	1	1	1	1	3
44135	1.4	1	1	1	1	1	1	3
44137	0.4	1	1	1	1	1	1	3
44141	0.4	1	1	1	1	1	1	3
44335	0.4	1	1	1	1	1	1	3
44337	0.4	1	1	1	1	1	1	3
MEAN	0.6							
S.D.	0.33							
N	15							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 54 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L SEX: MALES
TEST PERIOD: WEEK 0

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44091	1	8.0	0.0	1.0	2.0	1.0
44099	1	8.0	0.0	3.0	1.0	1.0
44103	1	7.0	0.0	2.0	1.0	0.0
44108	1	7.0	0.0	0.0	3.0	0.0
44114	1	5.0	0.0	1.0	7.0	0.0
44115	1	4.0	0.0	1.0	2.0	3.0
44121	1	11.0	0.0	2.0	1.0	0.0
44125	1	6.0	0.0	2.0	1.0	0.0
44131	1	11.0	0.0	1.0	13.0	0.0
44132	1	9.0	0.0	0.0	7.0	0.0
44135	1	13.0	0.0	0.0	0.0	0.0
44137	1	5.0	0.0	1.0	3.0	2.0
44141	1	11.0	0.0	1.0	6.0	0.0
44335	1	5.0	0.0	0.0	12.0	1.0
44337	1	12.0	0.0	3.0	3.0	0.0
MEAN		8.1	0.0	1.2	4.1	0.5
S.D.		2.90	0.00	1.01	4.05	0.92
N		15	15	15	15	15

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 54 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
SEX: MALES
TEST PERIOD: WEEK 0

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44092	0.3	1	1	1	1	1	1	3
44093	0.3	1	1	1	1	1	1	3
44098	0.2	1	1	1	1	1	1	3
44101	0.7	1	1	1	1	1	1	3
44110	0.3	1	1	1	1	1	1	3
44113	0.5	1	1	1	1	1	1	3
44119	0.3	1	1	1	1	1	1	3
44126	0.6	1	1	1	1	1	1	3
44128	1.0	1	1	1	1	1	1	3
44138	0.5	1	1	1	1	1	1	3
44143	0.5	1	1	1	1	1	1	3
44144	0.5	1	1	1	1	1	1	3
44147	0.4	1	1	1	1	1	1	3
44339	0.5	1	1	1	1	1	1	3
44342	0.6	1	1	1	1	1	1	3
MEAN	0.5							
S.D.	0.20							
N	15							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 54 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
SEX: MALES
TEST PERIOD: WEEK 0

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44092	1	6.0	0.0	0.0	8.0	0.0
44093	1	17.0	0.0	3.0	5.0	0.0
44098	1	11.0	0.0	1.0	1.0	0.0
44101	1	10.0	0.0	2.0	1.0	0.0
44110	1	11.0	0.0	0.0	1.0	0.0
44113	1	10.0	0.0	0.0	0.0	0.0
44119	1	5.0	0.0	0.0	3.0	0.0
44126	1	8.0	0.0	0.0	1.0	0.0
44128	1	9.0	0.0	1.0	4.0	0.0
44138	1	2.0	0.0	4.0	1.0	0.0
44143	1	3.0	0.0	5.0	0.0	1.0
44144	1	14.0	0.0	0.0	2.0	0.0
44147	1	8.0	0.0	2.0	1.0	0.0
44339	1	13.0	0.0	1.0	0.0	0.0
44342	1	7.0	0.0	1.0	0.0	0.0
MEAN		8.9	0.0	1.3	1.9	0.1
S.D.		4.06	0.00	1.59	2.26	0.26
N		15	15	15	15	15

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 54 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
SEX: MALES
TEST PERIOD: WEEK 0

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44094	0.5	1	1	1	1	1	1	3
44096	0.5	1	1	1	1	1	1	3
44100	0.5	1	1	1	1	1	1	3
44107	0.3	1	1	1	1	1	1	3
44111	0.3	1	1	1	1	1	1	3
44116	0.6	1	1	1	1	1	1	3
44118	0.4	1	1	1	1	1	1	3
44124	0.6	1	1	1	1	1	1	3
44129	0.4	1	1	1	1	1	1	3
44134	0.3	1	1	1	1	1	1	3
44140	0.3	1	1	1	1	1	1	3
44142	0.4	1	1	1	1	1	1	3
44145	0.4	1	1	1	1	1	1	3
44333	0.4	1	1	1	1	1	1	3
44340	0.7	1	1	1	1	1	1	3
MEAN	0.4							
S.D.	0.12							
N	15							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 54 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
TEST PERIOD: WEEK 0

SEX: MALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44094	1	13.0	0.0	2.0	11.0	0.0
44096	1	10.0	0.0	0.0	0.0	0.0
44100	1	14.0	0.0	0.0	3.0	0.0
44107	1	11.0	0.0	1.0	5.0	0.0
44111	1	10.0	0.0	1.0	1.0	0.0
44116	1	15.0	0.0	1.0	0.0	0.0
44118	1	4.0	0.0	2.0	14.0	2.0
44124	1	9.0	0.0	1.0	6.0	0.0
44129	1	14.0	0.0	0.0	7.0	1.0
44134	1	11.0	0.0	3.0	5.0	0.0
44140	1	3.0	0.0	0.0	3.0	0.0
44142	1	5.0	0.0	1.0	2.0	0.0
44145	1	8.0	0.0	1.0	3.0	2.0
44333	1	11.0	0.0	0.0	1.0	0.0
44340	1	10.0	0.0	0.0	0.0	2.0
MEAN		9.9	0.0	0.9	4.1	0.5
S.D.		3.62	0.00	0.92	4.11	0.83
N		15	15	15	15	15

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 54 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
SEX: MALES
TEST PERIOD: WEEK 0

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44097	0.4	1	1	1	1	1	1	3
44102	0.8	1	1	1	1	1	1	3
44104	0.2	1	1	1	1	1	1	3
44109	0.4	1	1	1	1	1	1	3
44112	0.6	1	1	1	1	1	1	3
44120	0.5	1	1	1	1	1	1	3
44123	0.6	1	1	1	1	1	1	3
44130	0.7	1	1	1	1	1	1	3
44133	0.3	1	1	1	1	1	1	3
44136	0.4	1	1	1	1	1	1	3
44139	0.4	1	1	1	1	1	1	3
44146	0.3	1	1	1	1	1	1	3
44334	0.3	1	1	1	1	1	1	3
44338	0.8	1	1	1	1	1	1	3
MEAN	0.5							
S.D.	0.19							
N	14							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 54 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
TEST PERIOD: WEEK 0

SEX: MALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44097	1	5.0	0.0	1.0	0.0	0.0
44102	1	8.0	0.0	1.0	0.0	2.0
44104	1	5.0	0.0	2.0	3.0	0.0
44109	1	10.0	0.0	1.0	2.0	0.0
44112	1	6.0	0.0	3.0	0.0	1.0
44120	1	2.0	0.0	1.0	4.0	0.0
44123	1	9.0	0.0	2.0	1.0	0.0
44130	1	4.0	0.0	5.0	11.0	0.0
44133	1	12.0	0.0	0.0	4.0	0.0
44136	1	9.0	0.0	0.0	3.0	0.0
44139	1	8.0	0.0	2.0	28.0	0.0
44146	1	5.0	0.0	1.0	0.0	0.0
44334	1	9.0	0.0	1.0	0.0	0.0
44338	1	8.0	0.0	0.0	0.0	0.0
MEAN		7.1	0.0	1.4	4.0	0.2
S.D.		2.71	0.00	1.34	7.52	0.58
N		14	14	14	14	14

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 54 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
SEX: FEMALES
TEST PERIOD: WEEK 0

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44149	0.8	1	1	1	1	1	1	3
44151	0.4	1	1	1	1	1	1	3
44154	0.4	1	1	1	1	1	1	3
44156	0.5	1	1	1	1	1	1	3
44157	0.5	1	1	1	1	1	1	3
44164	0.5	1	1	1	1	1	1	3
44166	0.5	1	1	1	1	1	1	3
44176	0.5	1	1	1	1	1	1	3
44178	0.5	1	1	1	1	1	1	3
44180	0.4	1	1	1	1	1	1	3
44181	0.8	1	1	1	1	1	1	3
44204	0.4	1	1	1	1	1	1	3
44207	0.6	1	1	1	1	1	1	3
44346	0.4	1	1	1	1	1	1	3
44352	0.4	1	1	1	1	1	1	3
MEAN	0.5							
S.D.	0.13							
N	15							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 54 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
TEST PERIOD: WEEK 0

SEX: FEMALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44149	1	4.0	0.0	2.0	0.0	0.0
44151	1	16.0	0.0	1.0	0.0	0.0
44154	1	11.0	0.0	0.0	2.0	0.0
44156	1	6.0	0.0	1.0	11.0	0.0
44157	1	10.0	0.0	2.0	0.0	0.0
44164	1	8.0	0.0	2.0	0.0	0.0
44166	1	7.0	0.0	2.0	0.0	0.0
44176	1	9.0	0.0	0.0	4.0	0.0
44178	1	13.0	0.0	1.0	0.0	0.0
44180	1	8.0	0.0	1.0	0.0	0.0
44181	1	9.0	0.0	1.0	1.0	0.0
44204	1	13.0	0.0	0.0	0.0	0.0
44207	1	12.0	0.0	1.0	0.0	0.0
44346	1	12.0	0.0	1.0	0.0	0.0
44352	1	11.0	0.0	0.0	1.0	0.0
MEAN		9.9	0.0	1.0	1.3	0.0
S.D.		3.10	0.00	0.76	2.91	0.00
N		15	15	15	15	15

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 54 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L SEX: FEMALES
TEST PERIOD: WEEK 0

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44159	0.2	1	1	1	1	1	1	3
44160	0.4	1	1	1	1	1	1	3
44162	0.5	1	1	1	1	1	1	3
44170	0.5	1	1	1	1	1	1	3
44172	0.7	1	1	1	1	1	1	3
44179	0.5	1	1	1	1	1	1	3
44183	0.5	1	1	1	1	1	1	3
44187	0.3	1	1	1	1	1	1	3
44191	0.4	1	1	1	1	1	1	3
44192	0.6	1	1	1	1	1	1	3
44194	0.5	1	1	1	1	1	1	3
44195	0.4	1	1	1	1	1	1	3
44201	0.9	1	1	1	1	1	1	3
44349	0.3	1	1	1	1	1	1	3
44350	0.8	1	1	1	1	1	1	3
MEAN	0.5							
S.D.	0.19							
N	15							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 54 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
TEST PERIOD: WEEK 0

SEX: FEMALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44159	1	8.0	0.0	1.0	2.0	0.0
44160	1	10.0	0.0	1.0	5.0	0.0
44162	1	14.0	0.0	0.0	0.0	0.0
44170	1	11.0	0.0	1.0	0.0	0.0
44172	1	12.0	0.0	2.0	2.0	0.0
44179	1	6.0	0.0	2.0	4.0	0.0
44183	1	6.0	0.0	0.0	0.0	0.0
44187	1	13.0	0.0	1.0	0.0	0.0
44191	1	12.0	0.0	2.0	0.0	0.0
44192	1	6.0	0.0	0.0	0.0	0.0
44194	1	9.0	0.0	1.0	0.0	0.0
44195	1	16.0	0.0	0.0	3.0	0.0
44201	1	10.0	0.0	0.0	1.0	0.0
44349	1	12.0	0.0	0.0	0.0	0.0
44350	1	12.0	0.0	1.0	0.0	1.0
MEAN		10.5	0.0	0.8	1.1	0.1
S.D.		3.02	0.00	0.77	1.68	0.26
N		15	15	15	15	15

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 54 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
SEX: FEMALES
TEST PERIOD: WEEK 0

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44148	0.5	1	1	1	1	1	1	3
44150	0.3	1	1	1	1	1	1	3
44152	0.3	1	1	1	1	1	1	3
44161	0.6	1	1	1	1	1	1	3
44165	0.4	1	1	1	1	1	1	3
44169	0.5	1	1	1	1	1	1	3
44171	0.3	1	1	1	1	1	1	3
44186	0.4	1	1	1	1	1	1	3
44196	0.4	1	1	1	1	1	1	3
44197	0.4	1	1	1	1	1	1	3
44200	0.3	1	1	1	1	1	1	3
44202	0.4	1	1	1	1	1	1	3
44206	0.6	1	1	1	1	1	1	3
44344	0.4	1	1	1	1	1	1	3
44347	0.5	1	1	1	1	1	1	3
MEAN	0.4							
S.D.	0.10							
N	15							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 54 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
TEST PERIOD: WEEK 0

SEX: FEMALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44148	1	12.0	0.0	1.0	0.0	0.0
44150	1	11.0	0.0	1.0	1.0	1.0
44152	1	11.0	0.0	1.0	1.0	0.0
44161	1	19.0	0.0	1.0	0.0	0.0
44165	1	12.0	0.0	0.0	3.0	0.0
44169	1	9.0	0.0	1.0	0.0	0.0
44171	1	7.0	0.0	2.0	4.0	0.0
44186	1	15.0	0.0	1.0	0.0	0.0
44196	1	13.0	0.0	1.0	0.0	0.0
44197	1	15.0	0.0	0.0	0.0	0.0
44200	1	12.0	0.0	0.0	6.0	0.0
44202	1	15.0	0.0	0.0	0.0	0.0
44206	1	11.0	0.0	0.0	0.0	0.0
44344	1	3.0	0.0	0.0	5.0	0.0
44347	1	11.0	0.0	1.0	0.0	0.0
MEAN		11.7	0.0	0.7	1.3	0.1
S.D.		3.73	0.00	0.62	2.09	0.26
N		15	15	15	15	15

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 54 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
TEST PERIOD: WEEK 0

SEX: FEMALES

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44155	0.5	1	1	1	1	1	1	3
44163	0.4	1	1	1	1	1	1	3
44167	0.5	1	1	1	1	1	1	3
44168	0.3	1	1	1	1	1	1	3
44173	0.4	1	1	1	1	1	1	3
44175	0.6	1	1	1	1	1	1	3
44182	0.3	1	1	1	1	1	1	3
44184	0.4	1	1	1	1	1	1	3
44188	0.3	1	1	1	1	1	1	3
44189	0.4	1	1	1	1	1	1	3
44190	0.3	1	1	1	1	1	1	3
44198	0.5	1	1	1	1	1	1	3
44205	0.3	1	1	1	1	1	1	3
44345	0.7	1	1	1	1	1	1	3
44348	0.6	1	1	1	1	1	1	3
MEAN	0.4							
S.D.	0.13							
N	15							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 54 (WEEK 0 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
TEST PERIOD: WEEK 0

SEX: FEMALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44155	1	4.0	0.0	0.0	1.0	1.0
44163	1	13.0	0.0	0.0	1.0	1.0
44167	1	12.0	0.0	2.0	0.0	0.0
44168	1	8.0	0.0	0.0	0.0	0.0
44173	1	10.0	0.0	0.0	0.0	0.0
44175	1	10.0	0.0	0.0	3.0	0.0
44182	1	11.0	0.0	2.0	0.0	0.0
44184	1	8.0	0.0	2.0	3.0	0.0
44188	1	13.0	0.0	0.0	0.0	0.0
44189	1	7.0	0.0	2.0	1.0	0.0
44190	1	10.0	0.0	1.0	1.0	0.0
44198	1	11.0	0.0	0.0	2.0	0.0
44205	1	10.0	0.0	1.0	0.0	0.0
44345	1	12.0	0.0	1.0	2.0	0.0
44348	1	8.0	0.0	1.0	0.0	0.0
MEAN		9.8	0.0	0.8	0.9	0.1
S.D.		2.46	0.00	0.86	1.10	0.35
N		15	15	15	15	15

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 55 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
SEX: MALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44091	0.7	1	1	1	1	1	1	3
44099	0.5	1	1	1	1	1	1	3
44103	0.2	1	1	1	1	1	1	3
44108	0.2	1	1	1	1	1	1	3
44114	0.3	1	1	1	1	1	1	3
44115	0.2	1	1	1	1	1	1	3
44121	0.5	1	1	1	1	1	1	3
44131	0.2	1	1	1	1	1	1	3
44132	0.2	1	1	1	1	1	1	3
44135	0.5	1	1	1	1	1	1	3
44137	0.2	1	1	1	1	1	1	3
44141	0.5	1	1	1	1	1	1	3
44337	0.2	1	1	1	1	1	1	3
MEAN	0.3							
S.D.	0.18							
N	13							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 55 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
TEST PERIOD: WEEK 1

SEX: MALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44091	1	1.0	0.0	1.0	0.0	0.0
44099	1	4.0	0.0	0.0	1.0	0.0
44103	1	5.0	0.0	0.0	0.0	0.0
44108	1	2.0	0.0	0.0	2.0	0.0
44114	1	0.0	0.0	0.0	1.0	0.0
44115	1	1.0	0.0	0.0	2.0	4.0
44121	1	6.0	0.0	0.0	0.0	0.0
44131	1	3.0	0.0	3.0	1.0	0.0
44132	1	2.0	0.0	0.0	1.0	0.0
44135	1	7.0	0.0	1.0	4.0	0.0
44137	1	1.0	0.0	0.0	0.0	0.0
44141	1	4.0	0.0	1.0	2.0	0.0
44337	1	2.0	0.0	0.0	2.0	5.0
MEAN		2.9	0.0	0.5	1.2	0.7
S.D.		2.14	0.00	0.88	1.17	1.70
N		13	13	13	13	13

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 55 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
SEX: MALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44092	0.8	1	1	1	1	1	1	3
44093	0.2	1	1	1	1	1	1	3
44098	0.3	1	1	1	1	1	1	3
44101	0.2	1	1	1	1	1	1	3
44110	0.4	1	1	1	1	1	1	3
44113	0.3	1	1	1	1	1	1	3
44119	0.2	1	1	1	1	1	1	3
44126	0.8	1	1	1	1	1	1	3
44128	0.8	1	1	1	1	1	1	3
44138	0.2	1	1	1	1	1	1	3
44143	0.2	1	1	1	1	1	1	3
44144	0.3	1	1	1	1	1	1	3
44147	0.5	1	1	1	1	1	1	3
44339	0.3	1	1	1	1	1	1	3
44342	0.5	1	1	1	1	1	1	3
MEAN	0.4							
S.D.	0.23							
N	15							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 55 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
TEST PERIOD: WEEK 1

SEX: MALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44092	1	2.0	0.0	0.0	15.0	0.0
44093	1	5.0	0.0	1.0	3.0	0.0
44098	1	4.0	0.0	1.0	0.0	4.0
44101	1	10.0	0.0	2.0	0.0	0.0
44110	1	7.0	0.0	0.0	1.0	0.0
44113	1	9.0	0.0	2.0	0.0	0.0
44119	1	0.0	0.0	0.0	1.0	3.0
44126	1	1.0	0.0	0.0	0.0	0.0
44128	1	2.0	0.0	0.0	1.0	3.0
44138	1	3.0	0.0	0.0	0.0	0.0
44143	1	3.0	0.0	0.0	0.0	3.0
44144	1	9.0	0.0	0.0	3.0	0.0
44147	1	2.0	0.0	0.0	1.0	3.0
44339	1	11.0	0.0	0.0	0.0	0.0
44342	1	3.0	0.0	1.0	0.0	0.0
MEAN		4.7	0.0	0.5	1.7	1.1
S.D.		3.56	0.00	0.74	3.83	1.58
N		15	15	15	15	15

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 55 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L SEX: MALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44094	0.6	1	1	1	1	1	1	3
44096	0.3	1	1	1	1	1	1	3
44100	0.3	1	1	1	1	1	1	3
44107	0.2	1	1	1	1	1	1	3
44111	0.6	1	1	1	1	1	1	3
44116	0.6	1	1	1	1	1	1	3
44118	0.1	1	1	1	1	1	1	3
44124	0.2	1	1	1	1	1	1	3
44129	0.2	1	1	1	1	1	1	3
44134	0.2	1	1	1	1	1	1	3
44140	0.4	1	1	1	1	1	1	3
44142	0.6	1	1	1	1	1	1	3
44145	3.0	1	1	1	1	1	1	3
44333	0.2	1	1	1	1	1	1	3
44340	0.2	1	1	1	1	1	1	3
MEAN	0.5							
S.D.	0.71							
N	15							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 55 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
TEST PERIOD: WEEK 1

SEX: MALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44094	1	2.0	0.0	0.0	0.0	4.0
44096	1	6.0	0.0	0.0	0.0	0.0
44100	1	6.0	0.0	2.0	1.0	0.0
44107	1	3.0	0.0	0.0	1.0	0.0
44111	1	5.0	0.0	1.0	0.0	0.0
44116	1	10.0	0.0	1.0	0.0	0.0
44118	1	0.0	0.0	0.0	1.0	0.0
44124	1	4.0	0.0	0.0	0.0	0.0
44129	1	4.0	0.0	1.0	3.0	2.0
44134	1	5.0	0.0	0.0	4.0	0.0
44140	1	2.0	0.0	0.0	1.0	0.0
44142	1	5.0	0.0	0.0	0.0	0.0
44145	1	2.0	0.0	0.0	1.0	0.0
44333	1	3.0	0.0	1.0	0.0	0.0
44340	1	0.0	0.0	0.0	0.0	0.0
MEAN		3.8	0.0	0.4	0.8	0.4
S.D.		2.57	0.00	0.63	1.21	1.12
N		15	15	15	15	15

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 55 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
SEX: MALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44097	0.4	1	1	1	1	1	1	3
44102	0.5	1	1	1	1	1	1	3
44104	0.4	1	1	1	1	1	1	3
44089	0.4	1	1	1	1	1	1	3
44109	0.3	1	1	1	1	1	1	3
44112	0.3	1	1	1	1	1	1	3
44123	0.3	1	1	1	1	1	1	3
44130	0.3	1	1	1	1	1	1	3
44133	0.3	1	1	1	1	1	1	3
44136	0.3	1	1	1	1	1	1	3
44139	0.3	1	1	1	1	1	1	3
44146	0.2	1	1	1	1	1	1	3
44334	0.2	1	1	1	1	1	1	3
44338	0.2	1	1	1	1	1	1	3
MEAN	0.3							
S.D.	0.09							
N	14							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 55 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
SEX: MALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44097	1	3.0	0.0	0.0	0.0	0.0
44102	1	1.0	0.0	1.0	0.0	0.0
44104	1	3.0	0.0	1.0	0.0	0.0
44089	1	3.0	0.0	0.0	0.0	0.0
44109	1	6.0	0.0	0.0	0.0	0.0
44112	1	3.0	0.0	0.0	0.0	0.0
44123	1	6.0	0.0	2.0	1.0	0.0
44130	1	3.0	0.0	1.0	0.0	0.0
44133	1	2.0	0.0	0.0	1.0	0.0
44136	1	3.0	0.0	1.0	1.0	0.0
44139	1	8.0	0.0	2.0	1.0	0.0
44146	1	2.0	0.0	0.0	2.0	0.0
44334	1	5.0	0.0	0.0	0.0	3.0
44338	1	3.0	0.0	0.0	0.0	0.0
MEAN		3.6	0.0	0.6	0.4	0.2
S.D.		1.91	0.00	0.76	0.65	0.80
N		14	14	14	14	14

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 55 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L SEX: FEMALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44149	0.2	1	1	1	1	1	1	3
44151	0.3	1	1	1	1	1	1	3
44154	0.3	1	1	1	1	1	1	3
44156	0.2	1	1	1	1	1	1	3
44164	0.2	1	1	1	1	1	1	3
44166	0.2	1	1	1	1	1	1	3
44176	0.2	1	1	1	1	1	1	3
44178	0.2	1	1	1	1	1	1	3
44180	0.2	1	1	1	1	1	1	3
44181	0.3	1	1	1	1	1	1	3
44204	0.2	1	1	1	1	1	1	3
44207	0.9	1	1	1	1	1	1	3
44346	0.5	1	1	1	1	1	1	3
44352	0.2	1	1	1	1	1	1	3
MEAN	0.3							
S.D.	0.19							
N	14							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 55 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
TEST PERIOD: WEEK 1

SEX: FEMALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44149	1	3.0	0.0	0.0	0.0	0.0
44151	1	5.0	0.0	0.0	1.0	0.0
44154	1	5.0	0.0	0.0	0.0	0.0
44156	1	1.0	0.0	1.0	1.0	0.0
44164	1	3.0	0.0	0.0	0.0	0.0
44166	1	14.0	0.0	1.0	0.0	0.0
44176	1	9.0	0.0	0.0	0.0	0.0
44178	1	8.0	0.0	1.0	0.0	0.0
44180	1	9.0	0.0	0.0	0.0	0.0
44181	1	7.0	0.0	0.0	0.0	0.0
44204	1	12.0	0.0	1.0	2.0	0.0
44207	1	7.0	0.0	1.0	0.0	0.0
44346	1	11.0	0.0	1.0	0.0	0.0
44352	1	5.0	0.0	0.0	0.0	0.0
MEAN		7.1	0.0	0.4	0.3	0.0
S.D.		3.71	0.00	0.51	0.61	0.00
N		14	14	14	14	14

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 55 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
SEX: FEMALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44159	0.5	1	1	1	1	1	1	3
44160	0.1	1	1	1	1	1	1	3
44162	0.2	1	1	1	1	1	1	3
44170	0.3	1	1	1	1	1	1	3
44172	0.2	1	1	1	1	1	1	3
44179	0.4	1	1	1	1	1	1	3
44183	0.5	1	1	1	1	1	1	3
44187	0.4	1	1	1	1	1	1	3
44191	0.2	1	1	1	1	1	1	3
44192	0.2	1	1	1	1	1	1	3
44194	0.3	1	1	1	1	1	1	3
44195	0.4	1	1	1	1	1	1	3
44201	0.8	1	1	1	1	1	1	3
44349	0.2	1	1	1	1	1	1	3
44350	0.2	1	1	1	1	1	1	3
MEAN	0.3							
S.D.	0.18							
N	15							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 55 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
TEST PERIOD: WEEK 1

SEX: FEMALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44159	1	1.0	0.0	0.0	1.0	0.0
44160	1	6.0	0.0	2.0	4.0	0.0
44162	1	11.0	0.0	1.0	0.0	0.0
44170	1	4.0	0.0	0.0	2.0	0.0
44172	1	7.0	0.0	1.0	0.0	0.0
44179	1	6.0	0.0	0.0	7.0	0.0
44183	1	1.0	0.0	1.0	0.0	0.0
44187	1	13.0	0.0	0.0	0.0	0.0
44191	1	8.0	0.0	4.0	0.0	0.0
44192	1	5.0	0.0	2.0	0.0	0.0
44194	1	5.0	0.0	0.0	2.0	0.0
44195	1	11.0	0.0	0.0	0.0	0.0
44201	1	0.0	0.0	0.0	0.0	0.0
44349	1	1.0	0.0	0.0	0.0	0.0
44350	1	3.0	0.0	2.0	1.0	0.0
MEAN		5.5	0.0	0.9	1.1	0.0
S.D.		4.02	0.00	1.19	2.00	0.00
N		15	15	15	15	15

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 55 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
SEX: FEMALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44150	0.2	1	1	1	1	1	1	3
44152	0.2	1	1	1	1	1	1	3
44161	0.5	1	1	1	1	1	1	3
44165	0.6	1	1	1	1	1	1	3
44169	0.2	1	1	1	1	1	1	3
44171	0.2	1	1	1	1	1	1	3
44186	1.0	1	1	1	1	1	1	3
44196	0.2	1	1	1	1	1	1	3
44197	0.2	1	1	1	1	1	1	3
44200	0.3	1	1	1	1	1	1	3
44202	0.2	1	1	1	1	1	1	3
44206	0.6	1	1	1	1	1	1	3
44344	0.8	1	1	1	1	1	1	3
44347	0.5	1	1	1	1	1	1	3
MEAN	0.4							
S.D.	0.26							
N	14							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 55 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
SEX: FEMALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44150	1	2.0	0.0	1.0	1.0	0.0
44152	1	6.0	0.0	1.0	2.0	0.0
44161	1	13.0	0.0	1.0	0.0	0.0
44165	1	10.0	0.0	1.0	0.0	0.0
44169	1	1.0	0.0	0.0	0.0	0.0
44171	1	4.0	0.0	0.0	1.0	0.0
44186	1	6.0	0.0	0.0	0.0	0.0
44196	1	10.0	0.0	1.0	7.0	0.0
44197	1	2.0	0.0	0.0	0.0	0.0
44200	1	3.0	0.0	0.0	0.0	0.0
44202	1	6.0	0.0	4.0	0.0	0.0
44206	1	5.0	0.0	1.0	0.0	0.0
44344	1	4.0	0.0	0.0	0.0	0.0
44347	1	5.0	0.0	1.0	0.0	0.0
MEAN		5.5	0.0	0.8	0.8	0.0
S.D.		3.44	0.00	1.05	1.89	0.00
N		14	14	14	14	14

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 55 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
SEX: FEMALES
TEST PERIOD: WEEK 1

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44155	0.3	1	1	1	1	1	1	3
44167	0.4	1	1	1	1	1	1	3
44168	0.2	1	1	1	1	1	1	3
44173	0.8	1	1	1	1	1	1	3
44175	0.4	1	1	1	1	1	1	3
44182	0.2	1	1	1	1	1	1	3
44184	0.6	1	1	1	1	1	1	3
44189	0.5	1	1	1	1	1	1	3
44190	0.5	1	1	1	1	1	1	3
44198	0.3	1	1	1	1	1	1	3
44205	0.2	1	1	1	1	1	1	3
44345	0.3	1	1	1	1	1	1	3
44348	0.4	1	1	1	1	1	1	3
MEAN	0.4							
S.D.	0.18							
N	13							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 55 (WEEK 1 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
TEST PERIOD: WEEK 1

SEX: FEMALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44155	1	4.0	0.0	0.0	0.0	0.0
44167	1	8.0	0.0	0.0	0.0	0.0
44168	1	7.0	0.0	0.0	0.0	0.0
44173	1	1.0	0.0	0.0	0.0	0.0
44175	1	3.0	0.0	0.0	0.0	0.0
44182	1	3.0	0.0	0.0	1.0	0.0
44184	1	5.0	0.0	0.0	0.0	0.0
44189	1	6.0	0.0	2.0	0.0	0.0
44190	1	11.0	0.0	0.0	0.0	0.0
44198	1	6.0	0.0	0.0	0.0	0.0
44205	1	4.0	0.0	1.0	0.0	0.0
44345	1	5.0	0.0	0.0	0.0	0.0
44348	1	3.0	0.0	0.0	0.0	0.0
MEAN		5.1	0.0	0.2	0.1	0.0
S.D.		2.60	0.00	0.60	0.28	0.00
N		13	13	13	13	13

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 56 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L SEX: MALES
TEST PERIOD: WEEK 2

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44091	0.7	1	1	1	1	1	1	3
44099	0.4	1	1	1	1	1	1	3
44103	1.0	1	1	1	1	1	1	3
44108	0.2	1	1	1	1	1	1	3
44114	0.3	1	1	1	1	1	1	3
44115	0.2	1	1	1	1	1	1	3
44121	0.4	1	1	1	1	1	1	3
44131	0.4	1	1	1	1	1	1	3
44132	0.1	1	1	1	1	1	1	3
44135	0.3	1	1	1	1	1	1	3
44137	1.4	1	1	1	1	1	1	3
44141	0.5	1	1	1	1	1	1	3
44337	0.9	1	1	1	1	1	1	3
MEAN	0.5							
S.D.	0.38							
N	13							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 56 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
TEST PERIOD: WEEK 2

SEX: MALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44091	1	9.0	0.0	1.0	0.0	0.0
44099	1	4.0	0.0	0.0	1.0	1.0
44103	1	11.0	0.0	0.0	0.0	0.0
44108	1	2.0	0.0	0.0	1.0	0.0
44114	1	5.0	0.0	1.0	0.0	0.0
44115	1	2.0	0.0	0.0	1.0	4.0
44121	1	4.0	0.0	0.0	1.0	0.0
44131	1	8.0	0.0	1.0	0.0	0.0
44132	1	2.0	0.0	0.0	3.0	0.0
44135	1	10.0	0.0	0.0	3.0	0.0
44137	1	9.0	0.0	1.0	0.0	0.0
44141	1	15.0	0.0	0.0	4.0	0.0
44337	1	2.0	0.0	0.0	1.0	4.0
MEAN		6.4	0.0	0.3	1.2	0.7
S.D.		4.23	0.00	0.48	1.34	1.49
N		13	13	13	13	13

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 56 (WEEK 2 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2

DOSE LEVEL: 0.025 MG/L SEX: MALES

TEST PERIOD: WEEK 2

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44092	0.6	1	1	1	1	1	1	3
44093	0.4	1	1	1	1	1	1	3
44098	0.2	1	1	1	1	1	1	3
44101	0.7	1	1	1	1	1	1	3
44110	0.7	1	1	1	1	1	1	3
44113	0.3	1	1	1	1	1	1	3
44119	0.3	1	1	1	1	1	1	3
44126	0.8	1	1	1	1	1	1	3
44128	0.6	1	1	1	1	1	1	3
44138	0.2	1	1	1	1	1	1	3
44143	0.2	1	1	1	1	1	1	3
44144	0.7	1	1	1	1	1	1	3
44147	0.5	1	1	1	1	1	1	3
44339	0.3	1	1	1	1	1	1	3
44342	0.5	1	1	1	1	1	1	3
MEAN	0.5							
S.D.	0.21							
N	15							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 56 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
TEST PERIOD: WEEK 2

SEX: MALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44092	1	0.0	0.0	0.0	1.0	6.0
44093	1	5.0	0.0	1.0	0.0	0.0
44098	1	2.0	0.0	0.0	2.0	0.0
44101	1	17.0	0.0	3.0	1.0	0.0
44110	1	5.0	0.0	0.0	0.0	0.0
44113	1	8.0	0.0	0.0	0.0	0.0
44119	1	0.0	0.0	0.0	1.0	1.0
44126	1	4.0	0.0	0.0	2.0	0.0
44128	1	9.0	0.0	0.0	1.0	0.0
44138	1	5.0	0.0	0.0	0.0	0.0
44143	1	2.0	0.0	1.0	0.0	6.0
44144	1	4.0	0.0	1.0	4.0	0.0
44147	1	8.0	0.0	3.0	2.0	0.0
44339	1	13.0	0.0	0.0	0.0	0.0
44342	1	2.0	0.0	0.0	0.0	0.0
MEAN		5.6	0.0	0.6	0.9	0.9
S.D.		4.75	0.00	1.06	1.16	2.10
N		15	15	15	15	15

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 56 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
TEST PERIOD: WEEK 2

SEX: MALES

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44094	0.6	1	1	1	1	1	1	3
44096	0.3	1	1	1	1	1	1	3
44100	0.2	1	1	1	1	1	1	3
44107	0.3	1	1	1	1	1	1	3
44111	0.6	1	1	1	1	1	1	3
44116	0.4	1	1	1	1	1	1	3
44118	0.3	1	1	1	1	1	1	3
44124	0.5	1	1	1	1	1	1	3
44129	0.6	1	1	1	1	1	1	3
44134	0.2	1	1	1	1	1	1	3
44140	0.4	1	1	1	1	1	1	3
44142	0.6	1	1	1	1	1	1	3
44145	1.1	1	1	1	1	1	1	3
44333	0.3	1	1	1	1	1	1	3
44340	0.7	1	1	1	1	1	1	3
MEAN	0.5							
S.D.	0.24							
N	15							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 56 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
TEST PERIOD: WEEK 2

SEX: MALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44094	1	4.0	0.0	0.0	1.0	3.0
44096	1	11.0	0.0	0.0	8.0	0.0
44100	1	12.0	0.0	0.0	2.0	0.0
44107	1	6.0	0.0	0.0	0.0	0.0
44111	1	11.0	0.0	0.0	0.0	0.0
44116	1	17.0	0.0	1.0	1.0	0.0
44118	1	4.0	0.0	1.0	15.0	0.0
44124	1	3.0	0.0	0.0	0.0	0.0
44129	1	14.0	0.0	1.0	2.0	2.0
44134	1	5.0	0.0	0.0	2.0	0.0
44140	1	5.0	0.0	0.0	0.0	0.0
44142	1	7.0	0.0	0.0	2.0	0.0
44145	1	2.0	0.0	1.0	1.0	0.0
44333	1	7.0	0.0	0.0	6.0	2.0
44340	1	4.0	0.0	0.0	0.0	0.0
MEAN		7.5	0.0	0.3	2.7	0.5
S.D.		4.47	0.00	0.46	4.12	0.99
N		15	15	15	15	15

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 56 (WEEK 2 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L SEX: MALES
TEST PERIOD: WEEK 2

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44097	2.3	1	1	1	1	1	1	3
44102	0.8	1	1	1	1	1	1	3
44104	0.5	1	1	1	1	1	1	3
44089	0.4	1	1	1	1	1	1	3
44109	0.2	1	1	1	1	1	1	3
44112	0.2	1	1	1	1	1	1	3
44123	0.2	1	1	1	1	1	1	3
44130	0.5	1	1	1	1	1	1	3
44133	0.3	1	1	1	1	1	1	3
44136	0.3	1	1	1	1	1	1	3
44139	0.3	1	1	1	1	1	1	3
44146	0.2	1	1	1	1	1	1	3
44334	0.5	1	1	1	1	1	1	3
44338	0.5	1	1	1	1	1	1	3
MEAN	0.5							
S.D.	0.54							
N	14							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 56 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
TEST PERIOD: WEEK 2

SEX: MALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44097	1	4.0	0.0	0.0	2.0	0.0
44102	1	8.0	0.0	0.0	0.0	0.0
44104	1	15.0	0.0	2.0	1.0	0.0
44089	1	8.0	0.0	1.0	2.0	0.0
44109	1	6.0	0.0	0.0	5.0	0.0
44112	1	2.0	0.0	0.0	0.0	0.0
44123	1	10.0	0.0	0.0	6.0	0.0
44130	1	8.0	0.0	1.0	0.0	0.0
44133	1	1.0	0.0	0.0	0.0	0.0
44136	1	14.0	0.0	1.0	1.0	0.0
44139	1	12.0	0.0	1.0	2.0	0.0
44146	1	3.0	0.0	0.0	0.0	0.0
44334	1	4.0	0.0	0.0	1.0	0.0
44338	1	7.0	0.0	0.0	4.0	0.0
MEAN		7.3	0.0	0.4	1.7	0.0
S.D.		4.34	0.00	0.65	1.98	0.00
N		14	14	14	14	14

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 56 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
TEST PERIOD: WEEK 2

SEX: FEMALES

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44149	0.2	1	1	1	1	1	1	3
44151	0.3	1	1	1	1	1	1	4
44154	0.3	1	1	1	1	1	1	3
44156	0.5	1	1	1	1	1	1	3
44164	0.2	1	1	1	1	1	1	3
44176	0.2	1	1	1	1	1	1	3
44178	0.2	1	1	1	1	1	1	3
44180	0.2	1	1	1	1	1	1	3
44181	0.4	1	1	1	1	1	1	3
44204	0.2	1	1	1	1	1	1	3
44207	0.2	1	1	1	1	1	1	3
44346	0.5	1	1	1	1	1	1	5
44352	0.2	1	1	1	1	1	1	3
MEAN	0.3							
S.D.	0.12							
N	13							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 56 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
TEST PERIOD: WEEK 2

SEX: FEMALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44149	1	12.0	0.0	1.0	0.0	0.0
44151	1	16.0	0.0	0.0	0.0	0.0
44154	1	10.0	0.0	2.0	0.0	0.0
44156	1	4.0	0.0	0.0	4.0	0.0
44164	1	6.0	0.0	0.0	0.0	0.0
44176	1	13.0	0.0	1.0	0.0	0.0
44178	1	9.0	0.0	0.0	0.0	0.0
44180	1	8.0	0.0	0.0	0.0	0.0
44181	1	8.0	0.0	0.0	0.0	0.0
44204	1	14.0	0.0	0.0	0.0	0.0
44207	1	6.0	0.0	1.0	0.0	0.0
44346	1	28.0	0.0	0.0	0.0	0.0
44352	1	5.0	0.0	0.0	0.0	0.0
MEAN		10.7	0.0	0.4	0.3	0.0
S.D.		6.36	0.00	0.65	1.11	0.00
N		13	13	13	13	13

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 56 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
TEST PERIOD: WEEK 2

SEX: FEMALES

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44159	0.2	1	1	1	1	1	1	3
44160	0.2	1	1	1	1	1	1	3
44162	0.4	1	1	1	1	1	1	4
44170	0.5	1	1	1	1	1	1	3
44172	0.7	1	1	1	1	1	1	3
44179	0.2	1	1	1	1	1	1	3
44183	0.5	1	1	1	1	1	1	3
44187	0.4	1	1	1	1	1	1	3
44191	0.2	1	1	1	1	1	1	3
44192	0.2	1	1	1	1	1	1	4
44195	0.4	1	1	1	1	1	1	3
44201	0.3	1	1	1	1	1	1	4
44349	0.4	1	1	1	1	1	1	3
44350	0.2	1	1	1	1	1	1	3
MEAN	0.3							
S.D.	0.16							
N	14							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 56 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
TEST PERIOD: WEEK 2

SEX: FEMALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44159	1	2.0	0.0	0.0	1.0	0.0
44160	1	7.0	0.0	1.0	1.0	0.0
44162	1	17.0	0.0	2.0	0.0	0.0
44170	1	8.0	0.0	0.0	0.0	0.0
44172	1	12.0	0.0	1.0	0.0	0.0
44179	1	2.0	0.0	0.0	9.0	0.0
44183	1	7.0	0.0	0.0	0.0	0.0
44187	1	16.0	0.0	0.0	0.0	0.0
44191	1	8.0	0.0	1.0	0.0	0.0
44192	1	13.0	0.0	0.0	0.0	0.0
44195	1	20.0	0.0	1.0	0.0	0.0
44201	1	15.0	0.0	1.0	0.0	0.0
44349	1	17.0	0.0	0.0	0.0	0.0
44350	1	3.0	0.0	0.0	1.0	0.0
MEAN		10.5	0.0	0.5	0.9	0.0
S.D.		6.02	0.00	0.65	2.38	0.00
N		14	14	14	14	14

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 56 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
TEST PERIOD: WEEK 2

SEX: FEMALES

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44150	0.7	1	1	1	1	1	1	3
44152	0.7	1	1	1	1	1	1	3
44161	0.5	1	1	1	1	1	1	3
44165	0.4	1	1	1	1	1	1	3
44169	0.6	1	1	1	1	1	1	3
44171	0.3	1	1	1	1	1	1	3
44186	0.4	1	1	1	1	1	1	3
44196	0.3	1	1	1	1	1	1	3
44197	0.4	1	1	1	1	1	1	3
44200	0.4	1	1	1	1	1	1	3
44202	0.2	1	1	1	1	1	1	3
44206	0.6	1	1	1	1	1	1	3
44344	0.8	1	1	1	1	1	1	3
44347	0.3	1	1	1	1	1	1	3
MEAN	0.5							
S.D.	0.18							
N	14							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 56 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
TEST PERIOD: WEEK 2

SEX: FEMALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44150	1	0.0	0.0	2.0	0.0	0.0
44152	1	2.0	0.0	2.0	1.0	0.0
44161	1	24.0	0.0	0.0	0.0	0.0
44165	1	14.0	0.0	1.0	0.0	0.0
44169	1	1.0	0.0	0.0	0.0	0.0
44171	1	3.0	0.0	0.0	1.0	0.0
44186	1	13.0	0.0	1.0	0.0	0.0
44196	1	17.0	0.0	1.0	0.0	0.0
44197	1	8.0	0.0	0.0	0.0	0.0
44200	1	4.0	0.0	0.0	0.0	0.0
44202	1	11.0	0.0	0.0	0.0	0.0
44206	1	11.0	0.0	2.0	0.0	0.0
44344	1	4.0	0.0	0.0	0.0	0.0
44347	1	10.0	0.0	0.0	0.0	0.0
MEAN		8.7	0.0	0.6	0.1	0.0
S.D.		6.90	0.00	0.84	0.36	0.00
N		14	14	14	14	14

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 56 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
TEST PERIOD: WEEK 2

SEX: FEMALES

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44155	0.5	1	1	1	1	1	1	3
44167	0.3	1	1	1	1	1	1	3
44168	0.3	1	1	1	1	1	1	3
44173	0.8	1	1	1	1	1	1	4
44175	0.5	1	1	1	1	1	1	3
44182	0.2	1	1	1	1	1	1	3
44184	0.1	1	1	1	1	1	1	3
44189	0.3	1	1	1	1	1	1	3
44190	0.7	1	1	1	1	1	1	3
44198	0.3	1	1	1	1	1	1	3
44205	0.6	1	1	1	1	1	1	3
44345	0.2	1	1	1	1	1	1	3
44348	0.4	1	1	1	1	1	1	3
MEAN	0.4							
S.D.	0.21							
N	13							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 56 (WEEK 2 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
TEST PERIOD: WEEK 2

SEX: FEMALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44155	1	4.0	0.0	2.0	0.0	0.0
44167	1	6.0	0.0	0.0	0.0	0.0
44168	1	6.0	0.0	0.0	0.0	0.0
44173	1	12.0	0.0	0.0	0.0	0.0
44175	1	14.0	0.0	0.0	0.0	0.0
44182	1	7.0	0.0	1.0	2.0	0.0
44184	1	3.0	0.0	1.0	0.0	0.0
44189	1	9.0	0.0	2.0	0.0	0.0
44190	1	13.0	0.0	2.0	0.0	0.0
44198	1	13.0	0.0	1.0	1.0	0.0
44205	1	8.0	0.0	2.0	1.0	0.0
44345	1	2.0	0.0	0.0	0.0	0.0
44348	1	3.0	0.0	1.0	0.0	0.0
MEAN		7.7	0.0	0.9	0.3	0.0
S.D.		4.21	0.00	0.86	0.63	0.00
N		13	13	13	13	13

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 57 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
SEX: MALES
TEST PERIOD: WEEK 3

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44091	0.5	1	1	1	1	1	1	3
44099	0.5	1	1	1	1	1	1	3
44103	0.5	1	1	1	1	1	1	3
44108	0.4	1	1	1	1	1	1	3
44114	0.6	1	1	1	1	1	1	3
44115	0.4	1	1	1	1	1	1	3
44121	0.3	1	1	1	1	1	1	3
44131	0.3	1	1	1	1	1	1	3
44132	0.2	1	1	1	1	1	1	3
44135	0.4	1	1	1	1	1	1	3
44137	0.3	1	1	1	1	1	1	3
44141	0.4	1	1	1	1	1	1	3
44337	0.4	1	1	1	1	1	1	3
MEAN	0.4							
S.D.	0.11							
N	13							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 57 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L SEX: MALES
TEST PERIOD: WEEK 3

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44091	1	8.0	0.0	2.0	0.0	0.0
44099	1	6.0	0.0	2.0	0.0	0.0
44103	1	4.0	0.0	3.0	1.0	1.0
44108	1	4.0	0.0	0.0	4.0	0.0
44114	1	6.0	0.0	2.0	1.0	0.0
44115	1	1.0	0.0	0.0	7.0	0.0
44121	1	5.0	0.0	0.0	1.0	0.0
44131	1	4.0	0.0	2.0	2.0	0.0
44132	1	12.0	0.0	1.0	4.0	0.0
44135	1	9.0	0.0	1.0	4.0	0.0
44137	1	1.0	0.0	0.0	3.0	0.0
44141	1	10.0	0.0	0.0	2.0	0.0
44337	1	7.0	0.0	0.0	0.0	0.0
MEAN		5.9	0.0	1.0	2.2	0.1
S.D.		3.28	0.00	1.08	2.09	0.28
N		13	13	13	13	13

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 57 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
TEST PERIOD: WEEK 3

SEX: MALES

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44092	0.8	1	1	1	1	1	1	3
44093	0.3	1	1	1	1	1	1	3
44098	0.4	1	1	1	1	1	1	3
44101	0.9	1	1	1	1	1	1	3
44110	0.7	1	1	1	1	1	1	3
44113	0.5	1	1	1	1	1	1	3
44119	0.5	1	1	1	1	1	1	3
44126	0.4	1	1	1	1	1	1	3
44128	0.5	1	1	1	1	1	1	3
44138	0.6	1	1	1	1	1	1	3
44143	0.3	1	1	1	1	1	1	3
44144	0.4	1	1	1	1	1	1	3
44147	0.3	1	1	1	1	1	1	3
44339	0.4	1	1	1	1	1	1	3
44342	0.4	1	1	1	1	1	1	3
MEAN	0.5							
S.D.	0.18							
N	15							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 57 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
TEST PERIOD: WEEK 3

SEX: MALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44092	1	4.0	0.0	1.0	9.0	0.0
44093	1	5.0	0.0	2.0	3.0	0.0
44098	1	6.0	0.0	3.0	11.0	0.0
44101	1	8.0	0.0	0.0	1.0	0.0
44110	1	3.0	0.0	0.0	0.0	0.0
44113	1	13.0	0.0	3.0	0.0	0.0
44119	1	0.0	0.0	0.0	3.0	0.0
44126	1	3.0	0.0	0.0	3.0	0.0
44128	1	5.0	0.0	1.0	3.0	0.0
44138	1	11.0	0.0	0.0	1.0	0.0
44143	1	3.0	0.0	2.0	0.0	0.0
44144	1	12.0	0.0	0.0	6.0	0.0
44147	1	7.0	0.0	3.0	0.0	0.0
44339	1	10.0	0.0	0.0	1.0	0.0
44342	1	8.0	0.0	1.0	0.0	0.0
MEAN		6.5	0.0	1.1	2.7	0.0
S.D.		3.78	0.00	1.22	3.43	0.00
N		15	15	15	15	15

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 57 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
TEST PERIOD: WEEK 3

SEX: MALES

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44094	0.2	1	1	1	1	1	1	3
44096	0.3	1	1	1	1	1	1	3
44100	0.6	1	1	1	1	1	1	3
44107	0.4	1	1	1	1	1	1	3
44111	0.6	1	1	1	1	1	1	3
44116	0.9	1	1	1	1	1	1	3
44118	0.5	1	1	1	1	1	1	3
44124	0.2	1	1	1	1	1	1	3
44129	0.3	1	1	1	1	1	1	3
44134	0.5	1	1	1	1	1	1	3
44140	0.3	1	1	1	1	1	1	3
44142	0.4	1	1	1	1	1	1	3
44145	0.7	1	1	1	1	1	1	3
44333	0.5	1	1	1	1	1	1	3
44340	0.5	1	1	1	1	1	1	3
MEAN	0.5							
S.D.	0.19							
N	15							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 57 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
TEST PERIOD: WEEK 3

SEX: MALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44094	1	2.0	0.0	1.0	0.0	0.0
44096	1	10.0	0.0	1.0	4.0	0.0
44100	1	14.0	0.0	1.0	1.0	0.0
44107	1	6.0	0.0	0.0	3.0	0.0
44111	1	13.0	0.0	0.0	4.0	0.0
44116	1	11.0	0.0	2.0	0.0	0.0
44118	1	9.0	0.0	3.0	10.0	0.0
44124	1	8.0	0.0	1.0	3.0	0.0
44129	1	5.0	0.0	3.0	0.0	0.0
44134	1	12.0	0.0	1.0	10.0	0.0
44140	1	2.0	0.0	0.0	0.0	0.0
44142	1	10.0	0.0	1.0	1.0	0.0
44145	1	0.0	0.0	0.0	0.0	0.0
44333	1	9.0	0.0	0.0	6.0	0.0
44340	1	3.0	0.0	0.0	1.0	0.0
MEAN		7.6	0.0	0.9	2.9	0.0
S.D.		4.37	0.00	1.03	3.44	0.00
N		15	15	15	15	15

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 57 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
TEST PERIOD: WEEK 3

SEX: MALES

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44097	0.4	1	1	1	1	1	1	3
44102	0.8	1	1	1	1	1	1	3
44104	0.6	1	1	1	1	1	1	3
44089	0.5	1	1	1	1	1	1	3
44109	0.4	1	1	1	1	1	1	3
44112	0.2	1	1	1	1	1	1	3
44123	1.0	1	1	1	1	1	1	3
44130	0.5	1	1	1	1	1	1	3
44133	0.3	1	1	1	1	1	1	3
44136	0.6	1	1	1	1	1	1	3
44139	0.4	1	1	1	1	1	1	3
44146	0.3	1	1	1	1	1	1	3
44334	0.6	1	1	1	1	1	1	3
44338	0.7	1	1	1	1	1	1	3
MEAN	0.5							
S.D.	0.22							
N	14							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 57 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
TEST PERIOD: WEEK 3

SEX: MALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44097	1	9.0	0.0	2.0	0.0	0.0
44102	1	2.0	0.0	1.0	1.0	0.0
44104	1	4.0	0.0	2.0	0.0	0.0
44089	1	4.0	0.0	1.0	0.0	0.0
44109	1	14.0	0.0	1.0	12.0	0.0
44112	1	4.0	0.0	3.0	1.0	0.0
44123	1	10.0	0.0	1.0	6.0	0.0
44130	1	3.0	0.0	1.0	0.0	0.0
44133	1	3.0	0.0	0.0	5.0	0.0
44136	1	6.0	0.0	1.0	1.0	0.0
44139	1	6.0	0.0	3.0	0.0	0.0
44146	1	4.0	0.0	1.0	4.0	0.0
44334	1	1.0	0.0	0.0	1.0	0.0
44338	1	8.0	0.0	0.0	9.0	0.0
MEAN		5.6	0.0	1.2	2.9	0.0
S.D.		3.57	0.00	0.97	3.84	0.00
N		14	14	14	14	14

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 57 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
TEST PERIOD: WEEK 3

SEX: FEMALES

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44149	0.3	1	1	1	1	1	1	3
44151	0.3	1	1	1	1	1	1	3
44154	0.3	1	1	1	1	1	1	3
44156	0.3	1	1	1	1	1	1	3
44164	1.0	1	1	1	1	1	1	3
44176	0.3	1	1	1	1	1	1	3
44178	0.2	1	1	1	1	1	1	3
44180	0.4	1	1	1	1	1	1	3
44181	0.4	1	1	1	1	1	1	3
44204	0.3	1	1	1	1	1	1	3
44207	0.6	1	1	1	1	1	1	3
44346	0.5	1	1	1	1	1	1	5
44352	0.9	1	1	1	1	1	1	3
MEAN	0.4							
S.D.	0.25							
N	13							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 57 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 1
DOSE LEVEL: 0.00 MG/L
TEST PERIOD: WEEK 3

SEX: FEMALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44149	1	13.0	0.0	3.0	0.0	0.0
44151	1	18.0	0.0	0.0	1.0	0.0
44154	1	10.0	0.0	2.0	0.0	0.0
44156	1	8.0	0.0	3.0	1.0	0.0
44164	1	8.0	0.0	3.0	0.0	0.0
44176	1	8.0	0.0	0.0	0.0	0.0
44178	1	11.0	0.0	1.0	0.0	0.0
44180	1	15.0	0.0	1.0	4.0	0.0
44181	1	10.0	0.0	1.0	0.0	0.0
44204	1	14.0	0.0	2.0	0.0	0.0
44207	1	10.0	0.0	2.0	0.0	0.0
44346	1	28.0	0.0	0.0	0.0	0.0
44352	1	7.0	0.0	0.0	0.0	0.0
MEAN		12.3	0.0	1.4	0.5	0.0
S.D.		5.71	0.00	1.19	1.13	0.00
N		13	13	13	13	13

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 57 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
TEST PERIOD: WEEK 3

SEX: FEMALES

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44159	0.6	1	1	1	1	1	1	3
44160	0.3	1	1	1	1	1	1	3
44162	0.6	1	1	1	1	1	1	3
44170	0.3	1	1	1	1	1	1	3
44172	0.4	1	1	1	1	1	1	3
44179	0.4	1	1	1	1	1	1	3
44183	0.5	1	1	1	1	1	1	3
44187	0.3	1	1	1	1	1	1	3
44191	0.4	1	1	1	1	1	1	3
44192	0.2	1	1	1	1	1	1	3
44195	0.4	1	1	1	1	1	1	3
44201	0.4	1	1	1	1	1	1	3
44349	0.4	1	1	1	1	1	1	3
44350	0.3	1	1	1	1	1	1	3
MEAN	0.4							
S.D.	0.11							
N	14							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 57 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 2
DOSE LEVEL: 0.025 MG/L
TEST PERIOD: WEEK 3

SEX: FEMALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44159	11	6.0	0.0	1.0	0.0	0.0
44160	1	14.0	0.0	4.0	3.0	0.0
44162	1	15.0	0.0	1.0	3.0	0.0
44170	1	13.0	0.0	0.0	2.0	0.0
44172	1	18.0	0.0	1.0	2.0	0.0
44179	1	9.0	0.0	0.0	10.0	0.0
44183	1	7.0	0.0	0.0	10.0	0.0
44187	1	14.0	0.0	1.0	0.0	0.0
44191	1	14.0	0.0	0.0	0.0	0.0
44192	1	15.0	0.0	2.0	1.0	0.0
44195	1	18.0	0.0	1.0	0.0	0.0
44201	1	8.0	0.0	1.0	0.0	0.0
44349	1	15.0	0.0	0.0	3.0	0.0
44350	1	9.0	0.0	0.0	0.0	0.0
MEAN		12.5	0.0	0.9	2.4	0.0
S.D.		3.96	0.00	1.10	3.44	0.00
N		14	14	14	14	14

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 57 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
TEST PERIOD: WEEK 3

SEX: FEMALES

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44150	0.3	1	1	1	1	1	1	3
44152	0.2	1	1	1	1	1	1	3
44161	0.2	1	1	1	1	1	1	4
44165	0.6	1	1	1	1	1	1	3
44169	0.7	1	1	1	1	1	1	3
44171	0.3	1	1	1	1	1	1	3
44186	0.3	1	1	1	1	1	1	3
44196	0.3	1	1	1	1	1	1	3
44197	0.3	1	1	1	1	1	1	3
44200	0.4	1	1	1	1	1	1	3
44202	0.3	1	1	1	1	1	1	3
44206	0.3	1	1	1	1	1	1	3
44344	0.5	1	1	1	1	1	1	3
44347	0.3	1	1	1	1	1	1	3
MEAN	0.4							
S.D.	0.15							
N	14							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 57 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 3
DOSE LEVEL: 0.075 MG/L
TEST PERIOD: WEEK 3

SEX: FEMALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44150	1	6.0	0.0	2.0	0.0	0.0
44152	1	4.0	0.0	5.0	0.0	0.0
44161	1	29.0	0.0	0.0	1.0	0.0
44165	1	13.0	0.0	2.0	0.0	0.0
44169	1	2.0	0.0	0.0	0.0	0.0
44171	1	6.0	0.0	2.0	0.0	0.0
44186	1	8.0	0.0	0.0	0.0	0.0
44196	1	18.0	0.0	2.0	2.0	0.0
44197	1	14.0	0.0	2.0	0.0	0.0
44200	1	8.0	0.0	0.0	0.0	0.0
44202	1	11.0	0.0	1.0	0.0	0.0
44206	1	7.0	0.0	0.0	0.0	0.0
44344	1	5.0	0.0	0.0	0.0	0.0
44347	1	15.0	0.0	1.0	0.0	0.0
MEAN		10.4	0.0	1.2	0.2	0.0
S.D.		7.06	0.00	1.42	0.58	0.00
N		14	14	14	14	14

OBSERVATION SCORE, UNLESS STATED OTHERWISE

TABLE 57 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
TEST PERIOD: WEEK 3

SEX: FEMALES

ANIMAL NUMBER	TIME TO 1ST STEP (seconds)	MOBILITY	GAIT	CONVULSIONS CLONIC	CONVULSIONS TONIC	TREMORS	GAIT SCORE	AROUSAL
44155	0.3	1	1	1	1	1	1	3
44167	0.5	1	1	1	1	1	1	3
44168	0.5	1	1	1	1	1	1	3
44173	0.6	1	1	1	1	1	1	3
44175	0.4	1	1	1	1	1	1	3
44182	0.2	1	1	1	1	1	1	3
44184	0.4	1	1	1	1	1	1	3
44189	0.2	1	1	1	1	1	1	4
44190	0.5	1	1	1	1	1	1	3
44198	0.2	1	1	1	1	1	1	3
44205	0.4	1	1	1	1	1	1	3
44345	0.4	1	1	1	1	1	1	3
44348	0.4	1	1	1	1	1	1	3
MEAN	0.4							
S.D.	0.13							
N	13							

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 57 (WEEK 3 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FUNCTIONAL OBSERVATIONAL BATTERY DATA

OPEN FIELD OBSERVATIONS

DOSE GROUP: 4
DOSE LEVEL: 0.25 MG/L
TEST PERIOD: WEEK 3

SEX: FEMALES

ANIMAL NUMBER	BIZARRE/STEREO-TYPIC BEHAVIOR	REARING (counts)	BACKING (counts)	GROOMING (counts)	URINATION (counts)	DEFECATION (counts)
44155	1	3.0	0.0	3.0	0.0	0.0
44167	1	12.0	0.0	2.0	3.0	0.0
44168	1	8.0	0.0	2.0	0.0	0.0
44173	1	13.0	0.0	0.0	0.0	0.0
44175	1	5.0	0.0	0.0	0.0	0.0
44182	1	8.0	0.0	2.0	0.0	0.0
44184	1	11.0	0.0	3.0	0.0	0.0
44189	1	19.0	0.0	3.0	2.0	0.0
44190	1	8.0	0.0	2.0	0.0	0.0
44198	1	13.0	0.0	1.0	0.0	0.0
44205	1	11.0	0.0	0.0	1.0	0.0
44345	1	8.0	0.0	0.0	0.0	0.0
44348	1	7.0	0.0	1.0	0.0	0.0
MEAN		9.7	0.0	1.5	0.5	0.0
S.D.		4.11	0.00	1.20	0.97	0.00
N		13	13	13	13	13

OBSERVATION SCORE, UNLESS STATED OTHERWISE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 58
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL BODY WEIGHTS (GRAMS)

MALE GROUP: 0.00 MG/L

WEEK	-1	0	1	2	3	4	5	6
ANIMAL								
44091	199.	251.	300.	325.	356.	371.	SCHEDULED EUTH	
44099	200.	239.	267.	292.	317.	331.	SCHEDULED EUTH	
44103	231.	285.	337.	374.	413.	431.	460.	NA SCHEDULED EUTH
44108	183.	220.	271.	307.	332.	344.	370.	NA SCHEDULED EUTH
44114	225.	272.	307.	338.	365.	369.	SCHEDULED EUTH	
44115	194.	231.	258.	285.	312.	342.	371.	NA SCHEDULED EUTH
44121	183.	228.	272.	308.	332.	366.	SCHEDULED EUTH	
44125	181.	216.	FOUND DEAD					
44131	218.	260.	290.	328.	349.	379.	SCHEDULED EUTH	
44132	193.	234.	269.	297.	321.	345.	SCHEDULED EUTH	
44135	192.	229.	276.	306.	328.	353.	380.	NA SCHEDULED EUTH
44137	202.	253.	287.	264.	329.	352.	388.	NA SCHEDULED EUTH
44141	209.	248.	281.	312.	333.	356.	SCHEDULED EUTH	
44335	133.	177.	211.	FOUND DEAD				
44337	131.	182.	229.	276.	310.	337.	SCHEDULED EUTH	
MEAN	192.	235.	275.	309.	338.	360.	394.	
S.D.	28.4	29.4	31.0	28.6	27.8	25.7	37.7	
N	15	15	14	13	13	13	5	

NA = NOT APPLICABLE

TABLE 58
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACI' IN RATS
INDIVIDUAL BODY WEIGHTS (GRAMS)

MALE GROUP: 0.025 MG/L

WEEK	-1	0	1	2	3	4	5	6
ANIMAL								
44092	191.	239.	282.	315.	343.	356.	SCHEDULED EUTH	
44093	219.	255.	297.	333.	364.	380.	SCHEDULED EUTH	
44098	198.	230.	268.	302.	327.	336.	371.	NA SCHEDULED EUTH
44101	196.	247.	289.	324.	353.	370.	390.	NA SCHEDULED EUTH
44110	170.	200.	232.	258.	278.	297.	SCHEDULED EUTH	
44113	211.	258.	297.	331.	358.	372.	SCHEDULED EUTH	
44119	230.	271.	291.	325.	346.	369.	389.	NA SCHEDULED EUTH
44126	226.	295.	347.	393.	425.	455.	483.	NA SCHEDULED EUTH
44128	207.	249.	287.	320.	338.	350.	384.	NA SCHEDULED EUTH
44138	196.	232.	267.	300.	324.	350.	SCHEDULED EUTH	
44143	198.	232.	267.	288.	314.	332.	SCHEDULED EUTH	
44144	186.	222.	252.	279.	307.	321.	SCHEDULED EUTH	
44147	183.	219.	250.	280.	293.	309.	SCHEDULED EUTH	
44339	130.	175.	209.	244.	268.	289.	SCHEDULED EUTH	
44342	125.	181.	228.	271.	296.	317.	SCHEDULED EUTH	
MEAN	191.	234.	271.	304.	329.	347.	403.	
S.D.	30.4	32.0	34.1	36.8	39.5	41.2	45.1	
N	15	15	15	15	15	15	5	

NA = NOT APPLICABLE

TABLE 58
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL BODY WEIGHTS (GRAMS)

MALE GROUP: 0.075 MG/L

WEEK	-1	0	1	2	3	4	5	6	
ANIMAL									
44094	191.	239.	278.	310.	333.	339.	381.	NA	SCHEDULED EUTH
44096	189.	231.	257.	286.	314.	329.	353.	NA	SCHEDULED EUTH
44100	214.	263.	306.	337.	365.	382.	421.	NA	SCHEDULED EUTH
44107	172.	216.	243.	267.	293.	308.	SCHEDULED EUTH		
44111	189.	231.	256.	277.	306.	323.	SCHEDULED EUTH		
44116	185.	218.	243.	269.	297.	308.	SCHEDULED EUTH		
44118	236.	276.	314.	338.	360.	381.	SCHEDULED EUTH		
44124	215.	253.	273.	294.	320.	332.	SCHEDULED EUTH		
44129	205.	249.	287.	322.	348.	365.	SCHEDULED EUTH		
44134	210.	244.	278.	306.	329.	337.	358.	NA	SCHEDULED EUTH
44140	189.	222.	244.	271.	296.	315.	SCHEDULED EUTH		
44142	196.	234.	260.	284.	313.	336.	SCHEDULED EUTH		
44145	227.	265.	304.	332.	352.	371.	SCHEDULED EUTH		
44333	134.	180.	207.	225.	242.	256.	SCHEDULED EUTH		
44340	134.	195.	240.	286.	314.	338.	378.	NA	SCHEDULED EUTH
MEAN	192.	234.	266.	294.	319.	335.	378.		
S.D.	29.1	26.0	29.3	31.1	31.5	32.6	26.8		
N	15	15	15	15	15	15	5		

NA = NOT APPLICABLE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 58
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL BODY WEIGHTS (GRAMS)

MALE GROUP: 0.25 MG/L

WEEK	-1	0	1	2	3	4	5	6	
ANIMAL									
44097	191.	229.	249.	266.	293.	307.	337.	NA	SCHEDULED EUTH
44102	185.	218.	206.	244.	276.	288.	SCHEDULED EUTH		
44104	210.	257.	261.	298.	329.	332.	SCHEDULED EUTH		
44089	209.	264.	306.	326.	348.	357.	403.	NA	SCHEDULED EUTH
44109	199.	238.	262.	283.	307.	323.	SCHEDULED EUTH		
44112	208.	254.	267.	290.	304.	323.	349.	NA	SCHEDULED EUTH
44120	234.	274.	FOUND DEAD						
44123	220.	252.	278.	312.	338.	355.	396.	NA	SCHEDULED EUTH
44130	182.	220.	243.	275.	301.	328.	SCHEDULED EUTH		
44133	171.	206.	226.	263.	285.	304.	332.	NA	SCHEDULED EUTH
44136	188.	232.	260.	291.	315.	331.	SCHEDULED EUTH		
44139	200.	241.	261.	282.	295.	315.	SCHEDULED EUTH		
44146	203.	243.	267.	291.	321.	339.	SCHEDULED EUTH		
44334	144.	185.	210.	235.	260.	280.	SCHEDULED EUTH		
44338	140.	177.	198.	215.	236.	253.	SCHEDULED EUTH		
MEAN	192.	233.	250.	277.	301.	317.	363.		
S.D.	25.7	27.8	30.2	30.0	30.2	28.7	33.6		
N	15	15	14	14	14	14	5		

NA = NOT APPLICABLE

TABLE 58
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL BODY WEIGHTS (GRAMS)

FEMALE GROUP: 0.00 MG/L

WEEK	-1	0	1	2	3	4	5	6	
ANIMAL									
44149	155.	164.	178.	185.	189.	206.	199.	NA	SCHEDULED EUTH
44151	179.	197.	215.	236.	250.	251.	251.	NA	SCHEDULED EUTH
44154	192.	205.	237.	252.	263.	277.	SCHEDULED EUTH		
44156	159.	174.	225.	226.	236.	239.	248.	NA	SCHEDULED EUTH
44157	177.	199.	222.	FOUND DEAD					
44164	202.	219.	236.	249.	261.	262.	SCHEDULED EUTH		
44166	184.	207.	219.	FOUND DEAD					
44176	163.	194.	226.	237.	245.	254.	268.	NA	SCHEDULED EUTH
44178	184.	196.	208.	223.	231.	235.	SCHEDULED EUTH		
44180	153.	179.	192.	211.	225.	233.	234.	NA	SCHEDULED EUTH
44181	167.	184.	211.	226.	242.	253.	SCHEDULED EUTH		
44204	170.	190.	196.	209.	217.	218.	SCHEDULED EUTH		
44207	173.	183.	191.	206.	209.	218.	SCHEDULED EUTH		
44346	128.	160.	181.	196.	206.	214.	SCHEDULED EUTH		
44352	140.	168.	171.	200.	212.	224.	SCHEDULED EUTH		
MEAN	168.	188.	207.	220.	230.	237.	240.		
S.D.	19.6	16.9	21.2	20.6	22.5	21.2	25.9		
N	15	15	15	13	13	13	5		

NA = NOT APPLICABLE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 58
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL BODY WEIGHTS (GRAMS)

FEMALE GROUP: 0.025 MG/L

WEEK	-1	0	1	2	3	4	5	6	
ANIMAL									
44159	169.	197.	227.	240.	257.	262.	SCHEDULED EUTH		
44160	146.	157.	180.	199.	218.	220.	SCHEDULED EUTH		
44162	167.	191.	210.	224.	233.	242.	251.	NA	SCHEDULED EUTH
44170	168.	182.	199.	215.	233.	240.	SCHEDULED EUTH		
44172	182.	195.	209.	221.	238.	252.	SCHEDULED EUTH		
44179	207.	229.	241.	256.	266.	280.	SCHEDULED EUTH		
44183	156.	177.	193.	206.	222.	246.	SCHEDULED EUTH		
44187	164.	187.	206.	220.	235.	244.	249.	NA	SCHEDULED EUTH
44191	172.	190.	206.	219.	227.	243.	SCHEDULED EUTH		
44192	178.	205.	233.	227.	246.	262.	SCHEDULED EUTH		
44194	180.	198.	210.	221.	FOUND DEAD				
44195	160.	181.	198.	212.	218.	226.	219.	NA	SCHEDULED EUTH
44201	185.	206.	242.	236.	258.	260.	SCHEDULED EUTH		
44349	129.	155.	179.	187.	197.	206.	209.	NA	SCHEDULED EUTH
44350	137.	174.	209.	210.	205.	230.	226.	NA	SCHEDULED EUTH
MEAN	167.	188.	209.	220.	232.	244.	231.		
S.D.	19.7	18.9	19.4	16.8	19.9	19.3	18.6		
N	15	15	15	15	14	14	5		

NA = NOT APPLICABLE

TABLE 58
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL BODY WEIGHTS (GRAMS)

FEMALE GROUP: 0.075 MG/L

WEEK	-1	0	1	2	3	4	5	6
ANIMAL								
44148	170.	184.	198.	FOUND DEAD				
44150	170.	192.	210.	229.	253.	256.	SCHEDULED EUTH	
44152	175.	197.	217.	230.	254.	265.	SCHEDULED EUTH	
44161	221.	235.	258.	274.	292.	306.	SCHEDULED EUTH	
44165	176.	201.	216.	228.	243.	251.	260.	NA SCHEDULED EUTH
44169	179.	196.	227.	233.	259.	259.	SCHEDULED EUTH	
44171	159.	175.	190.	223.	226.	237.	SCHEDULED EUTH	
44186	171.	198.	216.	228.	240.	250.	246.	NA SCHEDULED EUTH
44196	161.	181.	200.	215.	229.	235.	230.	NA SCHEDULED EUTH
44197	178.	206.	232.	226.	253.	255.	SCHEDULED EUTH	
44200	156.	178.	189.	200.	210.	210.	224.	NA SCHEDULED EUTH
44202	161.	188.	202.	218.	231.	244.	SCHEDULED EUTH	
44206	149.	165.	181.	188.	200.	206.	205.	NA SCHEDULED EUTH
44344	134.	162.	172.	180.	182.	185.	SCHEDULED EUTH	
44347	137.	162.	178.	184.	193.	200.	SCHEDULED EUTH	
MEAN	166.	188.	206.	218.	233.	240.	233.	
S.D.	20.6	19.2	23.0	24.4	29.7	31.3	21.0	
N	15	15	15	14	14	14	5	

NA = NOT APPLICABLE

TABLE 58
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL BODY WEIGHTS (GRAMS)

FEMALE GROUP: 0.25 MG/L

WEEK	-1	0	1	2	3	4	5	6	
ANIMAL									
44155	153.	165.	204.	221.	237.	250.	SCHEDULED EUTH		
44163	170.	195.	214.	FOUND DEAD					
44167	160.	179.	205.	220.	227.	234.	246.	NA	SCHEDULED EUTH
44168	192.	203.	219.	233.	248.	257.	SCHEDULED EUTH		
44173	155.	166.	186.	201.	216.	FOUND DEAD			
44175	190.	208.	223.	233.	247.	258.	SCHEDULED EUTH		
44182	193.	226.	234.	252.	259.	267.	269.	NA	SCHEDULED EUTH
44184	169.	187.	209.	225.	228.	239.	SCHEDULED EUTH		
44188	174.	192.	207.	FOUND DEAD					
44189	175.	197.	214.	231.	240.	255.	SCHEDULED EUTH		
44190	165.	198.	205.	224.	236.	243.	SCHEDULED EUTH		
44198	172.	183.	204.	210.	226.	225.	238.	NA	SCHEDULED EUTH
44205	171.	190.	199.	205.	211.	213.	224.	NA	SCHEDULED EUTH
44345	137.	169.	184.	203.	223.	228.	227.	NA	SCHEDULED EUTH
44348	128.	156.	177.	184.	194.	FOUND DEAD			
MEAN	167.	188.	206.	219.	230.	243.	241.		
S.D.	18.5	18.6	15.0	17.7	17.2	16.5	18.0		
N	15	15	15	13	13	11	5		

NA = NOT APPLICABLE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 59
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL BODY WEIGHT GAINS (GRAMS)

MALE GROUP: 0.00 MG/L

WEEK	-1 TO 0	0 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6
ANIMAL							
44091	52.	49.	25.	31.	15.	SCHEDULED EUTH	
44099	39.	28.	25.	25.	14.	SCHEDULED EUTH	
44103	54.	52.	37.	39.	18.	29.	NA SCHEDULED EUTH
44108	37.	51.	36.	25.	12.	26.	NA SCHEDULED EUTH
44114	47.	35.	31.	27.	4.	SCHEDULED EUTH	
44115	37.	27.	27.	27.	30.	29.	NA SCHEDULED EUTH
44121	45.	44.	36.	24.	34.	SCHEDULED EUTH	
44125	35.	FOUND DEAD					
44131	42.	30.	38.	21.	30.	SCHEDULED EUTH	
44132	41.	35.	28.	24.	24.	SCHEDULED EUTH	
44135	37.	47.	30.	22.	25.	27.	NA SCHEDULED EUTH
44137	51.	34.	23.	65.	23.	36.	NA SCHEDULED EUTH
44141	39.	33.	31.	21.	23.	SCHEDULED EUTH	
44335	44.	34.	FOUND DEAD				
44337	51.	47.	47.	34.	27.	SCHEDULED EUTH	
MEAN	43.	39.	28.	30.	21.	29.	
S.D.	6.3	8.9	16.6	11.9	8.5	3.9	
N	15	14	13	13	13	5	

NA = NOT APPLICABLE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 59
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL BODY WEIGHT GAINS (GRAMS)

MALE GROUP: 0.025 MG/L

WEEK	-1 TO 0	0 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6
ANIMAL							
44092	48.	43.	33.	28.	13.	SCHEDULED EUTH	
44093	36.	42.	36.	31.	16.	SCHEDULED EUTH	
44098	32.	38.	34.	25.	9.	35.	NA SCHEDULED EUTH
44101	51.	42.	35.	29.	17.	20.	NA SCHEDULED EUTH
44110	30.	32.	26.	20.	19.	SCHEDULED EUTH	
44113	47.	39.	34.	27.	14.	SCHEDULED EUTH	
44119	41.	20.	34.	21.	23.	20.	NA SCHEDULED EUTH
44126	69.	52.	46.	32.	30.	28.	NA SCHEDULED EUTH
44128	42.	38.	33.	18.	12.	34.	NA SCHEDULED EUTH
44138	36.	35.	33.	24.	26.	SCHEDULED EUTH	
44143	34.	35.	21.	26.	18.	SCHEDULED EUTH	
44144	36.	30.	27.	28.	14.	SCHEDULED EUTH	
44147	36.	31.	30.	13.	16.	SCHEDULED EUTH	
44339	45.	34.	35.	24.	21.	SCHEDULED EUTH	
44342	56.	47.	43.	25.	21.	SCHEDULED EUTH	
MEAN	43.	37.	33.	25.	18.	27.	
S.D.	10.4	7.7	6.1	5.1	5.6	7.3	
N	15	15	15	15	15	5	

NA = NOT APPLICABLE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 59
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL BODY WEIGHT GAINS (GRAMS)

MALE GROUP: 0.075 MG/L

WEEK	-1 TO 0	0 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6
ANIMAL							
44094	48.	39.	32.	23.	6.	42.	NA SCHEDULED EUTH
44096	42.	26.	29.	28.	15.	24.	NA SCHEDULED EUTH
44100	49.	43.	31.	28.	17.	39.	NA SCHEDULED EUTH
44107	44.	27.	24.	26.	15.	SCHEDULED EUTH	
44111	42.	25.	21.	29.	17.	SCHEDULED EUTH	
44116	33.	25.	26.	28.	11.	SCHEDULED EUTH	
44118	40.	38.	24.	22.	21.	SCHEDULED EUTH	
44124	38.	20.	21.	26.	12.	SCHEDULED EUTH	
44129	44.	38.	35.	26.	17.	SCHEDULED EUTH	
44134	34.	34.	28.	23.	8.	21.	NA SCHEDULED EUTH
44140	33.	22.	27.	25.	19.	SCHEDULED EUTH	
44142	38.	26.	24.	29.	23.	SCHEDULED EUTH	
44145	38.	39.	28.	20.	19.	SCHEDULED EUTH	
44333	46.	27.	18.	17.	14.	SCHEDULED EUTH	
44340	61.	45.	46.	28.	24.	40.	NA SCHEDULED EUTH
MEAN	42.	32.	28.	25.	16.	33.	
S.D.	7.3	8.1	6.8	3.5	5.1	9.9	
N	15	15	15	15	15	5	

NA = NOT APPLICABLE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 59
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL BODY WEIGHT GAINS (GRAMS)

MALE GROUP: 0.25 MG/L

WEEK	-1 TO 0	0 TO 1	1 TO 2	_ TO 3	3 TO 4	4 TO 5	5 TO 6	
ANIMAL								
44097	38.	20.	17.	27.	14.	30.	NA	SCHEDULED EUTH
44102	33.	-12.	38.	32.	12.	SCHEDULED EUTH		
44104	47.	4.	37.	31.	3.	SCHEDULED EUTH		
44089	55.	42.	20.	22.	9.	46.	NA	SCHEDULED EUTH
44109	39.	24.	21.	24.	16.	SCHEDULED EUTH		
44112	46.	13.	23.	14.	19.	26.	NA	SCHEDULED EUTH
44120	40.	FOUND DEAD						
44123	32.	26.	34.	26.	17.	41.	NA	SCHEDULED EUTH
44130	38.	23.	32.	26.	27.	SCHEDULED EUTH		
44133	35.	20.	37.	22.	19.	28.	NA	SCHEDULED EUTH
44136	44.	28.	31.	24.	16.	SCHEDULED EUTH		
44139	41.	20.	21.	13.	20.	SCHEDULED EUTH		
44146	40.	24.	24.	30.	18.	SCHEDULED EUTH		
44334	41.	25.	25.	25.	20.	SCHEDULED EUTH		
44338	37.	21.	17.	21.	17.	SCHEDULED EUTH		
MEAN	40.	20.	27.	24.	16.	34.		
S.D.	5.9	12.3	7.7	5.6	5.6	8.8		
N	15	14	14	14	14	5		

NA = NOT APPLICABLE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 59
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL BODY WEIGHT GAINS (GRAMS)

FEMALE GROUP: 0.00 MG/L

WEEK	-1 TO 0	0 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6
ANIMAL							
44149	9.	14.	7.	4.	17.	-7.	NA SCHEDULED EUTH
44151	18.	18.	21.	14.	1.	0.	NA SCHEDULED EUTH
44154	13.	32.	15.	11.	14.	SCHEDULED EUTH	
44156	15.	51.	1.	10.	3.	9.	NA SCHEDULED EUTH
44157	22.	23.	FOUND DEAD				
44164	17.	17.	13.	12.	1.	SCHEDULED EUTH	
44166	23.	12.	FOUND DEAD				
44176	31.	32.	11.	8.	9.	14.	NA SCHEDULED EUTH
44178	12.	12.	15.	8.	4.	SCHEDULED EUTH	
44180	26.	13.	19.	14.	8.	1.	NA SCHEDULED EUTH
44181	17.	27.	15.	16.	11.	SCHEDULED EUTH	
44204	20.	6.	13.	8.	1.	SCHEDULED EUTH	
44207	10.	8.	15.	3.	9.	SCHEDULED EUTH	
44346	32.	21.	15.	10.	8.	SCHEDULED EUTH	
44352	28.	3.	29.	12.	12.	SCHEDULED EUTH	
MEAN	20.	19.	15.	10.	8.	3.	
S.D.	7.3	12.4	6.6	3.8	5.2	8.2	
N	15	15	13	13	13	5	

NA = NOT APPLICABLE

TABLE 59
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL BODY WEIGHT GAINS (GRAMS)

FEMALE GROUP: 0.025 MG/L

WEEK	-1 TO 0	0 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6
ANIMAL							
44159	28.	30.	13.	17.	5.	SCHEDULED EUTH	
44160	11.	23.	19.	19.	2.	SCHEDULED EUTH	
44162	24.	19.	14.	9.	9.	9.	NA SCHEDULED EUTH
44170	14.	17.	16.	18.	7.	SCHEDULED EUTH	
44172	13.	14.	12.	17.	14.	SCHEDULED EUTH	
44179	22.	12.	15.	10.	14.	SCHEDULED EUTH	
44183	21.	16.	13.	16.	24.	SCHEDULED EUTH	
44187	23.	19.	14.	15.	9.	5.	NA SCHEDULED EUTH
44191	18.	16.	13.	8.	16.	SCHEDULED EUTH	
44192	27.	28.	-6.	19.	16.	SCHEDULED EUTH	
44194	18.	12.	11.	FOUND DEAD			
44195	21.	17.	14.	6.	8.	-7.	NA SCHEDULED EUTH
44201	21.	36.	-6.	22.	2.	SCHEDULED EUTH	
44349	26.	24.	8.	10.	9.	3.	NA SCHEDULED EUTH
44350	37.	35.	1.	-5.	25.	-4.	NA SCHEDULED EUTH
MEAN	22.	21.	10.	13.	11.	1.	
S.D.	6.6	7.9	7.6	7.1	7.2	6.6	
N	15	15	15	14	14	5	

NA = NOT APPLICABLE

TABLE 59

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL BODY WEIGHT GAINS (GRAMS)

FEMALE GROUP: 0.075 MG/L

WEEK	-1 TO 0	0 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6
ANIMAL							
44148	14.	14.	FOUND DEAD				
44150	22.	18.	19.	24.	3.	SCHEDULED EUTH	
44152	22.	20.	13.	24.	11.	SCHEDULED EUTH	
44161	14.	23.	16.	18.	14.	SCHEDULED EUTH	
44165	25.	15.	12.	15.	8.	9.	NA SCHEDULED EUTH
44169	17.	31.	6.	26.	0.	SCHEDULED EUTH	
44171	16.	15.	33.	3.	11.	SCHEDULED EUTH	
44186	27.	18.	12.	12.	10.	-4.	NA SCHEDULED EUTH
44196	20.	19.	15.	14.	6.	-5.	NA SCHEDULED EUTH
44197	28.	26.	-6.	27.	2.	SCHEDULED EUTH	
44200	22.	11.	11.	10.	0.	14.	NA SCHEDULED EUTH
44202	27.	14.	16.	13.	13.	SCHEDULED EUTH	
44206	16.	16.	7.	12.	6.	-1.	NA SCHEDULED EUTH
44344	28.	10.	8.	2.	3.	SCHEDULED EUTH	
44347	25.	16.	6.	9.	7.	SCHEDULED EUTH	
MEAN	22.	18.	12.	15.	7.	3.	
S.D.	5.1	5.6	8.6	8.0	4.7	8.4	
N	15	15	14	14	14	5	

NA = NOT APPLICABLE

TABLE 59

A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

INDIVIDUAL BODY WEIGHT GAINS (GRAMS)

FEMALE GROUP: 0.25 MG/L

WEEK	-1 TO 0	0 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6
ANIMAL							
44155	12.	39.	17.	16.	13.	SCHEDULED EUTH	
44163	25.	19.	FOUND DEAD				
44167	19.	26.	15.	7.	7.	12.	NA SCHEDULED EUTH
44168	11.	16.	14.	15.	9.	SCHEDULED EUTH	
44173	11.	20.	15.	15.	FOUND DEAD		
44175	18.	15.	10.	14.	11.	SCHEDULED EUTH	
44182	33.	8.	18.	7.	8.	2.	NA SCHEDULED EUTH
44184	18.	22.	16.	3.	11.	SCHEDULED EUTH	
44188	18.	15.	FOUND DEAD				
44189	22.	17.	17.	9.	15.	SCHEDULED EUTH	
44190	33.	7.	19.	12.	7.	SCHEDULED EUTH	
44198	11.	21.	6.	16.	-1.	13.	NA SCHEDULED EUTH
44205	19.	9.	6.	6.	2.	11.	NA SCHEDULED EUTH
44345	32.	15.	19.	20.	5.	-1.	NA SCHEDULED EUTH
44348	28.	21.	7.	10.	FOUND DEAD		
MEAN	21.	18.	14.	12.	8.	7.	
S.D.	8.0	7.9	4.9	5.0	4.7	6.4	
N	15	15	13	13	11	5	

NA = NOT APPLICABLE

TABLE 60

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL FOOD CONSUMPTION (GRAMS/ANIMAL/DAY)

MALE GROUP: 0.00 MG/L

WEEK	-1 TO 0	0 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6
ANIMAL							
44091	23.	24.	24.	25.	25.	SCHEDULED EUTH	
44099	23.	22.	22.	22.	23.	SCHEDULED EUTH	
44103	24.	27.	28.	28.	28.	29.	NA SCHEDULED EUTH
44108	19.	22.	24.	24.	23.	25.	NA SCHEDULED EUTH
44114	23.	23.	24.	25.	24.	SCHEDULED EUTH	
44115	21.	20.	21.	24.	25.	26.	NA SCHEDULED EUTH
44121	22.	23.	24.	25.	26.	SCHEDULED EUTH	
44125	19.	FOUND DEAD					
44131	23.	23.	25.	25.	28.	SCHEDULED EUTH	
44132	22.	21.	21.	21.	23.	SCHEDULED EUTH	
44135	20.	22.	22.	23.	24.	24.	NA SCHEDULED EUTH
44137	24.	23.	18.	22.	27.	30.	NA SCHEDULED EUTH
44141	22.	23.	23.	23.	24.	SCHEDULED EUTH	
44335	18.	19.	FOUND DEAD				
44337	20.	21.	23.	23.	24.	SCHEDULED EUTH	
MEAN	22.	22.	23.	24.	25.	27.	
S.D.	1.9	1.9	2.4	1.8	1.8	2.6	
N	15	14	13	13	13	5	

NA = NOT APPI BLE

TABLE 60
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FOOD CONSUMPTION (GRAMS/ANIMAL/DAY)

MALE GROUP: 0.025 MG/L

WEEK	-1 TO 0	0 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6
ANIMAL							
44092	23.	23.	25.	26.	24.	SCHEDULED EUTH	
44093	21.	23.	24.	25.	24.	SCHEDULED EUTH	
44098	20.	21.	22.	23.	22.	24.	NA SCHEDULED EUTH
44101	24.	26.	26.	26.	26.	26.	NA SCHEDULED EUTH
44110	19.	19.	19.	20.	22.	SCHEDULED EUTH	
44113	22.	23.	23.	24.	24.	SCHEDULED EUTH	
44119	22.	21.	23.	20.	25.	25.	NA SCHEDULED EUTH
44126	27.	29.	29.	29.	29.	29.	NA SCHEDULED EUTH
44128	22.	23.	25.	24.	24.	25.	NA SCHEDULED EUTH
44138	20.	22.	23.	23.	24.	SCHEDULED EUTH	
44143	20.	21.	20.	21.	21.	SCHEDULED EUTH	
44144	20.	20.	22.	22.	23.	SCHEDULED EUTH	
44147	21.	21.	23.	20.	22.	SCHEDULED EUTH	
44339	17.	17.	18.	18.	18.	SCHEDULED EUTH	
44342	19.	21.	22.	22.	22.	SCHEDULED EUTH	
MEAN	21.	22.	23.	23.	23.	26.	
S.D.	2.4	2.8	2.8	2.9	2.5	1.9	
N	15	15	15	15	15	5	

NA = NOT APPLICABLE

TABLE 60

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FOOD CONSUMPTION (GRAMS/ANIMAL/DAY)

MALE GROUP: 0.075 MG/L

WEEK	-1 TO 0	0 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6
ANIMAL							
44094	23.	23.	23.	23.	23.	26.	NA SCHEDULED EUTH
44096	21.	19.	20.	23.	22.	23.	NA SCHEDULED EUTH
44100	23.	23.	23.	24.	24.	26.	NA SCHEDULED EUTH
44107	22.	20.	21.	21.	22.	SCHEDULED EUTH	
44111	20.	20.	20.	22.	23.	SCHEDULED EUTH	
44116	20.	19.	21.	22.	22.	SCHEDULED EUTH	
44118	24.	23.	23.	25.	26.	SCHEDULED EUTH	
44124	22.	21.	20.	22.	21.	SCHEDULED EUTH	
44129	22.	23.	24.	26.	26.	SCHEDULED EUTH	
44134	21.	23.	23.	24.	23.	24.	NA SCHEDULED EUTH
44140	19.	18.	18.	19.	21.	SCHEDULED EUTH	
44142	21.	21.	20.	22.	25.	SCHEDULED EUTH	
44145	23.	24.	28.	25.	25.	SCHEDULED EUTH	
44333	18.	19.	18.	19.	19.	SCHEDULED EUTH	
44340	20.	22.	23.	23.	24.	26.	NA SCHEDULED EUTH
MEAN	21.	21.	22.	23.	23.	25.	
S.D.	1.7	1.9	2.6	2.0	2.0	1.4	
N	15	15	15	15	15	5	

NA = NOT APPLICABLE

TABLE 60

A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

INDIVIDUAL FOOD CONSUMPTION (GRAMS/ANIMAL/DAY)

MALE GROUP: 0.25 MG/L

WEEK	-1 0 0	0 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6
ANIMAL							
44097	20.	19.	19.	21.	21.	24.	NA SCHEDULED EUTH
44102	19.	16.	15.	22.	20.	SCHEDULED EUTH	
44104	22.	17.	23.	23.	22.	SCHEDULED EUTH	
44089	23.	NA	23.	25.	25.	28.	NA SCHEDULED EUTH
44109	21.	20.	20.	22.	23.	SCHEDULED EUTH	
44112	21.	21.	20.	21.	23.	23.	NA SCHEDULED EUTH
44120	22.	FOUND DEAD					
44123	21.	20.	22.	24.	24.	27.	NA SCHEDULED EUTH
44130	20.	19.	22.	23.	25.	SCHEDULED EUTH	
44133	19.	18.	22.	21.	23.	24.	NA SCHEDULED EUTH
44136	22.	20.	22.	23.	24.	SCHEDULED EUTH	
44139	21.	21.	22.	22.	24.	SCHEDULED EUTH	
44146	22.	21.	21.	23.	23.	SCHEDULED EUTH	
44334	19.	18.	20.	21.	21.	SCHEDULED EUTH	
44338	17.	19.	19.	21.	22.	SCHEDULED EUTH	
MEAN	21.	19.	21.	22.	23.	25.	
S.D.	1.6	1.6	2.1	1.3	1.5	2.2	
N	15	13	14	14	14	5	

NA = NOT APPLICABLE

TABLE 60

A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

INDIVIDUAL FOOD CONSUMPTION (GRAMS/ANIMAL/DAY)

FEMALE GROUP: 0.00 MG/L

WEEK	-1 TO 0	0 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6
ANIMAL							
44149	15.	17.	18.	17.	17.	15.	NA SCHEDULED EUTH
44151	18.	19.	20.	20.	19.	19.	NA SCHEDULED EUTH
44154	18.	20.	21.	20.	21.	SCHEDULED EUTH	
44156	16.	22.	19.	19.	19.	19.	NA SCHEDULED EUTH
44157	18.	19.	FOUND DEAD				
44164	20.	18.	19.	18.	18.	SCHEDULED EUTH	
44166	17.	18.	FOUND DEAD				
44176	18.	20.	18.	16.	17.	18.	NA SCHEDULED EUTH
44178	18.	17.	20.	20.	20.	SCHEDULED EUTH	
44180	15.	14.	15.	15.	16.	16.	NA SCHEDULED EUTH
44181	19.	19.	19.	19.	20.	SCHEDULED EUTH	
44204	17.	17.	NA	17.	17.	SCHEDULED EUTH	
44207	17.	16.	17.	17.	17.	SCHEDULED EUTH	
44346	15.	17.	17.	18.	17.	SCHEDULED EUTH	
44352	16.	15.	18.	17.	18.	SCHEDULED EUTH	
MEAN	17.	18.	18.	18.	18.	17.	
S.D.	1.5	2.1	1.6	1.6	1.5	1.8	
N	15	15	12	13	13	5	

NA = NOT APPLICABLE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 60
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FOOD CONSUMPTION (GRAMS/ANIMAL/DAY)

FEMALE GROUP: 0.025 MG/L

WEEK	-1 TO 0	0 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6
ANIMAL							
44159	16.	19.	20.	18.	18.	SCHEDULED EUTH	
44160	16.	18.	20.	21.	21.	SCHEDULED EUTH	
44162	17.	18.	19.	18.	18.	18.	NA SCHEDULED EUTH
44170	17.	17.	18.	19.	19.	SCHEDULED EUTH	
44172	17.	16.	17.	17.	18.	SCHEDULED EUTH	
44179	20.	19.	19.	19.	20.	SCHEDULED EUTH	
44183	15.	16.	16.	16.	18.	SCHEDULED EUTH	
44187	18.	18.	18.	19.	18.	19.	NA SCHEDULED EUTH
44191	17.	17.	17.	18.	19.	SCHEDULED EUTH	
44192	17.	20.	18.	19.	19.	SCHEDULED EUTH	
44194	17.	17.	19.	FOUND DEAD			
44195	17.	18.	18.	17.	17.	16.	NA SCHEDULED EUTH
44201	17.	21.	18.	18.	19.	SCHEDULED EUTH	
44349	15.	16.	16.	17.	17.	16.	NA SCHEDULED EUTH
44350	17.	20.	17.	16.	17.	18.	NA SCHEDULED EUTH
MEAN	17.	18.	18.	18.	18.	17.	
S.D.	1.2	1.6	1.3	1.4	1.2	1.3	
N	15	15	15	14	14	5	

NA = NOT APPLICABLE

TABLE 60

A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

INDIVIDUAL FOOD CONSUMPTION (GRAMS/ANIMAL/DAY)

FEMALE GROUP: 0.075 MG/L

WEEK	-1 TO 0	0 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6
ANIMAL							
44148	14.	15.	FOUND DEAD				
44150	16.	16.	17.	18.	18.	SCHEDULED EUTH	
44152	18.	19.	18.	20.	20.	SCHEDULED EUTH	
44161	19.	20.	22.	21.	22.	SCHEDULED EUTH	
44165	18.	19.	18.	19.	19.	19.	NA SCHEDULED EUTH
44169	16.	16.	17.	18.	19.	SCHEDULED EUTH	
44171	16.	15.	19.	17.	17.	SCHEDULED EUTH	
44186	19.	18.	18.	19.	19.	18.	NA SCHEDULED EUTH
44196	18.	20.	19.	NA	23.	21.	NA SCHEDULED EUTH
44197	18.	19.	16.	17.	19.	SCHEDULED EUTH	
44200	18.	17.	18.	18.	18.	19.	NA SCHEDULED EUTH
44202	19.	18.	18.	18.	19.	SCHEDULED EUTH	
44206	16.	17.	17.	18.	18.	20.	NA SCHEDULED EUTH
44344	15.	14.	15.	15.	16.	SCHEDULED EUTH	
44347	16.	17.	17.	16.	17.	SCHEDULED EUTH	
MEAN	17.	17.	18.	18.	19.	19.	
S.D.	1.6	1.9	1.6	1.6	1.9	1.1	
N	15	15	14	13	14	5	

NA = NOT APPLICABLE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 60
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL FOOD CONSUMPTION (GRAMS/ANIMAL/DAY)

FEMALE GROUP: 0.25 MG/L

WEEK	-1 TO 0	0 TO 1	1 TO 2	2 TO 3	3 TO 4	4 TO 5	5 TO 6
ANIMAL							
44155	15.	19.	18.	20.	21.	SCHEDULED EUTH	
44163	18.	18.	FOUND DEAD				
44167	15.	16.	17.	15.	16.	18.	NA SCHEDULED EUTH
44168	17.	17.	20.	19.	19.	SCHEDULED EUTH	
44173	14.	15.	17.	18.	FOUND DEAD		
44175	19.	17.	18.	19.	17.	SCHEDULED EUTH	
44182	20.	18.	19.	19.	19.	19.	NA SCHEDULED EUTH
44184	17.	18.	18.	18.	17.	SCHEDULED EUTH	
44188	15.	15.	FOUND DEAD				
44189	16.	17.	17.	17.	17.	SCHEDULED EUTH	
44190	19.	19.	18.	19.	20.	SCHEDULED EUTH	
44198	17.	17.	17.	19.	24.	19.	NA SCHEDULED EUTH
44205	17.	16.	16.	16.	17.	16.	NA SCHEDULED EUTH
44345	16.	16.	17.	19.	17.	18.	NA SCHEDULED EUTH
44348	15.	16.	17.	18.	FOUND DEAD		
MEAN	17.	17.	18.	18.	19.	18.	
S.D.	1.8	1.3	1.0	1.4	2.4	1.2	
N	15	15	13	13	11	5	

NA = NOT APPLICABLE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 61 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	WHITE CELL	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET
	thous/uL	mil/uL	g/dL	%	u 3	uug	g/dL	thous/uL
GROUP: 0.00 MG/L		MALES						
44091	10.8	8.46	16.1	46.4	54.8	19.0	34.7	1221.
44099	12.0	8.81	17.0	49.1	55.7	19.3	34.7	1092.
44114	12.2	8.19	16.1	47.6	58.1	19.7	33.8	1205.
44121	14.5	8.10	16.4	47.4	58.5	20.2	34.6	1180.
44131	13.8	8.91	16.8	48.5	54.4	18.9	34.7	1164.
44132	9.3	7.91	15.9	44.5	56.3	20.1	35.7	1164.
44141	13.2	8.72	17.0	48.8	55.9	19.5	34.8	1178.
44337	10.6	7.94	16.4	46.6	58.7	20.6	35.2	1032.
MEAN	12.0	8.38	16.5	47.4	56.6	19.7	34.8	1155.
S.D.	1.76	0.399	0.43	1.52	1.68	0.60	0.54	62.4
N	8	8	8	8	8	8	8	8

g/dL = GRAMS/DECILITER, thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, uug = PICOGRAMS,
u 3 = CUBIC MICRONS

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 61 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	WHITE CELL	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET
	thous/uL	mil/uL	g/dL	%	u 3	uug	g/dL	thous/uL
GROUP: 0.025 MG/L		MALES						
44092	5.4	7.66	14.7	42.5	55.5	19.1	34.5	1026.
44093	9.5	8.12	16.3	45.8	56.5	20.0	35.5	1361.
44110	8.4	9.21	16.3	49.3	53.5	17.7	33.0	1084.
44113	10.0	8.40	16.3	46.7	55.6	19.4	34.8	1343.
44138	16.3	8.09	16.2	46.2	57.2	20.0	34.9	971.
44143	13.5	8.58	17.2	49.6	57.8	20.1	34.7	1144.
44144	18.5	7.91	15.9	45.6	57.7	20.2	35.0	1066.
44147	11.2	8.72	17.1	48.8	56.0	19.6	35.0	1150.
44339	10.2	8.06	15.7	45.2	56.1	19.5	34.7	1082.
44342	10.7	8.13	16.2	46.8	57.5	19.9	34.6	1212.
MEAN	11.4	8.29	16.2	46.7	56.3	19.6	34.7	1144.
S.D.	3.83	0.449	0.70	2.15	1.32	0.74	0.65	128.6
N	10	10	10	10	10	10	10	10

g/dL = GRAMS/DECILITER, thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, uug = PICOGRAMS,
u 3 = CUBIC MICRONS

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 61 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	WHITE CELL	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET
	thous/uL	mil/uL	g/dL	%	u 3	uug	g/dL	thous/uL
GROUP: 0.075 MG/L		MALES						
44107	10.3	8.69	17.1	50.1	57.7	19.7	34.2	944.
44111	10.5	8.12	16.2	46.1	56.8	19.9	35.1	1079.
44116	15.2	8.79	16.5	48.0	54.6	18.8	34.4	1239.
44118	16.7	8.65	17.0	48.1	55.6	19.7	35.4	1139.
44124	12.6	8.68	16.9	49.0	56.4	19.5	34.6	1340.
44129	16.5	8.16	16.6	46.9	57.5	20.4	35.4	1222.
44140	13.8	8.13	16.0	45.4	55.8	19.6	35.2	1147.
44142	12.2	8.01	15.7	44.5	55.6	19.6	35.3	1059.
44145	19.1	8.18	15.5	44.7	54 6	19.0	34.8	1258.
44333	12.6	8.35	16.3	45.9	55.0	19.5	35.5	1266.
MEAN	14.0	8.38	16.4	46.9	56.0	19.6	35.0	1169.
S.D.	2.87	0.295	0.54	1.88	1.12	0.44	0.46	118.6
N	10	10	10	10	10	10	10	10

g/dL = GRAMS/DECILITER, thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, uug = PICOGRAMS,
u 3 = CUBIC MICRONS

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 61 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	WHITE CELL	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET
	thous/uL	mil/uL	g/dL	%	u 3	uug	g/dL	thous/uL
GROUP: 0.25 MG/L		MALES						
44102	11.1	8.57	16.7	47.8	55.8	19.5	34.9	1085.
44104	16.5	8.15	16.1	46.0	56.5	19.8	35.0	1067.
44109	13.8	8.61	16.6	47.8	55.6	19.3	34.7	1277.
44130	10.1	9.11	17.5	51.2	56.3	19.2	34.1	1273.
44136	12.7	8.32	16.6	47.5	57.1	20.0	35.0	1094.
44139	11.8	8.61	16.8	47.4	55.0	19.5	35.4	1250.
44146	16.4	8.31	16.3	46.6	56.0	19.6	35.0	1138.
44334	14.7	8.02	15.8	45.1	56.2	19.7	35.1	1093.
44338	17.1	8.72	16.2	46.4	53.2	18.6	34.9	1478.
MEAN	13.8	8.49	16.5	47.3	55.7	19.5	34.9	1195.
S.D.	2.55	0.330	0.49	1.72	1.12	0.41	0.35	136.1
N	9	9	9	9	9	9	9	9

g/dL = GRAMS/DECILITER, thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, uug = PICOGRAMS,
u 3 = CUBIC MICRONS

TABLE 61 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	WHITE CELL	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET
	thous/uL	mil/uL	g/dL	%	u 3	uug	g/dL	thous/uL
GROUP: 0.00 MG/L		FEMALES						
44154	8.1	8.05	16.2	46.2	57.3	20.1	35.0	1112.
44164	14.3	8.41	16.8	49.0	58.3	20.0	34.3	755.
44178	8.7	7.47	15.7	44.9	60.2	21.1	35.0	1055.
44181	10.5	7.17	15.0	42.8	59.8	20.9	35.0	1585.
44204	12.5	7.57	15.2	43.7	57.7	20.1	34.9	1149.
44207	12.9	7.86	16.2	45.8	58.3	20.6	35.4	1074.
44346	16.3	8.13	15.9	45.9	56.6	19.6	34.7	1213.
44352	10.7	8.03	16.0	46.4	57.8	19.9	34.4	1231.
MEAN	11.7	7.84	15.9	45.6	58.3	20.3	34.8	1147.
S.D.	2.80	0.405	0.58	1.88	1.22	0.52	0.36	230.5
N	8	8	8	8	8	8	8	8

g/dL = GRAMS/DECILITER, thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, uug = PICOGRAMS,
u 3 = CUBIC MICRONS

TABLE 61 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	WHITE CELL	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET
	thous/uL	mil/uL	g/dL	%	u 3	uug	g/dL	thous/uL
GROUP: 0.025 MG/L		FEMALES						
44159	10.2	7.79	15.8	45.4	58.2	20.3	34.9	1460.
44160	5.7	8.46	16.7	48.2	56.9	19.8	34.7	1106.
44170	10.4	8.19	16.3	47.0	57.4	19.9	34.6	1093.
44172	6.7	7.32	14.9	42.7	58.3	20.3	34.9	1090.
44179	22.9	7.72	15.3	44.3	57.3	19.8	34.6	1155.
44183	6.3	7.50	15.1	43.9	58.6	20.2	34.4	1192.
44191	10.4	7.50	15.4	44.5	59.3	20.6	34.7	1154.
44192	9.8	7.66	15.2	43.7	57.1	19.8	34.7	1094.
44201	12.8	7.75	15.5	45.3	58.4	20.0	34.3	1111.
MEAN	10.6	7.77	15.6	45.0	57.9	20.1	34.6	1162.
S.D.	5.19	0.356	0.59	1.71	0.80	0.29	0.20	117.3
N	9	9	9	9	9	9	9	9

g/dL = GRAMS/DECILITER, thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, uug = PICOGRAMS,
u 3 = CUBIC MICRONS

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 61 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	WHITE CELL	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET
	thous/uL	mil/uL	g/dL	%	u 3	uug	g/dL	thous/uL
GROUP: 0.075 MG/L		FEMALES						
44150	6.6	8.60	16.5	48.4	56.2	19.2	34.1	1079.
44152	8.3	7.66	15.2	44.9	58.6	19.9	33.9	1100.
44161	9.0	7.41	15.7	44.8	60.5	21.1	34.9	1168.
44169	11.6	8.11	16.4	47.3	58.4	20.2	34.5	937.
44171	10.4	7.93	15.6	44.8	56.5	19.7	34.8	1165.
44197	6.9	7.65	15.2	44.6	58.2	19.9	34.2	1233.
44202	8.7	8.14	16.2	47.9	58.9	19.9	33.8	1259.
44344	9.4	8.52	16.0	47.0	55.2	18.8	34.1	1293.
44347	11.1	8.09	15.7	44.8	55.4	19.5	35.1	858.
MEAN	9.1	8.01	15.8	46.1	57.5	19.8	34.4	1121.
S.D.	1.74	0.397	0.48	1.56	1.80	0.65	0.47	146.0
N	9	9	9	9	9	9	9	9

g/dL = GRAMS/DECILITER, thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, uug = PICOGRAMS,
u 3 = CUBIC MICRONS

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 61 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	WHITE CELL	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET
	thous/uL	mil/uL	g/dL	%	u 3	uug	g/dL	thous/uL
GROUP: 0.25 MG/L		FEMALES						
44155	9.2	7.93	16.3	47.8	60.3	20.5	34.1	1178.
44168	12.8	7.95	16.5	47.9	60.2	20.7	34.4	997.
44175	13.9	7.94	15.9	45.6	57.4	20.0	34.8	1292.
44184	12.4	7.52	15.7	45.3	60.2	20.8	34.6	1077.
44189	7.0	7.90	16.4	46.7	59.1	20.7	35.0	1118.
44190	9.8	8.44	16.0	47.4	56.2	19.0	33.9	1050.
MEAN	10.8	7.95	16.1	46.8	58.9	20.3	34.5	1119.
S.D.	2.62	0.293	0.31	1.12	1.73	0.69	0.42	104.7
N	6	6	6	6	6	6	6	6

g/dL = GRAMS/DECILITER, thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, uug = PICOGRAMS,
u 3 = CUBIC MICRONS

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 62 (WEEK 6 RECOVERY EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	MCHC
	g/dL
GROUP: 0.00 MG/L FEMALES	
44149	35.5
44151	35.3
44156	35.1
44176	35.5
44180	34.9
MEAN	35.3
S.D.	0.26
N	5

g/dL = GRAMS/DECILITER

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 62 (WEEK 6 RECOVERY EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	MCHC
	g/dL
GROUP: 0.025 MG/L FEMALES	
44162	35.3
44187	35.6
44195	35.9
44349	35.6
44350	34.2
MEAN	35.3
S.D.	0.66
N	5

g/dL = GRAMS/DECILITER

TABLE 62 (WEEK 6 RECOVERY EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	MCHC
	g/dL
GROUP: 0.075 MG/L FEMALES	
44165	35.5
44186	34.3
44196	35.5
44200	34.7
44206	35.2
MEAN	35.0
S.D.	0.53
N	5

g/dL = GRAMS/DECILITER

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 62 (WEEK 6 RECOVERY EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	MCHC
	g/dL
GROUP: 0.25 MG/L FEMALES	
44167	34.2
44182	36.1
44198	35.5
44205	35.3
44345	35.3
MEAN	35.3
S.D.	0.69
N	5

g/dL = GRAMS/DECILITER

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 63 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL LEUKOCYTE DIFFERENTIAL COUNT (%)

ANIMAL	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL
GROUP: 0.00 MG/L			MALES		
44091	11	76	10	3	0
44099	10	82	6	2	0
44114	12	76	10	2	0
44121	17	73	7	2	1
44131	16	77	5	2	0
44132	25	66	6	3	0
44141	10	78	9	2	1
44337	24	71	4	1	0
MEAN	16	75	7	2	0
S.D.	6.1	4.9	2.3	0.6	0.5
N	8	8	8	8	8

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 63 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL LEUKOCYTE DIFFERENTIAL COUNT (%)

ANIMAL	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL
GROUP: 0.025 MG/L MALES					
44092	24	63	11	2	0
44093	16	75	7	2	0
44110	10	83	5	2	0
44113	20	72	7	1	0
44138	20	70	8	2	0
44143	28	64	7	1	0
44144	43	49	7	1	0
44147	17	77	4	1	1
44339	22	68	9	1	0
44342	10	80	8	2	0
MEAN	21	70	7	2	0
S.D.	9.6	9.9	1.9	0.5	0.3
N	10	10	10	10	10

TABLE 63 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL LEUKOCYTE DIFFERENTIAL COUNT (%)

ANIMAL	NEUTROPHIL	LYMPHOCYTE	MONOCYTE	EOSINOPHIL	BASOPHIL
GROUP: 0.075 MG/L			MALES		
44107	23	66	10	1	0
44111	16	74	8	2	0
44116	13	80	6	1	0
44118	22	67	8	3	0
44124	15	75	8	2	0
44129	19	71	8	2	0
44140	11	76	9	3	1
44142	20	69	9	2	0
44145	19	76	2	3	0
44333	22	72	5	1	0
MEAN	18	73	7	2	0
S.D.	4.1	4.4	2.4	0.8	0.3
N	10	10	10	10	10

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 63 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL LEUKOCYTE DIFFERENTIAL COUNT (%)

ANIMAL	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL
GROUP: 0.25 MG/L			MALES		
44102	12	79	8	1	0
44104	13	77	7	3	0
44109	12	76	10	1	1
44130	16	75	6	3	0
44136	17	73	8	2	0
44139	26	63	8	3	0
44146	40	55	5	0	0
44334	23	69	7	1	0
44338	24	65	9	2	0
MEAN	20	70	8	2	0
S.D.	9.1	7.9	1.5	1.1	0.3
N	9	9	9	9	9

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 63 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL LEUKOCYTE DIFFERENTIAL COUNT (%)

ANIMAL	NEUTROPHIL	LYMPHOCYTE	MONOCYTE	EOSINOPHIL	BASOPHIL
GROUP: 0.00 MG/L		FEMALES			
44154	29	65	5	1	0
44164	13	80	5	2	0
44178	22	72	4	2	0
44181	19	73	6	2	0
44204	11	84	4	1	0
44207	15	77	6	2	0
44346	22	69	7	2	0
44352	17	75	6	2	0
MEAN	19	74	5	2	0
S.D.	5.8	6.0	1.1	0.5	0.0
N	8	8	8	8	8

TABLE 63 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL LEUKOCYTE DIFFERENTIAL COUNT (%)

ANIMAL	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL
GROUP: 0.025 MG/L FEMALES					
44159	21	69	8	2	0
44160	22	70	6	2	0
44170	29	66	4	1	0
44172	16	77	5	2	0
44179	28	66	5	1	0
44183	7	87	4	2	0
44191	22	69	8	1	0
44192	38	58	2	2	0
44201	16	76	7	1	0
MEAN	22	71	5	2	0
S.D.	8.9	8.3	2.0	0.5	0.0
N	9	9	9	9	9

TABLE 63 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL LEUKOCYTE DIFFERENTIAL COUNT (%)

ANIMAL	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL
GROUP: 0.075 MG/L FEMALES					
44150	13	81	4	2	0
44152	14	80	4	2	0
44161	25	65	7	3	0
44169	7	85	7	1	0
44171	14	81	4	1	0
44197	16	77	5	2	0
44202	9	82	5	4	0
44344	19	73	7	1	0
44347	22	73	3	2	0
MEAN	15	77	5	2	0
S.D.	5.8	6.2	1.5	1.0	0.0
N	9	9	9	9	9

TABLE 63 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL LEUKOCYTE DIFFERENTIAL COUNT (%)

ANIMAL	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL
GROUP: 0.25 MG/L FEMALES					
44155	43	50	5	2	0
44168	10	83	5	2	0
44175	15	80	4	1	0
44184	8	85	4	2	1
44189	25	68	6	1	0
44190	25	69	4	2	0
MEAN	21	73	5	2	0
S.D.	13.0	13.1	0.8	0.5	0.4
N	6	6	6	6	6

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 64 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL LEUKOCYTE COUNTS

0.00 MG/L MALE

ANIMAL	TOTAL LEUKOCYTES thous/uL	NEUTRO-PHIL thous/uL	LYMPH-OCYTE thous/uL	MONOCYTE thous/uL	EOSIN-OPHIL thous/uL	BASOPHIL thous/uL
44091	10.8	1.2	8.2	1.1	0.3	0.0
44099	12.0	1.2	9.8	0.7	0.2	0.0
44114	12.2	1.5	9.3	1.2	0.2	0.0
44121	14.5	2.5	10.6	1.0	0.3	0.1
44131	13.8	2.2	10.6	0.7	0.3	0.0
44132	9.3	2.3	6.1	0.6	0.3	0.0
44141	13.2	1.3	10.3	1.2	0.3	0.1
44337	10.6	2.5	7.5	0.4	0.1	0.0
MEAN	12.0	1.8	9.1	0.9	0.3	0.0
S.D.	1.76	0.60	1.63	0.30	0.06	0.06
N	8	8	8	8	8	8

thous/uL = THOUSANDS/MICROLITER

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 64 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL LEUKOCYTE COUNTS

0.025 MG/L MALE

ANIMAL	TOTAL LEUKOCYTES thous/uL	NEUTRO-PHIL thous/uL	LYMPH-OCYTE thous/uL	MONOCYTE thous/uL	EOSIN-OPHIL thous/uL	BASOPHIL thous/uL
44092	5.4	1.3	3.4	0.6	0.1	0.0
44093	9.5	1.5	7.1	0.7	0.2	0.0
44110	8.4	0.8	7.0	0.4	0.2	0.0
44113	10.0	2.0	7.2	0.7	0.1	0.0
44138	16.3	3.3	11.4	1.3	0.3	0.0
44143	13.5	3.8	8.6	0.9	0.1	0.0
44144	18.5	8.0	9.1	1.3	0.2	0.0
44147	11.2	1.9	8.6	0.4	0.1	0.1
44339	10.2	2.2	6.9	0.9	0.1	0.0
44342	10.7	1.1	8.6	0.9	0.2	0.0
MEAN	11.4	2.6	7.8	0.8	0.2	0.0
S.D.	3.83	2.10	2.07	0.31	0.07	0.04
N	10	10	10	10	10	10

thous/uL = THOUSANDS/MICROLITER

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 64 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL LEUKOCYTE COUNTS

0.075 MG/L MALE

ANIMAL	TOTAL LEUKOCYTES thous/uL	NEUTRO-PHIL thous/uL	LYMPH-OCYTE thous/uL	MONOCYTE thous/uL	EOSIN-OPHIL thous/uL	BASOPHIL thous/uL
44107	10.3	2.4	6.8	1.0	0.1	0.0
44111	10.5	1.7	7.8	0.8	0.2	0.0
44116	15.2	2.0	12.2	0.9	0.2	0.0
44118	16.7	3.7	11.2	1.3	0.5	0.0
44124	12.6	1.9	9.5	1.0	0.3	0.0
44129	16.5	3.1	11.7	1.3	0.3	0.0
44140	13.8	1.5	10.5	1.2	0.4	0.1
44142	12.2	2.4	8.4	1.1	0.2	0.0
44145	19.1	3.6	14.5	0.4	0.6	0.0
44333	12.6	2.8	9.1	0.6	0.1	0.0
MEAN	14.0	2.5	10.2	1.0	0.3	0.0
S.D.	2.87	0.78	2.32	0.30	0.16	0.04
N	10	10	10	10	10	10

thous/uL = THOUSANDS/MICROLITER

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 64 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL LEUKOCYTE COUNTS

0.25 MG/L MALE

ANIMAL	TOTAL LEUKOCYTES thous/uL	NEUTRO-PHIL thous/uL	LYMPH-OCYTE thous/uL	MONOCYTE thous/uL	EOSIN-OPHIL thous/uL	BASOPHIL thous/uL
44102	11.1	1.3	8.8	0.9	0.1	0.0
44104	16.5	2.1	12.7	1.2	0.5	0.0
44109	13.8	1.7	10.5	1.4	0.1	0.1
44130	10.1	1.6	7.6	0.6	0.3	0.0
44136	12.7	2.2	9.3	1.0	0.3	0.0
44139	11.8	3.1	7.4	0.9	0.4	0.0
44146	16.4	6.6	9.0	0.8	0.0	0.0
44334	14.7	3.4	10.1	1.0	0.1	0.0
44338	17.1	4.1	11.1	1.5	0.3	0.0
MEAN	13.8	2.9	9.6	1.0	0.2	0.0
S.D.	2.55	1.65	1.69	0.28	0.15	0.05
N	9	9	9	9	9	9

thous/uL = THOUSANDS/MICROLITER

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 64 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL LEUKOCYTE COUNTS

0.00 MG/L FEMALE

ANIMAL	TOTAL LEUKOCYTES thous/uL	NEUTRO-PHIL thous/uL	LYMPH-OCYTE thous/uL	MONOCYTE thous/uL	EOSIN-OPHIL thous/uL	BASOPHIL thous/uL
44154	8.1	2.3	5.2	0.4	0.1	0.0
44164	14.3	1.9	11.4	0.7	0.3	0.0
44178	8.6	1.9	6.2	0.3	0.2	0.0
44181	10.5	2.0	7.7	0.6	0.2	0.0
44204	12.5	1.4	10.5	0.5	0.1	0.0
44207	12.9	1.9	9.9	0.8	0.3	0.0
44346	16.3	3.6	11.2	1.1	0.3	0.0
44352	10.7	1.8	8.0	0.6	0.2	0.0
MEAN	11.7	2.1	8.8	0.6	0.2	0.0
S.D.	2.80	0.65	2.34	0.25	0.08	0.00
N	8	8	8	8	8	8

thous/uL = THOUSANDS/MICROLITER

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 64 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL LEUKOCYTE COUNTS

0.025 MG/L FEMALE

ANIMAL	TOTAL LEUKOCYTES thous/uL	NEUTRO-PHIL thous/uL	LYMPH-OCYTE thous/uL	MONOCYTE thous/uL	EOSIN-OPHIL thous/uL	BASOPHIL thous/uL
44159	10.2	2.1	7.0	0.8	0.2	0.0
44160	5.7	1.2	4.0	0.3	0.1	0.0
44170	10.4	3.0	6.9	0.4	0.1	0.0
44172	6.7	1.1	5.1	0.3	0.1	0.0
44179	22.9	6.4	15.1	1.1	0.2	0.0
44183	6.3	0.4	5.5	0.3	0.1	0.0
44191	10.4	2.3	7.2	0.8	0.1	0.0
44192	9.8	3.7	5.7	0.2	0.2	0.0
44201	12.8	2.0	9.7	0.9	0.1	0.0
MEAN	10.6	2.5	7.4	0.6	0.1	0.0
S.D.	5.19	1.78	3.33	0.34	0.05	0.00
N	9	9	9	9	9	9

thous/uL = THOUSANDS/MICROLITER

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 64 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL LEUKOCYTE COUNTS

0.075 MG/L FEMALE

ANIMAL	TOTAL LEUKOCYTES thous/uL	NEUTRO-PHIL thous/uL	LYMPH-OCYTE thous/uL	MONOCYTE thous/uL	EOSIN-OPHIL thous/uL	BASOPHIL thous/uL
44150	6.6	0.9	5.3	0.3	0.1	0.0
44152	8.3	1.2	6.7	0.3	0.2	0.0
44161	9.0	2.2	5.8	0.6	0.3	0.0
44169	11.6	0.8	9.9	0.8	0.1	0.0
44171	10.4	1.5	8.4	0.4	0.1	0.0
44197	6.9	1.1	5.3	0.3	0.1	0.0
44202	8.7	0.8	7.2	0.4	0.3	0.0
44344	9.4	1.8	6.9	0.7	0.1	0.0
44347	11.1	2.4	8.1	0.3	0.2	0.0
MEAN	9.1	1.4	7.1	0.5	0.2	0.0
S.D.	1.74	0.62	1.53	0.19	0.09	0.00
N	9	9	9	9	9	9

thous/uL = THOUSANDS/MICROLITER

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 64 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL LEUKOCYTE COUNTS

0.25 MG/L FEMALE

ANIMAL	TOTAL LEUKOCYTES thous/uL	NEUTRO-PHIL thous/uL	LYMPH-OCYTE thous/uL	MONOCYTE thous/uL	EOSIN-OPHIL thous/uL	BASOPHIL thous/uL
44155	9.2	4.0	4.6	0.5	0.2	0.0
44168	12.8	1.3	10.6	0.6	0.3	0.0
44175	13.9	2.1	11.1	0.6	0.1	0.0
44184	12.4	1.0	10.5	0.5	0.2	0.1
44189	7.0	1.7	4.7	0.4	0.1	0.0
44190	9.8	2.5	6.8	0.4	0.2	0.0
MEAN	10.8	2.1	8.1	0.5	0.2	0.0
S.D.	2.62	1.06	3.06	0.09	0.07	0.05
N	6	6	6	6	6	6

thous/uL = THOUSANDS/MICROLITER

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 65 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 0.00 MG/L		MALES									
44091	4.4	6.5	2.1	2.10	0.1	16.0	0.3	221.	52.	159.	0.
44099	4.6	6.6	2.0	2.30	0.2	14.5	0.2	223.	42.	133.	0.
44114	4.2	6.4	2.2	1.91	0.2	17.5	0.1	154.	32.	116.	0.
44121	4.4	6.7	2.3	1.91	0.1	15.5	0.2	152.	49.	136.	0.
44131	4.5	6.6	2.1	2.14	0.1	16.7	0.3	211.	49.	133.	1.
44132	4.6	6.6	2.0	2.30	0.1	16.3	0.2	197.	42.	139.	0.
44141	4.6	6.8	2.2	2.09	0.2	14.4	0.3	174.	41.	131.	0.
44337	4.4	6.7	2.3	1.91	0.1	18.8	0.2	136.	46.	190.	0.
MEAN	4.5	6.6	2.2	2.08	0.1	16.2	0.2	184.	44.	142.	0.
S.D.	0.14	0.12	0.12	0.164	0.05	1.48	0.07	34.0	6.3	22.7	0.4
N	8	8	8	8	8	8	8	8	8	8	8

U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mg/dL = MILLIGRAMS/DECILITER

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 65 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L
GROUP: 0.00 MG/L		MALES					
44091	105.	69.	9.5	97.	7.6	4.38	149.
44099	96.	41.	9.4	96.	8.3	6.31	148.
44114	73.	69.	9.3	104.	8.8	6.12	145.
44121	73.	65.	9.4	107.	8.2	6.12	146.
44131	86.	50.	9.6	95.	9.3	6.39	148.
44132	77.	52.	9.3	108.	7.7	6.35	145.
44141	79.	54.	9.4	94.	9.0	6.33	147.
44337	64.	62.	9.1	108.	8.1	4.53	148.
MEAN	82.	58.	9.4	101.	8.4	5.82	147.
S.D.	13.4	10.1	0.15	6.2	0.61	0.847	1.5
N	8	8	8	8	8	8	8

mg/dL = MILLIGRAMS/DECILITER, mEq/L = milliEquivalents/Liter

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 65 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 0.025 MG/L		MALES									
44092	4.4	6.3	1.9	2.32	0.2	15.0	0.2	148.	64.	211.	0.
44093	4.7	6.9	2.2	2.14	0.1	13.7	0.3	211.	42.	182.	1.
44110	4.7	6.4	1.7	2.76	0.2	15.2	0.2	194.	39.	145.	0.
44113	4.2	6.2	2.0	2.10	0.1	17.9	0.3	218.	43.	127.	0.
44138	4.4	6.4	2.0	2.20	0.1	19.1	0.3	153.	40.	95.	2.
44143	4.6	6.9	2.3	2.00	0.2	20.0	0.4	169.	48.	152.	0.
44144	4.4	6.9	2.5	1.76	0.1	14.5	0.2	187.	47.	132.	0.
44147	5.1	7.1	2.0	2.55	0.1	16.8	0.3	220.	42.	123.	0.
44339	4.6	6.4	1.8	2.56	0.2	19.4	0.3	241.	38.	154.	0.
44342	4.6	6.9	2.3	2.00	0.2	14.7	0.2	187.	33.	121.	0.
MEAN	4.6	6.6	2.1	2.24	0.2	16.6	0.3	193.	44.	144.	0.
S.D.	0.25	0.33	0.25	0.308	0.05	2.32	0.07	30.3	8.4	33.2	0.7
N	10	10	10	10	10	10	10	10	10	10	10

U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mg/dL = MILLIGRAMS/DECILITER

TABLE 65 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L
GROUP: 0.025 MG/L		MALES					
44092	80.	47.	9.0	96.	7.7	4.95	148.
44093	86.	50.	9.5	97.	8.8	6.17	148.
44110	79.	49.	9.4	108.	8.1	5.25	146.
44113	72.	52.	9.4	108.	8.2	5.45	146.
44138	91.	61.	9.6	95.	7.9	5.68	147.
44143	79.	45.	9.7	106.	9.7	6.72	146.
44144	75.	57.	9.5	107.	7.3	6.04	147.
44147	99.	33.	9.6	95.	9.2	6.81	148.
44339	76.	50.	9.6	108.	8.1	5.30	148.
44342	68.	58.	9.8	96.	8.2	5.47	149.
MEAN	81.	50.	9.5	102.	8.3	5.78	147.
S.D.	9.2	7.9	0.22	6.2	0.72	0.631	1.1
N	10	10	10	10	10	10	10

mg/dL = MILLIGRAMS/DECILITER, mEq/L = milliEquivalents/Liter

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 65 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 0.075 MG/L		MALES									
44107	4.7	6.7	2.0	2.35	0.2	20.0	0.3	224.	58.	147.	0.
44111	4.4	6.6	2.2	2.00	0.1	18.2	0.2	177.	47.	117.	0.
44116	4.7	6.7	2.0	2.35	0.2	18.7	0.3	205.	39.	159.	0.
44118	4.6	6.6	2.0	2.30	0.2	20.2	0.3	260.	55.	204.	0.
44124	4.5	6.6	2.1	2.14	0.2	16.3	0.3	196.	44.	143.	1.
44129	4.3	6.7	2.4	1.79	0.1	18.2	0.2	212.	41.	124.	0.
44140	4.4	6.1	1.7	2.59	0.2	18.4	0.3	167.	51.	134.	0.
44142	4.5	6.7	2.2	2.05	0.1	17.8	0.3	206.	55.	135.	0.
44145	4.0	6.7	2.7	1.48	0.1	19.7	0.2	214.	49.	127.	0.
44333	4.4	6.4	2.0	2.20	0.1	19.4	0.3	164.	44.	139.	0.
MEAN	4.5	6.6	2.1	2.13	0.2	18.7	0.3	203.	48.	143.	0.
S.D.	0.21	0.19	0.27	0.317	0.05	1.18	0.05	28.8	6.4	24.6	0.3
N	10	10	10	10	10	10	10	10	10	10	10

U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mg/dL = MILLIGRAMS/DECILITER

TABLE 65 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L
GROUP: 0.075 MG/L		MALES					
44107	81.	71.	9.3	98.	7.5	4.59	149.
44111	70.	83.	9.5	108.	6.8	5.27	148.
44116	73.	65.	9.9	108.	8.9	6.63	146.
44118	91.	54.	9.6	95.	8.7	5.45	147.
44124	77.	53.	9.5	97.	8.5	5.93	150.
44129	78.	42.	9.6	94.	8.7	6.36	149.
44140	101.	53.	9.3	95.	9.1	5.97	146.
44142	87.	58.	9.6	107.	7.7	5.05	148.
44145	89.	57.	9.7	104.	8.4	5.33	145.
44333	73.	60.	9.5	108.	7.6	5.43	147.
MEAN	82.	60.	9.6	101.	8.2	5.60	148.
S.D.	9.8	11.3	0.18	6.1	0.74	0.618	1.6
N	10	10	10	10	10	10	10

mg/dL = MILLIGRAMS/DECILITER, mEq/L = milliEquivalents/Liter

TABLE 65 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 0.25 MG/L		MALES									
44102	4.7	6.3	1.6	2.94	0.1	16.3	0.3	186.	44.	135.	1.
44104	4.2	6.2	2.0	2.10	0.1	20.1	0.3	202.	35.	104.	0.
44109	4.6	6.7	2.1	2.19	0.2	28.3	0.4	202.	48.	143.	0.
44130	4.4	6.8	2.4	1.83	0.2	24.4	0.4	205.	60.	136.	0.
44136	4.6	6.6	2.0	2.30	0.1	19.0	0.2	191.	53.	141.	0.
44139	4.4	7.3	2.9	1.52	0.2	20.9	0.4	176.	75.	154.	1.
44146	4.2	6.6	2.4	1.75	0.1	17.7	0.2	208.	49.	145.	0.
44334	4.4	6.6	2.2	2.00	0.1	17.1	0.2	172.	44.	130.	0.
44338	4.5	7.1	2.6	1.73	0.2	15.9	0.3	125.	43.	133.	0.
MEAN	4.4	6.7	2.2	2.04	0.1	20.0	0.3	185.	50.	136.	0.
S.D.	0.17	0.35	0.38	0.418	0.05	4.10	0.09	26.0	11.6	13.9	0.4
N	9	9	9	9	9	9	9	9	9	9	9

U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mg/dL = MILLIGRAMS/DECILITER

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 65 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L
GROUP: 0.25 MG/L		MALES					
44102	76.	48.	9.3	97.	8.6	5.31	148.
44104	90.	56.	9.4	108.	7.0	5.51	145.
44109	82.	60.	9.5	99.	8.9	5.64	151.
44130	110.	50.	9.5	96.	8.2	4.57	149.
44136	76.	62.	9.5	108.	7.9	5.22	148.
44139	97.	48.	9.6	95.	8.6	5.75	146.
44146	82.	47.	9.2	107.	8.8	5.45	147.
44334	68.	76.	9.5	95.	8.5	5.34	146.
44338	66.	69.	9.6	106.	10.9	7.22	148.
MEAN	83.	57.	9.5	101.	8.6	5.56	148.
S.D.	14.1	10.3	0.13	5.9	1.04	0.709	1.8
N	9	9	9	9	9	9	9

mg/dL = MILLIGRAMS/DECILITER, mEq/L = milliEquivalents/Liter

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 65 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 0.00 MG/L		FEMALES									
44154	5.0	7.2	2.2	2.27	0.1	19.2	0.4	178.	41.	112.	0.
44164	4.6	6.4	1.8	2.56	0.2	15.5	0.3	152.	32.	109.	0.
44178	4.7	6.5	1.8	2.61	0.1	20.4	0.3	137.	40.	107.	1.
44181	4.1	6.6	2.5	1.64	0.2	22.2	0.3	126.	44.	158.	0.
44204	4.5	7.1	2.6	1.73	0.1	20.1	0.3	105.	43.	118.	1.
44207	4.7	6.5	1.8	2.61	0.2	15.8	0.3	144.	40.	89.	1.
44346	4.3	6.8	2.5	1.72	0.2	19.9	0.3	144.	38.	116.	2.
44352	4.5	6.9	2.4	1.87	0.1	17.6	0.3	111.	32.	122.	0.
MEAN	4.6	6.8	2.2	2.13	0.2	18.8	0.3	137.	39.	116.	1.
S.D.	0.27	0.30	0.35	0.431	0.05	2.35	0.04	23.4	4.6	19.6	0.7
N	8	8	8	8	8	8	8	8	8	8	8

U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mg/dL = MILLIGRAMS/DECILITER

TABLE 65 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L
GROUP: 0.00 MG/L		FEMALES					
44154	96.	68.	9.6	101.	6.5	4.74	151.
44164	97.	63.	9.5	107.	7.0	5.43	145.
44178	85.	43.	9.5	108.	6.5	5.18	146.
44181	103.	63.	9.2	107.	7.9	6.14	144.
44204	95.	73.	9.5	95.	6.2	5.05	145.
44207	106.	58.	9.7	101.	7.6	6.28	148.
44346	91.	53.	9.4	98.	8.5	5.06	148.
44352	83.	73.	9.7	106.	7.5	5.72	144.
MEAN	95.	62.	9.5	103.	7.2	5.45	146.
S.D.	8.0	10.3	0.16	4.8	0.80	0.551	2.4
N	8	8	8	8	8	8	8

mg/dL = MILLIGRAMS/DECILITER, mEq/L = milliEquivalents/Liter

TABLE 65 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 0.025 MG/L		FEMALES									
44159	4.2	6.8	2.6	1.62	0.2	17.8	0.4	74.	45.	140.	0.
44160	4.8	6.8	2.0	2.40	0.1	17.8	0.3	158.	66.	121.	0.
44170	4.7	7.1	2.4	1.96	0.1	17.6	0.3	150.	32.	128.	1.
44172	4.4	6.9	2.5	1.76	0.2	21.4	0.4	148.	37.	147.	0.
44179	4.5	7.1	2.6	1.73	0.2	15.5	0.3	93.	34.	107.	0.
44183	5.0	6.9	1.9	2.63	0.2	19.0	0.3	126.	27.	102.	0.
44191	4.4	7.3	2.9	1.52	0.1	15.5	0.3	116.	47.	123.	0.
44192	4.3	6.7	2.4	1.79	0.1	17.0	0.3	150.	42.	128.	0.
44201	4.3	6.9	2.6	1.65	0.2	19.7	0.3	147.	26.	129.	0.
MEAN	4.5	6.9	2.4	1.90	0.2	17.9	0.3	129.	40.	125.	0.
S.D.	0.27	0.19	0.31	0.376	0.05	1.91	0.04	29.4	12.4	14.2	0.3
N	9	9	9	9	9	9	9	9	9	9	9

U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mg/dL = MILLIGRAMS/DECILITER

TABLE 65 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L
GROUP: 0.025 MG/L		FEMALES					
44159	96.	53.	9.4	98.	8.7	6.74	147.
44160	108.	54.	9.5	100.	5.9	4.40	150.
44170	100.	67.	9.7	97.	6.9	5.17	147.
44172	92.	61.	9.4	107.	7.3	4.87	145.
44179	102.	86.	9.8	106.	7.1	5.44	145.
44183	100.	73.	9.6	98.	6.4	5.08	146.
44191	76.	78.	9.8	109.	7.7	5.90	145.
44192	90.	53.	9.2	108.	6.2	5.83	145.
44201	105.	72.	9.4	108.	7.5	5.84	143.
MEAN	97.	66.	9.5	103.	7.1	5.47	146.
S.D.	9.6	11.9	0.21	5.1	0.86	0.690	2.0
N	9	9	9	9	9	9	9

mg/dL = MILLIGRAMS/DECILITER, mEq/L = milliEquivalents/Liter

TABLE 65 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 0.075 MG/L FEMALES											
44150	4.7	7.0	2.3	2.04	0.1	18.9	0.4	172.	21.	129.	1.
44152	4.5	6.8	2.3	1.96	0.1	21.6	0.3	93.	39.	142.	0.
44161	4.2	7.0	2.8	1.50	0.1	18.3	0.3	120.	36.	142.	0.
44169	4.7	6.8	2.1	2.24	0.2	14.8	0.3	129.	31.	125.	0.
44171	4.6	7.1	2.5	1.84	0.1	16.8	0.3	147.	51.	131.	1.
44197	4.1	6.3	2.2	1.86	0.1	16.2	0.2	121.	36.	123.	0.
44202	4.6	6.6	2.0	2.30	0.1	19.1	0.3	92.	46.	158.	1.
44344	4.8	7.1	2.3	2.09	0.2	25.4	0.3	97.	50.	148.	0.
44347	4.5	6.8	2.3	1.96	0.2	18.9	0.3	172.	39.	112.	1.
MEAN	4.5	6.8	2.3	1.98	0.1	18.9	0.3	127.	39.	134.	0.
S.D.	0.23	0.26	0.23	0.237	0.05	3.13	0.05	31.3	9.5	14.2	0.5
N	9	9	9	9	9	9	9	9	9	9	9

U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mg/dL = MILLIGRAMS/DECILITER

TABLE 65 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L
GROUP: 0.075 MG/L		FEMALES					
44150	97.	67.	9.8	101.	5.8	4.46	150.
44152	85.	98.	9.3	108.	7.1	5.32	146.
44161	94.	44.	9.2	110.	6.9	5.96	146.
44169	89.	62.	9.4	98.	7.3	5.60	147.
44171	86.	74.	9.5	99.	6.4	4.99	147.
44197	98.	59.	9.0	108.	6.9	5.23	146.
44202	81.	67.	9.6	98.	8.3	6.23	148.
44344	79.	72.	9.7	100.	7.6	5.34	152.
44347	84.	56.	9.5	110.	6.3	5.03	145.
MEAN	88.	67.	9.4	104.	7.0	5.35	147.
S.D.	6.9	14.9	0.25	5.3	0.75	0.530	2.2
N	9	9	9	9	9	9	9

mg/dL = MILLIGRAMS/DECILITER, mEq/L = milliEquivalents/Liter

TABLE 65 (WEEK 4 EVALUATION)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 0.25 MG/L		FEMALES									
44155	4.5	6.9	2.4	1.87	0.1	26.8	0.4	149.	50.	140.	0.
44168	4.8	7.0	2.2	2.18	0.2	19.3	0.3	215.	72.	161.	0.
44175	4.1	6.8	2.7	1.52	0.2	21.6	0.3	91.	40.	174.	0.
44184	4.5	6.7	2.2	2.05	0.1	21.5	0.4	140.	45.	111.	0.
44189	4.5	6.5	2.0	2.25	0.1	15.9	0.3	180.	42.	113.	0.
44190	4.5	6.5	2.0	2.25	0.2	18.9	0.3	139.	48.	190.	0.
MEAN	4.5	6.7	2.3	2.02	0.2	20.7	0.3	152.	50.	148.	0.
S.D.	0.22	0.21	0.27	0.285	0.05	3.66	0.05	41.9	11.6	32.5	0.0
N	6	6	6	6	6	6	6	6	6	6	6

U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mg/dL = MILLIGRAMS/DECILITER

TABLE 65 (WEEK 4 EVALUATION)

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SPONSOR:ELF ATOCHEM INC. — INDIVIDUAL SERUM CHEMISTRY VALUES — WEEK 4

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L
GROUP: 0.25 MG/L		FEMALES					
44155	95.	52.	9.3	109.	6.8	5.81	146.
44168	71.	59.	10.0	105.	9.2	6.96	144.
44175	93.	52.	9.2	98.	7.3	5.51	146.
44184	94.	54.	9.8	108.	7.9	5.31	147.
44189	99.	45.	9.2	98.	6.5	4.82	147.
44190	113.	58.	9.4	95.	7.6	5.41	145.
MEAN	94.	53.	9.5	102.	7.6	5.64	146.
S.D.	13.5	5.0	0.33	5.9	0.96	0.724	1.2
N	6	6	6	6	6	6	6

mg/dL = MILLIGRAMS/DECILITER, mEq/L = milliEquivalents/Liter

TABLE 66 (WEEK 6 RECOVERY EVALUATION)

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SPONSOR:ELF ATOCHEM INC. INDIVIDUAL SERUM CHEMISTRY VALUES WEEK 6

ANIMAL	UREA NITROGEN mg/dL
GROUP: 0.00 MG/L MALES	
44103	12.0
44108	14.8
44115	16.4
44135	13.0
44137	16.2
MEAN	14.5
S.D.	1.94
N	5

mg/dL = MILLIGRAMS/DECILITER

TABLE 66 (WEEK 6 RECOVERY EVALUATION)

PROJECT NO.:WIL-160033 | A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS | PAGE 2

SPONSOR:ELF ATOCHEM INC. | INDIVIDUAL SERUM CHEMISTRY VALUES | WEEK 6

ANIMAL	UREA NITROGEN
	mg/dL
GROUP: 0.025 MG/L MALES	
44098	14.8
44101	13.2
44119	15.0
44126	13.6
44128	11.9
MEAN	13.7
S.D.	1.26
N	5

mg/dL = MILLIGRAMS/DECILITER

TABLE 66 (WEEK 6 RECOVERY EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL SERUM CHEMISTRY VALUES WEEK 6

ANIMAL	UREA NITROGEN mg/dL
GROUP: 0.075 MG/L MALES	
44094	14.1
44096	14.0
44100	15.3
44134	15.2
44340	16.0
MEAN	14.9
S.D.	0.85
N	5

mg/dL = MILLIGRAMS/DECILITER

TABLE 66 (WEEK 6 RECOVERY EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	UREA NITROGEN
	mg/dL
GROUP: 0.25 MG/L MALES	
44097	15.3
44089	11.6
44112	14.1
44123	14.8
44133	15.4
MEAN	14.2
S.D.	1.56
N	5

mg/dL = MILLIGRAMS/DECILITER

TABLE 66 (WEEK 6 RECOVERY EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	ASPARTAT TRANSFER
	U/L
GROUP: 0.00 MG/L FEMALES	
44149	102.
44151	107.
44156	77.
44176	83.
44180	104.
MEAN	95.
S.D.	13.6
N	5

U/L = INTERNATIONAL UNIT/LITER

TABLE 66 (WEEK 6 RECOVERY EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS PAGE 6

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL SERUM CHEMISTRY VALUES WEEK 6

ANIMAL	ASPARTAT TRANSFER
	U/L
GROUP: 0.025 MG/L FEMALES	
44162	102.
44187	116.
44195	87.
44349	173.
44350	119.
MEAN	119.
S.D.	32.5
N	5

U/L = INTERNATIONAL UNIT/LITER

TABLE 66 (WEEK 6 RECOVERY EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL SERUM CHEMISTRY VALUES WEEK 6

ANIMAL	ASPARTAT TRANSFER
	U/L
GROUP: 0.075 MG/L FEMALES	
44165	69.
44186	185.
44196	70.
44200	84.
44206	96.
MEAN	101.
S.D.	48.4
N	5

U/L = INTERNATIONAL UNIT/LITER

TABLE 66 (WEEK 6 RECOVERY EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL SERUM CHEMISTRY VALUES WEEK 6

ANIMAL	ASPARTAT TRANSFER
	U/L
GROUP: 0.25 MG/L FEMALES	
44167	96.
44182	72.
44198	101.
44205	158.
44345	84.
MEAN	102.
S.D.	33.2
N	5

U/L = INTERNATIONAL UNIT/LITER

TABLE 67 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS PAGE 1

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL SPECIAL CHEMISTRY VALUES WEEK 4

ANIMAL	BILE ACIDS umol/L
GROUP: 0.00 MG/L MALES	
44091	23.5
44099	14.0
44114	54.8
44121	14.7
44131	82.1
44132	20.4
44141	56.5
44337	14.9
MEAN	35.1
S.D.	25.84
N	8

umol/L = micromoles/Liter

TABLE 67 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL SPECIAL CHEMISTRY VALUES WEEK 4

ANIMAL	BILE ACIDS
	umol/L
GROUP: 0.025 MG/L MALES	
44092	14.2
44093	71.6
44110	82.4
44113	24.9
44138	452.2
44143	60.7
44144	19.9
44147	30.2
44339	75.7
44342	35.1
MEAN	86.7
S.D.	130.82
N	10

umol/L = micromoles/Liter

TABLE 67 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS PAGE 3

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL SPECIAL CHEMISTRY VALUES WEEK 4

ANIMAL	BILE ACIDS umol/L
GROUP: 0.075 MG/L MALES	
44107	28.0
44111	34.8
44116	43.5
44118	60.1
44124	22.8
44129	14.2
44140	66.8
44142	64.9
44145	59.6
44333	64.3
MEAN	45.9
S.D.	19.76
N	10

umol/L = micromoles/Liter

TABLE 67 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS PAGE 4

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL SPECIAL CHEMISTRY VALUES WEEK 4

ANIMAL	BILE ACIDS
	umol/L
GROUP: 0.25 MG/L MALES	
44102	77.7
44104	52.5
44109	67.5
44130	53.3
44136	47.7
44139	21.7
44146	58.0
44334	59.9
44338	43.6
MEAN	53.5
S.D.	15.76
N	9

umol/L = micromoles/Liter

TABLE 67 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL SPECIAL CHEMISTRY VALUES WEEK 4

ANIMAL	BILE ACIDS umol/L
GROUP: 0.00 MG/L FEMALES	
44154	10.1
44164	39.8
44178	10.7
44181	35.5
44204	64.3
44207	42.0
44346	106.2
44352	12.5
MEAN	40.1
S.D.	32.75
N	8

umol/L = micromoles/Liter

TABLE 67 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL SPECIAL CHEMISTRY VALUES WEEK 4

ANIMAL	BILE ACIDS
	umol/L
GROUP: 0.025 MG/L FEMALES	
44159	14.8
44160	22.3
44170	41.4
44172	10.7
44179	25.4
44183	52.4
44191	14.9
44192	20.9
44201	29.0
MEAN	25.8
S.D.	13.53
N	9

umol/L = micromoles/Liter

TABLE 67 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL SPECIAL CHEMISTRY VALUES WEEK 4

ANIMAL	BILE ACIDS
	umol/L
GROUP: 0.075 MG/L FEMALES	
44150	13.1
44152	34.9
44161	12.2
44169	37.6
44171	26.9
44197	10.9
44202	16.6
44344	30.3
44347	39.5
MEAN	24.7
S.D.	11.58
N	9

umol/L = micromoles/Liter

TABLE 67 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL SPECIAL CHEMISTRY VALUES WEEK 4

ANIMAL	BILE ACIDS
	umol/L
GROUP: 0.25 MG/L FEMALES	
44155	12.4
44168	18.5
44175	62.4
44184	24.5
44189	18.4
44190	18.5
MEAN	25.8
S.D.	18.34
N	6

umol/L = micromoles/Liter

TABLE 68 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS PAGE 1

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL URINE VOLUMES AND CHEMISTRY VALUES WEEK 4

ANIMAL	TOTAL VOLUME	UROBIL-INOGEN
	mL	mg/dL
GROUP: 0.00 MG/L		MALES
44091	27.5	0.
44099	11.0	0.
44114	5.0	0.
44121	7.0	0.
44131	8.5	0.
44132	6.5	0.
44141	3.5	0.
44337	7.0	0.
MEAN	9.5	0.
S.D.	7.61	0.0
N	8	8

mL = MILLILITER, mg/dL = MILLIGRAMS/DECILITER

TABLE 68 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS PAGE 2

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL URINE VOLUMES AND CHEMISTRY VALUES WEEK 4

ANIMAL	TOTAL VOLUME	UROBIL-INOGEN
	mL	mg/dL
GROUP: 0.025 MG/L		MALES
44092	22.0	0.
44093	7.0	0.
44110	4.0	0.
44113	4.0	0.
44138	8.0	0.
44143	3.5	0.
44144	12.0	0.
44147	4.5	0.
44339	3.5	0.
44342	3.0	0.
MEAN	7.2	0.
S.D.	5.92	0.0
N	10	10

mL = MILLILITER, mg/dL = MILLIGRAMS/DECILITER

TABLE 68 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS PAGE 3

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL URINE VOLUMES AND CHEMISTRY VALUES WEEK 4

ANIMAL	TOTAL VOLUME	UROBIL-INOGEN
	mL	mg/dL
GROUP: 0.075 MG/L		MALES
44107	1.5	0.
44111	7.0	0.
44116	5.5	0.
44118	2.5	0.
44124	2.5	0.
44129	9.0	0.
44140	14.0	0.
44142	2.5	0.
44145	4.5	0.
44333	2.0	0.
MEAN	5.1	0.
S.D.	3.96	0.0
N	10	10

mL = MILLILITER, mg/dL = MILLIGRAMS/DECILITER

TABLE 68 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL URINE VOLUMES AND CHEMISTRY VALUES

ANIMAL	TOTAL VOLUME	UROBIL-INOGEN
	mL	mg/dL
GROUP: 0.25 MG/L		MALES
44102	14.0	0.
44104	3.0	0.
44109	2.0	0.
44130	3.0	0.
44136	4.5	0.
44139	2.0	0.
44146	24.0	0.
44334	2.0	0.
44338	13.0	0.
MEAN	7.5	0.
S.D.	7.79	0.0
N	9	9

mL = MILLILITER, mg/dL = MILLIGRAMS/DECILITER

TABLE 68 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS PAGE 5

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL URINE VOLUMES AND CHEMISTRY VALUES WEEK 4

ANIMAL	TOTAL VOLUME	UROBIL-INOGEN
	mL	mg/dL
GROUP: 0.00 MG/L		FEMALES
44154	3.5	0.
44164	6.0	0.
44178	3.0	0.
44181	2.5	0.
44204	6.0	0.
44207	3.0	0.
44346	3.0	0.
44352	11.5	0.
MEAN	4.8	0.
S.D.	3.03	0.0
N	8	8

mL = MILLILITER, mg/dL = MILLIGRAMS/DECILITER

TABLE 68 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL URINE VOLUMES AND CHEMISTRY VALUES

ANIMAL	TOTAL VOLUME	UROBIL-INOGEN
	mL	mg/dL
GROUP: 0.025 MG/L		FEMALES
44159	8.5	0.
44160	2.0	0.
44170	13.0	0.
44172	2.5	0.
44179	12.0	0.
44183	5.0	0.
44191	8.5	0.
44192	4.0	0.
44201	1.5	0.
MEAN	6.3	0.
S.D.	4.33	0.0
N	9	9

mL = MILLILITER, mg/dL = MILLIGRAMS/DECILITER

TABLE 68 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS PAGE 7

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL URINE VOLUMES AND CHEMISTRY VALUES WEEK 4

ANIMAL	TOTAL VOLUME	UROBIL-INOGEN
	mL	mg/dL
GROUP: 0.075 MG/L		FEMALES
44150	4.0	0.
44152	7.0	0.
44161	7.0	0.
44169	7.5	0.
44171	8.0	0.
44197	5.0	0.
44202	7.5	0.
44344	1.0	0.
44347	2.0	0.
MEAN	5.4	0.
S.D.	2.59	0.0
N	9	9

mL = MILLILITER, mg/dL = MILLIGRAMS/DECILITER

TABLE 68 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. INDIVIDUAL URINE VOLUMES AND CHEMISTRY VALUES WEEK 4

ANIMAL	TOTAL VOLUME	UROBIL-INOGEN
	mL	mg/dL
GROUP: 0.25 MG/L		FEMALES
44155	3.5	0.
44168	5.5	0.
44175	2.5	0.
44184	2.5	0.
44189	4.0	0.
44190	9.5	0.
MEAN	4.6	0.
S.D.	2.65	0.0
N	6	6

mL = MILLILITER, mg/dL = MILLIGRAMS/DECILITER

TABLE 69 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 — A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS — PAGE 1

SPONSOR:ELF ATOCHEM INC. — INDIVIDUAL URINALYSIS VALUES — WEEK 4

	MACRO											MICRO									
ANIMAL	CLOR	APP	SG	PH	PRO	GLU	KET	BIL	BLD	NIT	WBC	WBC	RBC	EPI	BAC	AMC	HA	TPH	COX	UAC	OTHER
GROUP:	0.00 MG/L			MALES																	
44091	LS	HAZ	1.015	6.5	TR	NG	NG	NG	1+	NG	NG	NG	0- 1	NG	R	NG	NG	NG	NG	NG	F-SPERM
44099	S	HAZ	1.025	5.5	TR	NG	NG	NG	NG	NG	NG	0- 1	NG	F	F	NG	NG	NG	NG	NG	F-SPERM
44114	S	HAZ	1.045	5.5	1+	NG	NG	NG	NG	NG	NG	NG	NG	F	F	NG	NG	R	NG	NG	F-SPERM
44121	S	HAZ	1.040	6.0	1+	NG	1+	NG	1+	NG	NG	NG	NG	F	F	NG	NG	F	NG	NG	F-SPERM
44131	S	HAZ	1.040	6.0	TR	NG	1+	NG	NG	NG	NG	0- 1	0- 1	F	F	NG	NG	R	NG	NG	F-SPERM
44132	S	HAZ	1.035	5.5	TR	NG	NG	NG	NG	NG	NG	NG	NG	F	F	NG	NG	M	NG	NG	F-SPERM
44141	S	CLD	1.045	6.0	TR	NG	1+	NG	NG	NG	NG	NG	0- 1	NG	F	NG	NG	M	R	NG	F-SPERM
44337	S	HAZ	1.035	5.5	TR	NG	NG	NG	NG	NG	NG	0- 2	NG	F	M	NG	NG	NG	NG	NG	A-SPERM
MEAN			1.035	5.8																	
S.D.			0.0104	0.37																	
N			8	8																	

------- MACRO CODE -------

CLOR=COLOR, APP=APPEARANCE, SG=SPECIFIC GRAVITY, PRO=PROTEIN, GLU=GLUCOSE, KET=KETONE, BIL=BILIRUBIN, BLD=BLOOD, NIT=NITRITE, S=STRAW, LS=LIGHT STRAW, HAZ=HAZY, CLD=CLOUDY, NG=NEGATIVE, 1+=TRACE TO SLIGHT, TR=TRACE

------- MICRO CODE -------

EPI=EPITHELIAL, BAC=BACTERIA, AMC=AMORPHOUS CRYSTALS, HA=HIPPURIC ACID, TPH=TRIPLE PHOSPHATES, COX=CALCIUM OXALATE, UAC=URIC ACID CRYSTALS, NG=NEGATIVE, R=RARE, F=FEW, M=MODERATE, A=ABUNDANT

TABLE 69 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 — A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS — PAGE 2

SPONSOR:ELF ATOCHEM INC. — INDIVIDUAL URINALYSIS VALUES — WEEK 4

	MACRO											MICRO										
ANIMAL	CLOR	APP	SG	PH	PRO	GLU	KET	BIL	BLD	NIT	WBC	WBC	RBC	EPI	BAC	AMC	HA	TPH	COX	UAC	CASTS	OTHER
GROUP:	0.025 MG/L											MALES										
44092	LS	HAZ	1.015	6.0	TR	NG	NG	NG	NG	NG	NG	NG	NG	R	F	NG	NG	NG	NG	NG	R-FINE GRN	F-SPERM
44093	S	CLD	1.035	6.0	1+	NG	NG	NG	NG	NG	NG	0- 1	NG	F	M	NG	NG	M	NG	NG		M-SPERM
44110	S	HAZ	1.035	5.5	TR	NG	NG	NG	NG	NG	NG	NG	NG	F	F	NG	NG	NG	NG	NG		
44113	S	HAZ	1.040	5.5	TR	NG	NG	NG	NG	NG	NG	NG	NG	M	F	NG	NG	NG	NG	NG		F-SPERM
44138	S	HAZ	1.025	6.5	TR	NG	NG	NG	NG	NG	NG	NG	NG	NG	F	NG	NG	NG	NG	NG	R-FINE GRN	F-SPERM
44143	S	HAZ	1.050	5.5	1+	NG	1+	NG	NG	NG	NG	NG	NG	F	F	NG	NG	F	NG	NG		M-SPERM
44144	LS	HAZ	1.020	6.0	TR	NG	NG	NG	1+	NG	NG	NG	2- 4	R	F	NG	NG	NG	NG	NG		M-SPERM
44147	S	HAZ	1.040	6.0	TR	NG	NG	NG	NG	NG	NG	NG	0- 1	F	F	NG	NG	NG	NG	NG	F-CRS GRN	A-SPERM
44339	S	HAZ	1.045	6.0	1+	NG	1+	NG	NG	NG	NG	NG	NG	M	F	NG	NG	NG	NG	NG		F-SPERM
44342	DS	CLD	1.050	6.0	1+	NG	1+	NG	NG	NG	NG	NG	NG	NG	F	NG	NG	A	NG	NG		F-SPERM
MEAN			1.036	5.9																		
S.D.			0.0121	0.32																		
N			10	10																		

------- MACRO CODE -------

CLOR=COLOR, APP=APPEARANCE, SG=SPECIFIC GRAVITY, PRO=PROTEIN, GLU=GLUCOSE, KET=KETONE, BIL=BILIRUBIN, BLD=BLOOD, NIT=NITRITE, S=STRAW, LS=LIGHT STRAW, DS=DARK STRAW, HAZ=HAZY, CLD=CLOUDY, NG=NEGATIVE, 1+=TRACE TO SLIGHT, TR=TRACE

------- MICRO CODE -------

EPI=EPITHELIAL, BAC=BACTERIA, AMC=AMORPHOUS CRYSTALS, HA=HIPPURIC ACID, TPH=TRIPLE PHOSPHATES, COX=CALCIUM OXALATE, UAC=URIC ACID CRYSTALS, NG=NEGATIVE, R=RARE, F=FEW, M=MODERATE, A=ABUNDANT, FINE GRN=FINE GRANULAR, CRS GRN=COARSE GRANULAR

TABLE 69 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 — A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS — PAGE 3

SPONSOR:ELF ATOCHEM INC. — INDIVIDUAL URINALYSIS VALUES — WEEK 4

	MACRO												MICRO									
ANIMAL	CLOR	APP	SG	PH	PRO	GLU	KET	BIL	BLD	NIT	WBC	WBC	RBC	EPI	BAC	AMC	HA	TPH	COX	UAC	CASTS	OTHER
GROUP:	0.075 MG/L			MALES																		
44107	S	CLD	1.080	5.0	1+	NG	1+	NG	1+	NG	NG	0- 1	0- 2	NG	F	NG	NG	F	NG	NG		F-SPERM
44111	S	HAZ	1.030	5.5	TR	NG	NG	NG	NG	NG	NG	NG	NG	F	M	NG	NG	NG	NG	NG		
44116	S	CLD	1.040	6.0	TR	NG	1+	NG	NG	NG	NG	NG	NG	R	F	NG	NG	NG	NG	NG		
44118	S	CLD	1.060	5.5	1+	NG	NG	NG	1+	NG	NG	0- 1	0- 1	NG	F	NG	NG	NG	NG	NG	F-FINE GRN	M-SPERM
44124	S	CLD	1.060	5.5	1+	NG	1+	NG	3+	NG	NG	1- 2	1- 3	M	M	NG	NG	NG	NG	NG		F-SPERM
44129	S	HAZ	1.030	6.0	TR	NG	NG	NG	1+	NG	TR	0- 2	0- 1	NG	F	NG	NG	NG	NG	NG		M-SPERM
44140	LS	HAZ	1.020	6.5	TR	NG	NG	NG	NG	NG	NG	NG	NG	NG	F	NG	NG	NG	NG	NG		F-SPERM
44142	S	HAZ	1.055	5.5	1+	NG	1+	NG	NG	NG	NG	0- 2	NG	F	M	NG	NG	NG	NG	NG		
44145	DS	HAZ	1.070	5.5	1+	NG	2+	1+	1+	NG	NG	NG	NG	R	F	NG	NG	F	NG	NG		F-SPERM
44333	S	HAZ	1.060	5.5	1+	NG	1+	NG	NG	NG	NG	NG	NG	F	F	NG	NG	F	NG	NG		M-SPERM
MEAN			1.051	5.7																		
S.D.			0.0195	0.41																		
N			10	10																		

------- MACRO CODE -------

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------- MICRO CODE -------

EPI=EPITHELIAL, BAC=BACTERIA, AMC=AMORPHOUS CRYSTALS, HA=HIPPURIC ACID, TPH=TRIPLE PHOSPHATES, COX=CALCIUM OXALATE, UAC=URIC ACID CRYSTALS, NG=NEGATIVE, R=RARE, F=FEW, M=MODERATE, FINE GRN=FINE GRANULAR

TABLE 69 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 — A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS — PAGE 4

SPONSOR:ELF ATOCHEM INC. — INDIVIDUAL URINALYSIS VALUES — WEEK 4

	MACRO											MICRO									
ANIMAL	CLOR	APP	SG	PH	PRO	GLU	KET	BIL	BLD	NIT	WBC	WBC	RBC	EPI	BAC	AMC	HA	TPH	COX	UAC	CASTS	OTHER
GROUP:	0.25 MG/L			MALES																		
44102	LS	HAZ	1.015	5.5	TR	NG	NG	NG	NG	NG	NG	0- 1	NG	F	M	NG	NG	NG	NG	NG		F-SPERM
44104	S	HAZ	1.045	5.5	1+	NG	1+	NG	NG	NG	NG	NG	NG	F	F	NG	NG	NG	NG	NG		M-SPERM
44109	DS	CLD	1.070	5.5	1+	NG	1+	NG	1+	NG	NG	0- 1	0- 1	NG	F	NG	NG	F	NG	NG	R-FINE GRN	F-SPERM
44130	S	CLD	1.050	5.5	1+	NG	1+	NG	2+	NG	NG	0- 2	0- 2	M	M	NG	NG	NG	NG	NG		F-SPERM
44136	S	CLD	1.060	6.0	1+	NG	1+	NG	NG	NG	NG	NG	NG	F	M	NG	NG	F	NG	NG		F-SPERM
44139	DS	HAZ	1.080	5.0	1+	NG	1+	NG	1+	NG	NG	0- 1	0- 1	F	M	NG	NG	R	NG	NG	F-FINE GRN	R-SPERM
44146	LS	HAZ	1.015	5.5	TR	NG	NG	NG	1+	NG	NG	NG	0- 2	F	F	NG	NG	NG	NG	NG		F-SPERM
44334	S	CLD	1.070	5.0	1+	NG	NG	NG	NG	NG	NG	0- 1	0- 1	NG	M	NG	NG	F	NG	NG	M-CRS GRN	
44338	LS	HAZ	1.020	6.0	TR	NG	NG	NG	NG	NG	NG	NG	NG	F	M	NG	NG	NG	NG	NG		
MEAN			1.047	5.5																		
S.D.			0.0253	0.35																		
N			9	9																		

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TABLE 69 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 — A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS — PAGE 5

SPONSOR:ELF ATOCHEM INC. — INDIVIDUAL URINALYSIS VALUES — WEEK 4

	MACRO											MICRO									
ANIMAL	CLOR	APP	SG	PH	PRO	GLU	KET	BIL	BLD	NIT	WBC	WBC	RBC	EPI	BAC	AMC	HA	TPH	COX	UAC	CASTS
GROUP: 0.00 MG/L FEMALES																					
44154	S	CLD	1.050	6.0	1+	NG	NG	NG	NG	NG	NG	0- 1	0- 1	F	F	NG	NG	F	NG	NG	
44164	S	HAZ	1.035	5.5	TR	NG	NG	NG	NG	NG	NG	NG	0- 1	R	F	NG	NG	NG	NG	NG	
44178	S	HAZ	1.055	5.0	1+	NG	1+	NG	NG	NG	NG	NG	NG	R	F	NG	NG	NG	NG	NG	
44181	S	HAZ	1.080	6.0	2+	NG	2+	NG	NG	NG	NG	NG	NG	F	F	NG	NG	R	NG	NG	R-HYALINE
44204	S	CLD	1.035	5.5	TR	NG	NG	NG	NG	NG	NG	0- 1	0- 2	NG	F	NG	NG	NG	NG	NG	
44207	S	HAZ	1.045	5.5	TR	NG	NG	NG	NG	NG	NG	NG	0- 2	R	F	NG	NG	NG	NG	NG	
44346	S	HAZ	1.050	5.0	TR	NG	NG	NG	NG	NG	NG	NG	0- 1	F	F	NG	NG	NG	NG	NG	
44352	LS	HAZ	1.020	6.0	TR	NG	NG	NG	NG	P+	NG	NG	NG	R	F	NG	NG	NG	NG	NG	
MEAN			1.046	5.6																	
S.D.			0.0177	0.42																	
N			8	8																	

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TABLE 69 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 — A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS — PAGE 6

SPONSOR:ELF ATOCHEM INC. — INDIVIDUAL URINALYSIS VALUES — WEEK 4

	MACRO											MICRO									
ANIMAL	CLOR	APP	SG	PH	PRO	GLU	KET	BIL	BLD	NIT	WBC	WBC	RBC	EPI	BAC	AMC	HA	TPH	COX	UAC	CASTS
GROUP:	0.025 MG/L			FEMALES																	
44159	S	HAZ	1.035	5.5	TR	NG	NG	NG	2+	NG	NG	0- 2	0- 2	NG	F	NG	NG	NG	NG	NG	R-FINE GRN
44160	S	HAZ	1.060	5.0	1+	NG	NG	NG	NG	NG	NG	NG	NG	F	F	NG	NG	NG	NG	NG	
44170	LS	HAZ	1.020	6.5	TR	NG	NG	NG	NG	NG	NG	0- 1	0- 1	F	F	NG	NG	NG	NG	NG	
44172	S	HAZ	1.060	5.5	1+	NG	1+	NG	NG	NG	NG	NG	NG	R	F	NG	NG	NG	NG	NG	
44179	LS	HAZ	1.020	5.5	TR	NG	NG	NG	NG	NG	NG	NG	NG	F	F	NG	NG	NG	NG	NG	
44183	S	HAZ	1.030	5.0	TR	NG	NG	NG	NG	NG	NG	0- 1	NG	R	F	NG	NG	NG	NG	NG	
44191	S	HAZ	1.025	6.0	TR	NG	NG	NG	NG	NG	NG	NG	NG	F	F	NG	NG	NG	NG	NG	
44192	S	HAZ	1.050	5.0	TR	NG	NG	NG	NG	NG	NG	NG	NG	R	F	NG	NG	NG	NG	NG	
44201	S	HAZ	1.050	5.5	1+	NG	NG	NG	NG	NG	NG	NG	NG	F	F	NG	NG	NG	NG	NG	
MEAN			1.039	5.5																	
S.D.			0.0164	0.50																	
N			9	9																	

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TABLE 69 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 — A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS — PAGE 7

SPONSOR:ELF ATOCHEM INC. — INDIVIDUAL URINALYSIS VALUES — WEEK 4

	MACRO												MICRO									
ANIMAL	CLOR	APP	SG	PH	PRO	GLU	KET	BIL	BLD	NIT	WBC	WBC	RBC	EPI	BAC	AMC	HA	TPH	COX	UAC	CASTS
GROUP: 0.075 MG/L FEMALES																					
44150	S	HAZ	1.045	6.0	TR	NG	NG	NG	NG	NG	NG	0- 1	NG	F	F	NG	NG	R	NG	NG	R-FINE GRN
44152	LS	HAZ	1.025	5.0	NG	NG	NG	NG	NG	NG	NG	NG	NG	R	F	NG	NG	NG	NG	NG	
44161	S	HAZ	1.030	5.5	TR	NG	NG	NG	NG	NG	NG	NG	NG	R	F	NG	NG	NG	NG	NG	
44169	S	HAZ	1.030	6.0	TR	NG	NG	NG	NG	NG	NG	0- 1	0- 1	F	F	NG	NG	NG	NG	NG	
44171	S	HAZ	1.030	6.0	TR	NG	NG	NG	NG	NG	NG	0- 1	0- 1	F	F	NG	NG	NG	NG	NG	
44197	S	HAZ	1.040	5.5	TR	NG	1+	NG	2+	NG	NG	NG	NG	M	M	NG	NG	NG	NG	NG	
44202	S	HAZ	1.025	5.5	TR	NG	NG	NG	NG	P+	NG	0- 2	0- 2	R	M	NG	NG	NG	NG	NG	F-FINE GRN
44344	DS	CLD	1.070	5.0	2+	NG	NG	NG	NG	NG	NG	NG	NG	F	M	NG	NG	NG	NG	NG	M-FINE GRN
44347	S	HAZ	1.060	5.5	TR	NG	NG	NG	NG	NG	NG	NG	NG	F	F	NG	NG	NG	NG	NG	
MEAN			1.039	5.6																	
S.D.			0.0161	0.39																	
N			9	9																	

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TABLE 69 (WEEK 4 EVALUATION)

PROJECT NO.:WIL-160033 — A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS — PAGE 8

SPONSOR:ELF ATOCHEM INC. — INDIVIDUAL URINALYSIS VALUES — WEEK 4

	MACRO											MICRO									
ANIMAL	CLOR	APP	SG	PH	PRO	GLU	KET	BIL	BLD	NIT	WBC	WBC	RBC	EPI	BAC	AMC	HA	TPH	COX	UAC	CASTS
GROUP: 0.25 MG/L FEMALES																					
44155	S	HAZ	1.055	5.0	TR	NG	1+	NG	NG	NG	NG	NG	NG	F	F	NG	NG	NG	NG	NG	
44168	S	HAZ	1.035	5.5	TR	NG	NG	NG	NG	NG	NG	NG	0- 2	F	M	NG	NG	NG	NG	NG	
44175	S	HAZ	1.060	5.0	1+	NG	1+	NG	NG	NG	NG	0- 1	NG	NG	F	NG	NG	NG	NG	NG	R-FINE GRN
44184	S	HAZ	1.060	5.0	1+	NG	2+	NG	NG	NG	NG	NG	NG	R	M	NG	NG	NG	NG	NG	
44189	S	HAZ	1.035	5.0	TR	NG	NG	NG	NG	NG	NG	NG	NG	R	F	NG	NG	NG	NG	NG	R-FINE GRN
44190	S	HAZ	1.025	5.0	TR	NG	NG	NG	1+	NG	NG	0- 1	0- 3	F	F	NG	NG	NG	NG	NG	
MEAN			1.045	5.1																	
S.D.			0.0152	0.20																	
N			6	6																	

------- MACRO CODE -------

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EPI=EPITHELIAL, BAC=BACTERIA, AMC=AMORPHOUS CRYSTALS, HA=HIPPURIC ACID, TPH=TRIPLE PHOSPHATES, COX=CALCIUM OXALATE, UAC=URIC ACID CRYSTALS, NG=NEGATIVE, R=RARE, F=FEW, M=MODERATE, FINE GRN=FINE GRANULAR

FINAL REPORT

VOLUME 3 OF 3
(Individual Tables 70-76 and Appendices)

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STUDY TITLE

A 4-WEEK INHALATION TOXICITY STUDY
OF METHANE SULFONIC ACID IN ALBINO RATS
CAS Registry Number 75-75-2

PROJECT NUMBER

WIL-160033

PERFORMING LABORATORY

WIL Research Laboratories, Inc.
1407 George Road
Ashland, OH 44805-9281

STUDY DIRECTOR

Charles E. Ulrich, B.S.

STUDY INITIATED ON

November 14, 1995

STUDY COMPLETION DATE

December 17, 1996

SPONSOR

Elf Atochem North America, Inc.
2000 Market Street
Philadelphia, PA 19103

TABLE 70 (UNSCHEDULED DEATHS)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44125 GROUP 1: 0.00 MG/L MALE FOUND DEAD 11/21/95 DATE OF DEATH: 11/21/95 STUDY DAY: 5

		GRADE
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	1
KIDNEYS	MICRO: INFLAMMATION, NONSUPPURATIVE FOCAL, INTERSTITIAL, CORTICAL	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL	1
LYMPH NODE, MES	MICRO: HYPERPLASIA, LYMPHOID PARACORTICAL	1
THYROID GLANDS	MICRO: AUTOLYTIC FOLLICULAR EPITHELIUM SEPARATED FROM BASEMENT MEMBRANE	2
CAUSE DEATH/MORB	GROSS: MECHANICAL TRAUMA ATTRIBUTED TO TRAUMA RESULTING FROM CONFINEMENT IN THE NOSE-ONLY RESTRAINT TUBE	P
LYMPH NODE	GROSS: CERVICAL- REDDENED BILATERAL	P
LYMPH NODE	GROSS: CERVICAL- ENLARGED BILATERAL	P
LYMPH NODE	MICRO: HISTIOCYTOSIS, SINUS- CERVICAL CERVICAL NODE	1
EXTERNAL SURFACE	GROSS: BROWN MATTING ALL EXTERNAL SURFACES	P

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
PANCREAS	RECTUM	PITUITARY	PROSTATE

TABLE 70 (UNSCHEDULED DEATHS)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44125 GROUP 1: 0.00 MG/L MALE FOUND DEAD 11/21/95 DATE OF DEATH: 11/21/95 STUDY DAY: 5

GRADE

SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	STOMACH	TESTES
THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER
MICRO:ADRENAL GLANDS	AORTA	STERNEBRAE	BRAIN
CECUM	COLON	DUODENUM	NASAL TURBINATES
EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	HEART
ILEUM	JEJUNUM	LUNGS	NERVE,SCIATIC
PANCREAS	PARATHYROID	RECTUM	PITUITARY
PROSTATE	SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE
SKIN	SPINAL CORD	SPLEEN	STOMACH
TESTES	THYMUS GLAND	TRACHEA	URINARY BLADDER

NOT EXAMINED

MICRO:LYMPH NODE, BRON

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 44335 GROUP 1: 0.00 MG/L MALE FOUND DEAD 11/22/95 DATE OF DEATH: 11/22/95 STUDY DAY: 6

		GRADE
CECUM	MICRO: AUTOLYTIC MUCOSA	1
DUODENUM	MICRO: AUTOLYTIC MUCOSA	1
LYMPH NODE, SUPR	GROSS: REDDENED BILATERAL	P
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	1
ILEUM	MICRO: AUTOLYTIC MUCOSA	1
JEJUNUM	MICRO: AUTOLYTIC MUCOSA	1
KIDNEYS	MICRO: DEGENERATION, TUBULAR MULTIFOCAL, CORTICAL	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL	1
LYMPH NODE, MES	MICRO: HYPERPLASIA, LYMPHOID PARACORTICAL	1
LUNGS	GROSS: DARK RED AREA(S) MULTIPLE, 2 X 2 TO 14 X 3 MM, ALL LOBES	P
LUNGS	MICRO: RBC EXTRAVASATION MULTIFOCAL, PERIVASCULAR	2
	EDEMA, PERIVASCULAR MULTIFOCAL	2

TABLE 70 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44335 GROUP 1: 0.00 MG/L MALE FOUND DEAD 11/22/95 DATE OF DEATH: 11/22/95 STUDY DAY: 6

		GRADE
	CONGESTION	
	MULTIFOCAL	2
	EDEMA, ALVEOLAR	
	MULTIFOCAL	1
PROSTATE	MICRO: AUTOLYTIC	
	EPITHELIUM SEPARATED FROM BASEMENT MEMBRANE	2
SEMINAL VESICLES	MICRO: AUTOLYTIC	
	EPITHELIUM SEPARATED FROM BASEMENT MEMBRANE	2
STOMACH	MICRO: AUTOLYTIC	
	GLANDULAR STOMACH	1
THYROID GLANDS	MICRO: AUTOLYTIC	
	FOLLICULAR EPITHELIUM SEPARATED FROM BASEMENT MEMBRANE	2
CAUSE DEATH/MORB	GROSS: MECHANICAL TRAUMA	
	ATTRIBUTED TO TRAUMA RESULTING FROM CONFINEMENT IN THE NOSE-ONLY RESTRAINT TUBE	P
EXTERNAL SURFACE	GROSS: BROWN MATTING	
	ALL EXTERNAL SURFACES	P
EXTERNAL SURFACE	GROSS: HAIR LOSS	
	ALL LIMBS	P

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	HEART
ILEUM	JEJUNUM	KIDNEYS	LIVER
LYMPH NODE, MES	NERVE,SCIATIC	PANCREAS	RECTUM
PITUITARY	PROSTATE	SALIVARY GLANDS	SEMINAL VESICLES

TABLE 70 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44335 GROUP 1: 0.00 MG/L MALE FOUND DEAD 11/22/95 DATE OF DEATH: 11/22/95 STUDY DAY: 6

GRADE

	SKELETAL MUSCLE	SKIN	SPINAL CORD	SPLEEN
	STOMACH	TESTES	THYMUS GLAND	THYROID GLANDS
	TRACHEA	URINARY BLADDER		
MICRO:	ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
	BRAIN	COLON	NASAL TURBINATES	EPIDIDYMIDES
	ESOPHAGUS	EYES/OPTIC N.	HEART	NERVE,SCIATIC
	PANCREAS	PARATHYROID	RECTUM	PITUITARY
	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN	SPINAL CORD
	SPLEEN	TESTES	THYMUS GLAND	TRACHEA
	URINARY BLADDER			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 70 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44120 GROUP 4: 0.25 MG/L MALE FOUND DEAD 11/21/95 DATE OF DEATH: 11/21/95 STUDY DAY: 5

		GRADE
CECUM	MICRO: AUTOLYTIC	
	MUCOSA	1
COLON	MICRO: AUTOLYTIC	
	MUCOSA	1
DUODENUM	MICRO: AUTOLYTIC	
	MUCOSA	1
NASAL TURBINATES	MICRO: METAPLASIA, SQUAMOUS	
	SECTION 1	1
	HYPERPLASIA, GOBLET CELL, PHARYNGEAL DUCT- SECTION 5	
EYES/OPTIC N.	MICRO: AUTOLYTIC	1
	RETINA	2
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	
ILEUM	MICRO: AUTOLYTIC	1
	MUCOSA	1
JEJUNUM	MICRO: AUTOLYTIC	
	MUCOSA	1
LIVER	MICRO: VACUOLATION, CYTOPLASMIC	
	MULTIFOCAL, PORTAL TO CENTROLOBULAR	2
	CONGESTION	
	MULTIFOCAL, MIDZONAL TO CENTROLOBULAR	1
LYMPH NODE, MES	MICRO: AUTOLYTIC	
LUNGS	GROSS: DARK RED	1
	ALL LOBES	P

TABLE 70 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44120 GROUP 4: 0.25 MG/L MALE FOUND DEAD 11/21/95 DATE OF DEATH: 11/21/95 STUDY DAY: 5

		GRADE
LUNGS	MICRO: EDEMA, ALVEOLAR	
	MULTIFOCAL INTRA-ALVEOLAR ACIDOPHILIC PROTEINACEOUS MATERIAL	1
	INFLAMMATION, GRANULOCYTIC	
	MULTIFOCAL	1
	CONGESTION	
	MULTIFOCAL	1
	INFLAMMATION, NONSUPPURATIVE, INTRA-ALVEOLAR	
	HISTIOCYTES, NEUTROPHILS	2
RECTUM	MICRO: AUTOLYTIC	
	MUCOSA	1
PROSTATE	MICRO: AUTOLYTIC	
	EPITHELIUM SEPARATED FROM BASEMENT MEMBRANE	1
SALIVARY GLANDS	MICRO: AUTOLYTIC	
	SUBMANDIBULAR GLAND DUCT EPITHELIUM	2
SEMINAL VESICLES	MICRO: AUTOLYTIC	
	EPITHELIUM SEPARATED FROM BASEMENT MEMBRANE	1
STOMACH	MICRO: AUTOLYTIC	
	MUCOSA, GLANDULAR STOMACH	1
	INFILTRATE, MONONUCLEAR	
	GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	1
TESTES	MICRO: AUTOLYTIC	
	GERMINAL EPITHELIUM SEPARATION FROM BASEMENT MEMBRANE	1

TABLE 70 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44120 GROUP 4: 0.25 MG/L MALE FOUND DEAD 11/21/95 DATE OF DEATH: 11/21/95 STUDY DAY: 5

		GRADE
THYROID GLANDS	MICRO: AUTOLYTIC FOLLICULAR EPITHELIUM SEPARATED FROM BASEMENT MEMBRANE	2
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, HEART, LIVER, RECTUM, SEMINAL VESICLES, SPLEEN, THYROID GLANDS, AORTA, CECUM, ESOPHAGUS, ILEUM, LYMPH NODE, MES, PITUITARY, SKELETAL MUSCLE, STOMACH, TRACHEA, STERNEBRAE, COLON, EYES/OPTIC N., JEJUNUM, NERVE,SCIATIC, PROSTATE, SKIN, TESTES, URINARY BLADDER, LYMPH NODE, BRON, DUODENUM, LYMPH NODE, SUPR, KIDNEYS, PANCREAS, SALIVARY GLANDS, SPINAL CORD, THYMUS GLAND

MICRO:ADRENAL GLANDS, BRAIN, KIDNEYS, PITUITARY, SPLEEN, AORTA, EPIDIDYMIDES, NERVE,SCIATIC, SKELETAL MUSCLE, THYMUS GLAND, STERNEBRAE, ESOPHAGUS, PANCREAS, SKIN, TRACHEA, LYMPH NODE, BRON, HEART, PARATHYROID, SPINAL CORD, URINARY BLADDER

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 70 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44157 GROUP 1: 0.00 MG/L FEMALE FOUND DEAD 11/22/95 DATE OF DEATH: 11/22/95 STUDY DAY: 6

		GRADE
STERNEBRAE	MICRO: AUTOLYTIC	
	PYKNOTIC MEGAKARYOCYTE NUCLEI	1
CECUM	MICRO: AUTOLYTIC	
	MUCOSA	2
COLON	MICRO: AUTOLYTIC	
	MUCOSA	1
DUODENUM	MICRO: AUTOLYTIC	
	MUCOSA	2
NASAL TURBINATES	MICRO: AUTOLYTIC	
	VOMERONASAL ORGAN	1
	INFLAMMATION, NONSUPPURATIVE	
	NASAL TURBINATE	1
EYES/OPTIC N.	MICRO: AUTOLYTIC	
	RETINA	1
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	1
ILEUM	MICRO: AUTOLYTIC	
	MUCOSA	2
KIDNEYS	MICRO: DEGENERATION, TUBULAR	
	MULTIFOCAL, CORTICAL	1
LIVER	MICRO: VACUOLATION, CYTOPLASMIC	
	DIFFUSE	1
LYMPH NODE, MES	MICRO: HISTIOCYTOSIS, SINUS	1

TABLE 70 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44157 GROUP 1: 0.00 MG/L FEMALE FOUND DEAD 11/22/95 DATE OF DEATH: 11/22/95 STUDY DAY: 6

		GRADE
LUNGS	GROSS: DARK RED	
	ALL LOBES	P
LUNGS	MICRO: INFLAMMATION, GRANULOCYTIC	
	MULTIFOCAL, PERIVASCULAR	1
	CONGESTION	
	DIFFUSE	3
	EDEMA, ALVEOLAR	
	MULTIFOCAL INTRA-ALVEOLAR ACIDOPHILIC PROTEINACEOUS MATERIAL	3
OVARIES	MICRO: AUTOLYTIC	
	MULTIFOCAL CORPORA LUTEA	1
PARATHYROID	MICRO: AUTOLYTIC	1
SALIVARY GLANDS	MICRO: AUTOLYTIC	1
	SUBMANDIBULAR GLAND DUCT EPITHELIUM	1
STOMACH	MICRO: AUTOLYTIC	
	MUCOSA, GLANDULAR STOMACH	1
THYROID GLANDS	MICRO: AUTOLYTIC	
	FOLLICULAR EPITHELIUM SEPARATED FROM BASEMENT MEMBRANE	3
UTERUS	MICRO: AUTOLYTIC	
	ENDOMETRIUM	1
CAUSE DEATH/MORB	GROSS: MECHANICAL TRAUMA	
	ATTRIBUTED TO TRAUMA RESULTING FROM CONFINEMENT IN THE NOSE-ONLY RESTRAINT TUBE	P
NO SIGNIFICANT CHANGES OBSERVED	GROSS:ADRENAL GLANDS AORTA STERNEBRAE OVIDUCTS	

TABLE 70 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44157 GROUP 1: 0.00 MG/L FEMALE FOUND DEAD 11/22/95 DATE OF DEATH: 11/22/95 STUDY DAY: 6

GRADE

LYMPH NODE, BRON
DUODENUM
HEART
LIVER
OVARIES
SALIVARY GLANDS
SPLEEN
TRACHEA

MICRO:ADRENAL GLANDS
ESOPHAGUS
NERVE,SCIATIC
SKELETAL MUSCLE
THYMUS GLAND

BRAIN
ESOPHAGUS
ILEUM
LYMPH NODE, MES
PANCREAS
SKELETAL MUSCLE
STOMACH
URINARY BLADDER
AORTA
HEART
PANCREAS
SKIN
TRACHEA

CECUM
EYES/OPTIC N.
JEJUNUM
MAMMARY GLAND
RECTUM
SKIN
THYMUS GLAND
UTERUS
OVIDUCTS
JEJUNUM
RECTUM
SPINAL CORD
URINARY BLADDER

COLON
LYMPH NODE, SUPR
KIDNEYS
NERVE,SCIATIC
PITUITARY
SPINAL CORD
THYROID GLANDS
VAGINA
BRAIN
MAMMARY GLAND
PITUITARY
SPLEEN
VAGINA

NOT EXAMINED
MICRO:LYMPH NODE, BRON

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 70 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44166 GROUP 1: 0.00 MG/L FEMALE FOUND DEAD 11/28/95 DATE OF DEATH: 11/28/95 STUDY DAY: 12

		GRADE
LYMPH NODE, BRON	MICRO: HISTIOCYTOSIS, SINUS	
CECUM	MICRO: AUTOLYTIC	1
	MUCOSA	1
DUODENUM	MICRO: AUTOLYTIC	
	MUCOSA	1
NASAL TURBINATES	MICRO: AUTOLYTIC	
	MULTIFOCAL TO DIFFUSE	4
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	
HEART	MICRO: INFLAMMATION, NONSUPPURATIVE	2
	FOCAL, EPICARDIUM, LEFT ATRIUM	1
ILEUM	MICRO: AUTOLYTIC	
	MUCOSA	1
JEJUNUM	MICRO: AUTOLYTIC	
	MUCOSA	1
KIDNEYS	MICRO: DEGENERATION, TUBULAR	
	MULTIFOCAL, CORTICAL	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE	
	MULTIFOCAL, PORTAL TO CENTROLOBULAR	1
LYMPH NODE, MES	MICRO: HISTIOCYTOSIS, SINUS	
LUNGS	GROSS: DARK RED	2
	ALL LOBES	P
LUNGS	MICRO: INFLAMMATION, GRANULOCYTIC	
	MULTIFOCAL, PERIVASCULAR	1

TABLE 70 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44166 GROUP 1: 0.00 MG/L FEMALE FOUND DEAD 11/28/95 DATE OF DEATH: 11/28/95 STUDY DAY: 12

		GRADE
	EDEMA, PERIVASCULAR	
	MULTIFOCAL	2
	CONGESTION	
	MULTIFOCAL	3
	EDEMA, ALVEOLAR	
	MULTIFOCAL	2
STOMACH	MICRO: AUTOLYTIC	
	MUCOSA, GLANDULAR STOMACH	1
	INFILTRATE, MONONUCLEAR	
	GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	1
THYROID GLANDS	MICRO: AUTOLYTIC	
	FOLLICULAR EPITHELIUM SEPARATED FROM BASEMENT MEMBRANE	1
TRACHEA	MICRO: AUTOLYTIC	
	MUCOSA	2
URINARY BLADDER	MICRO: INFLAMMATION, NONSUPPURATIVE	
	MULTIFOCAL, LAMINA PROPRIA/SUBMUCOSA	2
UTERUS	MICRO: INFLAMMATION, ACUTE	
	EPITHELIAL MICROABCESSES	1
CAUSE DEATH/MORB	GROSS: MECHANICAL TRAUMA	
	ATTRIBUTED TO TRAUMA RESULTING FROM CONFINEMENT IN THE NOSE-ONLY RESTRAINT TUBE	P
LYMPH NODE	GROSS: CERVICAL- REDDENED	
	BILATERAL	P

TABLE 70 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44166 GROUP 1: 0.00 MG/L FEMALE FOUND DEAD 11/28/95 DATE OF DEATH: 11/28/95 STUDY DAY: 12

GRADE

NO SIGNIFICANT CHANGES OBSERVED

GROSS:
ADRENAL GLANDS
LYMPH NODE, BRON
DUODENUM
HEART
LIVER
OVARIES
SALIVARY GLANDS
SPLEEN
TRACHEA
AORTA
BRAIN
ESOPHAGUS
ILEUM
LYMPH NODE, MES
PANCREAS
SKELETAL MUSCLE
STOMACH
URINARY BLADDER
STERNEBRAE
CECUM
EYES/OPTIC N.
JEJUNUM
MAMMARY GLAND
RECTUM
SKIN
THYMUS GLAND
UTERUS
OVIDUCTS
COLON
LYMPH NODE, SUPR
KIDNEYS
NERVE,SCIATIC
PITUITARY
SPINAL CORD
THYROID GLANDS
VAGINA

MICRO:
ADRENAL GLANDS
BRAIN
MAMMARY GLAND
PARATHYROID
SKELETAL MUSCLE
THYMUS GLAND
AORTA
COLON
NERVE,SCIATIC
RECTUM
SKIN
VAGINA
STERNEBRAE
ESOPHAGUS
OVARIES
PITUITARY
SPINAL CORD
OVIDUCTS
EYES/OPTIC N.
PANCREAS
SALIVARY GLANDS
SPLEEN

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 70 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44194 GROUP 2: 0.025 MG/L FEMALE FOUND DEAD 11/30/95 DATE OF DEATH: 11/30/95 STUDY DAY: 14

		GRADE
DUODENUM	MICRO: AUTOLYTIC	
	MUCOSA	1
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	
	PLASMACYTOSIS	2
	MEDULLARY SINUS	1
ILEUM	MICRO: AUTOLYTIC	
	MUCOSA	1
JEJUNUM	MICRO: AUTOLYTIC	
	MUCOSA	1
KIDNEYS	MICRO: DEGENERATION, TUBULAR	
	MULTIFOCAL, CORTICAL	1
LIVER	MICRO: VACUOLATION, CYTOPLASMIC	
	DIFFUSE	2
	CONGESTION	
	MULTIFOCAL, MIDZONAL	2
	INFLAMMATION, NONSUPPURATIVE	
	MULTIFOCAL, PORTAL TO CENTROLOBULAR	1
LYMPH NODE, MES	MICRO: HISTIOCYTOSIS, SINUS	
	HYPERPLASIA, LYMPHOID	3
	PARACORTICAL	2
STOMACH	MICRO: INFILTRATE, MONONUCLEAR	
	GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	1

TABLE 70 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44194 GROUP 2: 0.025 MG/L FEMALE FOUND DEAD 11/30/95 DATE OF DEATH: 11/30/95 STUDY DAY: 14

		GRADE
THYROID GLANDS	MICRO: AUTOLYTIC FOLLICULAR EPITHELIUM SEPARATED FROM BASEMENT MEMBRANE	2
TRACHEA	MICRO: INFLAMMATION, NONSUPPURATIVE FOCAL, LAMINA PROPRIA/SUBMUCOSA	1
CAUSE DEATH/MORB	GROSS: MECHANICAL TRAUMA ATTRIBUTED TO TRAUMA RESULTING FROM CONFINEMENT IN THE NOSE-ONLY RESTRAINT TUBE	P
LYMPH NODE	GROSS: CERVICAL- ENLARGED BILATERAL	P
LYMPH NODE	MICRO: PLASMACYTOSIS- CERVICAL MEDULLARY CORDS	3
EXTERNAL SURFACE	GROSS: BROWN MATTING ENTIRE VENTRAL SURFACE	P

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
LYMPH NODE, BRON	BRAIN	CECUM	COLON
DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
NERVE,SCIATIC	OVARIES	PANCREAS	RECTUM
PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	STOMACH	THYMUS GLAND
THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
VAGINA			

MICRO:

ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
BRAIN	CECUM	COLON	NASAL TURBINATES
ESOPHAGUS	EYES/OPTIC N.	HEART	LUNGS
MAMMARY GLAND	NERVE,SCIATIC	OVARIES	PANCREAS
PARATHYROID	RECTUM	PITUITARY	SALIVARY GLANDS

TABLE 70 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44194 GROUP 2: 0.025 MG/L FEMALE FOUND DEAD 11/30/95 DATE OF DEATH: 11/30/95 STUDY DAY: 14

GRADE

SKELETAL MUSCLE SKIN SPINAL CORD SPLEEN
THYMUS GLAND URINARY BLADDER UTERUS VAGINA

NOT EXAMINED

MICRO:LYMPH NODE, BRON

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 70 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44148 GROUP 3: 0.075 MG/L FEMALE FOUND DEAD 11/22/95 DATE OF DEATH: 11/22/95 STUDY DAY: 6

		GRADE
OVIDUCTS	MICRO: AUTOLYTIC	
LYMPH NODE, BRON	MICRO: HISTIOCYTOSIS, SINUS	1
CECUM	MICRO: AUTOLYTIC	1
	MUCOSA	3
COLON	MICRO: AUTOLYTIC	
	MUCOSA	3
DUODENUM	MICRO: AUTOLYTIC	
	MUCOSA	4
NASAL TURBINATES	MICRO: AUTOLYTIC	
	EPITHELIUM, ALL SECTIONS	4
EYES/OPTIC N.	MICRO: AUTOLYTIC	
	RETINA	2
LYMPH NODE, SUPR	GROSS: REDDENED	
	BILATERAL	P
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	
	PLASMACYTOSIS	2
	MEDULLARY CORDS	1
	AUTOLYTIC	
ILEUM	MICRO: AUTOLYTIC	1
	MUCOSA	4
JEJUNUM	MICRO: AUTOLYTIC	
	MUCOSA	4
KIDNEYS	MICRO: MINERALIZATION, TUBULAR	
	MULTIFOCAL, CORTICAL	2

TABLE 70 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44148 GROUP 3: 0.075 MG/L FEMALE FOUND DEAD 11/22/95 DATE OF DEATH: 11/22/95 STUDY DAY: 6

			GRADE
		AUTOLYTIC	
		MULTIFOCAL, CORTICAL	1
LIVER	MICRO:	VACUOLATION, CYTOPLASMIC	
		DIFFUSE	1
		CONGESTION	
		MULTIFOCAL, MIDZONAL TO CENTROLOBULAR	1
		INFLAMMATION, NONSUPPURATIVE	
		MULTIFOCAL, PORTAL TO CENTROLOBULAR	1
LYMPH NODE, MES	MICRO:	HISTIOCYTOSIS, SINUS	
		AUTOLYTIC	1
LUNGS	GROSS:	DARK RED	1
		ALL LOBES	P
LUNGS	MICRO:	INFLAMMATION, GRANULOCYTIC	
		MULTIFOCAL, PERIVASCULAR	1
		CONGESTION	
		MULTIFOCAL	2
OVARIES	MICRO:	AUTOLYTIC	
		MULTIFOCAL CORPORA LUTEA	2
RECTUM	MICRO:	AUTOLYTIC	
		MUCOSA	3
SALIVARY GLANDS	MICRO:	AUTOLYTIC	
		SUBMANDIBULAR GLAND DUCT EPITHELIUM	1
SPLEEN	MICRO:	AUTOLYTIC	1

TABLE 70 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44148 GROUP 3: 0.075 MG/L FEMALE FOUND DEAD 11/22/95 DATE OF DEATH: 11/22/95 STUDY DAY: 6

		GRADE
STOMACH	MICRO: AUTOLYTIC	
	MUCOSA, GLANDULAR STOMACH	1
THYMUS GLAND	MICRO: AUTOLYTIC	
THYROID GLANDS	MICRO: AUTOLYTIC	2
	FOLLICULAR EPITHELIUM SEPARATED FROM BASEMENT MEMBRANE	3
TRACHEA	MICRO: AUTOLYTIC	
	MUCOSA	2
URINARY BLADDER	MICRO: AUTOLYTIC	
UTERUS	MICRO: AUTOLYTIC	1
	ENDOMETRIUM	1
EXTERNAL SURFACE	GROSS: RED MATTING	
	NASAL AND BUCCAL	P

NO SIGNIFICANT CHANGES OBSERVED

GROSS: ADRENAL GLANDS, AORTA, STERNEBRAE, OVIDUCTS, LYMPH NODE, BRON, BRAIN, CECUM, COLON, DUODENUM, ESOPHAGUS, EYES/OPTIC N., HEART, ILEUM, JEJUNUM, KIDNEYS, LIVER, LYMPH NODE, MES, MAMMARY GLAND, NERVE,SCIATIC, OVARIES, PANCREAS, RECTUM, PITUITARY, SALIVARY GLANDS, SKELETAL MUSCLE, SKIN, SPINAL CORD, SPLEEN, STOMACH, THYMUS GLAND, THYROID GLANDS, TRACHEA, URINARY BLADDER, UTERUS, VAGINA

MICRO: ADRENAL GLANDS, AORTA, STERNEBRAE, BRAIN, ESOPHAGUS, HEART, MAMMARY GLAND, NERVE,SCIATIC, PANCREAS, PARATHYROID, PITUITARY, SKELETAL MUSCLE, SKIN, SPINAL CORD, VAGINA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 70 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44163 GROUP 4: 0.25 MG/L FEMALE FOUND DEAD 11/22/95 DATE OF DEATH: 11/22/95 STUDY DAY: 6

			GRADE
LYMPH NODE, BRON	MICRO:	HYPERPLASIA, LYMPHOID	
		FOLLICULAR AND PARACORTICAL	1
		HISTIOCYTOSIS, SINUS	
NASAL TURBINATES	MICRO:	INFLAMMATION, NEUTROPHILIC	2
		SECTION 1	2
		HYPERPLASIA, GOBLET CELL- SECTION 1	
		BILATERAL	1
		HYPERPLASIA, GOBLET CELL- SECTION 2	
		BILATERAL	1
LYMPH NODE, SUPR	GROSS:	ENLARGED	
		LEFT	P
LYMPH NODE, SUPR	MICRO:	HISTIOCYTOSIS, SINUS	
		HYPERPLASIA, LYMPHOID	3
		PARACORTICAL	1
ILEUM	GROSS:	DARK RED CONTENTS	
KIDNEYS	MICRO:	NEPHROPATHY	P
		REGENERATIVE TUBULAR EPITHELIUM, THICKENED BASEMENT MEMBRANE	1
LYMPH NODE, MES	MICRO:	HYPERPLASIA, LYMPHOID	
		PARACORTICAL	2
STOMACH	MICRO:	INFILTRATE, MONONUCLEAR	
		GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	1
TRACHEA	MICRO:	ECTASIA, SUBMUCOSAL GLANDS	
CAUSE DEATH/MORB	GROSS:	MECHANICAL TRAUMA	1
		ATTRIBUTED TO TRAUMA RESULTING FROM CONFINEMENT IN THE NOSE-	P

TABLE 70 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44163 GROUP 4: 0.25 MG/L FEMALE FOUND DEAD 11/22/95 DATE OF DEATH: 11/22/95 STUDY DAY: 6

		GRADE
EXTERNAL SURFACE	ONLY RESTRAINT TUBE GROSS: BROWN MATTING ALL EXTERNAL SURFACES	P
NO SIGNIFICANT CHANGES OBSERVED		

GROSS: ADRENAL GLANDS, AORTA, STERNEBRAE, OVIDUCTS, LYMPH NODE, BRON, BRAIN, CECUM, COLON, DUODENUM, ESOPHAGUS, EYES/OPTIC N., HEART, JEJUNUM, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, NERVE,SCIATIC, OVARIES, PANCREAS, RECTUM, PITUITARY, SALIVARY GLANDS, SKELETAL MUSCLE, SKIN, SPINAL CORD, SPLEEN, STOMACH, THYMUS GLAND, THYROID GLANDS, TRACHEA, URINARY BLADDER, UTERUS, VAGINA

MICRO: ADRENAL GLANDS, AORTA, STERNEBRAE, OVIDUCTS, BRAIN, CECUM, COLON, DUODENUM, ESOPHAGUS, EYES/OPTIC N., HEART, ILEUM, JEJUNUM, LIVER, LUNGS, MAMMARY GLAND, NERVE,SCIATIC, OVARIES, PANCREAS, PARATHYROID, RECTUM, PITUITARY, SALIVARY GLANDS, SKELETAL MUSCLE, SKIN, SPINAL CORD, SPLEEN, THYMUS GLAND, THYROID GLANDS, URINARY BLADDER, UTERUS, VAGINA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 70 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44173 GROUP 4: 0.25 MG/L FEMALE FOUND DEAD 12/11/95 DATE OF DEATH: 12/11/95 STUDY DAY: 25

		GRADE
ADRENAL GLANDS	MICRO: CONGESTION	1
LYMPH NODE, BRON	MICRO: HISTIOCYTOSIS, SINUS	3
CECUM	MICRO: AUTOLYTIC	
	MUCOSA	2
COLON	MICRO: AUTOLYTIC	
	MUCOSA	2
DUODENUM	MICRO: AUTOLYTIC	
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1	3
	BILATERAL SEPTAL EPITHELIUM	1
	HYPERPLASIA, GOBLET CELL- SECTION 2	
	BILATERAL SEPTAL EPITHELIUM	1
	AUTOLYTIC	
	SECTION 2	1
	DEGENERATION, OLFACTORY EPITHELIUM- SECTION 4	
	BILATERAL	2
	DEGENERATION, OLFACTORY EPITHELIUM- SECTION 5	
	BILATERAL	2
LYMPH NODE, SUPR	GROSS: ENLARGED	
	RIGHT	P
LYMPH NODE, SUPR	MICRO: AUTOLYTIC	
	HISTIOCYTOSIS, SINUS	2
ILEUM	MICRO: AUTOLYTIC	2
JEJUNUM	MICRO: AUTOLYTIC	3
KIDNEYS	MICRO: DEGENERATION, TUBULAR	3
	MULTIFOCAL, CORTICAL	2

TABLE 70 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44173 GROUP 4: 0.25 MG/L FEMALE FOUND DEAD 12/11/95 DATE OF DEATH: 12/11/95 STUDY DAY: 25

		GRADE
LIVER	MICRO: VACUOLATION, CYTOPLASMIC	
	DIFFUSE	1
	INFLAMMATION, NONSUPPURATIVE	
	MULTIFOCAL, PORTAL	1
LYMPH NODE, MES	MICRO: AUTOLYTIC	
	HISTIOCYTOSIS, SINUS	2
LUNGS	MICRO: CONGESTION	2
	BILATERAL	2
	EDEMA, ALVEOLAR	
	MULTIFOCAL, UNILATERAL	2
OVARIES	MICRO: AUTOLYTIC	
	MULTIFOCAL CORPORA LUTEA	1
PANCREAS	MICRO: AUTOLYTIC	
RECTUM	MICRO: AUTOLYTIC	2
	MUCOSA	1
STOMACH	MICRO: AUTOLYTIC	
	MUCOSA, GLANDULAR STOMACH	1
	INFILTRATE, MONONUCLEAR	
	GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	1
THYROID GLANDS	MICRO: AUTOLYTIC	
	FOLLICULAR EPITHELIUM SEPARATED FROM BASEMENT MEMBRANE	3
TRACHEA	MICRO: AUTOLYTIC	
	MUCOSA	3

TABLE 70 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44173 GROUP 4: 0.25 MG/L FEMALE FOUND DEAD 12/11/95 DATE OF DEATH: 12/11/95 STUDY DAY: 25

		GRADE
UTERUS	MICRO: AUTOLYTIC ENDOMETRIUM	2
EXTERNAL SURFACE	GROSS: BROWN MATTING ANOGENITAL	P
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:ADRENAL GLANDS, LYMPH NODE, BRON, DUODENUM, ILEUM, LYMPH NODE, MES, OVARIES, SALIVARY GLANDS, SPLEEN, TRACHEA, AORTA, BRAIN, ESOPHAGUS, JEJUNUM, LUNGS, PANCREAS, SKELETAL MUSCLE, STOMACH, URINARY BLADDER, STERNEBRAE, CECUM, EYES/OPTIC N., KIDNEYS, MAMMARY GLAND, RECTUM, SKIN, THYMUS GLAND, UTERUS, OVIDUCTS, HEART, SALIVARY GLANDS, SPLEEN, OVIDUCTS, COLON, HEART, LIVER, NERVE,SCIATIC, PITUITARY, SPINAL CORD, THYROID GLANDS, VAGINA, BRAIN, MAMMARY GLAND, SKELETAL MUSCLE, THYMUS GLAND

MICRO:AORTA, ESOPHAGUS, NERVE,SCIATIC, SKIN, URINARY BLADDER, STERNEBRAE, EYES/OPTIC N., PITUITARY, SPINAL CORD, VAGINA

NOT EXAMINED

MICRO:PARATHYROID

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 70 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44188 GROUP 4: 0.25 MG/L FEMALE FOUND DEAD 11/24/95 DATE OF DEATH: 11/24/95 STUDY DAY: 8

		GRADE
CECUM	MICRO: AUTOLYTIC	
	MUCOSA	3
COLON	MICRO: AUTOLYTIC	
	MUCOSA	2
DUODENUM	MICRO: AUTOLYTIC	
	MUCOSA	2
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1	
	AUTOLYTIC	1
	ALL SECTIONS	3
LYMPH NODE, SUPR	GROSS: REDDENED	
	BILATERAL	P
LYMPH NODE, SUPR	MICRO: AUTOLYTIC	
	HISTIOCYTOSIS, SINUS	2
ILEUM	MICRO: AUTOLYTIC	1
	MUCOSA	2
JEJUNUM	MICRO: AUTOLYTIC	
	MUCOSA	2
KIDNEYS	MICRO: MINERALIZATION, TUBULAR	
	MULTIFOCAL, CORTICOMEDULLARY JUNCTION	1
	DEGENERATION, TUBULAR	
	MULTIFOCAL, CORTICAL	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE	
	MULTIFOCAL, MIDZONAL	2

TABLE 70 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44188 GROUP 4: 0.25 MG/L FEMALE FOUND DEAD 11/24/95 DATE OF DEATH: 11/24/95 STUDY DAY: 8

		GRADE
	VACUOLATION, CYTOPLASMIC	
	MULTIFOCAL, MIDZONAL	2
LYMPH NODE, MES	MICRO: AUTOLYTIC	
LUNGS	GROSS: DARK RED	2
	ALL LOBES	P
LUNGS	MICRO: INFLAMMATION, ACUTE	
	MULTIFOCAL, PERIVASCULAR	1
	EDEMA, ALVEOLAR	
	MULTIFOCAL	1
OVARIES	MICRO: AUTOLYTIC	
	MULTIFOCAL CORPORA LUTEA	1
RECTUM	MICRO: AUTOLYTIC	
	MUCOSA	2
SALIVARY GLANDS	GROSS: REDDENED	
	BILATERAL	P
THYROID GLANDS	GROSS: REDDENED	
	BILATERAL	P
THYROID GLANDS	MICRO: AUTOLYTIC	
	FOLLICULAR EPITHELIUM SEPARATED FROM BASEMENT MEMBRANE	3
TRACHEA	MICRO: AUTOLYTIC	
	MUCOSA, SUBMUCOSAL GLANDS	2
URINARY BLADDER	MICRO: INFLAMMATION, NONSUPPURATIVE	
	MULTIFOCAL, EPITHELIUM, LAMINA PROPRIA/SUBMUCOSA	2
UTERUS	MICRO: INFLAMMATION, NONSUPPURATIVE	
		1

TABLE 70 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44188 GROUP 4: 0.25 MG/L FEMALE FOUND DEAD 11/24/95 DATE OF DEATH: 11/24/95 STUDY DAY: 8

		GRADE
LYMPH NODE	ENDOMETRIUM GROSS: CERVICAL- REDDENED BILATERAL	P
LYMPH NODE	GROSS: MEDIASTINAL- REDDENED	P
NO SIGNIFICANT CHANGES OBSERVED	GROSS:ADRENAL GLANDS, AORTA, STERNEBRAE, OVIDUCTS LYMPH NODE, BRON, BRAIN, CECUM, COLON DUODENUM, ESOPHAGUS, EYES/OPTIC N., HEART ILEUM, JEJUNUM, KIDNEYS, LIVER LYMPH NODE, MES, MAMMARY GLAND, NERVE,SCIATIC, OVARIES PANCREAS, RECTUM, PITUITARY, SKELETAL MUSCLE SKIN, SPINAL CORD, SPLEEN, STOMACH THYMUS GLAND, TRACHEA, URINARY BLADDER, UTERUS VAGINA MICRO:ADRENAL GLANDS, AORTA, STERNEBRAE, OVIDUCTS BRAIN, ESOPHAGUS, EYES/OPTIC N., HEART MAMMARY GLAND, NERVE,SCIATIC, PANCREAS, PARATHYROID PITUITARY, SALIVARY GLANDS, SKELETAL MUSCLE, SKIN SPINAL CORD, SPLEEN, STOMACH, THYMUS GLAND VAGINA	

NOT EXAMINED
MICRO:LYMPH NODE, BRON

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 70 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44348 GROUP 4: 0.25 MG/L FEMALE FOUND DEAD 12/11/95 DATE OF DEATH: 12/11/95 STUDY DAY: 25

		GRADE
LYMPH NODE, BRON	MICRO: HISTIOCYTOSIS, SINUS	
CECUM	MICRO: AUTOLYTIC	2
	MUCOSA	3
COLON	MICRO: AUTOLYTIC	
DUODENUM	MICRO: AUTOLYTIC	1
	MUCOSA	2
NASAL TURBINATES	MICRO: INFLAMMATION, NEUTROPHILIC	
	SECTION 1 ULCERATION OF STRAT. SQUAMOUS EPITHELIUM, VENTRAL MEATUS	1
	AUTOLYTIC	
	SECTION 2	2
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	
ILEUM	MICRO: AUTOLYTIC	3
	MUCOSA	2
JEJUNUM	MICRO: AUTOLYTIC	
	MUCOSA	2
KIDNEYS	MICRO: DEGENERATION, TUBULAR	
	MULTIFOCAL, CORTICAL	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE	
	MULTIFOCAL, MIDZONAL	1
LYMPH NODE, MES	MICRO: HYPERPLASIA, LYMPHOID	
	FOLLICULAR	1

TABLE 70 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44348 GROUP 4: 0.25 MG/L FEMALE FOUND DEAD 12/11/95 DATE OF DEATH: 12/11/95 STUDY DAY: 25

		GRADE
STOMACH	MICRO: AUTOLYTIC MUCOSA, GLANDULAR STOMACH	1
	INFILTRATE, MONONUCLEAR GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	1
THYROID GLANDS	MICRO: AUTOLYTIC FOLLICULAR EPITHELIUM SEPARATED FROM BASEMENT MEMBRANE	2
VAGINA	MICRO: INFLAMMATION, ACUTE MULTIFOCAL, SUBMUCOSAL	?
EXTERNAL SURFACE	GROSS: SCABBING PROXIMAL TAIL; HINDPAW, BILATERAL	P
EXTERNAL SURFACE	GROSS: BROWN MATTING ALL EXTERNAL SURFACES	P

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
	LYMPH NODE, BRON	BRAIN	CECUM	COLON
	DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	NERVE,SCIATIC	OVARIES	PANCREAS	RECTUM
	PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	STOMACH	THYMUS GLAND
	THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
	VAGINA			
MICRO:	ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
	BRAIN	ESOPHAGUS	EYES/OPTIC N.	HEART
	LUNGS	MAMMARY GLAND	NERVE,SCIATIC	OVARIES
	PANCREAS	PARATHYROID	RECTUM	PITUITARY
	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN	SPINAL CORD

TABLE 70 (UNSCHEDULED DEATHS)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44348 GROUP 4: 0.25 MG/L FEMALE FOUND DEAD 12/11/95 DATE OF DEATH: 12/11/95 STUDY DAY: 25

	GRADE
SPLEEN	
UTERUS	
THYMUS GLAND	
TRACHEA	
URINARY BLADDER	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44091 GROUP 1: 0.00 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.01	0.595
LIVER	9.75	2.885
KIDNEYS	2.85	0.843
HEART	1.16	0.343
SPLEEN	0.70	0.207
LUNGS	1.84	0.544
TESTES/EPIDID.	4.35	1.287
THYMUS GLAND	0.2785	0.082
ADRENAL GLANDS	0.0712	0.021
FINAL BODY WT(G)	338.	

LYMPH NODE, SUPR
LYMPH NODE, MES
STOMACH

NO SIGNIFICANT CHANGES OBSERVED

	GRADE
MICRO: HISTIOCYTOSIS, SINUS	3
MICRO: HYPERPLASIA, LYMPHOID	1
MICRO: INFILTRATE, MONONUCLEAR GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	1

GROSS:ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, HEART, LIVER, PANCREAS, SALIVARY GLANDS, SPINAL CORD, THYMUS GLAND, AORTA, CECUM, ESOPHAGUS, ILEUM, LYMPH NODE, MES, RECTUM, SEMINAL VESICLES, SPLEEN, THYROID GLANDS, STERNEBRAE, COLON, EYES/OPTIC N., JEJUNUM, LUNGS, PITUITARY, SKELETAL MUSCLE, STOMACH, TRACHEA, LYMPH NODE, BRON, DUODENUM, LYMPH NODE, SUPR, KIDNEYS, NERVE,SCIATIC, PROSTATE, SKIN, TESTES, URINARY BLADDER

MICRO:ADRENAL GLANDS, CECUM, EPIDIDYMIDES, ILEUM, LUNGS, RECTUM, SEMINAL VESICLES, SPLEEN, TRACHEA, AORTA, COLON, ESOPHAGUS, JEJUNUM, NERVE,SCIATIC, PITUITARY, SKELETAL MUSCLE, TESTES, URINARY BLADDER, STERNEBRAE, DUODENUM, EYES/OPTIC N., KIDNEYS, PANCREAS, PROSTATE, SKIN, THYMUS GLAND, BRAIN, NASAL TURBINATES, HEART, LIVER, PARATHYROID, SALIVARY GLANDS, SPINAL CORD, THYROID GLANDS

NOT EXAMINED
MICRO:LYMPH NODE, BRON

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44099 GROUP 1: 0.00 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.00	0.669
LIVER	11.15	3.729
KIDNEYS	2.93	0.980
HEART	1.37	0.458
SPLEEN	0.66	0.221
LUNGS	1.70	0.569
TESTES/EPIDID.	5.08	1.699
THYMUS GLAND	0.7023	0.235
ADRENAL GLANDS	0.0710	0.024
FINAL BODY WT(G)	299.	

		GRADE
LYMPH NODE, BRON	MICRO: HISTIOCYTOSIS, SINUS	
CECUM	MICRO: INFILTRATE, MONONUCLEAR LAMINA PROPRIA/SUBMUCOSA, MIX OF NEUTROPHILS AND EOSINOPHILS	1
COLON	MICRO: INFILTRATE, MONONUCLEAR LAMINA PROPRIA/SUBMUCOSA, MIX OF NEUTROPHILS AND EOSINOPHILS	1
DUODENUM	MICRO: INFILTRATE, MONONUCLEAR LAMINA PROPRIA/SUBMUCOSA, MIX OF NEUTROPHILS AND EOSINOPHILS	1
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	
ILEUM	MICRO: INFILTRATE, MONONUCLEAR LAMINA PROPRIA, MIXTURE OF NEUTROPHILS AND EOSINOPHILS	1
JEJUNUM	MICRO: INFILTRATE, MONONUCLEAR LAMINA PROPRIA/SUBMUCOSA, MIX OF NEUTROPHILS AND EOSINOPHILS	1
LYMPH NODE, MES	MICRO: HYPERPLASIA, LYMPHOID HISTIOCYTOSIS, SINUS	1
RECTUM	MICRO: INFILTRATE, MONONUCLEAR LAMINA PROPRIA/SUBMUCOSA, MIX OF NEUTROPHILS AND EOSINOPHILS	1
STOMACH	MICRO: INFILTRATE, MONONUCLEAR GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	1
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
PANCREAS	RECTUM	PITUITARY	PROSTATE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44099 GROUP 1: 0.00 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

GRADE

	SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	STOMACH	TESTES
	THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER
MICRO:	ADRENAL GLANDS	AORTA	STERNEBRAE	BRAIN
	NASAL TURBINATES	EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.
	HEART	KIDNEYS	LIVER	LUNGS
	NERVE,SCIATIC	PANCREAS	PARATHYROID	PITUITARY
	PROSTATE	SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE
	SKIN	SPINAL CORD	SPLEEN	TESTES
	THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44114 GROUP 1: 0.00 MG/L MALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.92	0.570
LIVER	10.41	3.089
KIDNEYS	3.25	0.964
HEART	1.28	0.380
SPLEEN	0.68	0.202
LUNGS	1.76	0.522
TESTES/EPIDID.	4.81	1.427
THYMUS GLAND	0.2676	0.079
ADRENAL GLANDS	0.0848	0.025
FINAL BODY WT(G)	337.	

		GRADE
ADRENAL GLANDS	MICRO: HYPERTROPHY, CORTICAL RETICULARIS	1
DUODENUM	MICRO: INFILTRATE, MONONUCLEAR LAMINA PROPRIA/SUBMUCOSA, MIX OF NEUTROPHILS AND EOSINOPHILS	1
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	1
	HYPERPLASIA, LYMPHOID	1
	PLASMACYTOSIS MEDULLARY CORDS	1
ILEUM	MICRO: INFILTRATE, MONONUCLEAR LAMINA PROPRIA, MIXTURE OF NEUTROPHILS AND EOSINOPHILS	1
JEJUNUM	MICRO: INFILTRATE, MONONUCLEAR LAMINA PROPRIA/SUBMUCOSA, MIX OF NEUTROPHILS AND EOSINOPHILS	1
KIDNEYS	MICRO: INFLAMMATION, NONSUPPURATIVE FOCAL, INTERSTITIAL	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL	1
LYMPH NODE, MES	GROSS: REDDENED	P
LYMPH NODE, MES	MICRO: HYPERPLASIA, LYMPHOID	1
	HISTIOCYTOSIS, SINUS	1
STOMACH	MICRO: INFILTRATE, MONONUCLEAR GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	2
NO SIGNIFICANT CHANGES OBSERVED	GROSS: ADRENAL GLANDS, AORTA, STERNEBRAE, LYMPH NODE, BRON, BRAIN, CECUM, COLON, DUODENUM	

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44114 GROUP 1: 0.00 MG/L MALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

GRADE

EPIDIDYMIDES
HEART
LIVER
RECTUM
SEMINAL VESICLES
SPLEEN
THYROID GLANDS

MICRO:AORTA
CECUM
ESOPHAGUS
NERVE,SCIATIC
PITUITARY
SKELETAL MUSCLE
TESTES
URINARY BLADDER

ESOPHAGUS
ILEUM
LUNGS
PITUITARY
SKELETAL MUSCLE
STOMACH
TRACHEA
STERNEBRAE
COLON
EYES/OPTIC N.
PANCREAS
PROSTATE
SKIN
THYMUS GLAND

EYES/OPTIC N.
JEJUNUM
NERVE,SCIATIC
PROSTATE
SKIN
TESTES
URINARY BLADDER
LYMPH NODE, BRON
NASAL TURBINATES
HEART
PARATHYROID
SALIVARY GLANDS
SPINAL CORD
THYROID GLANDS

LYMPH NODE, SUPR
KIDNEYS
PANCREAS
SALIVARY GLANDS
SPINAL CORD
THYMUS GLAND

BRAIN
EPIDIDYMIDES
LUNGS
RECTUM
SEMINAL VESICLES
SPLEEN
TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44121 GROUP 1: 0.00 MG/L MALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.88	0.565
LIVER	14.39	4.321
KIDNEYS	3.05	0.916
HEART	1.15	0.345
SPLEEN	0.65	0.195
LUNGS	2.21	0.664
TESTES/EPIDID.	4.53	1.360
THYMUS GLAND	0.3881	0.117
ADRENAL GLANDS	0.0741	0.022
FINAL BODY WT(G)	333.	

		GRADE
DUODENUM	MICRO: INFILTRATE, MONONUCLEAR LAMINA PROPRIA/SUBMUCOSA, MIX OF NEUTROPHILS AND EOSINOPHILS	1
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	
	HYPERPLASIA, LYMPHOID	1
ILEUM	MICRO: INFILTRATE, MONONUCLEAR LAMINA PROPRIA, MIXTURE OF NEUTROPHILS AND EOSINOPHILS	1
JEJUNUM	MICRO: INFILTRATE, MONONUCLEAR LAMINA PROPRIA/SUBMUCOSA, MIX OF NEUTROPHILS AND EOSINOPHILS	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL	1
LYMPH NODE, MES	MICRO: HISTIOCYTOSIS, SINUS	
	HYPERPLASIA, LYMPHOID	2
LUNGS	MICRO: EDEMA, ALVEOLAR MULTIFOCAL INTRA-ALVEOLAR ACIDOPHILIC PROTEINACEOUS MATERIAL	1
	CONGESTION MULTIFOCAL	1
STOMACH	MICRO: INFILTRATE, MONONUCLEAR GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	4
NO SIGNIFICANT CHANGES OBSERVED		1

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, HEART, LIVER, PANCREAS, AORTA, CECUM, ESOPHAGUS, ILEUM, LYMPH NODE, MES, RECTUM, STERNEBRAE, COLON, EYES/OPTIC N., JEJUNUM, LUNGS, PITUITARY, LYMPH NODE, BRON, DUODENUM, LYMPH NODE, SUPR, KIDNEYS, NERVE,SCIATIC, PROSTATE

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44121 GROUP 1: 0.00 MG/L MALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

GRADE

	SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	STOMACH	TESTES
	THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER
MICRO:	ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
	BRAIN	CECUM	COLON	NASAL TURBINATES
	EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	HEART
	KIDNEYS	NERVE,SCIATIC	PANCREAS	PARATHYROID
	RECTUM	PITUITARY	PROSTATE	SALIVARY GLANDS
	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN	SPINAL CORD
	SPLEEN	TESTES	THYMUS GLAND	THYROID GLANDS
	TRACHEA	URINARY BLADDER		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44131 GROUP 1: 0.00 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.03	0.604
LIVER	10.57	3.146
KIDNEYS	2.97	0.884
HEART	1.34	0.399
SPLEEN	0.77	0.229
LUNGS	2.95	0.878
TESTES/EPIDID.	5.86	1.744
THYMUS GLAND	0.4747	0.141
ADRENAL GLANDS	0.0668	0.020
FINAL BODY WT(G)	336.	

		GRADE
EPIDIDYMIDES	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL	1
HEART	MICRO: INFLAMMATION, NONSUPPURATIVE FOCAL, LEFT VENTRICLE, SUBENDOCARDIAL	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL	1
LYMPH NODE, MES	MICRO: HISTIOCYTOSIS, SINUS	2
LUNGS	MICRO: CONGESTION FOCALLY EXTENSIVE	4
	EDEMA, ALVEOLAR MULTIFOCAL INTRA-ALVEOLAR ACIDOPHILIC PROTEINACEOUS MATERIAL	1
STOMACH	MICRO: INFILTRATE, MONONUCLEAR GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	1
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
	PANCREAS	RECTUM	PITUITARY	PROSTATE
	SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	STOMACH	TESTES
	THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER
MICRO:	ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
	BRAIN	CECUM	COLON	DUODENUM
	NASAL TURBINATES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44131 GROUP 1: 0.00 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

			GRADE
ILEUM	JEJUNUM	KIDNEYS	NERVE,SCIATIC
PANCREAS	PARATHYROID	RECTUM	PITUITARY
PROSTATE	SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE
SKIN	SPINAL CORD	SPLEEN	TESTES
THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44132 GROUP 1: 0.00 MG/L MALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.93	0.615
LIVER	9.10	2.898
KIDNEYS	2.64	0.841
HEART	1.15	0.366
SPLEEN	0.60	0.191
LUNGS	1.43	0.455
TESTES/EPIDID.	4.37	1.392
THYMUS GLAND	0.2310	0.074
ADRENAL GLANDS	0.0627	0.020
FINAL BODY WT(G)	314.	

		GRADE
NASAL TURBINATES	MICRO: INFLAMMATION, NONSUPPURATIVE FOCAL, DERMIS- NASAL SECTION 2	1
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	1
HEART	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, VENTRICLES	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL TO CENTROLOBULAR	1
LYMPH NODE, MES	MICRO: HISTIOCYTOSIS, SINUS	1
STOMACH	MICRO: INFILTRATE, MONONUCLEAR GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	1
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
	PANCREAS	RECTUM	PITUITARY	PROSTATE
	SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	STOMACH	TESTES
	THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER
MICRO:	ADRENAL GLANDS	AORTA	STERNEBRAE	BRAIN
	CECUM	COLON	DUODENUM	EPIDIDYMIDES
	ESOPHAGUS	EYES/OPTIC N.	ILEUM	JEJUNUM
	KIDNEYS	LUNGS	NERVE,SCIATIC	PANCREAS
	PARATHYROID	RECTUM	PITUITARY	PROSTATE
	SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	TESTES	THYMUS GLAND
	THYROID GLANDS	TRACHEA	URINARY BLADDER	

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44132 GROUP 1: 0.00 MG/L MALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

GRADE

NOT EXAMINED

MICRO:LYMPH NODE, BRON

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44141 GROUP 1: 0.00 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.99	0.614
LIVER	8.81	2.719
KIDNEYS	2.58	0.796
HEART	1.20	0.370
SPLEEN	0.77	0.238
LUNGS	2.46	0.759
TESTES/EPIDID.	4.67	1.441
THYMUS GLAND	0.4489	0.139
ADRENAL GLANDS	0.0665	0.021
FINAL BODY WT(G)	324.	

		GRADE
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE	1
	MULTIFOCAL, PORTAL TO CENTROLOBULAR	1
LYMPH NODE, MES	MICRO: HISTIOCYTOSIS, SINUS	
LUNGS	MICRO: EDEMA, ALVEOLAR	1
	FOCALLY EXTENSIVE	2
	CONGESTION	
	DIFFUSE	3
STOMACH	MICRO: INFILTRATE, MONONUCLEAR	
	GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, HEART, LIVER, PANCREAS, SALIVARY GLANDS, SPINAL CORD, THYMUS GLAND, AORTA, CECUM, ESOPHAGUS, ILEUM, LYMPH NODE, MES, RECTUM, SEMINAL VESICLES, SPLEEN, THYROID GLANDS, STERNEBRAE, COLON, EYES/OPTIC N., JEJUNUM, LUNGS, PITUITARY, SKELETAL MUSCLE, STOMACH, TRACHEA, LYMPH NODE, BRON, DUODENUM, KIDNEYS, NERVE,SCIATIC, PROSTATE, SKIN, TESTES, URINARY BLADDER

MICRO:ADRENAL GLANDS, BRAIN, NASAL TURBINATES, HEART, NERVE,SCIATIC, PITUITARY, SKELETAL MUSCLE, TESTES, AORTA, CECUM, EPIDIDYMIDES, ILEUM, PANCREAS, PROSTATE, SKIN, THYMUS GLAND, STERNEBRAE, COLON, ESOPHAGUS, JEJUNUM, PARATHYROID, SALIVARY GLANDS, SPINAL CORD, THYROID GLANDS, LYMPH NODE, BRON, DUODENUM, EYES/OPTIC N., KIDNEYS, RECTUM, SEMINAL VESICLES, SPLEEN, TRACHEA

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44141 GROUP 1: 0.00 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

GRADE

URINARY BLADDER

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44337 GROUP 1: 0.00 MG/L MALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.03	0.672
LIVER	10.55	3.493
KIDNEYS	2.60	0.861
HEART	1.08	0.358
SPLEEN	0.53	0.175
LUNGS	1.63	0.540
TESTES/EPIDID.	4.29	1.421
THYMUS GLAND	0.5280	0.175
ADRENAL GLANDS	0.0802	0.027
FINAL BODY WT(G)	302.	

		GRADE
ADRENAL GLANDS	MICRO: HYPERTROPHY, CORTICAL RETICULARIS	1
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL	1 1
LYMPH NODE, MES	MICRO: HISTIOCYTOSIS, SINUS	
STOMACH	MICRO: INFILTRATE, MONONUCLEAR GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	1 1
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, HEART, LIVER, PANCREAS, SALIVARY GLANDS, SPINAL CORD, THYMUS GLAND, AORTA, CECUM, ESOPHAGUS, ILEUM, LYMPH NODE, MES, RECTUM, SEMINAL VESICLES, SPLEEN, THYROID GLANDS, STERNEBRAE, COLON, EYES/OPTIC N., JEJUNUM, LUNGS, PITUITARY, SKELETAL MUSCLE, STOMACH, TRACHEA, LYMPH NODE, BRON, DUODENUM, KIDNEYS, NERVE,SCIATIC, PROSTATE, SKIN, TESTES, URINARY BLADDER

MICRO:AORTA, CECUM, EPIDIDYMIDES, ILEUM, NERVE,SCIATIC, PITUITARY, SKELETAL MUSCLE, TESTES, URINARY BLADDER, STERNEBRAE, COLON, ESOPHAGUS, JEJUNUM, PANCREAS, PROSTATE, SKIN, THYMUS GLAND, LYMPH NODE, BRON, DUODENUM, EYES/OPTIC N., KIDNEYS, PARATHYROID, SALIVARY GLANDS, SPINAL CORD, THYROID GLANDS, BRAIN, NASAL TURBINATES, HEART, LUNGS, RECTUM, SEMINAL VESICLES, SPLEEN, TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44092 GROUP 2: 0.025 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.86	0.579
LIVER	10.49	3.268
KIDNEYS	2.71	0.844
HEART	1.26	0.393
SPLEEN	0.67	0.209
LUNGS	2.45	0.763
TESTES/EPIDID.	4.05	1.262
THYMUS GLAND	0.3235	0.101
ADRENAL GLANDS	0.0595	0.019
FINAL BODY WT(G)	321.	

		GRADE
NASAL TURBINATES	MICRO: ECTASIA, MUCOSAL GLAND- SECTION 2 CELL DEBRIS WITHIN GLAND	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL	1
LUNGS	MICRO: HISTIOCYTOSIS, ALVEOLAR MULTIFOCAL	1
	INFLAMMATION, GRANULOCYTIC MULTIFOCAL, PERIVASCULAR	1
	EDEMA, ALVEOLAR MULTIFOCAL INTRA-ALVEOLAR ACIDOPHILIC PROTEINACEOUS MATERIAL	1
	CONGESTION FOCALLY EXTENSIVE	3

NO SIGNIFICANT CHANGES OBSERVED

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, HEART, LIVER, PANCREAS, SALIVARY GLANDS, SPINAL CORD, THYMUS GLAND, AORTA, CECUM, ESOPHAGUS, ILEUM, LYMPH NODE, MES, RECTUM, SEMINAL VESICLES, SPLEEN, THYROID GLANDS, TRACHEA, STERNEBRAE, COLON, EYES/OPTIC N., JEJUNUM, LUNGS, PITUITARY, SKELETAL MUSCLE, STOMACH, TRACHEA, LYMPH NODE, BRON, DUODENUM, LYMPH NODE, SUPR, KIDNEYS, NERVE,SCIATIC, PROSTATE, SKIN, TESTES, URINARY BLADDER

MICRO: KIDNEYS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44093 GROUP 2: 0.025 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.12	0.613
LIVER	13.13	3.795
KIDNEYS	3.47	1.003
HEART	1.40	0.405
SPLEEN	0.65	0.188
LUNGS	1.68	0.486
TESTES/EPIDID.	4.66	1.347
THYMUS GLAND	0.4221	0.122
ADRENAL GLANDS	0.0634	0.018
FINAL BODY WT(G)	346.	

TRACHEA
NO SIGNIFICANT
CHANGES OBSERVED

	GRADE
MICRO: ECTASIA, SUBMUCOSAL GLANDS	1

GROSS:ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, HEART, LIVER, PANCREAS, SALIVARY GLANDS, SPINAL CORD, THYMUS GLAND, AORTA, CECUM, ESOPHAGUS, ILEUM, LYMPH NODE, MES, RECTUM, SEMINAL VESICLES, SPLEEN, THYROID GLANDS, STERNEBRAE, COLON, EYES/OPTIC N., JEJUNUM, LUNGS, PITUITARY, SKELETAL MUSCLE, STOMACH, TRACHEA, LIVER, LYMPH NODE, BRON, DUODENUM, LYMPH NODE, SUPR, KIDNEYS, NERVE,SCIATIC, PROSTATE, SKIN, TESTES, URINARY BLADDER, LUNGS

MICRO:NASAL TURBINATES, KIDNEYS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44110 GROUP 2: 0.025 MG/L MALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.85	0.683
LIVER	8.89	3.280
KIDNEYS	2.24	0.827
HEART	0.98	0.362
SPLEEN	0.51	0.188
LUNGS	2.31	0.852
TESTES/EPIDID.	3.93	1.450
THYMUS GLAND	0.4288	0.158
ADRENAL GLANDS	0.0571	0.021
FINAL BODY WT(G)	271.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1 BILATERAL SEPTAL EPITHELIUM	1
LIVER	MICRO: NECROSIS, CENTROLOBULAR	2
LUNGS	GROSS: DARK RED ALL LOBES	P
LUNGS	MICRO: EDEMA, ALVEOLAR FOCALLY EXTENSIVE ACIDOPHILIC PROTEINACEOUS MATERIAL	3
	EDEMA, PERIVASCULAR MULTIFOCAL	2
LYMPH NODE	GROSS: CERVICAL- REDDENED BILATERAL	P

NO SIGNIFICANT CHANGES OBSERVED

GROSS:ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, HEART, LIVER, RECTUM, SEMINAL VESICLES, SPLEEN, THYROID GLANDS, AORTA, CECUM, ESOPHAGUS, ILEUM, LYMPH NODE, MES, PITUITARY, SKELETAL MUSCLE, STOMACH, TRACHEA, STERNEBRAE, COLON, EYES/OPTIC N., JEJUNUM, NERVE,SCIATIC, PROSTATE, SKIN, TESTES, URINARY BLADDER, LYMPH NODE, BRON, DUODENUM, LYMPH NODE, SUPR, KIDNEYS, PANCREAS, SALIVARY GLANDS, SPINAL CORD, THYMUS GLAND

MICRO:KIDNEYS, TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44113 GROUP 2: 0.025 MG/L MALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.09	0.622
LIVER	10.78	3.208
KIDNEYS	3.05	0.908
HEART	1.26	0.375
SPLEEN	0.69	0.205
LUNGS	1.46	0.435
TESTES/EPIDID.	4.80	1.429
THYMUS GLAND	0.3283	0.098
ADRENAL GLANDS	0.0720	0.021
FINAL BODY WT(G)	336.	

		GRADE
NASAL TURBINATES	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, EPITHELIUM AND LAMINA PROPRIA/SUBMUCOSA	1
LYMPH NODE, SUPR	GROSS: ENLARGED RIGHT	P
KIDNEYS	MICRO: INFLAMMATION, NONSUPPURATIVE FOCAL, INTERSTITIAL	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL TO CENTROLOBULAR	1
LYMPH NODE	MICRO: HISTIOCYTOSIS, SINUS- SUPRAPHARYNGEAL	1
	PLASMACYTOSIS- SUPRAPHARYNGEAL MEDULLARY CORDS	2

NO SIGNIFICANT CHANGES OBSERVED

GROSS:ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ILEUM, LYMPH NODE, MES, RECTUM, SEMINAL VESICLES, SPLEEN, THYROID GLANDS, AORTA, CECUM, ESOPHAGUS, JEJUNUM, LUNGS, PITUITARY, SKELETAL MUSCLE, STOMACH, TRACHEA, STERNEBRAE, COLON, EYES/OPTIC N., KIDNEYS, NERVE,SCIATIC, PROSTATE, SKIN, TESTES, URINARY BLADDER, LYMPH NODE, BRON, DUODENUM, HEART, LIVER, PANCREAS, SALIVARY GLANDS, SPINAL CORD, THYMUS GLAND

MICRO:LUNGS, TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44138 GROUP 2: 0.025 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.79	0.563
LIVER	9.14	2.874
KIDNEYS	2.57	0.808
HEART	1.30	0.409
SPLEEN	0.97	0.305
LUNGS	2.23	0.701
TESTES/EPIDID.	4.16	1.308
THYMUS GLAND	0.6671	0.210
ADRENAL GLANDS	0.0789	0.025
FINAL BODY WT(G)	318.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1 BILATERAL SEPTAL EPITHELIUM	1
LYMPH NODE, SUPR	GROSS: ENLARGED LEFT	P
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL TO CENTROLOBULAR	1
LUNGS	MICRO: HISTIOCYTOSIS, ALVEOLAR MULTIFOCAL	1
	INFLAMMATION, GRANULOCYTIC MULTIFOCAL, PERIVASCULAR	1
	CONGESTION MULTIFOCAL	1
LYMPH NODE	MICRO: HISTIOCYTOSIS, SINUS- SUPRAPHARYNGEAL	2
NO SIGNIFICANT CHANGES OBSERVED	GROSS: ADRENAL GLANDS, AORTA, STERNEBRAE, LYMPH NODE, BRON, BRAIN, CECUM, COLON, DUODENUM, EPIDIDYMIDES, ESOPHAGUS, EYES/OPTIC N., HEART, ILEUM, JEJUNUM, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, NERVE,SCIATIC, PANCREAS, RECTUM, PITUITARY, PROSTATE, SALIVARY GLANDS, SEMINAL VESICLES, SKELETAL MUSCLE, SKIN, SPINAL CORD, SPLEEN, STOMACH, TESTES, THYMUS GLAND, THYROID GLANDS, TRACHEA, URINARY BLADDER; MICRO: KIDNEYS, TRACHEA	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44143 GROUP 2: 0.025 MG/L MALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.04	0.675
LIVER	8.15	2.699
KIDNEYS	1.96	0.649
HEART	1.23	0.407
SPLEEN	0.62	0.205
LUNGS	1.54	0.510
TESTES/EPIDID.	4.87	1.613
THYMUS GLAND	0.3630	0.120
ADRENAL GLANDS	0.0804	0.027
FINAL BODY WT(G)	302.	

NASAL TURBINATES
LYMPH NODE, SUPR

LIVER

LYMPH NODE

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO:	INFLAMMATION, NONSUPPURATIVE- SKIN SECTION 1	
GROSS:	ENLARGED	1
	LEFT	P
MICRO:	INFLAMMATION, NONSUPPURATIVE	
	MULTIFOCAL, PORTAL TO CENTROLOBULAR	2
MICRO:	PLASMACYTOSIS- SUPRAPHARYNGEAL	
	HISTIOCYTOSIS, SINUS- SUPRAPHARYNGEAL	2
		2

GROSS:ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ILEUM, LYMPH NODE, MES, RECTUM, SEMINAL VESICLES, SPLEEN, THYROID GLANDS, AORTA, CECUM, ESOPHAGUS, JEJUNUM, LUNGS, PITUITARY, SKELETAL MUSCLE, STOMACH, TRACHEA, STERNEBRAE, COLON, EYES/OPTIC N., KIDNEYS, NERVE,SCIATIC, PROSTATE, SKIN, TESTES, URINARY BLADDER, LYMPH NODE, BRON, DUODENUM, HEART, LIVER, PANCREAS, SALIVARY GLANDS, SPINAL CORD, THYMUS GLAND

MICRO:KIDNEYS, LUNGS, TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44144 GROUP 2: 0.025 MG/L MALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.83	0.620
LIVER	8.68	2.942
KIDNEYS	2.41	0.817
HEART	1.34	0.454
SPLEEN	0.63	0.214
LUNGS	1.31	0.444
TESTES/EPIDID.	4.07	1.380
THYMUS GLAND	0.3526	0.120
ADRENAL GLANDS	0.0503	0.017
FINAL BODY WT(G)	295.	

NASAL TURBINATES
LIVER

NO SIGNIFICANT
CHANGES OBSERVED

	GRADE
MICRO: HYPERPLASIA, LYMPHOID- SECTION 4	1
MICRO: INFLAMMATION, NONSUPPURATIVE	1
MULTIFOCAL, MIDZONAL TO CENTROLOBULAR	1

GROSS:ADRENAL GLANDS
BRAIN
EPIDIDYMIDES
HEART
LIVER
PANCREAS
SALIVARY GLANDS
SPINAL CORD
THYMUS GLAND
MICRO:KIDNEYS
AORTA
CECUM
ESOPHAGUS
ILEUM
LYMPH NODE, MES
RECTUM
SEMINAL VESICLES
SPLEEN
THYROID GLANDS
LUNGS
STERNEBRAE
COLON
EYES/OPTIC N.
JEJUNUM
LUNGS
PITUITARY
SKELETAL MUSCLE
STOMACH
TRACHEA
TRACHEA
LYMPH NODE, BRON
DUODENUM
LYMPH NODE, SUPR
KIDNEYS
NERVE,SCIATIC
PROSTATE
SKIN
TESTES
URINARY BLADDER

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44147 GROUP 2: 0.025 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.70	0.616
LIVER	9.09	3.293
KIDNEYS	2.72	0.986
HEART	1.06	0.384
SPLEEN	0.76	0.275
LUNGS	1.87	0.678
TESTES/EPIDID.	4.53	1.641
THYMUS GLAND	0.8014	0.290
ADRENAL GLANDS	0.0667	0.024
FINAL BODY WT(G)	276.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1 SECTION 1	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL TO CENTROLOBULAR	1
LUNGS	MICRO: INFLAMMATION, GRANULOCYTIC MULTIFOCAL, PERIVASCULAR	1
	EDEMA, ALVEOLAR MULTIFOCAL	1
	CONGESTION MULTIFOCAL	2

NO SIGNIFICANT CHANGES OBSERVED

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, HEART, LIVER, PANCREAS, SALIVARY GLANDS, SPINAL CORD, THYMUS GLAND, AORTA, CECUM, ESOPHAGUS, ILEUM, LYMPH NODE, MES, RECTUM, SEMINAL VESICLES, SPLEEN, THYROID GLANDS, TRACHEA, STERNEBRAE, COLON, EYES/OPTIC N., JEJUNUM, LUNGS, PITUITARY, SKELETAL MUSCLE, STOMACH, TRACHEA, LYMPH NODE, BRON, DUODENUM, LYMPH NODE, SUPR, KIDNEYS, NERVE,SCIATIC, PROSTATE, SKIN, TESTES, URINARY BLADDER

MICRO: KIDNEYS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44339 GROUP 2: 0.025 MG/L MALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.91	0.737
LIVER	8.00	3.089
KIDNEYS	2.24	0.865
HEART	1.16	0.448
SPLEEN	0.53	0.205
LUNGS	1.44	0.556
TESTES/EPIDID.	4.05	1.564
THYMUS GLAND	0.2505	0.097
ADRENAL GLANDS	0.0527	0.020
FINAL BODY WT(G)	259.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1 SECTION 1	1
	DEGENERATION, OLFACTORY EPITHELIUM- SECTION 5 UNILATERAL, DORSAL MEATUS	2
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL TO CENTROLOBULAR	1
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
	PANCREAS	RECTUM	PITUITARY	PROSTATE
	SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	STOMACH	TESTES
	THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER
MICRO:	KIDNEYS	LUNGS	TRACHEA	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44342 GROUP 2: 0.025 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.96	0.693
LIVER	7.51	2.654
KIDNEYS	2.39	0.845
HEART	1.20	0.424
SPLEEN	0.53	0.187
LUNGS	1.44	0.509
TESTES/EPIDID.	4.50	1.590
THYMUS GLAND	0.4032	0.142
ADRENAL GLANDS	0.0812	0.029
FINAL BODY WT(G)	283.	

NASAL TURBINATES NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO:	HYPERPLASIA, GOBLET CELL- SECTION 1 BILATERAL	3
	DEGENERATION, OLFACTORY EPITHELIUM- SECTION 3 UNILATERAL, DORSAL MEATUS	1
LIVER MICRO:	INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL	1
TRACHEA MICRO:	DEGENERATION,EPITHELIAL FOCAL	1

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
PANCREAS	RECTUM	PITUITARY	PROSTATE
SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	STOMACH	TESTES
THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER

MICRO:KIDNEYS LUNGS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 44107 GROUP 3: 0.075 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.79	0.651
LIVER	9.07	3.298
KIDNEYS	2.35	0.855
HEART	1.00	0.364
SPLEEN	0.69	0.251
LUNGS	2.75	1.000
TESTES/EPIDID.	4.05	1.473
THYMUS GLAND	0.3711	0.135
ADRENAL GLANDS	0.0726	0.026
FINAL BODY WT(G)	275.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1 BILATERAL SEPTAL EPITHELIUM	1
	HYPERPLASIA, GOBLET CELL- SECTION 3 BILATERAL SEPTAL EPITHELIUM	1
	INFLAMMATION, NEUTROPHILIC- SECTION 4 LAMINA PROPRIA MAXILLOTURBINATE, EDEMA	1
	DEGENERATION, OLFACTORY EPITHELIUM- SECTION 4	1
	DEGENERATION, OLFACTORY EPITHELIUM- SECTION 5	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL	1
LUNGS	GROSS: MOTTLED ALL LOBES	P
LUNGS	MICRO: EDEMA, ALVEOLAR MULTIFOCAL	2
	INFLAMMATION, GRANULOCYTIC MULTIFOCAL, PERIVASCULAR	1
	EDEMA, PERIVASCULAR MULTIFOCAL	1
TRACHEA	GROSS: RED FLUID CONTENTS	P
NO SIGNIFICANT CHANGES OBSERVED	GROSS: ADRENAL GLANDS, AORTA, STERNEBRAE, LYMPH NODE, BRON; BRAIN, CECUM, COLON, DUODENUM; EPIDIDYMIDES, ESOPHAGUS, EYES/OPTIC N., LYMPH NODE, SUPR; HEART, ILEUM, JEJUNUM, KIDNEYS; LIVER, LYMPH NODE, MES, NERVE,SCIATIC, PANCREAS	

ANIMAL NO. 44107 GROUP 3: 0.075 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

GRADE

RECTUM	PITUITARY	PROSTATE	SALIVARY GLANDS
SEMINAL VESICLES	SKELETAL MUSCLE	SKIN	SPINAL CORD
SPLEEN	STOMACH	TESTES	THYMUS GLAND
THYROID GLANDS	URINARY BLADDER		
MICRO:KIDNEYS	TRACHEA		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 7. (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44111 GROUP 3: 0.075 MG/L MALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.84	0.630
LIVER	9.18	3.144
KIDNEYS	2.51	0.860
HEART	1.12	0.384
SPLEEN	0.60	0.205
LUNGS	1.40	0.479
TESTES/EPIDID.	4.32	1.479
THYMUS GLAND	0.4317	0.148
ADRENAL GLANDS	0.0487	0.017
FINAL BODY WT(G)	292.	

NASAL TURBINATES NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO:	INFLAMMATION, NEUTROPHILIC- SECTION 4	1
	INFLAMMATION, NEUTROPHILIC	1
	VENTRAL TURBINATES- SECTION 5	
MICRO:	INFLAMMATION, NONSUPPURATIVE	1
	MULTIFOCAL, PORTAL TO CENTROLOBULAR	
MICRO:	INFLAMMATION, GRANULOCYTIC	1
	FOCAL, PERIVASCULAR	

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
PANCREAS	RECTUM	PITUITARY	PROSTATE
SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	STOMACH	TESTES
THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER

MICRO: KIDNEYS TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 44116 GROUP 3: 0.075 MG/L MALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.76	0.624
LIVER	9.59	3.401
KIDNEYS	2.21	0.784
HEART	1.07	0.379
SPLEEN	0.58	0.206
LUNGS	3.05	1.082
TESTES/EPIDID.	3.86	1.369
THYMUS GLAND	0.3578	0.127
ADRENAL GLANDS	0.0570	0.020
FINAL BODY WT(G)	282.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1 UNILATERAL, VENTRAL SEPTUM	1
	EDEMA, NASAL TURBINATE- SECTION 1 LAMINA PROPRIA/SUBMUCOSA, UNILATERAL, RIGHT	1
	EDEMA, MAXILLOTURBINATE- SECTION 1 BILATERAL, LAMINA PROPRIA	1
	INFLAMMATION, NEUTROPHILIC, MAX. TURBINATE SECTION 1 BILATERAL, LAMINA PROPRIA	1
	HYPERPLASIA, LYMPHOID- SECTION 4	1
	DEGENERATION, OLFACTORY EPITHELIUM- SECTION 4 BILATERAL, VENTRAL TURBINATES	1
	DEGENERATION, OLFACTORY EPITHELIUM- SECTION 5 BILATERAL, VENTRAL TURBINATES	2
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, MIDZONAL TO CENTROLOBULAR	2
LUNGS	MICRO: EDEMA, ALVEOLAR MULTIFOCAL	2

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
PANCREAS	RECTUM	PITUITARY	PROSTATE

TABLE 71 (WEEK 4 PRIMARY NECROPSY)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44116 GROUP 3: 0.075 MG/L MALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

				GRADE
	SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	STOMACH	TESTES
	THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER
MICRO:	KIDNEYS	TRACHEA		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)

PROJECT NO.:WIL-160033 — A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS — PAGE 30

SPONSOR:ELF ATOCHEM INC. — GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44118 GROUP 3: 0.075 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.87	0.547
LIVER	9.42	2.754
KIDNEYS	2.79	0.816
HEART	1.35	0.395
SPLEEN	0.71	0.208
LUNGS	1.57	0.459
TESTES/EPIDID.	4.76	1.392
THYMUS GLAND	0.3842	0.112
ADRENAL GLANDS	0.0702	0.021
FINAL BODY WT(G)	342.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1 BILATERAL SEPTAL EPITHELIUM	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL TO CENTROLOBULAR	1
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
PANCREAS	RECTUM	PITUITARY	PROSTATE
SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	STOMACH	TESTES
THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER

MICRO:

KIDNEYS	LUNGS	TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44124 GROUP 3: 0.075 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.03	0.677
LIVER	10.67	3.557
KIDNEYS	2.72	0.907
HEART	1.36	0.453
SPLEEN	0.59	0.197
LUNGS	1.78	0.593
TESTES/EPIDID.	4.38	1.460
THYMUS GLAND	0.2537	0.085
ADRENAL GLANDS	0.0628	0.021
FINAL BODY WT(G)	300.	

		GRADE
NASAL TURBINATES	MICRO: INFLAMMATION, NONSUPPURATIVE- SECTION 1	
	FOCAL, LEFT VENTRAL SEPTUM	1
KIDNEYS	MICRO: CYST(S), CORTICAL	
	FOCALLY EXTENSIVE, ADJACENT TO 1 MM SUBCAPSULAR, CORTICAL CYST	1
	INFLAMMATION, NONSUPPURATIVE	
	FOCAL, INTERSTITIAL	1
LIVER	MICRO: NECROSIS, CENTROLOBULAR	1
	CONGESTION	2
	MULTIFOCAL, MIDZONAL TO CENTROLOBULAR	
	DEGENERATION/NECROSIS, CENTRAL VEIN	2
	MULTIFOCAL	
	INFLAMMATION, NONSUPPURATIVE	1
	MULTIFOCAL, PORTAL TO CENTROLOBULAR	
LUNGS	MICRO: INFLAMMATION, GRANULOCYTIC	
	MULTIFOCAL, PERIVASCULAR	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
PANCREAS	RECTUM	PITUITARY	PROSTATE
SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	STOMACH	TESTES
THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER

ANIMAL NO. 44124 GROUP 3: 0.075 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

	GRADE
MICRO:TRACHEA	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)

PROJECT NO.:WIL-160033 — A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS — PAGE 33

SPONSOR:ELF ATOCHEM INC. — GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44129 GROUP 3: 0.075 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.83	0.555
LIVER	9.46	2.867
KIDNEYS	2.68	0.812
HEART	1.36	0.412
SPLEEN	0.52	0.158
LUNGS	2.29	0.694
TESTES/EPIDID.	4.58	1.388
THYMUS GLAND	0.5665	0.172
ADRENAL GLANDS	0.0907	0.027
FINAL BODY WT(G)	330.	

		GRADE
NASAL TURBINATES	MICRO: DEGENERATION, OLFACTORY EPITHELIUM- SECTION 4	1
	DEGENERATION, OLFACTORY EPITHELIUM- SECTION 5	1
	MULTIFOCAL, UNILATERAL, LEFT VENTRAL TURBINATE	
KIDNEYS	MICRO: MINERALIZATION, TUBULAR	1
	FOCAL, CORTICAL	
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE	1
	MULTIFOCAL, PORTAL TO CENTROLOBULAR	
LUNGS	MICRO: INFLAMMATION, GRANULOCYTIC	1
	MULTIFOCAL, PERIVASCULAR	
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
PANCREAS	RECTUM	PITUITARY	PROSTATE
SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	STOMACH	TESTES
THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER

MICRO:TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 44140 GROUP 3: 0.075 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.02	0.727
LIVER	9.47	3.406
KIDNEYS	2.46	0.885
HEART	1.14	0.410
SPLEEN	0.65	0.234
LUNGS	2.89	1.040
TESTES/EPIDID.	4.15	1.493
THYMUS GLAND	0.3454	0.124
ADRENAL GLANDS	0.0547	0.020
FINAL BODY WT(G)	278.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1	1
	BILATERAL SEPTAL EPITHELIUM	
	INFLAMMATION, NEUTROPHILIC- SECTION 4	1
	BILATERAL, LAMINA PROPRIA	
KIDNEYS	MICRO: MINERALIZATION, MEDULLARY PAPILLA TUBULES	1
	MULTIFOCAL, RIGHT KIDNEY, TIP OF PAPILLA, INTRATUBULAR	
	INFLAMMATION, NONSUPPURATIVE	1
	FOCAL, INTERSTITIAL, CORTICOMEDULLARY JUNCTION	
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE	1
	MULTIFOCAL, PORTAL TO CENTROLOBULAR	
	CONGESTION	1
	MULTIFOCAL, MIDZONAL TO CENTROLOBULAR	
LUNGS	GROSS: MOTTLED	P
	ALL LOBES	
LUNGS	MICRO: EDEMA, ALVEOLAR	3
	MULTIFOCAL INTRA-ALVEOLAR ACIDOPHILIC PROTEINACEOUS MATERIAL	
	EDEMA, PERIVASCULAR	2
	MULTIFOCAL	

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	NERVE,SCIATIC	PANCREAS

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44140 GROUP 3: 0.075 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

GRADE

RECTUM	PITUITARY	PROSTATE	SALIVARY GLANDS
SEMINAL VESICLES	SKELETAL MUSCLE	SKIN	SPINAL CORD
SPLEEN	STOMACH	TESTES	THYMUS GLAND
THYROID GLANDS	TRACHEA	URINARY BLADDER	

MICRO:TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 44142 GROUP 3: 0.075 MG/L MALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.82	0.593
LIVER	12.46	4.059
KIDNEYS	2.46	0.801
HEART	1.38	0.450
SPLEEN	0.65	0.212
LUNGS	1.41	0.459
TESTES/EPIDID.	4.38	1.427
THYMUS GLAND	0.3325	0.108
ADRENAL GLANDS	0.0466	0.015
FINAL BODY WT(G)	307.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1	1
	DEGENERATION, OLFACTORY EPITHELIUM- SECTION 4	1
	FOCAL, LEFT DORSAL MEATUS EPITHELIUM	
	DEGENERATION, OLFACTORY EPITHELIUM- SECTION 5	1
	FOCAL, LEFT DORSAL MEATUS EPITHELIUM	
KIDNEYS	MICRO: INFLAMMATION, NONSUPPURATIVE	1
	MULTIFOCAL, CORTICAL	
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE	1
	MULTIFOCAL, PORTAL TO CENTROLOBULAR	
	NECROSIS, CENTROLOBULAR	1
	MULTIFOCAL	
	CONGESTION	3
	MULTIFOCAL, MIDZONAL TO CENTROLOBULAR	
LYMPH NODE	GROSS: CERVICAL- ENLARGED	P
	BILATERAL	
LYMPH NODE	GROSS: MEDIASTINAL- ENLARGED	P
LYMPH NODE	MICRO: HYPERPLASIA, LYMPHOID- CERVICAL	2
	PLASMACYTOSIS- CERVICAL	2
	MEDULLARY CORDS	
	HISTIOCYTOSIS, SINUS- CERVICAL	2
THYMUS	MICRO: WITHIN NORMAL LIMITS	P
	TISSUE HARVESTED AS A MEDIASTINAL NODE	
NO SIGNIFICANT CHANGES OBSERVED	GROSS:ADRENAL GLANDS AORTA STERNEBRAE LYMPH NODE, BRON	

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44142 GROUP 3: 0.075 MG/L MALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

GRADE

BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
PANCREAS	RECTUM	PITUITARY	PROSTATE
SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	STOMACH	TESTES
THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER
MICRO:LUNGS	TRACHEA		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44145 GROUP 3: 0.075 MG/L MALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.92	0.580
LIVER	14.56	4.399
KIDNEYS	3.14	0.949
HEART	1.29	0.390
SPLEEN	0.84	0.254
LUNGS	1.55	0.468
TESTES/EPIDID.	5.17	1.562
THYMUS GLAND	0.3885	0.117
ADRENAL GLANDS	0.0770	0.023
FINAL BODY WT(G)	331.	

		GRADE
NASAL TURBINATES	MICRO: EDEMA, SUBMUCOSA, BILATERAL, VENTRAL/MAX. TURBINATE	1
	INFLAMMATION, NEUTROPHILIC- SECTION 4 BILATERAL, VENTRAL TURBINATES	1
	EDEMA, VENTRAL TURBINATES BILATERAL, LAMINA PROPRIA	1
	DYSPLASIA BILATERAL, LAMINA PROPRIA	1
	INFLAMMATION, NEUTROPHILIC VENTRAL TURBINATES- SECTION 5	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL TO CENTROLOBULAR	1
	CONGESTION MULTIFOCAL, MIDZONAL TO CENTROLOBULAR	2

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
	PANCREAS	RECTUM	PITUITARY	PROSTATE
	SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	STOMACH	TESTES
	THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER
MICRO:	KIDNEYS	LUNGS	TRACHEA	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44333 GROUP 3: 0.075 MG/L MALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.81	0.797
LIVER	8.06	3.551
KIDNEYS	1.90	0.837
HEART	0.85	0.374
SPLEEN	0.41	0.181
LUNGS	1.46	0.643
TESTES/EPIDID.	3.67	1.617
THYMUS GLAND	0.4566	0.201
ADRENAL GLANDS	0.0725	0.032
FINAL BODY WT(G)	227.	

		GRADE
NASAL TURBINATES	MICRO: INFLAMMATION, NEUTROPHILIC- SECTION 4	1
	BILATERAL, VENTRAL TURBINATES	
LIVER	MICRO: NECROSIS, CENTROLOBULAR	3
	MULTIFOCAL	
	CONGESTION	2
	MULTIFOCAL, MIDZONAL TO CENTROLOBULAR	
LUNGS	MICRO: INFLAMMATION, GRANULOCYTIC	1
	MULTIFOCAL, PERIVASCULAR	
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
PANCREAS	RECTUM	PITUITARY	PROSTATE
SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	STOMACH	TESTES
THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER
MICRO:KIDNEYS	TRACHEA		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44102 GROUP 4: 0.25 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.81	0.699
LIVER	8.45	3.263
KIDNEYS	2.54	0.981
HEART	1.03	0.398
SPLEEN	0.56	0.216
LUNGS	1.38	0.533
TESTES/EPIDID.	4.15	1.602
THYMUS GLAND	0.3771	0.146
ADRENAL GLANDS	0.0700	0.027
FINAL BODY WT(G)	259.	

		GRADE
LYMPH NODE, BRON	MICRO: HISTIOCYTOSIS, SINUS	2
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1	1
	HYPERPLASIA, GOBLET CELL- SECTION 2	1
	HYPERPLASIA, GOBLET CELL, PHARYNGEAL DUCT- SECTION 6	1
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	2
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL TO CENTROLOBULAR	1
LYMPH NODE, MES	MICRO: HISTIOCYTOSIS, SINUS	2
STOMACH	MICRO: INFILTRATE, MONONUCLEAR GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	1
MAMMARY GLAND	MICRO: HYPERPLASIA, GLANDULAR MULTIFOCAL	2

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
	PANCREAS	RECTUM	PITUITARY	PROSTATE
	SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	STOMACH	TESTES
	THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER
MICRO:	ADRENAL GLANDS	AORTA	STERNEBRAE	BRAIN
	CECUM	COLON	DUODENUM	EPIDIDYMIDES
	ESOPHAGUS	EYES/OPTIC N.	HEART	ILEUM
	JEJUNUM	KIDNEYS	LUNGS	NERVE,SCIATIC
	PANCREAS	PARATHYROID	RECTUM	PITUITARY
	PROSTATE	SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE
	SKIN	SPINAL CORD	SPLEEN	TESTES

TABLE 71 (WEEK 4 PRIMARY NECROPSY)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44102 GROUP 4: 0.25 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

	GRADE
THYMUS GLAND	
THYROID GLANDS	
TRACHEA	
URINARY BLADDER	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 44104 GROUP 4: 0.25 MG/L MALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.86	0.612
LIVER	8.58	2.822
KIDNEYS	2.51	0.826
HEART	1.35	0.444
SPLEEN	0.61	0.201
LUNGS	1.68	0.553
TESTES/EPIDID.	4.56	1.500
THYMUS GLAND	0.3099	0.102
ADRENAL GLANDS	0.0687	0.023
FINAL BODY WT(G)	304.	

		GRADE
LYMPH NODE, BRON	MICRO: HISTIOCYTOSIS, SINUS	1
NASAL TURBINATES	MICRO: METAPLASIA, SQUAMOUS	1
	UNILATERAL, RIGHT	
	HYPERPLASIA, GOBLET CELL- SECTION 2	1
LYMPH NODE, SUPR	MICRO: PLASMACYTOSIS	1
	MEDULLARY CORDS	
	HISTIOCYTOSIS, SINUS	2
HEART	MICRO: INFLAMMATION, NONSUPPURATIVE	1
	FOCAL, SUBEPICARDIAL, LEFT VENTRICLE	
KIDNEYS	MICRO: INFLAMMATION, NONSUPPURATIVE	2
	FOCAL, INTERSTITIAL, CORTICAL	
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE	1
	MULTIFOCAL, PORTAL TO CENTROLOBULAR	
LYMPH NODE, MES	MICRO: HYPERPLASIA, LYMPHOID	1
	FOLLICULAR	
	HISTIOCYTOSIS, SINUS	2
STOMACH	MICRO: INFILTRATE, MONONUCLEAR	1
	GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
PANCREAS	RECTUM	PITUITARY	PROSTATE

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44104 GROUP 4: 0.25 MG/L MALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

GRADE

	SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	STOMACH	TESTES
	THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER
MICRO:	ADRENAL GLANDS	AORTA	STERNEBRAE	BRAIN
	CECUM	COLON	DUODENUM	EPIDIDYMIDES
	ESOPHAGUS	EYES/OPTIC N.	ILEUM	JEJUNUM
	LUNGS	NERVE,SCIATIC	PANCREAS	PARATHYROID
	RECTUM	PITUITARY	PROSTATE	SALIVARY GLANDS
	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN	SPINAL CORD
	SPLEEN	TESTES	THYMUS GLAND	THYROID GLANDS
	TRACHEA	URINARY BLADDER		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 44109 GROUP 4: 0.25 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.90	0.660
LIVER	11.04	3.833
KIDNEYS	2.64	0.917
HEART	1.24	0.431
SPLEEN	0.51	0.177
LUNGS	1.98	0.688
TESTES/EPIDID.	3.96	1.375
THYMUS GLAND	0.2561	0.089
ADRENAL GLANDS	0.0599	0.021
FINAL BODY WT(G)	288.	

		GRADE
NASAL TURBINATES	MICRO: METAPLASIA, SQUAMOUS SECTION 1	1
	HYPERPLASIA, GOBLET CELL- SECTION 2 BILATERAL SEPTAL EPITHELIUM	1
	DEGENERATION, OLFACTORY EPITHELIUM- SECTION 3 FOCAL DORSAL MEATUS	1
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	2
LIVER	MICRO: CONGESTION MULTIFOCAL, MIDZONAL TO CENTROLOBULAR	2
	INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL	1
LYMPH NODE, MES	MICRO: HISTIOCYTOSIS, SINUS	1
LUNGS	MICRO: EDEMA, ALVEOLAR FOCALLY EXTENSIVE	1
	CONGESTION FOCALLY EXTENSIVE	1
PITUITARY	MICRO: CRANIOPHARYNGEAL DUCT REMNANT	P
STOMACH	MICRO: INFILTRATE, MONONUCLEAR GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44109 GROUP 4: 0.25 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

GRADE

LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
PANCREAS	RECTUM	PITUITARY	PROSTATE
SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	STOMACH	TESTES
THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER
MICRO:ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	HEART
ILEUM	JEJUNUM	KIDNEYS	NERVE,SCIATIC
PANCREAS	RECTUM	PROSTATE	SALIVARY GLANDS
SEMINAL VESICLES	SKELETAL MUSCLE	SKIN	SPINAL CORD
SPLEEN	TESTES	THYMUS GLAND	THYROID GLANDS
TRACHEA	URINARY BLADDER		

NOT EXAMINED
MICRO:PARATHYROID

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 44130 GROUP 4: 0.25 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.96	0.683
LIVER	8.10	2.822
KIDNEYS	2.07	0.721
HEART	1.24	0.432
SPLEEN	0.51	0.178
LUNGS	1.87	0.652
TESTES/EPIDID.	4.68	1.631
THYMUS GLAND	0.3975	0.139
ADRENAL GLANDS	0.0698	0.024
FINAL BODY WT(G)	287.	

		GRADE
LYMPH NODE, BRON	MICRO: HISTIOCYTOSIS, SINUS	1
NASAL TURBINATES	MICRO: METAPLASIA, SQUAMOUS	1
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS MULTIFOCAL HEMOSIDERIN LADEN MACROPHAGES	3
HEART	MICRO: INFLAMMATION, NONSUPPURATIVE FOCAL, RIGHT VENTRICLE	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL	1
LYMPH NODE, MES	MICRO: HISTIOCYTOSIS, SINUS	3
	HYPERPLASIA, LYMPHOID FOLLICULAR AND PARACORTICAL	1
LUNGS	MICRO: CONGESTION MULTIFOCAL	1
STOMACH	MICRO: INFILTRATE, MONONUCLEAR GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	1
MAMMARY GLAND	MICRO: HYPERPLASIA, GLANDULAR MULTIFOCAL	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
PANCREAS	RECTUM	PITUITARY	PROSTATE
SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN

ANIMAL NO. 44130 GROUP 4: 0.25 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

GRADE

	SPINAL CORD	SPLEEN	STOMACH	TESTES
	THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER
MICRO:	ADRENAL GLANDS	AORTA	STERNEBRAE	BRAIN
	CECUM	COLON	DUODENUM	EPIDIDYMIDES
	ESOPHAGUS	EYES/OPTIC N.	ILEUM	JEJUNUM
	KIDNEYS	NERVE,SCIATIC	PANCREAS	PARATHYROID
	RECTUM	PITUITARY	PROSTATE	SALIVARY GLANDS
	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN	SPINAL CORD
	SPLEEN	TESTES	THYMUS GLAND	THYROID GLANDS
	TRACHEA	URINARY BLADDER		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44136 GROUP 4: 0.25 MG/L MALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.94	0.645
LIVER	8.46	2.811
KIDNEYS	2.61	0.867
HEART	1.20	0.399
SPLEEN	0.59	0.196
LUNGS	1.43	0.475
TESTES/EPIDID.	4.18	1.389
THYMUS GLAND	0.3146	0.105
ADRENAL GLANDS	0.0648	0.022
FINAL BODY WT(G)	301.	

		GRADE
NASAL TURBINATES	MICRO: INFLAMMATION, NONSUPPURATIVE- SKIN SECTION 1 FOLLICULITIS	1
	METAPLASIA, SQUAMOUS	1
	HYPERPLASIA, GOBLET CELL- SECTION 1 BILATERAL SEPTAL EPITHELIUM	1
	HYPERPLASIA, GOBLET CELL- SECTION 2 BILATERAL SEPTAL EPITHELIUM	1
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE FOCAL, MIDZONAL	1
LYMPH NODE, MES	MICRO: HISTIOCYTOSIS, SINUS	2
STOMACH	MICRO: INFILTRATE, MONONUCLEAR GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	1
MAMMARY GLAND	MICRO: HYPERPLASIA, GLANDULAR MULTIFOCAL	2

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
	PANCREAS	RECTUM	PITUITARY	PROSTATE
	SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	STOMACH	TESTES
	THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER
MICRO:	ADRENAL GLANDS	AORTA	STERNEBRAE	BRAIN

ANIMAL NO. 44136 GROUP 4: 0.25 MG/L MALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

GRADE

CECUM	COLON	DUODENUM	EPIDIDYMIDES
ESOPHAGUS	EYES/OPTIC N.	HEART	ILEUM
JEJUNUM	KIDNEYS	LUNGS	NERVE,SCIATIC
PANCREAS	PARATHYROID	RECTUM	PITUITARY
PROSTATE	SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE
SKIN	SPINAL CORD	SPLEEN	TESTES
THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER

NOT EXAMINED
MICRO:LYMPH NODE, BRON

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44139 GROUP 4: 0.25 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.95	0.709
LIVER	8.35	3.036
KIDNEYS	2.25	0.818
HEART	1.28	0.465
SPLEEN	0.70	0.255
LUNGS	1.47	0.535
TESTES/EPIDID.	4.35	1.582
THYMUS GLAND	0.3372	0.123
ADRENAL GLANDS	0.0698	0.025
FINAL BODY WT(G)	275.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1 BILATERAL SEPTAL EPITHELIUM	1
	HYPERPLASIA, GOBLET CELL- SECTION 2 BILATERAL SEPTAL EPITHELIUM	1
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	3
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL TO CENTROLOBULAR	2
SPLEEN	GROSS: CAPSULAR SCARRING	P
STOMACH	MICRO: INFILTRATE, MONONUCLEAR GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	1
MAMMARY GLAND	MICRO: HYPERPLASIA, GLANDULAR	2

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
PANCREAS	RECTUM	PITUITARY	PROSTATE
SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
SPINAL CORD	STOMACH	TESTES	THYMUS GLAND
THYROID GLANDS	TRACHEA	URINARY BLADDER	

MICRO:

ADRENAL GLANDS	AORTA	STERNEBRAE	BRAIN
CECUM	COLON	DUODENUM	EPIDIDYMIDES
ESOPHAGUS	EYES/OPTIC N.	HEART	ILEUM
JEJUNUM	KIDNEYS	LUNGS	NERVE,SCIATIC
PANCREAS	PARATHYROID	RECTUM	PITUITARY
PROSTATE	SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE
SKIN	SPINAL CORD	SPLEEN	TESTES

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44139 GROUP 4: 0.25 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

	GRADE
THYMUS GLAND	
THYROID GLANDS	
TRACHEA	
URINARY BLADDER	

NOT EXAMINED

MICRO:LYMPH NODE, BRON LYMPH NODE, MES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44146 GROUP 4: 0.25 MG/L MALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.89	0.616
LIVER	8.35	2.720
KIDNEYS	2.43	0.792
HEART	1.73	0.564
SPLEEN	0.58	0.189
LUNGS	1.38	0.450
TESTES/EPIDID.	4.36	1.420
THYMUS GLAND	0.2802	0.091
ADRENAL GLANDS	0.0599	0.020
FINAL BODY WT(G)	307.	

		GRADE
NASAL TURBINATES	MICRO: INFLAMMATION, NONSUPPURATIVE- UNILATERAL, VENTRAL SEPTUM SKIN SECTION 1	1
	DYSPLASIA SECTION 2	1
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	1
HEART	MICRO: INFLAMMATION, NONSUPPURATIVE FOCAL, SUBEPICARDIAL, LEFT VENTRICLE	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL TO CENTROLOBULAR	1
LYMPH NODE, MES	MICRO: HISTIOCYTOSIS, SINUS	1
PITUITARY	MICRO: CRANIOPHARYNGEAL DUCT REMNANT	P
SKIN	MICRO: INFLAMMATION, NONSUPPURATIVE-DERMIS FOCAL	1
STOMACH	MICRO: INFILTRATE, MONONUCLEAR GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	1
TRACHEA	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, LAMINA PROPRIA/SUBMUCOSA	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADREHAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
PANCREAS	RECTUM	PITUITARY	PROSTATE
SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44146 GROUP 4: 0.25 MG/L MALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

GRADE

	SPINAL CORD	SPLEEN	STOMACH	TESTES
	THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER
MICRO:	ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	ILEUM
	JEJUNUM	KIDNEYS	LUNGS	NERVE,SCIATIC
	PANCREAS	PARATHYROID	RECTUM	PROSTATE
	SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SPINAL CORD
	SPLEEN	TESTES	THYMUS GLAND	THYROID GLANDS
	URINARY BLADDER			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44334 GROUP 4: 0.25 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.74	0.690
LIVER	8.03	3.187
KIDNEYS	2.14	0.849
HEART	1.31	0.520
SPLEEN	0.49	0.194
LUNGS	1.91	0.758
TESTES/EPIDID.	3.74	1.484
THYMUS GLAND	0.2978	0.118
ADRENAL GLANDS	0.0526	0.021
FINAL BODY WT(G)	252.	

		GRADE
LYMPH NODE, BRON	MICRO: HYPERPLASIA, LYMPHOID FOLLICULAR	1
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1	1
	INFLAMMATION, NONSUPPURATIVE	1
	DYSPLASIA SECTION 6	1
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	2
HEART	MICRO: INFLAMMATION, NONSUPPURATIVE FOCAL, RIGHT VENTRICLE	2
LIVER	MICRO: CONGESTION MULTIFOCAL, MIDZONAL TO CENTROLOBULAR	1
	INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL TO CENTROLOBULAR	1
LYMPH NODE, MES	MICRO: HISTIOCYTOSIS, SINUS	2
LUNGS	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL	1
STOMACH	MICRO: INFILTRATE, MONONUCLEAR GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
PANCREAS	RECTUM	PITUITARY	PROSTATE

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44334 GROUP 4: 0.25 MG/L MALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

GRADE

SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	STOMACH	TESTES
THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER
MICRO:ADRENAL GLANDS	AORTA	STERNEBRAE	BRAIN
CECUM	COLON	DUODENUM	EPIDIDYMIDES
ESOPHAGUS	EYES/OPTIC N.	ILEUM	JEJUNUM
KIDNEYS	NERVE,SCIATIC	PANCREAS	RECTUM
PITUITARY	PROSTATE	SALIVARY GLANDS	SEMINAL VESICLES
SKELETAL MUSCLE	SKIN	SPINAL CORD	SPLEEN
TESTES	THYMUS GLAND	THYROID GLANDS	TRACHEA
URINARY BLADDER			

NOT EXAMINED
MICRO:PARATHYROID

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44338 GROUP 4: 0.25 MG/L MALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.69	0.738
LIVER	6.19	2.703
KIDNEYS	1.82	0.795
HEART	0.92	0.402
SPLEEN	0.44	0.192
LUNGS	1.29	0.563
TESTES/EPIDID.	3.48	1.520
THYMUS GLAND	0.4639	0.203
ADRENAL GLANDS	0.0575	0.025
FINAL BODY WT(G)	229.	

			GRADE
NASAL TURBINATES	MICRO:	METAPLASIA, SQUAMOUS	2
		HYPERPLASIA, GOBLET CELL- SECTION 2	2
		SECTION 2	
		DYSPLASIA	1
		SECTION 2	
		HYPERPLASIA, GOBLET CELL- SECTION 3	1
		DEGENERATION, OLFACTORY EPITHELIUM- SECTION 4	2
LYMPH NODE, SUPR	MICRO:	HISTIOCYTOSIS, SINUS	2
HEART	MICRO:	INFLAMMATION, NONSUPPURATIVE	1
		FOCAL, RIGHT VENTRICLE	
LIVER	MICRO:	INFLAMMATION, NONSUPPURATIVE	1
		MULTIFOCAL, PORTAL	
LYMPH NODE, MES	MICRO:	HISTIOCYTOSIS, SINUS	2
STOMACH	MICRO:	INFILTRATE, MONONUCLEAR	1
		GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	
MAMMARY GLAND	MICRO:	HYPERPLASIA, GLANDULAR	1
		MULTIFOCAL	

NO SIGNIFICANT CHANGES OBSERVED

GROSS:			
ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
PANCREAS	RECTUM	PITUITARY	PROSTATE
SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	STOMACH	TESTES

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44338 GROUP 4: 0.25 MG/L MALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

				GRADE
	THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER
MICRO:	ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	ILEUM
	JEJUNUM	KIDNEYS	LUNGS	NERVE,SCIATIC
	PANCREAS	PARATHYROID	RECTUM	PITUITARY
	PROSTATE	SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE
	SKIN	SPINAL CORD	SPLEEN	TESTES
	THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44154 GROUP 1: 0.00 MG/L FEMALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.83	0.744
LIVER	8.01	3.256
KIDNEYS	2.02	0.821
HEART	1.09	0.443
SPLEEN	0.61	0.248
LUNGS	1.89	0.768
OVARIES	0.1589	0.065
THYMUS GLAND	0.4048	0.165
ADRENAL GLANDS	0.1024	0.042
FINAL BODY WT(G)	246.	

		GRADE
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL TO CENTROLOBULAR	1
LYMPH NODE, MES	MICRO: HISTIOCYTOSIS, SINUS	1
LUNGS	MICRO: EDEMA, ALVEOLAR MULTIFOCAL INTRA-ALVEOLAR ACIDOPHILIC PROTEINACEOUS MATERIAL	1
	CONGESTION MULTIFOCAL	2
STOMACH	MICRO: INFILTRATE, MONONUCLEAR GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
	LYMPH NODE, BRON	BRAIN	CECUM	COLON
	DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	NERVE,SCIATIC	OVARIES	PANCREAS	RECTUM
	PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	STOMACH	THYMUS GLAND
	THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
	VAGINA			
MICRO:	ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
	BRAIN	CECUM	COLON	DUODENUM
	NASAL TURBINATES	ESOPHAGUS	EYES/OPTIC N.	HEART
	ILEUM	JEJUNUM	KIDNEYS	MAMMARY GLAND
	NERVE,SCIATIC	OVARIES	PANCREAS	RECTUM
	PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	THYMUS GLAND	THYROID GLANDS

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44154 GROUP 1: 0.00 MG/L FEMALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

GRADE

TRACHEA	URINARY BLADDER	UTERUS	VAGINA
NOT EXAMINED			

MICRO:LYMPH NODE, BRON PARATHYROID

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44164 GROUP 1: 0.00 MG/L FEMALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.73	0.749
LIVER	8.26	3.576
KIDNEYS	2.15	0.931
HEART	0.87	0.377
SPLEEN	0.88	0.381
LUNGS	2.71	1.173
OVARIES	0.1531	0.066
THYMUS GLAND	0.3098	0.134
ADRENAL GLANDS	0.1162	0.050
FINAL BODY WT(G)	231.	

		GRADE
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL	1
LYMPH NODE, MES	MICRO: HISTIOCYTOSIS, SINUS	1
LUNGS	GROSS: MOTTLED ALL LOBES	P
LUNGS	MICRO: EDEMA, ALVEOLAR MULTIFOCAL INTRA-ALVEOLAR ACIDOPHILIC PROTEINACEOUS MATERIAL	3
	CONGESTION MULTIFOCAL	2
STOMACH	MICRO: INFILTRATE, MONONUCLEAR GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
	LYMPH NODE, BRON	BRAIN	CECUM	COLON
	DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LIVER	LYMPH NODE, MES	MAMMARY GLAND	NERVE,SCIATIC
	OVARIES	PANCREAS	RECTUM	PITUITARY
	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN	SPINAL CORD
	SPLEEN	STOMACH	THYMUS GLAND	THYROID GLANDS
	TRACHEA	URINARY BLADDER	UTERUS	VAGINA
MICRO:	ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
	LYMPH NODE, BRON	BRAIN	CECUM	COLON
	DUODENUM	NASAL TURBINATES	ESOPHAGUS	EYES/OPTIC N.
	HEART	ILEUM	JEJUNUM	KIDNEYS
	MAMMARY GLAND	NERVE,SCIATIC	OVARIES	PANCREAS
	RECTUM	PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44164 GROUP 1: 0.00 MG/L FEMALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

GRADE

SKIN	SPINAL CORD	SPLEEN	THYMUS GLAND
THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
VAGINA			

NOT EXAMINED

MICRO:PARATHYROID

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44178 GROUP 1: 0.00 MG/L FEMALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.78	0.836
LIVER	9.10	4.272
KIDNEYS	1.99	0.934
HEART	0.89	0.418
SPLEEN	0.33	0.155
LUNGS	2.55	1.197
OVARIES	0.1395	0.065
THYMUS GLAND	0.3397	0.159
ADRENAL GLANDS	0.0773	0.036
FINAL BODY WT(G)	213.	

		GRADE
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	2
KIDNEYS	MICRO: MINERALIZATION, TUBULAR MULTIFOCAL, CORTICOMEDULLARY JUNCTION	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL	1
LYMPH NODE, MES	MICRO: HISTIOCYTOSIS, SINUS	1
LUNGS	GROSS: MOTTLED ALL LOBES	P
LUNGS	MICRO: INFLAMMATION, GRANULOCYTIC FOCAL, SUBPLEURAL	1
	EDEMA, PERIVASCULAR MULTIFOCAL	2
	EDEMA, ALVEOLAR MULTIFOCAL INTRA-ALVEOLAR ACIDOPHILIC PROTEINACEOUS MATERIAL	3
	CONGESTION MULTIFOCAL	2
STOMACH	MICRO: AUTOLYTIC GLANDULAR STOMACH	1
	INFILTRATE, MONONUCLEAR GLANDULAR STOMACH	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS: ADRENAL GLANDS, AORTA, STERNEBRAE, OVIDUCTS, LYMPH NODE, BRON, BRAIN, CECUM, COLON, DUODENUM, ESOPHAGUS, EYES/OPTIC N., LYMPH NODE, SUPR

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44178 GROUP 1: 0.00 MG/L FEMALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

GRADE

HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	MAMMARY GLAND	NERVE,SCIATIC
OVARIES	PANCREAS	RECTUM	PITUITARY
SALIVARY GLANDS	SKELETAL MUSCLE	SKIN	SPINAL CORD
SPLEEN	STOMACH	THYMUS GLAND	THYROID GLANDS
TRACHEA	URINARY BLADDER	UTERUS	VAGINA
MICRO:ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
LYMPH NODE, BRON	BRAIN	CECUM	COLON
DUODENUM	NASAL TURBINATES	ESOPHAGUS	EYES/OPTIC N.
HEART	ILEUM	JEJUNUM	MAMMARY GLAND
NERVE,SCIATIC	OVARIES	PANCREAS	RECTUM
PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	THYMUS GLAND	THYROID GLANDS
TRACHEA	URINARY BLADDER	UTERUS	VAGINA

NOT EXAMINED
MICRO:PARATHYROID

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44181 GROUP 1: 0.00 MG/L FEMALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.90	0.826
LIVER	7.71	3.352
KIDNEYS	1.69	0.735
HEART	1.09	0.474
SPLEEN	0.63	0.274
LUNGS	2.29	0.996
OVARIES	0.1497	0.065
THYMUS GLAND	0.4437	0.193
ADRENAL GLANDS	0.0861	0.037
FINAL BODY WT(G)	230.	

		GRADE
NASAL TURBINATES	MICRO: INFLAMMATION, NONSUPPURATIVE	1
	NASOLACRIMAL DUCT- NASAL SECTION 3	
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	1
	PLASMACYTOSIS	1
	MEDULLARY CORDS	
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE	1
	MULTIFOCAL, PORTAL TO CENTROLOBULAR	
LYMPH NODE, MES	MICRO: HISTIOCYTOSIS, SINUS	1
	HYPERPLASIA, LYMPHOID	1
	FOLLICULAR AND PARACORTICAL	
LUNGS	GROSS: MOTTLED	P
	ALL LOBES	
LUNGS	MICRO: INFLAMMATION, GRANULOCYTIC	1
	MULTIFOCAL, PERIVASCULAR	
	EDEMA, ALVEOLAR	2
	MULTIFOCAL INTRA-ALVEOLAR ACIDOPHILIC PROTEINACEOUS MATERIAL	
	CONGESTION	1
	MULTIFOCAL	
STOMACH	MICRO: INFILTRATE, MONONUCLEAR	1
	GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	
LYMPH NODE	GROSS: CERVICAL- REDDENED	P
	BILATERAL	
NO SIGNIFICANT CHANGES OBSERVED	GROSS:ADRENAL GLANDS AORTA STERNEBRAE OVIDUCTS	

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44181 GROUP 1: 0.00 MG/L FEMALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

GRADE

LYMPH NODE, BRON	BRAIN	CECUM	COLON
DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	MAMMARY GLAND	NERVE,SCIATIC
OVARIES	PANCREAS	RECTUM	PITUITARY
SALIVARY GLANDS	SKELETAL MUSCLE	SKIN	SPINAL CORD
SPLEEN	STOMACH	THYMUS GLAND	THYROID GLANDS
TRACHEA	URINARY BLADDER	UTERUS	VAGINA
MICRO:ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
LYMPH NODE, BRON	BRAIN	CECUM	COLON
DUODENUM	ESOPHAGUS	EYES/OPTIC N.	HEART
ILEUM	JEJUNUM	KIDNEYS	MAMMARY GLAND
NERVE,SCIATIC	OVARIES	PANCREAS	PARATHYROID
RECTUM	PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE
SKIN	SPINAL CORD	SPLEEN	THYMUS GLAND
THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
VAGINA			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

ANIMAL NO. 44204 GROUP 1: 0.00 MG/L FEMALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.76	0.912
LIVER	7.38	3.824
KIDNEYS	1.98	1.026
HEART	0.81	0.420
SPLEEN	0.59	0.306
LUNGS	2.57	1.332
OVARIES	0.1459	0.076
THYMUS GLAND	0.3933	0.204
ADRENAL GLANDS	0.0677	0.035
FINAL BODY WT(G)	193.	

		GRADE
LYMPH NODE, SUPR	GROSS: ENLARGED RIGHT	P
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	1
	PLASMACYTOSIS MEDULLARY CORDS	2
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL TO CENTROLOBULAR	1
LYMPH NODE, MES	MICRO: HISTIOCYTOSIS, SINUS	1
	HYPERPLASIA, LYMPHOID PARACORTICAL	1
LUNGS	GROSS: DARK RED ALL LOBES	P
LUNGS	MICRO: EDEMA, ALVEOLAR FOCALLY EXTENSIVE	3
	EDEMA, PERIVASCULAR MULTIFOCAL	2
STOMACH	MICRO: INFILTRATE, MONONUCLEAR GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
LYMPH NODE, BRON	BRAIN	CECUM	COLON
DUODENUM	ESOPHAGUS	EYES/OPTIC N.	HEART
ILEUM	JEJUNUM	KIDNEYS	LIVER
LYMPH NODE, MES	MAMMARY GLAND	NERVE,SCIATIC	OVARIES
PANCREAS	RECTUM	PITUITARY	SALIVARY GLANDS
SKELETAL MUSCLE	SKIN	SPINAL CORD	SPLEEN

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44204 GROUP 1: 0.00 MG/L FEMALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

GRADE

STOMACH	THYMUS GLAND	THYROID GLANDS	TRACHEA
URINARY BLADDER	UTERUS	VAGINA	
MICRO:ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
LYMPH NODE, BRON	BRAIN	CECUM	COLON
DUODENUM	NASAL TURBINATES	ESOPHAGUS	EYES/OPTIC N.
HEART	ILEUM	JEJUNUM	KIDNEYS
MAMMARY GLAND	NERVE,SCIATIC	OVARIES	PANCREAS
RECTUM	PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE
SKIN	SPINAL CORD	SPLEEN	THYMUS GLAND
THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
VAGINA			

NOT EXAMINED
MICRO:PARATHYROID

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44207 GROUP 1: 0.00 MG/L FEMALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.90	0.995
LIVER	5.80	3.037
KIDNEYS	1.75	0.916
HEART	0.89	0.466
SPLEEN	0.45	0.236
LUNGS	1.28	0.670
OVARIES	0.1196	0.063
THYMUS GLAND	0.2388	0.125
ADRENAL GLANDS	0.0605	0.032
FINAL BODY WT(G)	191.	

		GRADE
LYMPH NODE, BRON	MICRO: HISTIOCYTOSIS, SINUS	1
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL TO CENTROLOBULAR	1
LYMPH NODE, MES	MICRO: HISTIOCYTOSIS, SINUS	2
STOMACH	MICRO: INFILTRATE, MONONUCLEAR GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
	LYMPH NODE, BRON	BRAIN	CECUM	COLON
	DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	NERVE,SCIATIC	OVARIES	PANCREAS	RECTUM
	PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	STOMACH	THYMUS GLAND
	THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
	VAGINA			
MICRO:	ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
	BRAIN	CECUM	COLON	DUODENUM
	NASAL TURBINATES	ESOPHAGUS	EYES/OPTIC N.	HEART
	ILEUM	JEJUNUM	KIDNEYS	LUNGS
	MAMMARY GLAND	NERVE,SCIATIC	OVARIES	PANCREAS
	PARATHYROID	RECTUM	PITUITARY	SALIVARY GLANDS
	SKELETAL MUSCLE	SKIN	SPINAL CORD	SPLEEN
	THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	VAGINA		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44346 GROUP 1: 0.00 MG/L FEMALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.67	0.898
LIVER	5.83	3.134
KIDNEYS	1.62	0.871
HEART	0.81	0.435
SPLEEN	0.33	0.177
LUNGS	0.98	0.527
OVARIES	0.1000	0.054
THYMUS GLAND	0.2621	0.141
ADRENAL GLANDS	0.0670	0.036
FINAL BODY WT(G)	186.	

		GRADE
LYMPH NODE, BRON	MICRO: HISTIOCYTOSIS, SINUS	1
CECUM	MICRO: HYPERPLASIA, LYMPHOID	1
NASAL TURBINATES	MICRO: INFLAMMATION, NONSUPPURATIVE- SKIN SECTION 1 MULTIFOCAL	2
LYMPH NODE, SUPR	GROSS: ENLARGED RIGHT	P
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	2
LYMPH NODE, MES	MICRO: HISTIOCYTOSIS, SINUS	3
STOMACH	MICRO: INFILTRATE, MONONUCLEAR GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	1
LYMPH NODE	GROSS: CERVICAL- ENLARGED RIGHT	P
LYMPH NODE	GROSS: ILIAC- ENLARGED BILATERAL	P
LYMPH NODE	MICRO: HISTIOCYTOSIS, SINUS- CERVICAL	1
	HYPERPLASIA, LYMPHOID- CERVICAL	3
	PLASMACYTOSIS- CERVICAL CERVICAL NODE	2
	HISTIOCYTOSIS, SINUS- ILIAC	2

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
LYMPH NODE, BRON	BRAIN	CECUM	COLON
DUODENUM	ESOPHAGUS	EYES/OPTIC N.	HEART
ILEUM	JEJUMUM	KIDNEYS	LIVER
LYMPH NODE, MES	LUNGS	MAMMARY GLAND	NERVE,SCIATIC
OVARIES	PANCREAS	RECTUM	PITUITARY
SALIVARY GLANDS	SKELETAL MUSCLE	SKIN	SPINAL CORD
SPLEEN	STOMACH	THYMUS GLAND	THYROID GLANDS
TRACHEA	URINARY BLADDER	UTERUS	VAGINA

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44346 GROUP 1: 0.00 MG/L FEMALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

GRADE

MICRO:ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
BRAIN	COLON	DUODENUM	ESOPHAGUS
EYES/OPTIC N.	HEART	ILEUM	JEJUNUM
KIDNEYS	LIVER	LUNGS	MAMMARY GLAND
NERVE,SCIATIC	OVARIES	PANCREAS	PARATHYROID
RECTUM	PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE
SKIN	SPINAL CORD	SPLEEN	THYMUS GLAND
THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
VAGINA			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44352 GROUP 1: 0.00 MG/L FEMALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.82	0.938
LIVER	8.09	4.170
KIDNEYS	1.58	0.814
HEART	0.86	0.443
SPLEEN	0.42	0.216
LUNGS	1.32	0.680
OVARIES	0.1179	0.061
THYMUS GLAND	0.4329	0.223
ADRENAL GLANDS	0.0774	0.040
FINAL BODY WT(G)	194.	

		GRADE
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	3
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL	1
LYMPH NODE, MES	MICRO: HYPERPLASIA, LYMPHOID FOLLICULAR	1
	HISTIOCYTOSIS, SINUS	1
STOMACH	MICRO: INFILTRATE, MONONUCLEAR GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	1

MICRO: NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
	LYMPH NODE, BRON	BRAIN	CECUM	COLON
	DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	NERVE,SCIATIC	OVARIES	PANCREAS	RECTUM
	PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	STOMACH	THYMUS GLAND
	THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
	VAGINA			
MICRO:	ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
	LYMPH NODE, BRON	BRAIN	CECUM	COLON
	DUODENUM	NASAL TURBINATES	ESOPHAGUS	EYES/OPTIC N.
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LUNGS	MAMMARY GLAND	NERVE,SCIATIC	OVARIES
	PANCREAS	PARATHYROID	RECTUM	PITUITARY
	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN	SPINAL CORD
	SPLEEN	THYMUS GLAND	THYROID GLANDS	TRACHEA
	URINARY BLADDER	UTERUS	VAGINA	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44159 GROUP 2: 0.025 MG/L FEMALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.91	0.827
LIVER	7.58	3.281
KIDNEYS	1.72	0.745
HEART	0.95	0.411
SPLEEN	0.55	0.238
LUNGS	2.24	0.970
OVARIES	0.1353	0.059
THYMUS GLAND	0.2990	0.129
ADRENAL GLANDS	0.0858	0.037
FINAL BODY WT(G)	231.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1 BILATERAL SEPTAL EPITHELIUM	1
KIDNEYS	MICRO: MINERALIZATION, TUBULAR MULTIFOCAL, CORTICOMEDULLARY JUNCTION	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL TO CENTROLOBULAR	1
LUNGS	GROSS: MOTTLED ALL LOBES	P
LUNGS	MICRO: INFLAMMATION, GRANULOCYTIC MULTIFOCAL, PERIVASCULAR	1
	EDEMA, ALVEOLAR MULTIFOCAL INTRA-ALVEOLAR ACIDOPHILIC PROTEINACEOUS MATERIAL	1
	CONGESTION MULTIFOCAL	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
LYMPH NODE, BRON	BRAIN	CECUM	COLON
DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	MAMMARY GLAND	NERVE,SCIATIC
OVARIES	PANCREAS	RECTUM	PITUITARY
SALIVARY GLANDS	SKELETAL MUSCLE	SKIN	SPINAL CORD
SPLEEN	STOMACH	THYMUS GLAND	THYROID GLANDS
TRACHEA	URINARY BLADDER	UTERUS	VAGINA

MICRO:TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)

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SPONSOR:ELF ATOCHEM INC. — GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44160 GROUP 2: 0.025 MG/L FEMALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.77	0.927
LIVER	6.50	3.403
KIDNEYS	1.77	0.927
HEART	0.87	0.455
SPLEEN	0.42	0.220
LUNGS	1.21	0.634
OVARIES	0.1247	0.065
THYMUS GLAND	0.3641	0.191
ADRENAL GLANDS	0.0757	0.040
FINAL BODY WT(G)	191.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1 BILATERAL SEPTAL EPITHELIUM	2
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
	LYMPH NODE, BRON	BRAIN	CECUM	COLON
	DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	NERVE,SCIATIC	OVARIES	PANCREAS	RECTUM
	PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	STOMACH	THYMUS GLAND
	THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
	VAGINA			
MICRO:	KIDNEYS	LUNGS	TRACHEA	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44170 GROUP 2: 0.025 MG/L FEMALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.81	0.883
LIVER	6.92	3.376
KIDNEYS	1.79	0.873
HEART	0.94	0.459
SPLEEN	0.68	0.332
LUNGS	1.54	0.751
OVARIES	0.1515	0.074
THYMUS GLAND	0.5065	0.247
ADRENAL GLANDS	0.0977	0.048
FINAL BODY WT(G)	205.	

		GRADE
NASAL TURBINATES	MICRO: METAPLASIA, RESPIRATORY SECTION 3	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL	1
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
	LYMPH NODE, BRON	BRAIN	CECUM	COLON
	DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	NERVE,SCIATIC	OVARIES	PANCREAS	RECTUM
	PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	STOMACH	THYMUS GLAND
	THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
	VAGINA			
MICRO:	KIDNEYS	LUNGS	TRACHEA	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44172 GROUP 2: 0.025 MG/L FEMALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.79	0.803
LIVER	8.83	3.960
KIDNEYS	1.80	0.807
HEART	0.97	0.435
SPLEEN	0.48	0.215
LUNGS	2.50	1.121
OVARIES	0.1289	0.058
THYMUS GLAND	0.4791	0.215
ADRENAL GLANDS	0.0781	0.035
FINAL BODY WT(G)	223.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1	
	BILATERAL SEPTAL EPITHELIUM	2
	INFLAMMATION, NONSUPPURATIVE- SKIN SECTION 1	
	FOCAL RIGHT VENTRAL SEPTUM, LAMINA PROPRIA/SUBMUCOSA	1
KIDNEYS	MICRO: AUTOLYTIC	
	FOCAL, CORTICAL	1
LIVER	MICRO: NECROSIS, CENTROLOBULAR	
	MULTIFOCAL/COALESCING, CONGESTION, ONLY ONE LOBE INVOLVED	3
LUNGS	GROSS: DARK RED	
	ALL LOBES	P
LUNGS	MICRO: INFLAMMATION, GRANULOCYTIC	
	MULTIFOCAL, PERIVASCULAR	1
	EDEMA, ALVEOLAR	
	MULTIFOCAL INTRA-ALVEOLAR ACIDOPHILIC PROTEINACEOUS MATERIAL	2
	CONGESTION	
	MULTIFOCAL	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
LYMPH NODE, BRON	BRAIN	CECUM	COLON
DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	MAMMARY GLAND	NERVE,SCIATIC
OVARIES	PANCREAS	RECTUM	PITUITARY
SALIVARY GLANDS	SKELETAL MUSCLE	SKIN	SPINAL CORD
SPLEEN	STOMACH	THYMUS GLAND	THYROID GLANDS

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44172 GROUP 2: 0.025 MG/L FEMALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

	GRADE
TRACHEA	
MICRO:TRACHEA	
URINARY BLADDER	
UTERUS	
VAGINA	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44179 GROUP 2: 0.025 MG/L FEMALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.00	0.810
LIVER	9.58	3.879
KIDNEYS	1.84	0.745
HEART	0.86	0.348
SPLEEN	0.64	0.259
LUNGS	2.45	0.992
OVARIES	0.1247	0.050
THYMUS GLAND	0.3899	0.158
ADRENAL GLANDS	0.1075	0.044
FINAL BODY WT(G)	247.	

		GRADE
KIDNEYS	MICRO: MINERALIZATION, TUBULAR MULTIFOCAL, CORTICOMEDULLARY JUNCTION	1
LIVER	MICRO: NECROSIS, CENTROLOBULAR MULTIFOCAL/COALESCING, CONGESTION, ONLY ONE LOBE INVOLVED	2
	INFLAMMATION, NONSUPPURATIVE MULTIFOCAL,INVOLVING AREAS OF NECROSIS	2
LUNGS	GROSS: MOTTLED ALL LOBES	P
LUNGS	MICRO: INFLAMMATION, GRANULOCYTIC MULTIFOCAL, PERIVASCULAR	1
	EDEMA, ALVEOLAR MULTIFOCAL INTRA-ALVEOLAR ACIDOPHILIC PROTEINACEOUS MATERIAL	2
LYMPH NODE	GROSS: CERVICAL- ENLARGED BILATERAL	P
LYMPH NODE	MICRO: HYPERPLASIA, LYMPHOID- CERVICAL CERVICAL NODE	3

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
LYMPH NODE, BRON	BRAIN	CECUM	COLON
DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	MAMMARY GLAND	NERVE,SCIATIC
OVARIES	PANCREAS	RECTUM	PITUITARY
SALIVARY GLANDS	SKELETAL MUSCLE	SKIN	SPINAL CORD
SPLEEN	STOMACH	THYMUS GLAND	THYROID GLANDS
TRACHEA	URINARY BLADDER	UTERUS	VAGINA

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44179 GROUP 2: 0.025 MG/L FEMALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

GRADE

MICRO:NASAL TURBINATES TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44183 GROUP 2: 0.025 MG/L FEMALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.71	0.784
LIVER	7.12	3.266
KIDNEYS	1.67	0.766
HEART	0.76	0.349
SPLEEN	0.50	0.229
LUNGS	1.24	0.569
OVARIES	0.1190	0.055
THYMUS GLAND	0.3713	0.170
ADRENAL GLANDS	0.0809	0.037
FINAL BODY WT(G)	218.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1 BILATERAL SEPTAL EPITHELIUM	2
KIDNEYS	MICRO: MINERALIZATION, TUBULAR MULTIFOCAL, CORTICOMEDULLARY JUNCTION	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL	1
LUNGS	MICRO: INFLAMMATION, GRANULOCYTIC MULTIFOCAL, PERIVASCULAR	1
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:ADRENAL GLANDS, AORTA, STERNEBRAE, OVIDUCTS, LYMPH NODE, BRON, BRAIN, CECUM, COLON, DUODENUM, ESOPHAGUS, EYES/OPTIC N., LYMPH NODE, SUPR, HEART, ILEUM, JEJUNUM, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, NERVE,SCIATIC, OVARIES, PANCREAS, RECTUM, PITUITARY, SALIVARY GLANDS, SKELETAL MUSCLE, SKIN, SPINAL CORD, SPLEEN, STOMACH, THYMUS GLAND, THYROID GLANDS, TRACHEA, URINARY BLADDER, UTERUS, VAGINA

MICRO:TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44191 GROUP 2: 0.025 MG/L FEMALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.81	0.826
LIVER	9.85	4.498
KIDNEYS	2.24	1.023
HEART	0.98	0.447
SPLEEN	0.61	0.279
LUNGS	2.79	1.274
OVARIES	0.1257	0.057
THYMUS GLAND	0.3220	0.147
ADRENAL GLANDS	0.0724	0.033
FINAL BODY WT(G)	219.	

		GRADE
NASAL TURBINATES	MICRO: DEGENERATION, OLFACTORY EPITHELIUM- SECTION 4 FOCAL, LEFT VENTRAL MEATUS	1
KIDNEYS	MICRO: MINERALIZATION, TUBULAR MULTIFOCAL, CORTICOMEDULLARY JUNCTION	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL TO CENTROLOBULAR	1
LUNGS	GROSS: DARK RED ALL LOBES	P
LUNGS	MICRO: INFLAMMATION, GRANULOCYTIC MULTIFOCAL, PERIVASCULAR	1
	EDEMA, ALVEOLAR FOCALLY EXTENSIVE	3
	EDEMA, PERIVASCULAR MULTIFOCAL	2

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
LYMPH NODE, BRON	BRAIN	CECUM	COLON
DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	MAMMARY GLAND	NERVE,SCIATIC
OVARIES	PANCREAS	RECTUM	PITUITARY
SALIVARY GLANDS	SKELETAL MUSCLE	SKIN	SPINAL CORD
SPLEEN	STOMACH	THYMUS GLAND	THYROID GLANDS
TRACHEA	URINARY BLADDER	UTERUS	VAGINA

MICRO:TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44192 GROUP 2: 0.025 MG/L FEMALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.00	0.866
LIVER	8.19	3.545
KIDNEYS	2.20	0.952
HEART	1.14	0.494
SPLEEN	0.64	0.277
LUNGS	1.43	0.619
OVARIES	0.1482	0.064
THYMUS GLAND	0.4739	0.205
ADRENAL GLANDS	0.0769	0.033
FINAL BODY WT(G)	231.	

		GRADE
LYMPH NODE, SUPR	GROSS: ENLARGED RIGHT	P
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL	1
LYMPH NODE	GROSS: CERVICAL- ENLARGED BILATERAL	P
LYMPH NODE	MICRO: HYPERPLASIA, LYMPHOID- SUPRAPHARYNGEAL	3
	HISTIOCYTOSIS, SINUS- SUPRAPHARYNGEAL	1
	HYPERPLASIA, LYMPHOID- CERVICAL	3

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
LYMPH NODE, BRON	BRAIN	CECUM	COLON
DUODENUM	ESOPHAGUS	EYES/OPTIC N.	HEART
ILEUM	JEJUNUM	KIDNEYS	LIVER
LYMPH NODE, MES	LUNGS	MAMMARY GLAND	NERVE,SCIATIC
OVARIES	PANCREAS	RECTUM	PITUITARY
SALIVARY GLANDS	SKELETAL MUSCLE	SKIN	SPINAL CORD
SPLEEN	STOMACH	THYMUS GLAND	THYROID GLANDS
TRACHEA	URINARY BLADDER	UTERUS	VAGINA

MICRO:

NASAL TURBINATES	KIDNEYS	LUNGS	TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44201 GROUP 2: 0.025 MG/L FEMALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.85	0.808
LIVER	8.19	3.576
KIDNEYS	2.00	0.873
HEART	1.02	0.445
SPLEEN	0.69	0.301
LUNGS	2.08	0.908
OVARIES	0.1728	0.075
THYMUS GLAND	0.3741	0.163
ADRENAL GLANDS	0.0833	0.036
FINAL BODY WT(G)	229.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 2 MULTIFOCAL	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL TO CENTROLOBULAR	1
LUNGS	MICRO: EDEMA, ALVEOLAR MULTIFOCAL INTRA-ALVEOLAR ACIDOPHILIC PROTEINACEOUS MATERIAL	1
	CONGESTION MULTIFOCAL	2
	EDEMA, PERIVASCULAR MULTIFOCAL	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
LYMPH NODE, BRON	BRAIN	CECUM	COLON
DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
NERVE,SCIATIC	OVARIES	PANCREAS	RECTUM
PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	STOMACH	THYMUS GLAND
THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
VAGINA			

MICRO:KIDNEYS TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44150 GROUP 3: 0.075 MG/L FEMALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.88	0.862
LIVER	9.35	4.289
KIDNEYS	2.02	0.927
HEART	1.36	0.624
SPLEEN	0.59	0.271
LUNGS	2.79	1.280
OVARIES	0.1793	0.082
THYMUS GLAND	0.4612	0.212
ADRENAL GLANDS	0.0897	0.041
FINAL BODY WT(G)	218.	

		GRADE
NASAL TURBINATES	MICRO: DEGENERATION, OLFACTORY EPITHELIUM- SECTION 4 BILATERAL, VENTRAL TURBINATES	2
LIVER	MICRO: CONGESTION MULTIFOCAL, MIDZONAL TO CENTROLOBULAR	2
	INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL TO CENTROLOBULAR	1
	NECROSIS, CENTROLOBULAR MULTIFOCAL	1
LUNGS	MICRO: INFLAMMATION, GRANULOCYTIC MULTIFOCAL, PERIVASCULAR	1
	CONGESTION MULTIFOCAL	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
LYMPH NODE, BRON	BRAIN	CECUM	COLON
DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
NERVE,SCIATIC	OVARIES	PANCREAS	RECTUM
PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	STOMACH	THYMUS GLAND
THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
VAGINA			

MICRO:KIDNEYS TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44152 GROUP 3: 0.075 MG/L FEMALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.87	0.799
LIVER	8.86	3.786
KIDNEYS	2.08	0.889
HEART	0.85	0.363
SPLEEN	0.63	0.269
LUNGS	2.29	0.979
OVARIES	0.1297	0.055
THYMUS GLAND	0.4846	0.207
ADRENAL GLANDS	0.0746	0.032
FINAL BODY WT(G)	234.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA BILATERAL, SEPTUM, RESPIRATORY EPITHELIUM	1
	HYPERPLASIA, GOBLET CELL- SECTION 2 BILATERAL SEPTAL EPITHELIUM	1
	METAPLASIA, RESPIRATORY SECTION 5	1
KIDNEYS	MICRO: MINERALIZATION, TUBULAR FOCAL, CORTICAL	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE FOCAL, PORTAL PERIVASCULAR	2
LUNGS	MICRO: CONGESTION MULTIFOCAL	1
	INFLAMMATION, GRANULOCYTIC MULTIFOCAL, PERIVASCULAR	1
	EDEMA, ALVEOLAR MULTIFOCAL	3
NO SIGNIFICANT CHANGES OBSERVED	GROSS: ADRENAL GLANDS, AORTA, STERNEBRAE, OVIDUCTS, LYMPH NODE, BRON, BRAIN, CECUM, COLON, DUODENUM, ESOPHAGUS, EYES/OPTIC N., LYMPH NODE, SUPR, HEART, ILEUM, JEJUNUM, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND	

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44152 GROUP 3: 0.075 MG/L FEMALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

GRADE

NERVE,SCIATIC	OVARIES	PANCREAS	RECTUM
PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	STOMACH	THYMUS GLAND
THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
VAGINA			

MICRO:TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44161 GROUP 3: 0.075 MG/L FEMALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.35	0.880
LIVER	12.07	4.521
KIDNEYS	2.97	1.112
HEART	1.23	0.461
SPLEEN	0.79	0.296
LUNGS	2.39	0.895
OVARIES	0.2548	0.095
THYMUS GLAND	0.5132	0.192
ADRENAL GLANDS	0.1264	0.047
FINAL BODY WT(G)	267.	

		GRADE
NASAL TURBINATES	MICRO: EDEMA, LAMINA PROPRIA, NASAL TURBINATE- SECTION 2	1
	INFLAMMATION, NEUTROPHILIC NASAL TURBINATE- SECTION 2	1
LYMPH NODE, SUPR	GROSS: ENLARGED	P
	BILATERAL	
KIDNEYS	MICRO: MINERALIZATION, TUBULAR	2
	MULTIFOCAL, CORTICOMEDULLARY JUNCTION	
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE	2
	MULTIFOCAL, PORTAL TO CENTROLOBULAR	
LUNGS	GROSS: MOTTLED	P
	ALL LOBES	
LUNGS	MICRO: EDEMA, ALVEOLAR	1
	MULTIFOCAL INTRA-ALVEOLAR ACIDOPHILIC PROTEINACEOUS MATERIAL	
	INFLAMMATION, GRANULOCYTIC	1
	MULTIFOCAL, PERIVASCULAR	
	CONGESTION	1
	MULTIFOCAL	
LYMPH NODE	GROSS: MEDIASTINAL- ENLARGED	P
NO SIGNIFICANT CHANGES OBSERVED	GROSS:	

ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
LYMPH NODE, BRON	BRAIN	CECUM	COLON
DUODENUM	ESOPHAGUS	EYES/OPTIC N.	HEART
ILEUM	JEJUNUM	KIDNEYS	LIVER
LYMPH NODE, MES	MAMMARY GLAND	NERVE,SCIATIC	OVARIES
PANCREAS	RECTUM	PITUITARY	SALIVARY GLANDS
SKELETAL MUSCLE	SKIN	SPINAL CORD	SPLEEN
STOMACH	THYMUS GLAND	THYROID GLANDS	TRACHEA
URINARY BLADDER	UTERUS	VAGINA	

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44161 GROUP 3: 0.075 MG/L FEMALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

GRADE

MICRO:TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44169 GROUP 3: 0.075 MG/L FEMALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.82	0.774
LIVER	8.89	3.783
KIDNEYS	2.21	0.940
HEART	1.01	0.430
SPLEEN	0.78	0.332
LUNGS	2.72	1.157
OVARIES	0.1723	0.073
THYMUS GLAND	0.4105	0.175
ADRENAL GLANDS	0.0854	0.036
FINAL BODY WT(G)	235.	

		GRADE
NASAL TURBINATES	MICRO: DEGENERATION, OLFACTORY EPITHELIUM- SECTION 4 BILATERAL, DORSAL & VENTRAL TURBINATES	1
	DEGENERATION, OLFACTORY EPITHELIUM- SECTION 5 MULTIFOCAL, RIGHT TURBINATE	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL TO CENTROLOBULAR	1
LUNGS	GROSS: MOTTLED ALL LOBES	P
LUNGS	MICRO: EDEMA, ALVEOLAR MULTIFOCAL INTRA-ALVEOLAR ACIDOPHILIC PROTEINACEOUS MATERIAL	1
	INFLAMMATION, NONSUPPURATIVE FOCAL, SUBPLEURAL	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS: ADRENAL GLANDS, AORTA, STERNEBRAE, OVIDUCTS, LYMPH NODE, BRON, BRAIN, CECUM, COLON, DUODENUM, ESOPHAGUS, EYES/OPTIC N., LYMPH NODE, SUPR, HEART, ILEUM, JEJUNUM, KIDNEYS, LIVER, LYMPH NODE, MES, MAMMARY GLAND, NERVE,SCIATIC, OVARIES, PANCREAS, RECTUM, PITUITARY, SALIVARY GLANDS, SKELETAL MUSCLE, SKIN, SPINAL CORD, SPLEEN, STOMACH, THYMUS GLAND, THYROID GLANDS, TRACHEA, URINARY BLADDER, UTERUS, VAGINA

MICRO: KIDNEYS, TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44171 GROUP 3: 0.075 MG/L FEMALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.83	0.910
LIVER	7.01	3.488
KIDNEYS	1.75	0.871
HEART	0.82	0.408
SPLEEN	0.50	0.249
LUNGS	2.56	1.274
OVARIES	0.1296	0.064
THYMUS GLAND	0.3843	0.191
ADRENAL GLANDS	0.0674	0.034
FINAL BODY WT(G)	201.	

		GRADE
NASAL TURBINATES	MICRO: EDEMA, NASAL TURBINATE- SECTION 3 LAMINA PROPRIA/SUBMUCOSA, UNILATERAL, LEFT	1
	INFLAMMATION, NEUTROPHILIC- SECTION 3 LAMINA PROPRIA/SUBMUCOSA, UNILATERAL, LEFT	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, PORTAL	1
LUNGS	MICRO: EDEMA, ALVEOLAR FOCALLY EXTENSIVE	3
	EDEMA, PERIVASCULAR MULTIFOCAL	2

NO SIGNIFICANT CHANGES OBSERVED

GROSS:ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
LYMPH NODE, BRON	BRAIN	CECUM	COLON
DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
NERVE,SCIATIC	OVARIES	PANCREAS	RECTUM
PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	STOMACH	THYMUS GLAND
THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
VAGINA			
MICRO:KIDNEYS	TRACHEA		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44197 GROUP 3: 0.075 MG/L FEMALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.87	0.820
LIVER	8.07	3.539
KIDNEYS	2.19	0.961
HEART	1.08	0.474
SPLEEN	0.63	0.276
LUNGS	2.75	1.206
OVARIES	0.1351	0.059
THYMUS GLAND	0.3639	0.160
ADRENAL GLANDS	0.0924	0.041
FINAL BODY WT(G)	228.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, LYMPHOID- SECTION 4	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE	1
	MULTIFOCAL, PORTAL	
LUNGS	GROSS: MOTTLED	P
	ALL LOBES	
LUNGS	MICRO: EDEMA, ALVEOLAR	3
	MULTIFOCAL	
	EDEMA, PERIVASCULAR	2
	MULTIFOCAL	
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:ADRENAL GLANDS, AORTA, STERNEBRAE, OVIDUCTS, LYMPH NODE, BRON, BRAIN, CECUM, COLON, DUODENUM, ESOPHAGUS, EYES/OPTIC N., LYMPH NODE, SUPR, HEART, ILEUM, JEJUNUM, KIDNEYS, LIVER, LYMPH NODE, MES, MAMMARY GLAND, NERVE,SCIATIC, OVARIES, PANCREAS, RECTUM, PITUITARY, SALIVARY GLANDS, SKELETAL MUSCLE, SKIN, SPINAL CORD, SPLEEN, STOMACH, THYMUS GLAND, THYROID GLANDS, TRACHEA, URINARY BLADDER, UTERUS, VAGINA
MICRO:KIDNEYS, TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44202 GROUP 3: 0.075 MG/L FEMALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.89	0.904
LIVER	9.99	4.780
KIDNEYS	2.11	1.010
HEART	0.90	0.431
SPLEEN	0.47	0.225
LUNGS	2.32	1.110
OVARIES	0.1628	0.078
THYMUS GLAND	0.3678	0.176
ADRENAL GLANDS	0.0876	0.042
FINAL BODY WT(G)	209.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1	1
	HYPERPLASIA, GOBLET CELL- SECTION 3	1
	BILATERAL SEPTAL EPITHELIUM	
	HYPERPLASIA, GOBLET CELL, PHARYNGEAL DUCT- SECTION 6	1
KIDNEYS	MICRO: MINERALIZATION, TUBULAR	2
	MULTIFOCAL, CORTICOMEDULLARY JUNCTION	
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE	1
	MULTIFOCAL, PORTAL TO CENTROLOBULAR	
LUNGS	GROSS: MOTTLED	P
	ALL LOBES	
LUNGS	MICRO: EDEMA, ALVEOLAR	1
	FOCALLY EXTENSIVE	

NO SIGNIFICANT CHANGES OBSERVED

GROSS:ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
LYMPH NODE, BRON	BRAIN	CECUM	COLON
DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	MAMMARY GLAND	NERVE,SCIATIC
OVARIES	PANCREAS	RECTUM	PITUITARY
SALIVARY GLANDS	SKELETAL MUSCLE	SKIN	SPINAL CORD
SPLEEN	STOMACH	THYMUS GLAND	THYROID GLANDS
TRACHEA	URINARY BLADDER	UTERUS	VAGINA
MICRO:TRACHEA			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44344 GROUP 3: 0.075 MG/L FEMALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.77	1.127
LIVER	5.32	3.389
KIDNEYS	1.61	1.025
HEART	0.75	0.478
SPLEEN	0.30	0.191
LUNGS	2.11	1.344
OVARIES	0.0976	0.062
THYMUS GLAND	0.1750	0.111
ADRENAL GLANDS	0.0892	0.057
FINAL BODY WT(G)	157.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1 BILATERAL SEPTAL EPITHELIUM	1
	INFLAMMATION, NONSUPP. VOMERONASAL ORGAN- SECTION 1 LEFT	1
KIDNEYS	MICRO: MINERALIZATION, TUBULAR MULTIFOCAL, CORTICOMEDULLARY JUNCTION	1
LIVER	MICRO: NECROSIS, CENTROLOBULAR MULTIFOCAL, MIDZONAL TO CENTROLOBULAR	2
LUNGS	GROSS: MOTTLED ALL LOBES	P
LUNGS	MICRO: EDEMA, ALVEOLAR MULTIFOCAL	3
	EDEMA, PERIVASCULAR MULTIFOCAL, PERIVASCULAR	2

NO SIGNIFICANT CHANGES OBSERVED

GROSS: ADRENAL GLANDS, AORTA, STERNEBRAE, OVIDUCTS, LYMPH NODE, BRON, BRAIN, CECUM, COLON, DUODENUM, ESOPHAGUS, EYES/OPTIC N., LYMPH NODE, SUPR, HEART, ILEUM, JEJUNUM, KIDNEYS, LIVER, LYMPH NODE, MES, MAMMARY GLAND, NERVE,SCIATIC, OVARIES, PANCREAS, RECTUM, PITUITARY, SALIVARY GLANDS, SKELETAL MUSCLE, SKIN, SPINAL CORD, SPLEEN, STOMACH, THYMUS GLAND, THYROID GLANDS, TRACHEA, URINARY BLADDER, UTERUS, VAGINA

MICRO: TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44347 GROUP 3: 0.075 MG/L FEMALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.63	0.964
LIVER	6.54	3.870
KIDNEYS	1.76	1.041
HEART	0.78	0.462
SPLEEN	0.40	0.237
LUNGS	1.09	0.645
OVARIES	0.1326	0.078
THYMUS GLAND	0.2797	0.166
ADRENAL GLANDS	0.0678	0.040
FINAL BODY WT(G)	169.	

NASAL TURBINATES

	GRADE
MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1	
BILATERAL SEPTAL EPITHELIUM	2
INFLAMMATION, NEUTROPHILIC- SECTION 3	
UNILATERAL, LEFT NASOTURBINATE, LAMINA PROPRIA/SUBMUCOSA	1
INFLAMMATION, NEUTROPHILIC- SECTION 4	
FOCAL, LEFT VENTRAL MEATUS	1
HYPERPLASIA, GOBLET CELL, PHARYNGEAL DUCT- SECTION 6	1

KIDNEYS

MICRO: MINERALIZATION, TUBULAR	
MULTIFOCAL, CORTICOMEDULLARY JUNCTION	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
LYMPH NODE, BRON	BRAIN	CECUM	COLON
DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
NERVE,SCIATIC	OVARIES	PANCREAS	RECTUM
PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	STOMACH	THYMUS GLAND
THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
VAGINA			

MICRO:LIVER LUNGS TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44155 GROUP 4: 0.25 MG/L FEMALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.79	0.848
LIVER	8.06	3.820
KIDNEYS	1.73	0.820
HEART	0.99	0.469
SPLEEN	0.57	0.270
LUNGS	1.25	0.592
OVARIES	0.1725	0.082
THYMUS GLAND	0.4029	0.191
ADRENAL GLANDS	0.0912	0.043
FINAL BODY WT(G)	211.	

		GRADE
NASAL TURBINATES	MICRO: METAPLASIA, SQUAMOUS	
	HYPERPLASIA, GOBLET CELL- SECTION 1	1
	HYPERPLASIA, GOBLET CELL- SECTION 2	1
LYMPH NODE, SUPR	MICRO: HYPERPLASIA, LYMPHOID	1
	PLASMACYTOSIS	3
	MEDULLARY CORDS	1
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE	
	MULTIFOCAL, PORTAL TO CENTROLOBULAR	1
LYMPH NODE, MES	MICRO: HYPERPLASIA, LYMPHOID	
	FOLLICULAR	1
	HISTIOCYTOSIS, SINUS	
MAMMARY GLAND	MICRO: HYPERPLASIA, GLANDULAR	2
	MULTIFOCAL	1
STOMACH	MICRO: INFILTRATE, MONONUCLEAR	
	GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	1
VAGINA	MICRO: INFLAMMATION, ACUTE	
	EPITHELIAL/SUBEPITHELIAL	1
MAMMARY GLAND	MICRO: HYPERPLASIA, GLANDULAR	
	MULTIFOCAL	1
NO SIGNIFICANT CHANGES OBSERVED	GROSS: ADRENAL GLANDS, AORTA, STERNEBRAE, OVIDUCTS, LYMPH NODE, BRON, BRAIN, CECUM, COLON, DUODENUM, ESOPHAGUS, EYES/OPTIC N., LYMPH NODE, SUPR, HEART, ILEUM, JEJUNUM, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND	

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44155 GROUP 4: 0.25 MG/L FEMALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

GRADE

NERVE,SCIATIC
PITUITARY
SPINAL CORD
THYROID GLANDS
VAGINA

OVARIES
SALIVARY GLANDS
SPLEEN
TRACHEA

PANCREAS
SKELETAL MUSCLE
STOMACH
URINARY BLADDER

RECTUM
SKIN
THYMUS GLAND
UTERUS

MICRO:ADRENAL GLANDS
BRAIN
ESOPHAGUS
JEJUNUM
OVARIES
PITUITARY
SPINAL CORD
TRACHEA

AORTA
CECUM
EYES/OPTIC N.
KIDNEYS
PANCREAS
SALIVARY GLANDS
SPLEEN
URINARY BLADDER

STERNEBRAE
COLON
HEART
LUNGS
PARATHYROID
SKELETAL MUSCLE
THYMUS GLAND
UTERUS

OVIDUCTS
DUODENUM
ILEUM
NERVE,SCIATIC
RECTUM
SKIN
THYROID GLANDS

NOT EXAMINED

MICRO:LYMPH NODE, BRON

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44168 GROUP 4: 0.25 MG/L FEMALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.89	0.818
LIVER	7.17	3.104
KIDNEYS	1.96	0.848
HEART	0.95	0.411
SPLEEN	0.56	0.242
LUNGS	1.41	0.610
OVARIES	0.1713	0.074
THYMUS GLAND	0.3511	0.152
ADRENAL GLANDS	0.0834	0.036
FINAL BODY WT(G)	231.	

		GRADE
LYMPH NODE, BRON	MICRO: HISTIOCYTOSIS, SINUS	1
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1	2
	BILATERAL SEPTAL EPITHELIUM	
	HYPERPLASIA, GOBLET CELL- SECTION 2	2
	BILATERAL SEPTAL EPITHELIUM	
	METAPLASIA, RESPIRATORY	1
	SECTION 4	
	DEGENERATION, OLFACTORY EPITHELIUM- SECTION 4	1
	UNILATERAL, DORSAL MEATUS	
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	2
KIDNEYS	MICRO: MINERALIZATION, TUBULAR	1
	MULTIFOCAL, CORTICAL	
	NEPHROPATHY	1
	REGENERATIVE TUBULAR EPITHELIUM, THICKENED BASEMENT MEMBRANE	
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE	1
	MULTIFOCAL, PORTAL	
LYMPH NODE, MES	MICRO: HISTIOCYTOSIS, SINUS	2
STOMACH	MICRO: INFILTRATE, MONONUCLEAR	1
	GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	
VAGINA	MICRO: INFLAMMATION, NONSUPPURATIVE	1
	MULTIFOCAL, SUBMUCOSAL	
NO SIGNIFICANT CHANGES OBSERVED	GROSS:ADRENAL GLANDS AORTA STERNEBRAE OVIDUCTS	

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44168 GROUP 4: 0.25 MG/L FEMALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

GRADE

	LYMPH NODE, BRON	BRAIN	CECUM	COLON
	DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	NERVE,SCIATIC	OVARIES	PANCREAS	RECTUM
	PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	STOMACH	THYMUS GLAND
	THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
	VAGINA			
MICRO:	ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES/OPTIC N.	HEART	ILEUM
	JEJUNUM	LUNGS	MAMMARY GLAND	NERVE,SCIATIC
	OVARIES	PANCREAS	PARATHYROID	RECTUM
	PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	THYMUS GLAND	THYROID GLANDS
	TRACHEA	URINARY BLADDER	UTERUS	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44175 GROUP 4: 0.25 MG/L FEMALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.84	0.814
LIVER	7.13	3.155
KIDNEYS	2.01	0.889
HEART	1.16	0.513
SPLEEN	0.64	0.283
LUNGS	1.32	0.584
OVARIES	0.1732	0.077
THYMUS GLAND	0.3722	0.165
ADRENAL GLANDS	0.0935	0.041
FINAL BODY WT(G)	226.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1	
	BILATERAL SEPTAL EPITHELIUM	2
	DEGENERATION, OLFACTORY EPITHELIUM- SECTION 4	
	UNILATERAL, LEFT	1
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	
	PLASMACYTOSIS	2
	MEDULLARY CORDS	2
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE	
	MULTIFOCAL, PORTAL	1
	VASCULITIS	
	PORTAL VEIN, TRANSMURAL INFILTRATION OF INFLAMMATORY CELLS	1
LYMPH NODE, MES	MICRO: HISTIOCYTOSIS, SINUS	2
SKELETAL MUSCLE	MICRO: DEGENERATION	
	MULTIFOCAL, INDIVIDUAL MUSCLE FIBERS, DISSOLUTION	1
STOMACH	MICRO: INFILTRATE, MONONUCLEAR	
	GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	1
THYROID GLANDS	MICRO: AUTOLYTIC	
	FOLLICULAR EPITHELIUM SEPARATED FROM BASEMENT MEMBRANE	1
TRACHEA	MICRO: INFLAMMATION, ACUTE	
	MULTIFOCAL, LAMINA PROPRIA/SUBMUCOSA	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS: ADRENAL GLANDS, AORTA, STERNEBRAE, OVIDUCTS, LYMPH NODE, BRON, BRAIN, CECUM, COLON

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44175 GROUP 4: 0.25 MG/L FEMALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

GRADE

	DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	NERVE,SCIATIC	OVARIES	PANCREAS	RECTUM
	PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	STOMACH	THYMUS GLAND
	THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
	VAGINA			
MICRO:	ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
	LYMPH NODE, BRON	BRAIN	CECUM	COLON
	DUODENUM	ESOPHAGUS	EYES/OPTIC N.	HEART
	ILEUM	JEJUNUM	KIDNEYS	LUNGS
	MAMMARY GLAND	NERVE,SCIATIC	OVARIES	PANCREAS
	PARATHYROID	RECTUM	PITUITARY	SALIVARY GLANDS
	SKIN	SPINAL CORD	SPLEEN	THYMUS GLAND
	URINARY BLADDER	UTERUS	VAGINA	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44184 GROUP 4: 0.25 MG/L FEMALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.77	0.835
LIVER	6.97	3.288
KIDNEYS	2.03	0.958
HEART	0.99	0.467
SPLEEN	0.48	0.226
LUNGS	1.36	0.642
OVARIES	0.1223	0.058
THYMUS GLAND	0.3433	0.162
ADRENAL GLANDS	0.0845	0.040
FINAL BODY WT(G)	212.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1 BILATERAL SEPTAL EPITHELIUM	2
	DEGENERATION, OLFACTORY EPITHELIUM- SECTION 4 UNILATERAL, RIGHT	1
LYMPH NODE, SUPR	GROSS: ENLARGED RIGHT	P
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	1
HEART	MICRO: INFLAMMATION, NONSUPPURATIVE FOCAL, LEFT VENTRICLE	1
LYMPH NODE, MES	MICRO: HYPERPLASIA, LYMPHOID FOLLICULAR	1
UTERUS	MICRO: INFLAMMATION, ACUTE ENDOMETRIUM AND MYOMETRIUM	1
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:ADRENAL GLANDS, AORTA, STERNEBRAE, OVIDUCTS, LYMPH NODE, BRON, BRAIN, CECUM, COLON, DUODENUM, ESOPHAGUS, EYES/OPTIC N., HEART, ILEUM, JEJUNUM, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, NERVE,SCIATIC, OVARIES, PANCREAS, RECTUM, PITUITARY, SALIVARY GLANDS, SKELETAL MUSCLE, SKIN, SPINAL CORD, SPLEEN, STOMACH, THYMUS GLAND, THYROID GLANDS, TRACHEA, URINARY BLADDER, UTERUS, VAGINA

MICRO:ADRENAL GLANDS, AORTA, STERNEBRAE, OVIDUCTS, LYMPH NODE, BRON, BRAIN, CECUM, COLON, DUODENUM, ESOPHAGUS, EYES/OPTIC N., ILEUM, JEJUNUM, KIDNEYS, LIVER, LUNGS

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44184 GROUP 4: 0.25 MG/L FEMALE SCHEDULED EUTH 12/15/95 DATE OF DEATH: 12/15/95 STUDY DAY: 29

GRADE

MAMMARY GLAND	NERVE,SCIATIC	OVARIES	PANCREAS
RECTUM	PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE
SKIN	SPINAL CORD	SPLEEN	STOMACH
THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER
VAGINA			

NOT EXAMINED

MICRO:PARATHYROID

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44189 GROUP 4: 0.25 MG/L FEMALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.84	0.844
LIVER	7.08	3.248
KIDNEYS	1.92	0.881
HEART	0.79	0.362
SPLEEN	0.47	0.216
LUNGS	2.05	0.940
OVARIES	0.1369	0.063
THYMUS GLAND	0.3621	0.166
ADRENAL GLANDS	0.0878	0.040
FINAL BODY WT(G)	218.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1	1
	HYPERPLASIA, GOBLET CELL- SECTION 2	1
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	2
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE MULTIFOCAL, MIDZONAL TO CENTROLOBULAR	1
LYMPH NODE, MES	MICRO: HYPERPLASIA, LYMPHOID FOLLICULAR	1
	HISTIOCYTOSIS, SINUS	
LUNGS	MICRO: EDEMA, ALVEOLAR MULTIFOCAL INTRA-ALVEOLAR ACIDOPHILIC PROTEINACEOUS MATERIAL	3
	CONGESTION MULTIFOCAL, BILATERAL	1
STOMACH	MICRO: INFILTRATE, MONONUCLEAR GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	1
UTERUS	MICRO: INFLAMMATION, ACUTE ENDOMETRIUM AND MYOMETRIUM	1
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
LYMPH NODE, BRON	BRAIN	CECUM	COLON
DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
NERVE,SCIATIC	OVARIES	PANCREAS	RECTUM
PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	STOMACH	THYMUS GLAND
THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44189 GROUP 4: 0.25 MG/L FEMALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

GRADE

VAGINA

MICRO:ADRENAL GLANDS
BRAIN
ESOPHAGUS
JEJUNUM
OVARIES
PITUITARY
SPINAL CORD
TRACHEA
AORTA
CECUM
EYES/OPTIC N.
KIDNEYS
PANCREAS
SALIVARY GLANDS
SPLEEN
URINARY BLADDER
STERNEBRAE
COLON
HEART
MAMMARY GLAND
PARATHYROID
SKELETAL MUSCLE
THYMUS GLAND
VAGINA
OVIDUCTS
DUODENUM
ILEUM
NERVE,SCIATIC
RECTUM
SKIN
THYROID GLANDS

NOT EXAMINED

MICRO:LYMPH NODE, BRON

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44190 GROUP 4: 0.25 MG/L FEMALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.76	0.830
LIVER	6.80	3.208
KIDNEYS	1.90	0.896
HEART	0.83	0.392
SPLEEN	0.55	0.259
LUNGS	2.62	1.236
OVARIES	0.1024	0.048
THYMUS GLAND	0.3923	0.185
ADRENAL GLANDS	0.0784	0.037
FINAL BODY WT(G)	212.	

		GRADE
LYMPH NODE, BRON	MICRO: HISTIOCYTOSIS, SINUS	3
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1	1
	BILATERAL SEPTAL EPITHELIUM	
	HYPERPLASIA, GOBLET CELL- SECTION 2	1
	BILATERAL SEPTAL EPITHELIUM	
LYMPH NODE, SUPR	MICRO: HISTIOCYTOSIS, SINUS	2
KIDNEYS	MICRO: NEPHROPATHY	1
	REGENERATIVE TUBULAR EPITHELIUM, THICKENED BASEMENT MEMBRANE	
LIVER	MICRO: INFLAMMATION, NONSUPPURATIVE	1
	FOCAL, PORTAL	
	PERIVASCULAR	
LYMPH NODE, MES	MICRO: HISTIOCYTOSIS, SINUS	1
LUNGS	GROSS: DARK RED	P
	ALL LOBES	
LUNGS	MICRO: EDEMA, ALVEOLAR	2
	MULTIFOCAL INTRA-ALVEOLAR ACIDOPHILIC PROTEINACEOUS MATERIAL	
	INFLAMMATION, ACUTE	1
	MULTIFOCAL, PERIVASCULAR	
STOMACH	MICRO: INFILTRATE, MONONUCLEAR	1
	GLANDULAR LAMINA PROPRIA/SUBMUCOSA, MIX OF PMN & EOSINOPHILS	
UTERUS	GROSS: CLEAR FLUID CONTENTS	P
	BILATERAL	
UTERUS	MICRO: INFLAMMATION, ACUTE	1
	ENDOMETRIUM AND MYOMETRIUM	

TABLE 71 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44190 GROUP 4: 0.25 MG/L FEMALE SCHEDULED EUTH 12/14/95 DATE OF DEATH: 12/14/95 STUDY DAY: 28

GRADE

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
LYMPH NODE, BRON	BRAIN	CECUM	COLON
DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	MAMMARY GLAND	NERVE,SCIATIC
OVARIES	PANCREAS	RECTUM	PITUITARY
SALIVARY GLANDS	SKELETAL MUSCLE	SKIN	SPINAL CORD
SPLEEN	STOMACH	THYMUS GLAND	THYROID GLANDS
TRACHEA	URINARY BLADDER	VAGINA	

MICRO:

ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
BRAIN	CECUM	COLON	DUODENUM
ESOPHAGUS	EYES/OPTIC N.	HEART	ILEUM
JEJUNUM	MAMMARY GLAND	OVARIES	PANCREAS
PARATHYROID	RECTUM	PITUITARY	SALIVARY GLANDS
SKELETAL MUSCLE	SKIN	SPINAL CORD	SPLEEN
THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER
VAGINA			

NOT EXAMINED

MICRO:NERVE,SCIATIC

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44103 GROUP 1: 0.00 MG/L MALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.88	0.395
LIVER	15.45	3.246
KIDNEYS	3.92	0.824
HEART	1.58	0.332
SPLEEN	0.84	0.176
LUNGS	1.75	0.368
TESTES/EPIDID.	5.44	1.143
THYMUS GLAND	0.6206	0.130
ADRENAL GLANDS	0.0490	0.010
FINAL BODY WT(G)	476.	

MAMMARY GLAND

NO SIGNIFICANT CHANGES OBSERVED

	GRADE
MICRO: HYPERPLASIA, GLANDULAR MULTIFOCAL	1

GROSS:ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, HEART, LIVER, PANCREAS, SALIVARY GLANDS, SPINAL CORD, THYMUS GLAND, AORTA, CECUM, ESOPHAGUS, ILEUM, LYMPH NODE, MES, RECTUM, SEMINAL VESICLES, SPLEEN, THYROID GLANDS, STERNEBRAE, COLON, EYES/OPTIC N., JEJUNUM, LUNGS, PITUITARY, SKELETAL MUSCLE, STOMACH, TRACHEA, LYMPH NODE, BRON, DUODENUM, LYMPH NODE, SUPR, KIDNEYS, NERVE,SCIATIC, PROSTATE, SKIN, TESTES, URINARY BLADDER

MICRO:LYMPH NODE, BRON, DUODENUM, EYES/OPTIC N., JEJUNUM, LUNGS, RECTUM, SEMINAL VESICLES, SPLEEN, THYROID GLANDS, BRAIN, NASAL TURBINATES, LYMPH NODE, SUPR, KIDNEYS, NERVE,SCIATIC, PITUITARY, SKELETAL MUSCLE, STOMACH, TRACHEA, CECUM, EPIDIDYMIDES, HEART, LIVER, PANCREAS, PROSTATE, SKIN, TESTES, URINARY BLADDER, COLON, ESOPHAGUS, ILEUM, LYMPH NODE, MES, PARATHYROID, SALIVARY GLANDS, SPINAL CORD, THYMUS GLAND

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44108 GROUP 1: 0.00 MG/L MALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.08	0.546
LIVER	11.13	2.921
KIDNEYS	2.78	0.730
HEART	1.33	0.349
SPLEEN	0.72	0.189
LUNGS	1.64	0.430
TESTES/EPIDID.	4.20	1.102
THYMUS GLAND	0.4259	0.112
ADRENAL GLANDS	0.0569	0.015
FINAL BODY WT(G)	381.	

MAMMARY GLAND
NO SIGNIFICANT
CHANGES OBSERVED

		GRADE
MICRO:	HYPERPLASIA, GLANDULAR	P

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
PANCREAS	RECTUM	PITUITARY	PROSTATE
SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	STOMACH	TESTES
THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER

MICRO:

LYMPH NODE, BRON	BRAIN	CECUM	COLON
DUODENUM	NASAL TURBINATES	EPIDIDYMIDES	ESOPHAGUS
EYES/OPTIC N.	LYMPH NODE, SUPR	HEART	ILEUM
JEJUNUM	KIDNEYS	LIVER	LYMPH NODE, MES
LUNGS	NERVE,SCIATIC	PANCREAS	PARATHYROID
RECTUM	PITUITARY	PROSTATE	SALIVARY GLANDS
SEMINAL VESICLES	SKELETAL MUSCLE	SKIN	SPINAL CORD
SPLEEN	STOMACH	TESTES	THYMUS GLAND
THYROID GLANDS	TRACHEA	URINARY BLADDER	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44115 GROUP 1: 0.00 MG/L MALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.95	0.515
LIVER	10.70	2.823
KIDNEYS	2.81	0.741
HEART	1.17	0.309
SPLEEN	0.76	0.201
LUNGS	1.31	0.346
TESTES/EPIDID.	4.39	1.158
THYMUS GLAND	0.5746	0.152
ADRENAL GLANDS	0.0809	0.021
FINAL BODY WT(G)	379.	

		GRADE
SPLEEN	GROSS: CAPSULAR SCARRING	P
LYMPH NODE	GROSS: CERVICAL- REDDENED BILATERAL	P
MAMMARY GLAND	MICRO: HYPERPLASIA, GLANDULAR MULTIFOCAL	1
NO SIGNIFICANT CHANGES OBSERVED		

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, HEART, LIVER, PANCREAS, SALIVARY GLANDS, SPINAL CORD, THYROID GLANDS, AORTA, CECUM, ESOPHAGUS, ILEUM, LYMPH NODE, MES, RECTUM, SEMINAL VESICLES, STOMACH, TRACHEA, STERNEBRAE, COLON, EYES/OPTIC N., JEJUNUM, LUNGS, PITUITARY, SKELETAL MUSCLE, TESTES, URINARY BLADDER, LYMPH NODE, BRON, DUODENUM, LYMPH NODE, SUPR, KIDNEYS, NERVE,SCIATIC, PROSTATE, SKIN, THYMUS GLAND

MICRO: LYMPH NODE, BRON, DUODENUM, EYES/OPTIC N., JEJUNUM, LUNGS, RECTUM, SEMINAL VESICLES, SPLEEN, THYROID GLANDS, BRAIN, NASAL TURBINATES, LYMPH NODE, SUPR, KIDNEYS, NERVE,SCIATIC, PITUITARY, SKELETAL MUSCLE, STOMACH, TRACHEA, CECUM, EPIDIDYMIDES, HEART, LIVER, PANCREAS, PROSTATE, SKIN, TESTES, URINARY BLADDER, COLON, ESOPHAGUS, ILEUM, LYMPH NODE, MES, PARATHYROID, SALIVARY GLANDS, SPINAL CORD, THYMUS GLAND

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44135 GROUP 1: 0.00 MG/L MALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.95	0.512
LIVER	11.11	2.916
KIDNEYS	2.77	0.727
HEART	1.35	0.354
SPLEEN	0.85	0.223
LUNGS	2.57	0.675
TESTES/EPIDID.	4.50	1.181
THYMUS GLAND	0.5721	0.150
ADRENAL GLANDS	0.0658	0.017
FINAL BODY WT(G)	381.	

		GRADE
LYMPH NODE	GROSS: CERVICAL- REDDENED BILATERAL	P
MAMMARY GLAND	MICRO: HYPERPLASIA, GLANDULAR MULTIFOCAL	1
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, HEART, LIVER, PANCREAS, SALIVARY GLANDS, SPINAL CORD, THYMUS GLAND, AORTA, CECUM, ESOPHAGUS, ILEUM, LYMPH NODE, MES, RECTUM, SEMINAL VESICLES, SPLEEN, THYROID GLANDS, STERNEBRAE, COLON, EYES/OPTIC N., JEJUNUM, LUNGS, PITUITARY, SKELETAL MUSCLE, STOMACH, TRACHEA, LYMPH NODE, BRON, DUODENUM, LYMPH NODE, SUPR, KIDNEYS, NERVE,SCIATIC, PROSTATE, SKIN, TESTES, URINARY BLADDER

MICRO:LYMPH NODE, BRON, DUODENUM, EYES/OPTIC N., JEJUNUM, LUNGS, RECTUM, SEMINAL VESICLES, SPLEEN, THYROID GLANDS, BRAIN, NASAL TURBINATES, LYMPH NODE, SUPR, KIDNEYS, NERVE,SCIATIC, PITUITARY, SKELETAL MUSCLE, STOMACH, TRACHEA, CECUM, EPIDIDYMIDES, HEART, LIVER, PANCREAS, PROSTATE, SKIN, TESTES, URINARY BLADDER, COLON, ESOPHAGUS, ILEUM, LYMPH NODE, MES, PARATHYROID, SALIVARY GLANDS, SPINAL CORD, THYMUS GLAND

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44137 GROUP 1: 0.00 MG/L MALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.02	0.522
LIVER	11.78	3.044
HEART	1.33	0.344
SPLEEN	0.88	0.227
LUNGS	1.64	0.424
THYMUS GLAND	0.5490	0.142
ADRENAL GLANDS	0.0748	0.019
FINAL BODY WT(G)	387.	

		GRADE
GENERAL COMMENT	GROSS: SINGLE ORGAN WEIGHT RIGHT KIDNEY: 2.51 G; RIGHT EPIDIDYMIS AND TESTIS, BILATERAL: 3.46 G	P
EPIDIDYMIDES	GROSS: ABSENT LEFT	P
LYMPH NODE, SUPR	GROSS: REDDENED BILATERAL	P
LYMPH NODE, SUPR	GROSS: ENLARGED RIGHT	P
KIDNEYS	GROSS: ABSENT LEFT	P
SEMINAL VESICLES	GROSS: SMALL LEFT	P
TESTES	GROSS: PALE LEFT	P
LYMPH NODE	GROSS: CERVICAL- REDDENED BILATERAL	P
URETER(S)	GROSS: ABSENT LEFT	P
COAGULATING GL	GROSS: SMALL LEFT	P

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
	BRAIN	CECUM	COLON	DUODENUM
	ESOPHAGUS	EYES/OPTIC N.	HEART	ILEUM
	JEJUNUM	LIVER	LYMPH NODE, MES	LUNGS
	NERVE,SCIATIC	PANCREAS	RECTUM	PITUITARY
	PROSTATE	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	STOMACH	THYMUS GLAND
	THYROID GLANDS	TRACHEA	URINARY BLADDER	
MICRO:	LYMPH NODE, BRON	BRAIN	CECUM	COLON
	DUODENUM	NASAL TURBINATES	EPIDIDYMIDES	ESOPHAGUS

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44137 GROUP 1: 0.00 MG/L MALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

GRADE

EYES/OPTIC N.	LYMPH NODE, SUPR	HEART	ILEUM
JEJUNUM	KIDNEYS	LIVER	LYMPH NODE, MES
LUNGS	NERVE,SCIATIC	PANCREAS	PARATHYROID
RECTUM	PITUITARY	PROSTATE	SALIVARY GLANDS
SEMINAL VESICLES	SKELETAL MUSCLE	SKIN	SPINAL CORD
SPLEEN	STOMACH	TESTES	THYMUS GLAND
THYROID GLANDS	TRACHEA	URINARY BLADDER	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44098 GROUP 2: 0.025 MG/L MALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.90	0.507
LIVER	10.71	2.856
KIDNEYS	2.93	0.781
HEART	1.65	0.440
SPLEEN	0.72	0.192
LUNGS	1.75	0.467
TESTES/EPIDID.	4.67	1.245
THYMUS GLAND	0.4816	0.128
ADRENAL GLANDS	0.0671	0.018
FINAL BODY WT(G)	375.	

NASAL TURBINATES

		GRADE
MICRO:	DEGENERATION, OLFACTORY EPITHELIUM- SECTION 4 UNILATERAL, RIGHT	1
	DEGENERATION, OLFACTORY EPITHELIUM- SECTION 5 UNILATERAL, RIGHT	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
	PANCREAS	RECTUM	PITUITARY	PROSTATE
	SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	STOMACH	TESTES
	THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44101 GROUP 2: 0.025 MG/L MALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.98	0.496
LIVER	13.15	3.296
KIDNEYS	3.68	0.922
HEART	1.43	0.358
SPLEEN	0.80	0.201
LUNGS	1.52	0.381
TESTES/EPIDID.	4.98	1.248
THYMUS GLAND	0.5446	0.136
ADRENAL GLANDS	0.0566	0.014
FINAL BODY WT(G)	399.	

		GRADE
GENERAL COMMENT	GROSS: ORGAN DAMAGED AT NECROPSY KIDNEY, LEFT	P
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1 BILATERAL SEPTAL EPITHELIUM	1
	INFLAMMATION, NONSUPPURATIVE- SECTION 1 UNILATERAL, LEFT DORSAL SEPTUM	1
	AUTOLYTIC SECTION 4	1
LYMPH NODE, SUPR	GROSS: ENLARGED RIGHT	P
NO SIGNIFICANT CHANGES OBSERVED	GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ILEUM, LYMPH NODE, MES, RECTUM, SEMINAL VESICLES, SPLEEN, THYROID GLANDS, AORTA, CECUM, ESOPHAGUS, JEJUNUM, LUNGS, PITUITARY, SKELETAL MUSCLE, STOMACH, TRACHEA, STERNEBRAE, COLON, EYES/OPTIC N., KIDNEYS, NERVE,SCIATIC, PROSTATE, SKIN, TESTES, URINARY BLADDER, LYMPH NODE, BRON, DUODENUM, HEART, LIVER, PANCREAS, SALIVARY GLANDS, SPINAL CORD, THYMUS GLAND MICRO: KIDNEYS, LIVER, LUNGS, TRACHEA	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44119 GROUP 2: 0.025 MG/L MALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.15	0.556
LIVER	10.57	2.731
KIDNEYS	3.04	0.786
HEART	1.61	0.416
SPLEEN	0.59	0.152
LUNGS	1.51	0.390
TESTES/EPIDID.	4.68	1.209
THYMUS GLAND	0.3182	0.082
ADRENAL GLANDS	0.0766	0.020
FINAL BODY WT(G)	387.	

NASAL TURBINATES

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO:	HYPERPLASIA, GOBLET CELL- SECTION 1 BILATERAL SEPTAL EPITHELIUM	2
	HYPERPLASIA, GOBLET CELL- SECTION 2 BILATERAL SEPTAL EPITHELIUM	1
	DEGENERATION, OLFACTORY EPITHELIUM- SECTION 3 BILATERAL	1

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
	PANCREAS	RECTUM	PITUITARY	PROSTATE
	SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	STOMACH	TESTES
	THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44126 GROUP 2: 0.025 MG/L MALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.04	0.438
LIVER	13.00	2.790
KIDNEYS	3.61	0.775
HEART	1.40	0.300
SPLEEN	0.83	0.178
LUNGS	1.84	0.395
TESTES/EPIDID.	4.90	1.052
THYMUS GLAND	0.5602	0.120
ADRENAL GLANDS	0.0661	0.014
FINAL BODY WT(G)	466.	

		GRADE
NASAL TURBINATES	MICRO: INFLAMMATION, NONSUPPURATIVE- SECTION 1	
	UNILATERAL, LEFT	1
	HYPERPLASIA	
	RIGHT, NASAL TURBINATE- SECTION 2	1
LYMPH NODE, SUPR	GROSS: REDDENED	
	RIGHT	P
LYMPH NODE	GROSS: CERVICAL- REDDENED	
	BILATERAL	P
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ILEUM, LYMPH NODE, MES, RECTUM, SEMINAL VESICLES, SPLEEN, THYROID GLANDS, AORTA, CECUM, ESOPHAGUS, JEJUNUM, LUNGS, PITUITARY, SKELETAL MUSCLE, STOMACH, TRACHEA, LIVER, STERNEBRAE, COLON, EYES/OPTIC N., KIDNEYS, NERVE,SCIATIC, PROSTATE, SKIN, TESTES, URINARY BLADDER, LUNGS, LYMPH NODE, BRON, DUODENUM, HEART, LIVER, PANCREAS, SALIVARY GLANDS, SPINAL CORD, THYMUS GLAND, TRACHEA

MICRO:KIDNEYS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44128 GROUP 2: 0.025 MG/L MALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.90	0.487
LIVER	13.40	3.436
KIDNEYS	3.69	0.946
HEART	1.31	0.336
SPLEEN	0.81	0.208
LUNGS	1.84	0.472
TESTES/EPIDID.	4.87	1.249
THYMUS GLAND	0.3633	0.093
ADRENAL GLANDS	0.0520	0.013
FINAL BODY WT(G)	390.	

GENERAL COMMENT: NO SIGNIFICANT CHANGES OBSERVED

		GRADE
NASAL TURBINATES	GROSS: ORGAN DAMAGED AT NECROPSY ADRENAL, LEFT	P
	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1 BILATERAL SEPTAL EPITHELIUM	1
	HYPERPLASIA, GOBLET CELL- SECTION 2 BILATERAL SEPTAL EPITHELIUM	1
	HYPERPLASIA UNILATERAL, DORSAL MEATUS	1

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, HEART, LIVER, PANCREAS, SALIVARY GLANDS, SPINAL CORD, THYMUS GLAND, AORTA, CECUM, ESOPHAGUS, ILEUM, LYMPH NODE, MES, RECTUM, SEMINAL VESICLES, SPLEEN, THYROID GLANDS, STERNEBRAE, COLON, EYES/OPTIC N., JEJUNUM, LUNGS, PITUITARY, SKELETAL MUSCLE, STOMACH, TRACHEA, LYMPH NODE, BRON, DUODENUM, LYMPH NODE, SUPR, KIDNEYS, NERVE,SCIATIC, PROSTATE, SKIN, TESTES, URINARY BLADDER, TRACHEA

MICRO: KIDNEYS, LIVER, LUNGS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44094 GROUP 3: 0.075 MG/L MALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.84	0.475
LIVER	12.05	3.114
KIDNEYS	3.13	0.809
HEART	1.49	0.385
SPLEEN	0.60	0.155
LUNGS	1.47	0.380
TESTES/EPIDID.	4.41	1.140
THYMUS GLAND	0.6578	0.170
ADRENAL GLANDS	0.0661	0.017
FINAL BODY WT(G)	387.	

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1 BILATERAL SEPTAL EPITHELIUM	1
	METAPLASIA, SQUAMOUS BILATERAL, DORSAL MEATUS	1
	HYPERPLASIA, GOBLET CELL- SECTION 2 BILATERAL SEPTAL EPITHELIUM	1

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
PANCREAS	RECTUM	PITUITARY	PROSTATE
SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	STOMACH	TESTES
THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER

MICRO:

KIDNEYS	LIVER	LUNGS	TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44096 GROUP 3: 0.075 MG/L MALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.00	0.543
LIVER	11.55	3.139
KIDNEYS	2.99	0.813
HEART	1.34	0.364
SPLEEN	0.91	0.247
LUNGS	1.72	0.467
TESTES/EPIDID.	4.15	1.128
THYMUS GLAND	0.5206	0.141
ADRENAL GLANDS	0.0583	0.016
FINAL BODY WT(G)	368.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1 BILATERAL SEPTAL EPITHELIUM	1
	HYPERPLASIA, GOBLET CELL- SECTION 2 BILATERAL SEPTAL EPITHELIUM	1
EXTERNAL SURFACE	GROSS: SCABBING DORSAL HEAD	P

NO SIGNIFICANT CHANGES OBSERVED

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, HEART, LIVER, PANCREAS, SALIVARY GLANDS, SPINAL CORD, THYMUS GLAND, AORTA, CECUM, ESOPHAGUS, ILEUM, LYMPH NODE, MES, RECTUM, SEMINAL VESICLES, SPLEEN, THYROID GLANDS, STERNEBRAE, COLON, EYES/OPTIC N., JEJUNUM, LUNGS, PITUITARY, SKELETAL MUSCLE, STOMACH, TRACHEA, LUNGS, LYMPH NODE, BRON, DUODENUM, LYMPH NODE, SUPR, KIDNEYS, NERVE,SCIATIC, PROSTATE, SKIN, TESTES, URINARY BLADDER, TRACHEA

MICRO: KIDNEYS, LIVER

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44100 GROUP 5: 0.075 MG/L MALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.07	0.495
LIVER	12.25	2.931
KIDNEYS	3.23	0.773
HEART	1.52	0.364
SPLEEN	0.79	0.189
LUNGS	1.90	0.455
TESTES/EPIDID.	5.61	1.342
THYMUS GLAND	0.4356	0.104
ADRENAL GLANDS	0.0770	0.018
FINAL BODY WT(G)	418.	

LYMPH NODE

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
GROSS:	CERVICAL- REDDENED BILATERAL	P

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, HEART, LIVER, PANCREAS, SALIVARY GLANDS, SPINAL CORD, THYMUS GLAND, AORTA, CECUM, ESOPHAGUS, ILEUM, LYMPH NODE, MES, RECTUM, SEMINAL VESICLES, SPLEEN, THYROID GLANDS, KIDNEYS, STERNEBRAE, COLON, EYES/OPTIC N., JEJUNUM, LUNGS, PITUITARY, SKELETAL MUSCLE, STOMACH, TRACHEA, LIVER, LYMPH NODE, BRON, DUODENUM, LYMPH NODE, SUPR, KIDNEYS, NERVE,SCIATIC, PROSTATE, SKIN, TESTES, URINARY BLADDER, LUNGS

MICRO: NASAL TURBINATES, TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44134 GROUP 3: 0.075 MG/L MALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.92	0.538
LIVER	12.16	3.406
KIDNEYS	3.18	0.891
HEART	1.79	0.501
SPLEEN	0.90	0.252
LUNGS	1.85	0.518
TESTES/EPIDID.	4.82	1.350
THYMUS GLAND	0.6168	0.173
ADRENAL GLANDS	0.0736	0.021
FINAL BODY WT(G)	357.	

NASAL TURBINATES MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1 — GRADE 1
BILATERAL SEPTAL EPITHELIUM
METAPLASIA, SQUAMOUS — 1
SECTION 1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
BRAIN	CECUM	COLON	DUODENUM
EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
PANCREAS	RECTUM	PITUITARY	PROSTATE
SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	STOMACH	TESTES
THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER

MICRO:

KIDNEYS	LIVER	LUNGS	TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44340 GROUP 3: 0.075 MG/L MALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.12	0.556
LIVER	13.93	3.656
KIDNEYS	3.29	0.864
HEART	1.29	0.339
SPLEEN	0.76	0.199
LUNGS	1.86	0.488
TESTES/EPIDID.	4.27	1.121
THYMUS GLAND	0.4140	0.109
ADRENAL GLANDS	0.0583	0.015
FINAL BODY WT(G)	381.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
	PANCREAS	RECTUM	PITUITARY	PROSTATE
	SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	STOMACH	TESTES
	THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER
MICRO:	NASAL TURBINATES	KIDNEYS	LIVER	LUNGS
	TRACHEA			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44097 GROUP 4: 0.25 MG/L MALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.97	0.558
LIVER	11.41	3.232
KIDNEYS	2.43	0.688
HEART	1.30	0.368
SPLEEN	0.87	0.246
LUNGS	1.71	0.484
TESTES/EPIDID.	4.54	1.286
THYMUS GLAND	0.6927	0.196
ADRENAL GLANDS	0.0609	0.017
FINAL BODY WT(G)	353.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1 BILATERAL SEPTAL EPITHELIUM	1
	INFLAMMATION, NEUTROPHILIC SECTION 1	1
	METAPLASIA, RESPIRATORY SECTION 6	1
LYMPH NODE	GROSS: CERVICAL- REDDENED BILATERAL	P
LYMPH NODE	GROSS: CERVICAL- ENLARGED BILATERAL	P
LYMPH NODE	GROSS: ILIAC- ENLARGED BILATERAL	P
MAMMARY GLAND	MICRO: HYPERPLASIA, GLANDULAR MULTIFOCAL	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	LYMPH NODE, BRON
	BRAIN	CECUM	COLON	DUODENUM
	EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	NERVE,SCIATIC
	PANCREAS	RECTUM	PITUITARY	PROSTATE
	SALIVARY GLANDS	SEMINAL VESICLES	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	STOMACH	TESTES
	THYMUS GLAND	THYROID GLANDS	TRACHEA	URINARY BLADDER
MICRO:	LYMPH NODE, BRON	BRAIN	CECUM	COLON
	DUODENUM	EPIDIDYMIDES	ESOPHAGUS	EYES/OPTIC N.
	LYMPH NODE, SUPR	HEART	ILEUM	JEJUNUM
	KIDNEYS	LIVER	LYMPH NODE, MES	LUNGS

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44097 GROUP 4: 0.25 MG/L MALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

GRADE

NERVE,SCIATIC	PANCREAS	PARATHYROID	RECTUM
PITUITARY	PROSTATE	SALIVARY GLANDS	SEMINAL VESICLES
SKELETAL MUSCLE	SKIN	SPINAL CORD	SPLEEN
STOMACH	TESTES	THYMUS GLAND	THYROID GLANDS
TRACHEA	URINARY BLADDER		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44089 GROUP 4: 0.25 MG/L MALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.97	0.483
LIVER	12.89	3.159
KIDNEYS	3.58	0.877
HEART	1.45	0.355
SPLEEN	0.87	0.213
LUNGS	1.70	0.417
TESTES/EPIDID.	4.39	1.076
THYMUS GLAND	0.3566	0.087
ADRENAL GLANDS	0.0649	0.016
FINAL BODY WT(G)	408.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1 BILATERAL SEPTAL EPITHELIUM	1
	METAPLASIA, SQUAMOUS BILATERAL, DORSAL MEATUS	1
	HYPERPLASIA, GOBLET CELL- SECTION 2 BILATERAL SEPTAL EPITHELIUM	1
EPIDIDYMIDES	GROSS: ABSCESS(ES) ONE, 3 MM IN DIAMETER, CAPUT, RIGHT	P
LYMPH NODE	GROSS: CERVICAL- ENLARGED BILATERAL	P
MAMMARY GLAND	MICRO: HYPERPLASIA, GLANDULAR	1
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:ADRENAL GLANDS, AORTA, STERNEBRAE, LYMPH NODE, BRON, BRAIN, CECUM, COLON, DUODENUM, ESOPHAGUS, EYES/OPTIC N., LYMPH NODE, SUPR, HEART, ILEUM, JEJUNUM, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, NERVE,SCIATIC, PANCREAS, RECTUM, PITUITARY, PROSTATE, SALIVARY GLANDS, SEMINAL VESICLES, SKELETAL MUSCLE, SKIN, SPINAL CORD, SPLEEN, STOMACH, TESTES, THYMUS GLAND, THYROID GLANDS, TRACHEA, URINARY BLADDER

MICRO:LYMPH NODE, BRON, BRAIN, CECUM, COLON, DUODENUM, EPIDIDYMIDES, ESOPHAGUS, EYES/OPTIC N., HEART, ILEUM, JEJUNUM, LIVER, LYMPH NODE, MES, LUNGS, PANCREAS, PARATHYROID, RECTUM, PROSTATE, SALIVARY GLANDS, SEMINAL VESICLES, SKIN, SPINAL CORD, SPLEEN, TESTES, THYMUS GLAND, THYROID GLANDS

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44089 GROUP 4: 0.25 MG/L MALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

	GRADE
TRACHEA	
URINARY BLADDER	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44112 GROUP 4: 0.25 MG/L MALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.03	0.561
LIVER	10.81	2.986
KIDNEYS	2.83	0.782
HEART	1.42	0.392
SPLEEN	0.97	0.268
LUNGS	1.61	0.445
TESTES/EPIDID.	5.12	1.414
THYMUS GLAND	0.3777	0.104
ADRENAL GLANDS	0.0656	0.018
FINAL BODY WT(G)	362.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1 BILATERAL SEPTAL EPITHELIUM	1
	INFLAMMATION, NEUTROPHILIC, MAX. TURBINATE SECTION 1 UNILATERAL, LEFT	1
	METAPLASIA, SQUAMOUS UNILATERAL, LEFT	1
MAMMARY GLAND	MICRO: HYPERPLASIA, GLANDULAR MULTIFOCAL	2

NO SIGNIFICANT CHANGES OBSERVED

GROSS:
ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, HEART, LIVER, PANCREAS, SALIVARY GLANDS, SPINAL CORD, THYMUS GLAND, AORTA, CECUM, ESOPHAGUS, ILEUM, LYMPH NODE, MES, RECTUM, SEMINAL VESICLES, SPLEEN, THYROID GLANDS, STERNEBRAE, COLON, EYES/OPTIC N., JEJUNUM, LUNGS, PITUITARY, SKELETAL MUSCLE, STOMACH, TRACHEA, LYMPH NODE, BRON, DUODENUM, LYMPH NODE, SUPR, KIDNEYS, NERVE,SCIATIC, PROSTATE, SKIN, TESTES, URINARY BLADDER

MICRO:
LYMPH NODE, BRON, DUODENUM, LYMPH NODE, SUPR, KIDNEYS, NERVE,SCIATIC, PITUITARY, SKELETAL MUSCLE, STOMACH, TRACHEA, BRAIN, EPIDIDYMIDES, HEART, LIVER, PANCREAS, PROSTATE, SKIN, TESTES, URINARY BLADDER, CECUM, ESOPHAGUS, ILEUM, LYMPH NODE, MES, PARATHYROID, SALIVARY GLANDS, SPINAL CORD, THYMUS GLAND, COLON, EYES/OPTIC N., JEJUNUM, LUNGS, RECTUM, SEMINAL VESICLES, SPLEEN, THYROID GLANDS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44123 GROUP 4: 0.25 MG/L MALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	2.06	0.528
LIVER	13.12	3.364
KIDNEYS	3.73	0.956
HEART	1.55	0.397
SPLEEN	0.72	0.185
LUNGS	2.89	0.741
TESTES/EPIDID.	4.74	1.215
THYMUS GLAND	0.5372	0.138
ADRENAL GLANDS	0.0697	0.018
FINAL BODY WT(G)	390.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1 BILATERAL SEPTAL EPITHELIUM	1
	METAPLASIA, SQUAMOUS SECTION 1	1
MAMMARY GLAND	MICRO: HYPERPLASIA, GLANDULAR MULTIFOCAL	2
NO SIGNIFICANT CHANGES OBSERVED		

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, HEART, LIVER, PANCREAS, SALIVARY GLANDS, SPINAL CORD, THYMUS GLAND, AORTA, CECUM, ESOPHAGUS, ILEUM, LYMPH NODE, MES, RECTUM, SEMINAL VESICLES, SPLEEN, THYROID GLANDS, STERNEBRAE, COLON, EYES/OPTIC N., JEJUNUM, LUNGS, PITUITARY, SKELETAL MUSCLE, STOMACH, TRACHEA, LYMPH NODE, BRON, DUODENUM, LYMPH NODE, SUPR, KIDNEYS, NERVE,SCIATIC, PROSTATE, SKIN, TESTES, URINARY BLADDER

MICRO: LYMPH NODE, BRON, DUODENUM, LYMPH NODE, SUPR, KIDNEYS, NERVE,SCIATIC, PITUITARY, SKELETAL MUSCLE, STOMACH, TRACHEA, BRAIN, EPIDIDYMIDES, HEART, LIVER, PANCREAS, PROSTATE, SKIN, TESTES, URINARY BLADDER, CECUM, ESOPHAGUS, ILEUM, LYMPH NODE, MES, PARATHYROID, SALIVARY GLANDS, SPINAL CORD, THYMUS GLAND, COLON, EYES/OPTIC N., JEJUNUM, LUNGS, RECTUM, SEMINAL VESICLES, SPLEEN, THYROID GLANDS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44133 GROUP 4: 0.25 MG/L MALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.89	0.551
LIVER	12.04	3.510
KIDNEYS	3.09	0.901
HEART	1.36	0.397
SPLEEN	0.78	0.227
LUNGS	1.57	0.458
TESTES/EPIDID.	4.17	1.216
THYMUS GLAND	0.4237	0.124
ADRENAL GLANDS	0.0722	0.021
FINAL BODY WT(G)	343.	

		GRADE
NASAL TURBINATES	MICRO: INFLAMMATION, NEUTROPHILIC, MAX. TURBINATE SECTION 1 BILATERAL	2
	METAPLASIA, SQUAMOUS MAXILLARY TURBINATE	1
	INFLAMMATION, NONSUPPURATIVE UNILATERAL, VENTRAL SEPTUM	1
	HYPERPLASIA, LYMPHOID- SECTION 4 UNILATERAL, LEFT	1
MAMMARY GLAND	MICRO: HYPERPLASIA, GLANDULAR MULTIFOCAL	2
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, HEART, LIVER, PANCREAS, SALIVARY GLANDS, SPINAL CORD, THYMUS GLAND, AORTA, CECUM, ESOPHAGUS, ILEUM, LYMPH NODE, MES, RECTUM, SEMINAL VESICLES, SPLEEN, THYROID GLANDS, STERNEBRAE, COLON, EYES/OPTIC N., JEJUNUM, LUNGS, PITUITARY, SKELETAL MUSCLE, STOMACH, TRACHEA, LYMPH NODE, BRON, DUODENUM, LYMPH NODE, SUPR, KIDNEYS, NERVE,SCIATIC, PROSTATE, SKIN, TESTES, URINARY BLADDER

MICRO:LYMPH NODE, BRON, DUODENUM, LYMPH NODE, SUPR, KIDNEYS, NERVE,SCIATIC, PITUITARY, SKELETAL MUSCLE, BRAIN, EPIDIDYMIDES, HEART, LIVER, PANCREAS, PROSTATE, SKIN, CECUM, ESOPHAGUS, ILEUM, LYMPH NODE, MES, PARATHYROID, SALIVARY GLANDS, SPINAL CORD, COLON, EYES/OPTIC N., JEJUNUM, LUNGS, RECTUM, SEMINAL VESICLES, SPLEEN

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44133 GROUP 4: 0.25 MG/L MALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

	GRADE			
STOMACH	TESTES	THYMUS GLAND	THYROID GLANDS	
TRACHEA	URINARY BLADDER			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44149 GROUP 1: 0.00 MG/L FEMALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.75	0.884
LIVER	6.13	3.096
KIDNEYS	1.58	0.798
HEART	0.93	0.470
SPLEEN	0.51	0.258
LUNGS	1.24	0.626
OVARIES	0.1201	0.061
THYMUS GLAND	0.2608	0.132
ADRENAL GLANDS	0.0603	0.030
FINAL BODY WT(G)	198.	

GENERAL COMMENT

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
GROSS:	ORGAN DAMAGED AT NECROPSY	
	PITUITARY	P

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
LYMPH NODE, BRON	BRAIN	CECUM	COLON
DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
NERVE,SCIATIC	OVARIES	PANCREAS	RECTUM
PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	STOMACH	THYMUS GLAND
THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
VAGINA			

MICRO:

OVIDUCTS	LYMPH NODE, BRON	BRAIN	CECUM
COLON	DUODENUM	NASAL TURBINATES	ESOPHAGUS
EYES/OPTIC N.	LYMPH NODE, SUPR	HEART	ILEUM
JEJUNUM	KIDNEYS	LIVER	LYMPH NODE, MES
LUNGS	MAMMARY GLAND	NERVE,SCIATIC	OVARIES
PANCREAS	PARATHYROID	RECTUM	PITUITARY
SALIVARY GLANDS	SKELETAL MUSCLE	SKIN	SPINAL CORD
SPLEEN	STOMACH	THYMUS GLAND	THYROID GLANDS
TRACHEA	URINARY BLADDER	UTERUS	VAGINA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44151 GROUP 1: 0.00 MG/L FEMALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.84	0.748
LIVER	7.40	3.008
KIDNEYS	2.06	0.837
HEART	0.95	0.386
SPLEEN	0.55	0.224
LUNGS	1.32	0.537
OVARIES	0.1558	0.063
THYMUS GLAND	0.5345	0.217
ADRENAL GLANDS	0.0739	0.030
FINAL BODY WT(G)	246.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS: ADRENAL GLANDS, AORTA, STERNEBRAE, OVIDUCTS, LYMPH NODE, BRON, BRAIN, CECUM, COLON, DUODENUM, ESOPHAGUS, EYES/OPTIC N., LYMPH NODE, SUPR, HEART, ILEUM, JEJUNUM, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, NERVE,SCIATIC, OVARIES, PANCREAS, RECTUM, PITUITARY, SALIVARY GLANDS, SKELETAL MUSCLE, SKIN, SPINAL CORD, SPLEEN, STOMACH, THYMUS GLAND, THYROID GLANDS, TRACHEA, URINARY BLADDER, UTERUS, VAGINA

MICRO: OVIDUCTS, LYMPH NODE, BRON, BRAIN, CECUM, COLON, DUODENUM, NASAL TURBINATES, ESOPHAGUS, EYES/OPTIC N., LYMPH NODE, SUPR, HEART, ILEUM, JEJUNUM, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, NERVE,SCIATIC, OVARIES, PANCREAS, PARATHYROID, RECTUM, PITUITARY, SALIVARY GLANDS, SKELETAL MUSCLE, SKIN, SPINAL CORD, SPLEEN, STOMACH, THYMUS GLAND, THYROID GLANDS, TRACHEA, URINARY BLADDER, UTERUS, VAGINA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44156 GROUP 1: 0.00 MG/L FEMALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.72	0.705
LIVER	7.28	2.984
KIDNEYS	1.89	0.775
HEART	1.08	0.443
SPLEEN	0.57	0.234
LUNGS	1.66	0.680
OVARIES	0.1575	0.065
THYMUS GLAND	0.5087	0.208
ADRENAL GLANDS	0.0686	0.028
FINAL BODY WT(G)	244.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS: ADRENAL GLANDS, AORTA, STERNEBRAE, OVIDUCTS, LYMPH NODE, BRON, BRAIN, CECUM, COLON, DUODENUM, ESOPHAGUS, EYES/OPTIC N., LYMPH NODE, SUPR, HEART, ILEUM, JEJUNUM, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, NERVE,SCIATIC, OVARIES, PANCREAS, RECTUM, PITUITARY, SALIVARY GLANDS, SKELETAL MUSCLE, SKIN, SPINAL CORD, SPLEEN, STOMACH, THYMUS GLAND, THYROID GLANDS, TRACHEA, URINARY BLADDER, UTERUS, VAGINA

MICRO: OVIDUCTS, LYMPH NODE, BRON, BRAIN, CECUM, COLON, DUODENUM, NASAL TURBINATES, ESOPHAGUS, EYES/OPTIC N., LYMPH NODE, SUPR, HEART, ILEUM, JEJUNUM, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, NERVE,SCIATIC, OVARIES, PANCREAS, PARATHYROID, RECTUM, PITUITARY, SALIVARY GLANDS, SKELETAL MUSCLE, SKIN, SPINAL CORD, SPLEEN, STOMACH, THYMUS GLAND, THYROID GLANDS, TRACHEA, URINARY BLADDER, UTERUS, VAGINA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44176 GROUP 1: 0.00 MG/L FEMALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.69	0.765
LIVER	10.46	4.235
KIDNEYS	1.91	0.773
HEART	1.00	0.405
SPLEEN	0.63	0.255
LUNGS	1.76	0.713
OVARIES	0.1544	0.063
THYMUS GLAND	0.4796	0.194
ADRENAL GLANDS	0.0881	0.036
FINAL BODY WT(G)	247.	

NO SIGNIFICANT CHANGES OBSERVED

	GRADE			
GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
	LYMPH NODE, BRON	BRAIN	CECUM	COLON
	DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	NERVE,SCIATIC	OVARIES	PANCREAS	RECTUM
	PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	STOMACH	THYMUS GLAND
	THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
	VAGINA			
MICRO:	OVIDUCTS	LYMPH NODE, BRON	BRAIN	CECUM
	COLON	DUODENUM	NASAL TURBINATES	ESOPHAGUS
	EYES/OPTIC N.	LYMPH NODE, SUPR	HEART	ILEUM
	JEJUNUM	KIDNEYS	LIVER	LYMPH NODE, MES
	LUNGS	MAMMARY GLAND	NERVE,SCIATIC	OVARIES
	PANCREAS	PARATHYROID	RECTUM	PITUITARY
	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN	SPINAL CORD
	SPLEEN	STOMACH	THYMUS GLAND	THYROID GLANDS
	TRACHEA	URINARY BLADDER	UTERUS	VAGINA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44180 GROUP 1: 0.00 MG/L FEMALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.75	0.774
LIVER	7.80	3.451
KIDNEYS	1.45	0.642
HEART	0.92	0.407
SPLEEN	0.51	0.226
LUNGS	1.37	0.606
OVARIES	0.1413	0.063
THYMUS GLAND	0.4787	0.212
ADRENAL GLANDS	0.0813	0.036
FINAL BODY WT(G)	226.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
	LYMPH NODE, BRON	BRAIN	CECUM	COLON
	DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	NERVE,SCIATIC	OVARIES	PANCREAS	RECTUM
	PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	STOMACH	THYMUS GLAND
	THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
	VAGINA			
MICRO:	OVIDUCTS	LYMPH NODE, BRON	BRAIN	CECUM
	COLON	DUODENUM	NASAL TURBINATES	ESOPHAGUS
	EYES/OPTIC N.	LYMPH NODE, SUPR	HEART	ILEUM
	JEJUNUM	KIDNEYS	LIVER	LYMPH NODE, MES
	LUNGS	MAMMARY GLAND	NERVE,SCIATIC	OVARIES
	PANCREAS	PARATHYROID	RECTUM	PITUITARY
	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN	SPINAL CORD
	SPLEEN	STOMACH	THYMUS GLAND	THYROID GLANDS
	TRACHEA	URINARY BLADDER	UTERUS	VAGINA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44162 GROUP 2: 0.025 MG/L FEMALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.92	0.768
LIVER	8.50	3.400
KIDNEYS	2.02	0.808
HEART	0.93	0.372
SPLEEN	0.63	0.252
LUNGS	1.39	0.556
OVARIES	0.1608	0.064
THYMUS GLAND	0.5138	0.206
ADRENAL GLANDS	0.0837	0.033
FINAL BODY WT(G)	250.	

NASAL TURBINATES MICRO: INFLAMMATION, NONSUPPURATIVE- SECTION 1 — GRADE 1
BILATERAL
METAPLASIA, SQUAMOUS — 1
BILATERAL SEPTUM, NASAL & MAXILLARY TURBINATES
HYPERPLASIA, GOBLET CELL- SECTION 2 — 1
BILATERAL SEPTAL EPITHELIUM

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
LYMPH NODE, BRON	BRAIN	CECUM	COLON
DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
NERVE,SCIATIC	OVARIES	PANCREAS	RECTUM
PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	STOMACH	THYMUS GLAND
THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
VAGINA			

MICRO:

KIDNEYS	LIVER	LUNGS	TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44187 GROUP 2: 0.025 MG/L FEMALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.81	0.754
LIVER	8.33	3.471
KIDNEYS	2.07	0.863
HEART	1.22	0.508
SPLEEN	0.83	0.346
LUNGS	1.47	0.613
OVARIES	0.1797	0.075
THYMUS GLAND	0.4909	0.205
ADRENAL GLANDS	0.0941	0.039
FINAL BODY WT(G)	240.	

		GRADE
NASAL TURBINATES	MICRO: INFLAMMATION, NONSUPP. VOMERONASAL ORGAN- SECTION 1 UNILATERAL, VENTRAL SEPTUM	1
LYMPH NODE	GROSS: CERVICAL- ENLARGED RIGHT	P
NO SIGNIFICANT CHANGES OBSERVED		

GROSS: ADRENAL GLANDS, AORTA, STERNEBRAE, OVIDUCTS, LYMPH NODE, BRON, BRAIN, CECUM, COLON, DUODENUM, ESOPHAGUS, EYES/OPTIC N., LYMPH NODE, SUPR, HEART, ILEUM, JEJUNUM, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, NERVE,SCIATIC, OVARIES, PANCREAS, RECTUM, PITUITARY, SALIVARY GLANDS, SKELETAL MUSCLE, SKIN, SPINAL CORD, SPLEEN, STOMACH, THYMUS GLAND, THYROID GLANDS, TRACHEA, URINARY BLADDER, UTERUS, VAGINA

MICRO: KIDNEYS, LIVER, LUNGS, TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44195 GROUP 2: 0.025 MG/L FEMALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.72	0.778
LIVER	7.20	3.258
KIDNEYS	1.95	0.882
HEART	0.79	0.357
SPLEEN	0.46	0.208
LUNGS	2.25	1.018
OVARIES	0.1325	0.060
THYMUS GLAND	0.4542	0.206
ADRENAL GLANDS	0.0796	0.036
FINAL BODY WT(G)	221.	

		GRADE
LUNGS	GROSS: MOTTLED ALL LOBES	P
NO SIGNIFICANT CHANGES OBSERVED		

GROSS: ADRENAL GLANDS, AORTA, STERNEBRAE, OVIDUCTS, LYMPH NODE, BRON, BRAIN, CECUM, COLON, DUODENUM, ESOPHAGUS, EYES/OPTIC N., LYMPH NODE, SUPR, HEART, ILEUM, JEJUNUM, KIDNEYS, LIVER, LYMPH NODE, MES, MAMMARY GLAND, NERVE,SCIATIC, OVARIES, PANCREAS, RECTUM, PITUITARY, SALIVARY GLANDS, SKELETAL MUSCLE, SKIN, SPINAL CORD, SPLEEN, STOMACH, THYMUS GLAND, THYROID GLANDS, TRACHEA, URINARY BLADDER, UTERUS, VAGINA

MICRO: NASAL TURBINATES, KIDNEYS, LIVER, LUNGS, TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44349 GROUP 2: 0.025 MG/L FEMALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.75	0.871
LIVER	6.90	3.433
KIDNEYS	1.50	0.746
HEART	0.85	0.423
SPLEEN	0.44	0.219
LUNGS	1.13	0.562
OVARIES	0.1146	0.057
THYMUS GLAND	0.4621	0.230
ADRENAL GLANDS	0.0675	0.034
FINAL BODY WT(G)	201.	

		GRADE
LYMPH NODE, SUPR	GROSS: REDDENED BILATERAL	P
LYMPH NODE	GROSS: CERVICAL- REDDENED BILATERAL	P
NO SIGNIFICANT CHANGES OBSERVED	GROSS: ADRENAL GLANDS, AORTA, STERNEBRAE, OVIDUCTS, LYMPH NODE, BRON, BRAIN, CECUM, COLON, DUODENUM, ESOPHAGUS, EYES/OPTIC N., HEART, ILEUM, JEJUNUM, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, NERVE,SCIATIC, OVARIES, PANCREAS, RECTUM, PITUITARY, SALIVARY GLANDS, SKELETAL MUSCLE, SKIN, SPINAL CORD, SPLEEN, STOMACH, THYMUS GLAND, THYROID GLANDS, TRACHEA, URINARY BLADDER, UTERUS, VAGINA	
	MICRO: NASAL TURBINATES, KIDNEYS, LIVER, LUNGS, TRACHEA	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44350 GROUP 2: 0.025 MG/L FEMALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.73	0.742
LIVER	8.02	3.442
KIDNEYS	2.02	0.867
HEART	0.68	0.292
SPLEEN	0.45	0.193
LUNGS	1.31	0.562
OVARIES	0.1093	0.047
THYMUS GLAND	0.2300	0.099
ADRENAL GLANDS	0.0794	0.034
FINAL BODY WT(G)	233.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS: ADRENAL GLANDS, AORTA, STERNEBRAE, OVIDUCTS, LYMPH NODE, BRON, BRAIN, CECUM, COLON, DUODENUM, ESOPHAGUS, EYES/OPTIC N., LYMPH NODE, SUPR, HEART, ILEUM, JEJUNUM, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, NERVE,SCIATIC, OVARIES, PANCREAS, RECTUM, PITUITARY, SALIVARY GLANDS, SKELETAL MUSCLE, SKIN, SPINAL CORD, SPLEEN, STOMACH, THYMUS GLAND, THYROID GLANDS, TRACHEA, URINARY BLADDER, UTERUS, VAGINA

MICRO: NASAL TURBINATES, KIDNEYS, LIVER, LUNGS, TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44165 GROUP 3: 0.075 MG/L FEMALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.87	0.782
LIVER	7.65	3.201
KIDNEYS	1.88	0.787
HEART	0.87	0.364
SPLEEN	0.54	0.226
LUNGS	2.23	0.933
OVARIES	0.1306	0.055
THYMUS GLAND	0.3951	0.165
ADRENAL GLANDS	0.0955	0.040
FINAL BODY WT(G)	239.	

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1 BILATERAL SEPTAL EPITHELIUM	1
	HYPERPLASIA, GOBLET CELL- SECTION 2 BILATERAL SEPTAL EPITHELIUM	1

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
LYMPH NODE, BRON	BRAIN	CECUM	COLON
DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
NERVE,SCIATIC	OVARIES	PANCREAS	RECTUM
PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	STOMACH	THYMUS GLAND
THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
VAGINA			

MICRO:

KIDNEYS	LIVER	LUNGS	TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44186 GROUP 3: 0.075 MG/L FEMALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.77	0.753
LIVER	8.65	3.681
KIDNEYS	1.87	0.796
HEART	0.87	0.370
SPLEEN	0.52	0.221
LUNGS	1.92	0.817
OVARIES	0.1418	0.060
THYMUS GLAND	0.3950	0.168
ADRENAL GLANDS	0.0693	0.029
FINAL BODY WT(G)	235.	

		GRADE
NASAL TURBINATES	MICRO: INFLAMMATION, NONSUPPURATIVE- SECTION 1 MAXILLARY TURBINATE	1
	METAPLASIA, SQUAMOUS MAXILLARY TURBINATE	1
	HYPERPLASIA, GOBLET CELL- SECTION 1 BILATERAL SEPTAL EPITHELIUM	1
	HYPERPLASIA, GOBLET CELL- SECTION 2 BILATERAL SEPTAL EPITHELIUM	1
	DEGENERATION, OLFACTORY EPITHELIUM- SECTION 5 MAXILLARY TURBINATE	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
LYMPH NODE, BRON	BRAIN	CECUM	COLON
DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
NERVE,SCIATIC	OVARIES	PANCREAS	RECTUM
PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	STOMACH	THYMUS GLAND
THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
VAGINA			

MICRO:

KIDNEYS	LIVER	LUNGS	TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44196 GROUP 3: 0.075 MG/L FEMALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.80	0.779
LIVER	10.01	4.333
KIDNEYS	1.86	0.805
HEART	1.04	0.450
SPLEEN	0.48	0.208
LUNGS	1.38	0.597
OVARIES	0.1293	0.056
THYMUS GLAND	0.2690	0.116
ADRENAL GLANDS	0.0994	0.043
FINAL BODY WT(G)	231.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1 BILATERAL SEPTAL EPITHELIUM	1
LYMPH NODE, SUPR	GROSS: ENLARGED BILATERAL	P
NO SIGNIFICANT CHANGES OBSERVED		

GROSS: ADRENAL GLANDS, AORTA, STERNEBRAE, OVIDUCTS, LYMPH NODE, BRON, BRAIN, CECUM, COLON, DUODENUM, ESOPHAGUS, EYES/OPTIC N., HEART, ILEUM, JEJUNUM, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, NERVE,SCIATIC, OVARIES, PANCREAS, RECTUM, PITUITARY, SALIVARY GLANDS, SKELETAL MUSCLE, SKIN, SPINAL CORD, SPLEEN, STOMACH, THYMUS GLAND, THYROID GLANDS, TRACHEA, URINARY BLADDER, UTERUS, VAGINA

MICRO: KIDNEYS, LIVER, LUNGS, TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44200 GROUP 3: 0.075 MG/L FEMALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.84	0.860
LIVER	8.47	3.958
KIDNEYS	2.11	0.986
HEART	0.87	0.407
SPLEEN	0.58	0.271
LUNGS	2.82	1.318
OVARIES	0.1512	0.071
THYMUS GLAND	0.4828	0.226
ADRENAL GLANDS	0.0813	0.038
FINAL BODY WT(G)	214.	

		GRADE
LYMPH NODE, SUPR	GROSS: ENLARGED RIGHT	P
LUNGS	GROSS: DARK RED ALL LOBES	P
LYMPH NODE	GROSS: CERVICAL- ENLARGED RIGHT	P
NO SIGNIFICANT CHANGES OBSERVED		

GROSS: ADRENAL GLANDS, AORTA, STERNEBRAE, OVIDUCTS, LYMPH NODE, BRON, BRAIN, CECUM, COLON, DUODENUM, ESOPHAGUS, EYES/OPTIC N., HEART, ILEUM, JEJUNUM, KIDNEYS, LIVER, LYMPH NODE, MES, MAMMARY GLAND, NERVE,SCIATIC, OVARIES, PANCREAS, RECTUM, PITUITARY, SALIVARY GLANDS, SKELETAL MUSCLE, SKIN, SPINAL CORD, SPLEEN, STOMACH, THYMUS GLAND, THYROID GLANDS, TRACHEA, URINARY BLADDER, UTERUS, VAGINA

MICRO: NASAL TURBINATES, KIDNEYS, LIVER, LUNGS, TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44206 GROUP 3: 0.075 MG/L FEMALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.67	0.811
LIVER	7.39	3.587
KIDNEYS	1.66	0.806
HEART	0.74	0.359
SPLEEN	0.48	0.233
LUNGS	2.49	1.209
OVARIES	0.1104	0.054
THYMUS GLAND	0.4255	0.207
ADRENAL GLANDS	0.0679	0.033
FINAL BODY WT(G)	206.	

		GRADE
NASAL TURBINATES	MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1 BILATERAL SEPTAL EPITHELIUM	1
LUNGS	GROSS: DARK RED ALL LOBES	P
NO SIGNIFICANT CHANGES OBSERVED		

GROSS: ADRENAL GLANDS, LYMPH NODE, BRON, DUODENUM, HEART, LIVER, OVARIES, SALIVARY GLANDS, SPLEEN, TRACHEA, AORTA, BRAIN, ESOPHAGUS, ILEUM, LYMPH NODE, MES, PANCREAS, SKELETAL MUSCLE, STOMACH, URINARY BLADDER, STERNEBRAE, CECUM, EYES/OPTIC N., JEJUNUM, MAMMARY GLAND, RECTUM, SKIN, THYMUS GLAND, UTERUS, OVIDUCTS, COLON, LYMPH NODE, SUPR, KIDNEYS, NERVE,SCIATIC, PITUITARY, SPINAL CORD, THYROID GLANDS, VAGINA

MICRO: KIDNEYS, LIVER, LUNGS, TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44167 GROUP 4: 0.25 MG/L FEMALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.81	0.777
LIVER	7.82	3.356
KIDNEYS	1.93	0.828
HEART	0.91	0.391
SPLEEN	0.70	0.300
LUNGS	1.34	0.575
OVARIES	0.1425	0.061
THYMUS GLAND	0.5445	0.234
ADRENAL GLANDS	0.0738	0.032
FINAL BODY WT(G)	233.	

NASAL TURBINATES NO SIGNIFICANT CHANGES OBSERVED

	GRADE
MICRO: HYPERPLASIA, GOBLET CELL- SECTION 1 BILATERAL SEPTAL EPITHELIUM	1
INFLAMMATION, NEUTROPHILIC, MAX. TURBINATE SECTION 1 UNILATERAL, LEFT	1
METAPLASIA, SQUAMOUS MAXILLARY TURBINATE	1
HYPERPLASIA, LYMPHOID- SECTION 4 BILATERAL	1

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
LYMPH NODE, BRON	BRAIN	CECUM	COLON
DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
NERVE,SCIATIC	OVARIES	PANCREAS	RECTUM
PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	STOMACH	THYMUS GLAND
THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
VAGINA			

MICRO:

OVIDUCTS	LYMPH NODE, BRON	BRAIN	CECUM
COLON	DUODENUM	ESOPHAGUS	EYES/OPTIC N.
LYMPH NODE, SUPR	HEART	ILEUM	JEJUNUM
KIDNEYS	LIVER	LYMPH NODE, MES	LUNGS
MAMMARY GLAND	NERVE,SCIATIC	OVARIES	PANCREAS
PARATHYROID	RECTUM	PITUITARY	SALIVARY GLANDS
SKELETAL MUSCLE	SKIN	SPINAL CORD	SPLEEN
STOMACH	THYMUS GLAND	THYROID GLANDS	TRACHEA
URINARY BLADDER	UTERUS	VAGINA	

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44167 GROUP 4: 0.25 MG/L FEMALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

GRADE

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44182 GROUP 4: 0.25 MG/L FEMALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.82	0.674
LIVER	8.93	3.307
KIDNEYS	1.98	0.733
HEART	1.02	0.378
SPLEEN	0.68	0.252
LUNGS	1.46	0.541
OVARIES	0.1810	0.067
THYMUS GLAND	0.2507	0.093
ADRENAL GLANDS	0.0805	0.030
FINAL BODY WT(G)	270.	

NASAL TURBINATES

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO:	HYPERPLASIA, GOBLET CELL- SECTION 1 BILATERAL SEPTAL EPITHELIUM	1
	METAPLASIA, SQUAMOUS SECTION 1	1
	HYPERPLASIA, GOBLET CELL- SECTION 2 BILATERAL SEPTAL EPITHELIUM	1

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
LYMPH NODE, BRON	BRAIN	CECUM	COLON
DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
NERVE,SCIATIC	OVARIES	PANCREAS	RECTUM
PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	STOMACH	THYMUS GLAND
THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
VAGINA			

MICRO:

OVIDUCTS	LYMPH NODE, BRON	BRAIN	CECUM
COLON	DUODENUM	ESOPHAGUS	EYES/OPTIC N.
LYMPH NODE, SUPR	HEART	ILEUM	JEJUNUM
KIDNEYS	LIVER	LYMPH NODE, MES	LUNGS
MAMMARY GLAND	NERVE,SCIATIC	OVARIES	PANCREAS
PARATHYROID	RECTUM	PITUITARY	SALIVARY GLANDS
SKELETAL MUSCLE	SKIN	SPINAL CORD	SPLEEN
STOMACH	THYMUS GLAND	THYROID GLANDS	TRACHEA
URINARY BLADDER	UTERUS	VAGINA	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44198 GROUP 4: 0.25 MG/L FEMALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.78	0.781
LIVER	7.18	3.149
KIDNEYS	1.73	0.759
HEART	0.80	0.351
SPLEEN	0.51	0.224
LUNGS	1.28	0.561
OVARIES	0.1272	0.056
THYMUS GLAND	0.3102	0.136
ADRENAL GLANDS	0.0689	0.030
FINAL BODY WT(G)	228.	

NASAL TURBINATES MICRO: METAPLASIA, SQUAMOUS UNILATERAL, LEFT — GRADE 1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
	LYMPH NODE, BRON	BRAIN	CECUM	COLON
	DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
	HEART	ILEUM	JEJUNUM	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	NERVE,SCIATIC	OVARIES	PANCREAS	RECTUM
	PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
	SPINAL CORD	SPLEEN	STOMACH	THYMUS GLAND
	THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
	VAGINA			
MICRO:	OVIDUCTS	LYMPH NODE, BRON	BRAIN	CECUM
	COLON	DUODENUM	ESOPHAGUS	EYES/OPTIC N.
	LYMPH NODE, SUPR	HEART	ILEUM	JEJUNUM
	KIDNEYS	LIVER	LYMPH NODE, MES	LUNGS
	MAMMARY GLAND	NERVE,SCIATIC	OVARIES	PANCREAS
	PARATHYROID	RECTUM	PITUITARY	SALIVARY GLANDS
	SKELETAL MUSCLE	SKIN	SPINAL CORD	SPLEEN
	STOMACH	THYMUS GLAND	THYROID GLANDS	TRACHEA
	URINARY BLADDER	UTERUS	VAGINA	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44205 GROUP 4: 0.25 MG/L FEMALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.79	0.821
LIVER	7.42	3.404
KIDNEYS	1.85	0.849
HEART	0.80	0.367
SPLEEN	0.53	0.243
LUNGS	2.29	1.050
OVARIES	0.1739	0.080
THYMUS GLAND	0.2462	0.113
ADRENAL GLANDS	0.0780	0.036
FINAL BODY WT(G)	218.	

NASAL TURBINATES

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO:	INFLAMMATION, NEUTROPHILIC UNILATERAL, LEFT	1
	EDEMA, NASAL TURBINATE- SECTION 3 UNILATERAL, RIGHT	1

GROSS:

ADRENAL GLANDS	AORTA	STERNEBRAE	OVIDUCTS
LYMPH NODE, BRON	BRAIN	CECUM	COLON
DUODENUM	ESOPHAGUS	EYES/OPTIC N.	LYMPH NODE, SUPR
HEART	ILEUM	JEJUNUM	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
NERVE,SCIATIC	OVARIES	PANCREAS	RECTUM
PITUITARY	SALIVARY GLANDS	SKELETAL MUSCLE	SKIN
SPINAL CORD	SPLEEN	STOMACH	THYMUS GLAND
THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
VAGINA			

MICRO:

OVIDUCTS	LYMPH NODE, BRON	BRAIN	CECUM
COLON	DUODENUM	ESOPHAGUS	EYES/OPTIC N.
LYMPH NODE, SUPR	HEART	ILEUM	JEJUNUM
KIDNEYS	LIVER	LYMPH NODE, MES	LUNGS
MAMMARY GLAND	NERVE,SCIATIC	OVARIES	PANCREAS
PARATHYROID	RECTUM	PITUITARY	SALIVARY GLANDS
SKELETAL MUSCLE	SKIN	SPINAL CORD	SPLEEN
STOMACH	THYMUS GLAND	THYROID GLANDS	TRACHEA
URINARY BLADDER	UTERUS	VAGINA	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE 72 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
GROSS AND MICROSCOPIC DESCRIPTION OF ORGANS

ANIMAL NO. 44345 GROUP 4: 0.25 MG/L FEMALE SCHEDULED EUTH 12/28/95 DATE OF DEATH: 12/28/95 STUDY DAY: 42

ORGAN WEIGHT	ABS.(G)	REL.
BRAIN	1.80	0.814
LIVER	6.18	2.796
KIDNEYS	1.69	0.765
HEART	0.79	0.357
SPLEEN	0.55	0.249
LUNGS	1.27	0.575
OVARIES	0.1355	0.061
THYMUS GLAND	0.1822	0.082
ADRENAL GLANDS	0.0632	0.029
FINAL BODY WT(G)	221.	

		GRADE
NASAL TURBINATES	MICRO: METAPLASIA, SQUAMOUS	
	MAXILLARY TURBINATE	1
	INFLAMMATION, NONSUPPURATIVE	
	RESPIRATORY EPITHELIUM, FOCAL, RIGHT DORSOLATERAL MEATUS	1
LYMPH NODE, SUPR	GROSS: ENLARGED	
	BILATERAL	P
LYMPH NODE	GROSS: CERVICAL- ENLARGED	
	BILATERAL	P
NO SIGNIFICANT CHANGES OBSERVED		

GROSS: ADRENAL GLANDS, LYMPH NODE, BRON, DUODENUM, ILEUM, LYMPH NODE, MES, OVARIES, SALIVARY GLANDS, SPLEEN, TRACHEA, AORTA, BRAIN, ESOPHAGUS, JEJUNUM, LUNGS, PANCREAS, SKELETAL MUSCLE, STOMACH, URINARY BLADDER, STERNEBRAE, CECUM, EYES/OPTIC N., KIDNEYS, MAMMARY GLAND, RECTUM, SKIN, THYMUS GLAND, UTERUS, OVIDUCTS, COLON, HEART, LIVER, NERVE,SCIATIC, PITUITARY, SPINAL CORD, THYROID GLANDS, VAGINA

MICRO: OVIDUCTS, COLON, LYMPH NODE, SUPR, KIDNEYS, MAMMARY GLAND, PARATHYROID, SKELETAL MUSCLE, STOMACH, URINARY BLADDER, LYMPH NODE, BRON, DUODENUM, HEART, LIVER, NERVE,SCIATIC, RECTUM, SKIN, THYMUS GLAND, UTERUS, BRAIN, ESOPHAGUS, ILEUM, LYMPH NODE, MES, OVARIES, PITUITARY, SPINAL CORD, THYROID GLANDS, VAGINA, CECUM, EYES/OPTIC N., JEJUNUM, LUNGS, PANCREAS, SALIVARY GLANDS, SPLEEN, TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 73 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS AND FINAL BODY WEIGHTS (GRAMS)

MALE GROUP: 0.00 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	TESTES/ EPIDID.	THYMUS GLAND	ADRENAL GLANDS
44091	338.	2.01	9.75	2.85	1.16	0.70	1.84	4.35	0.2785	0.0712
44099	299.	2.00	11.15	2.93	1.37	0.66	1.70	5.08	0.7023	0.0710
44114	337.	1.92	10.41	3.25	1.28	0.68	1.76	4.81	0.2676	0.0848
44121	333.	1.88	14.39	3.05	1.15	0.65	2.21	4.53	0.3881	0.0741
44131	336.	2.03	10.57	2.97	1.34	0.77	2.95	5.86	0.4747	0.0668
44132	314.	1.93	9.10	2.64	1.15	0.60	1.43	4.37	0.2310	0.0627
44141	324.	1.99	8.81	2.58	1.20	0.77	2.46	4.67	0.4489	0.0665
44337	302.	2.03	10.55	2.60	1.08	0.53	1.63	4.29	0.5280	0.0802
MEAN	323.	1.97	10.59	2.86	1.22	0.67	2.00	4.75	0.4149	0.0722
S.D.	16.0	0.056	1.727	0.239	0.103	0.081	0.506	0.523	0.15810	0.00737
N	8	8	8	8	8	8	8	8	8	8

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 73 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS AND FINAL BODY WEIGHTS (GRAMS)

MALE GROUP: 0.025 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	TESTES/ EPIDID.	THYMUS GLAND	ADRENAL GLANDS
44092	321.	1.86	10.49	2.71	1.26	0.67	2.45	4.05	0.3235	0.0595
44093	346.	2.12	13.13	3.47	1.40	0.65	1.68	4.66	0.4221	0.0634
44110	271.	1.85	8.89	2.24	0.98	0.51	2.31	3.93	0.4288	0.0571
44113	336.	2.09	10.78	3.05	1.26	0.69	1.46	4.80	0.3283	0.0720
44138	318.	1.79	9.14	2.57	1.30	0.97	2.23	4.16	0.6671	0.0789
44143	302.	2.04	8.15	1.96	1.23	0.62	1.54	4.87	0.3630	0.0804
44144	295.	1.83	8.68	2.41	1.34	0.63	1.31	4.07	0.3526	0.0503
44147	276.	1.70	9.09	2.72	1.06	0.76	1.87	4.53	0.8014	0.0667
44339	259.	1.91	8.00	2.24	1.16	0.53	1.44	4.05	0.2505	0.0527
44342	283.	1.96	7.51	2.39	1.20	0.53	1.44	4.50	0.4032	0.0812
MEAN	301.	1.92	9.39	2.58	1.22	0.66	1.77	4.36	0.4341	0.0662
S.D.	29.0	0.136	1.668	0.438	0.126	0.136	0.417	0.349	0.16969	0.01151
N	10	10	10	10	10	10	10	10	10	10

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 73 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS AND FINAL BODY WEIGHTS (GRAMS)

MALE GROUP: 0.075 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	TESTES/ EPIDID.	THYMUS GLAND	ADRENAL GLANDS
44107	275.	1.79	9.07	2.35	1.00	0.69	2.75	4.05	0.3711	0.0726
44111	292.	1.84	9.18	2.51	1.12	0.60	1.40	4.32	0.4317	0.0487
44116	282.	1.76	9.59	2.21	1.07	0.58	3.05	3.86	0.3578	0.0570
44118	342.	1.87	9.42	2.79	1.35	0.71	1.57	4.76	0.3842	0.0702
44124	300.	2.03	10.67	2.72	1.36	0.59	1.78	4.38	0.2537	0.0628
44129	330.	1.83	9.46	2.68	1.36	0.52	2.29	4.58	0.5665	0.0907
44140	278.	2.02	9.47	2.46	1.14	0.65	2.89	4.15	0.3454	0.0547
44142	307.	1.82	12.46	2.46	1.38	0.65	1.41	4.38	0.3325	0.0466
44145	331.	1.92	14.56	3.14	1.29	0.84	1.55	5.17	0.3885	0.0770
44333	227.	1.81	8.06	1.90	0.85	0.41	1.46	3.67	0.4566	0.0725
MEAN	296.	1.87	10.19	2.52	1.19	0.62	2.02	4.33	0.3888	0.0653
S.D.	33.9	0.093	1.923	0.340	0.183	0.115	0.665	0.438	0.08341	0.01384
N	10	10	10	10	10	10	10	10	10	10

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 73 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS AND FINAL BODY WEIGHTS (GRAMS)

MALE GROUP: 0.25 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	TESTES/ EPIDID.	THYMUS GLAND	ADRENAL GLANDS
44102	259.	1.81	8.45	2.54	1.03	0.56	1.38	4.15	0.3771	0.0700
44104	304.	1.86	8.58	2.51	1.35	0.61	1.68	4.56	0.3099	0.0687
44109	288.	1.90	11.04	2.64	1.24	0.51	1.98	3.96	0.2561	0.0599
44130	287.	1.96	8.10	2.07	1.24	0.51	1.87	4.68	0.3975	0.0698
44136	301.	1.94	8.46	2.61	1.20	0.59	1.43	4.18	0.3146	0.0648
44139	275.	1.95	8.35	2.25	1.28	0.70	1.47	4.35	0.3372	0.0698
44146	307.	1.89	8.35	2.43	1.73	0.58	1.38	4.36	0.2802	0.0599
44334	252.	1.74	8.03	2.14	1.31	0.49	1.91	3.74	0.2978	0.0526
44338	229.	1.69	6.19	1.82	0.92	0.44	1.29	3.48	0.4639	0.0575
MEAN	278.	1.86	8.39	2.33	1.26	0.55	1.60	4.16	0.3371	0.0637
S.D.	26.6	0.095	1.231	0.281	0.225	0.077	0.264	0.385	0.06511	0.00643
N	9	9	9	9	9	9	9	9	9	9

FBW = FINAL BODY WEIGHT

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 73 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS AND FINAL BODY WEIGHTS (GRAMS)

FEMALE GROUP: 0.00 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	OVARIES	THYMUS GLAND	ADRENAL GLANDS
44154	246.	1.83	8.01	2.02	1.09	0.61	1.89	0.1589	0.4048	0.1024
44164	231.	1.73	8.26	2.15	0.87	0.88	2.71	0.1531	0.3098	0.1162
44178	213.	1.78	9.10	1.99	0.89	0.33	2.55	0.1395	0.3397	0.0773
44181	230.	1.90	7.71	1.69	1.09	0.63	2.29	0.1497	0.4437	0.0861
44204	193.	1.76	7.38	1.98	0.81	0.59	2.57	0.1459	0.3933	0.0677
44207	191.	1.90	5.80	1.75	0.89	0.45	1.28	0.1196	0.2388	0.0605
44346	186.	1.67	5.83	1.62	0.81	0.33	0.98	0.1000	0.2621	0.0670
44352	194.	1.82	8.09	1.58	0.86	0.42	1.32	0.1179	0.4329	0.0774
MEAN	211.	1.80	7.52	1.85	0.91	0.53	1.95	0.1356	0.3531	0.0818
S.D.	22.8	0.080	1.164	0.213	0.113	0.186	0.679	0.02072	0.07770	0.01904
N	8	8	8	8	8	8	8	8	8	8

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 73 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS AND FINAL BODY WEIGHTS (GRAMS)

FEMALE GROUP: 0.025 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	OVARIES	THYMUS GLAND	ADRENAL GLANDS
44159	231.	1.91	7.58	1.72	0.95	0.55	2.24	0.1353	0.2990	0.0858
44160	191.	1.77	6.50	1.77	0.87	0.42	1.21	0.1247	0.3641	0.0757
44170	205.	1.81	6.92	1.79	0.94	0.68	1.54	0.1515	0.5065	0.0977
44172	223.	1.79	8.83	1.80	0.97	0.48	2.50	0.1289	0.4791	0.0781
44179	247.	2.00	9.58	1.84	0.86	0.64	2.45	0.1247	0.3899	0.1075
44183	218.	1.71	7.12	1.67	0.76	0.50	1.24	0.1190	0.3713	0.0809
44191	219.	1.81	9.85	2.24	0.98	0.61	2.79	0.1257	0.3220	0.0724
44192	231.	2.00	8.19	2.20	1.14	0.64	1.43	0.1482	0.4739	0.0769
44201	229.	1.85	8.19	2.00	1.02	0.69	2.08	0.1728	0.3741	0.0833
MEAN	222.	1.85	8.08	1.89	0.94	0.58	1.94	0.1368	0.3978	0.0843
S.D.	16.2	0.101	1.172	0.207	0.108	0.096	0.597	0.01746	0.07262	0.01141
N	9	9	9	9	9	9	9	9	9	9

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 73 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS AND FINAL BODY WEIGHTS (GRAMS)

FEMALE GROUP: 0.075 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	OVARIES	THYMUS GLAND	ADRENAL GLANDS
44150	218.	1.88	9.35	2.02	1.36	0.59	2.79	0.1793	0.4612	0.0897
44152	234.	1.87	8.86	2.08	0.85	0.63	2.29	0.1297	0.4846	0.0746
44161	267.	2.35	12.07	2.97	1.23	0.79	2.39	0.2548	0.5132	0.1264
44169	235.	1.82	8.89	2.21	1.01	0.78	2.72	0.1723	0.4105	0.0854
44171	201.	1.83	7.01	1.75	0.82	0.50	2.56	0.1296	0.3843	0.0674
44197	228.	1.87	8.07	2.19	1.08	0.63	2.75	0.1351	0.3639	0.0924
44202	209.	1.89	9.99	2.11	0.90	0.47	2.32	0.1628	0.3678	0.0876
44344	157.	1.77	5.32	1.61	0.75	0.30	2.11	0.0976	0.1750	0.0892
44347	169.	1.63	6.54	1.76	0.78	0.40	1.09	0.1326	0.2797	0.0678
MEAN	213.	1.88	8.46	2.08	0.98	0.57	2.34	0.1549	0.3822	0.0867
S.D.	34.1	0.194	2.010	0.397	0.212	0.165	0.522	0.04526	0.10528	0.01769
N	9	9	9	9	9	9	9	9	9	9

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 73 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS AND FINAL BODY WEIGHTS (GRAMS)

FEMALE GROUP: 0.25 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	OVARIES	THYMUS GLAND	ADRENAL GLANDS
44155	211.	1.79	8.06	1.73	0.99	0.57	1.25	0.1725	0.4029	0.0912
44168	231.	1.89	7.17	1.96	0.95	0.56	1.41	0.1713	0.3511	0.0834
44175	226.	1.84	7.13	2.01	1.16	0.64	1.32	0.1732	0.3722	0.0935
44184	212.	1.77	6.97	2.03	0.99	0.48	1.36	0.1223	0.3433	0.0845
44189	218.	1.84	7.08	1.92	0.79	0.47	2.05	0.1369	0.3621	0.0878
44190	212.	1.76	6.80	1.90	0.83	0.55	2.62	0.1024	0.3923	0.0784
MEAN	218.	1.82	7.20	1.93	0.95	0.55	1.67	0.1464	0.3707	0.0865
S.D.	8.4	0.050	0.441	0.108	0.132	0.063	0.549	0.03042	0.02330	0.00551
N	6	6	6	6	6	6	6	6	6	6

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 74 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS AND FINAL BODY WEIGHTS (GRAMS)

MALE GROUP: 0.00 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	TESTES/ EPIDID.	THYMUS GLAND	ADRENAL GLANDS
44103	476.	1.88	15.45	3.92	1.58	0.84	1.75	5.44	0.6206	0.0490
44108	381.	2.08	11.13	2.78	1.33	0.72	1.64	4.20	0.4259	0.0569
44115	379.	1.95	10.70	2.81	1.17	0.76	1.31	4.39	0.5746	0.0809
44135	381.	1.95	11.11	2.77	1.35	0.85	2.57	4.50	0.5721	0.0658
44137	387.	2.02	11.78	2.51A	1.33	0.88	1.64	3.46B	0.5490	0.0748
MEAN	401.	1.98	12.03	3.07	1.35	0.81	1.78	4.63	0.5484	0.0655
S.D.	42.1	0.076	1.948	0.567	0.147	0.067	0.470	0.552	0.07326	0.01294
N	5	5	5	4	5	5	5	4	5	5

FBW = FINAL BODY WEIGHT
A = RIGHT KIDNEY ONLY; NOT INCLUDED IN CALCULATION OF MEAN
B = RIGHT EPIDIDYMIS AND BOTH TESTES; NOT INCLUDED IN CALCULATION OF MEAN

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 74 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS AND FINAL BODY WEIGHTS (GRAMS)

MALE GROUP: 0.025 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	TESTES/ EPIDID.	THYMUS GLAND	ADRENAL GLANDS
44098	375.	1.90	10.71	2.93	1.65	0.72	1.75	4.67	0.4816	0.0671
44101	399.	1.98	13.15	3.68	1.43	0.80	1.52	4.98	0.5446	0.0566
44119	387.	2.15	10.57	3.04	1.61	0.59	1.51	4.68	0.3182	0.0766
44126	466.	2.04	13.00	3.61	1.40	0.83	1.84	4.90	0.5602	0.0661
44128	390.	1.90	13.40	3.69	1.31	0.81	1.84	4.87	0.3633	0.0520
MEAN	403.	1.99	12.17	3.39	1.48	0.75	1.69	4.82	0.4536	0.0637
S.D.	36.0	0.105	1.401	0.373	0.145	0.099	0.166	0.138	0.10830	0.00963
N	5	5	5	5	5	5	5	5	5	5

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 74 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS AND FINAL BODY WEIGHTS (GRAMS)

MALE GROUP: 0.075 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	TESTES/ EPIDID.	THYMUS GLAND	ADRENAL GLANDS
44094	387.	1.84	12.05	3.13	1.49	0.60	1.47	4.41	0.6578	0.0661
44096	368.	2.00	11.55	2.99	1.34	0.91	1.72	4.15	0.5206	0.0583
44100	418.	2.07	12.25	3.23	1.52	0.79	1.90	5.61	0.4356	0.0770
44134	357.	1.92	12.16	3.18	1.79	0.90	1.85	4.82	0.6168	0.0736
44340	381.	2.12	13.93	3.29	1.29	0.76	1.86	4.27	0.4140	0.0583
MEAN	382.	1.99	12.39	3.16	1.49	0.79	1.76	4.65	0.5290	0.0667
S.D.	23.1	0.113	0.904	0.114	0.196	0.126	0.176	0.592	0.10761	0.00859
N	5	5	5	5	5	5	5	5	5	5

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 74 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS AND FINAL BODY WEIGHTS (GRAMS)

MALE GROUP: 0.25 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	TESTES/ EPIDID.	THYMUS GLAND	ADRENAL GLANDS
44097	353.	1.97	11.41	2.43	1.30	0.87	1.71	4.54	0.6927	0.0609
44089	408.	1.97	12.89	3.58	1.45	0.87	1.70	4.39	0.3566	0.0649
44112	362.	2.03	10.81	2.83	1.42	0.97	1.61	5.12	0.3777	0.0656
44123	390.	2.06	13.12	3.73	1.55	0.72	2.89	4.74	0.5372	0.0697
44133	343.	1.89	12.04	3.09	1.36	0.78	1.57	4.17	0.4237	0.0722
MEAN	371.	1.98	12.05	3.13	1.42	0.84	1.90	4.59	0.4776	0.0667
S.D.	27.0	0.065	0.974	0.535	0.094	0.096	0.559	0.361	0.13906	0.00440
N	5	5	5	5	5	5	5	5	5	5

FBW = FINAL BODY WEIGHT

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 74 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS AND FINAL BODY WEIGHTS (GRAMS)

FEMALE GROUP: 0.00 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	OVARIES	THYMUS GLAND	ADRENAL GLANDS
44149	198.	1.75	6.13	1.58	0.93	0.51	1.24	0.1201	0.2608	0.0603
44151	246.	1.84	7.40	2.06	0.95	0.55	1.32	0.1558	0.5345	0.0739
44156	244.	1.72	7.28	1.89	1.08	0.57	1.66	0.1575	0.5087	0.0686
44176	247.	1.89	10.46	1.91	1.00	0.63	1.76	0.1544	0.4796	0.0881
44180	226.	1.75	7.80	1.45	0.92	0.51	1.37	0.1413	0.4787	0.0813
MEAN	232.	1.79	7.81	1.78	0.98	0.55	1.47	0.1458	0.4525	0.0744
S.D.	21.0	0.072	1.604	0.253	0.066	0.050	0.227	0.01574	0.10960	0.01082
N	5	5	5	5	5	5	5	5	5	5

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 74 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS AND FINAL BODY WEIGHTS (GRAMS)

FEMALE GROUP: 0.025 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	OVARIES	THYMUS GLAND	ADRENAL GLANDS
44162	250.	1.92	8.50	2.02	0.93	0.63	1.39	0.1608	0.5138	0.0837
44187	240.	1.81	8.33	2.07	1.22	0.83	1.47	0.1797	0.4909	0.0941
44195	221.	1.72	7.20	1.95	0.79	0.46	2.25	0.1325	0.4542	0.0796
44349	201.	1.75	6.90	1.50	0.85	0.44	1.13	0.1146	0.4621	0.0675
44350	233.	1.73	8.02	2.02	0.68	0.45	1.31	0.1093	0.2300	0.0794
MEAN	229.	1.79	7.79	1.91	0.89	0.56	1.51	0.1394	0.4302	0.0809
S.D.	18.9	0.083	0.705	0.234	0.204	0.169	0.432	0.03021	0.11440	0.00956
N	5	5	5	5	5	5	5	5	5	5

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 74 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS AND FINAL BODY WEIGHTS (GRAMS)

FEMALE GROUP: 0.075 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	OVARIES	THYMUS GLAND	ADRENAL GLANDS
44165	239.	1.87	7.65	1.88	0.87	0.54	2.23	0.1306	0.3951	0.0955
44186	235.	1.77	8.65	1.87	0.87	0.52	1.92	0.1418	0.3950	0.0693
44196	231.	1.80	10.01	1.86	1.04	0.48	1.38	0.1293	0.2690	0.0994
44200	214.	1.84	8.47	2.11	0.87	0.58	2.82	0.1512	0.4828	0.0813
44206	206.	1.67	7.39	1.66	0.74	0.48	2.49	0.1104	0.4255	0.0679
MEAN	225.	1.79	8.43	1.88	0.88	0.52	2.17	0.1327	0.3935	0.0827
S.D.	14.3	0.077	1.029	0.159	0.107	0.042	0.551	0.01532	0.07827	0.01452
N	5	5	5	5	5	5	5	5	5	5

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 74 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS AND FINAL BODY WEIGHTS (GRAMS)

FEMALE GROUP: 0.25 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	OVARIES	THYMUS GLAND	ADRENAL GLANDS
44167	233.	1.81	7.82	1.93	0.91	0.70	1.34	0.1425	0.5445	0.0738
44182	270.	1.82	8.93	1.98	1.02	0.68	1.46	0.1810	0.2507	0.0805
44198	228.	1.78	7.18	1.73	0.80	0.51	1.28	0.1272	0.3102	0.0689
44205	218.	1.79	7.42	1.85	0.80	0.53	2.29	0.1739	0.2462	0.0780
44345	221.	1.80	6.18	1.69	0.79	0.55	1.27	0.1355	0.1822	0.0632
MEAN	234.	1.80	7.51	1.84	0.86	0.59	1.53	0.1520	0.3068	0.0729
S.D.	21.0	0.016	1.000	0.125	0.100	0.089	0.433	0.02397	0.14041	0.00698
N	5	5	5	5	5	5	5	5	5	5

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 75 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS RELATIVE TO FINAL BODY WEIGHTS (GRAMS/100 GRAMS)

MALE GROUP: 0.00 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	TESTES/ EPIDID.	THYMUS GLAND	ADRENAL GLANDS
44091	338.	0.595	2.885	0.843	0.343	0.207	0.544	1.287	0.082	0.021
44099	299.	0.669	3.729	0.980	0.458	0.221	0.569	1.699	0.235	0.024
44114	337.	0.570	3.089	0.964	0.380	0.202	0.522	1.427	0.079	0.025
44121	333.	0.565	4.321	0.916	0.345	0.195	0.664	1.360	0.117	0.022
44131	336.	0.604	3.146	0.884	0.399	0.229	0.878	1.744	0.141	0.020
44132	314.	0.615	2.898	0.841	0.366	0.191	0.455	1.392	0.074	0.020
44141	324.	0.614	2.719	0.796	0.370	0.238	0.759	1.441	0.139	0.021
44337	302.	0.672	3.493	0.861	0.358	0.175	0.540	1.421	0.175	0.027
MEAN	323.	0.613	3.285	0.886	0.377	0.207	0.616	1.471	0.130	0.023
S.D.	16.0	0.0400	0.5347	0.0637	0.0373	0.0210	0.1411	0.1622	0.0554	0.0026
N	8	8	8	8	8	8	8	8	8	8

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 75 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS RELATIVE TO FINAL BODY WEIGHTS (GRAMS/100 GRAMS)

MALE GROUP: 0.025 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	TESTES/ EPIDID.	THYMUS GLAND	ADRENAL GLANDS
44092	321.	0.579	3.268	0.844	0.393	0.209	0.763	1.262	0.101	0.019
44093	346.	0.613	3.795	1.003	0.405	0.188	0.486	1.347	0.122	0.018
44110	271.	0.683	3.280	0.827	0.362	0.188	0.852	1.450	0.158	0.021
44113	336.	0.622	3.208	0.908	0.375	0.205	0.435	1.429	0.098	0.021
44138	318.	0.563	2.874	0.808	0.409	0.305	0.701	1.308	0.210	0.025
44143	302.	0.675	2.699	0.649	0.407	0.205	0.510	1.613	0.120	0.027
44144	295.	0.620	2.942	0.817	0.454	0.214	0.444	1.380	0.120	0.017
44147	276.	0.616	3.293	0.986	0.384	0.275	0.678	1.641	0.290	0.024
44339	259.	0.737	3.089	0.865	0.448	0.205	0.556	1.564	0.097	0.020
44342	283.	0.693	2.654	0.845	0.424	0.187	0.509	1.590	0.142	0.029
MEAN	301.	0.640	3.110	0.855	0.406	0.218	0.593	1.458	0.146	0.022
S.D.	29.0	0.0547	0.3379	0.0995	0.0297	0.0397	0.1448	0.1360	0.0611	0.0040
N	10	10	10	10	10	10	10	10	10	10

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 75 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS RELATIVE TO FINAL BODY WEIGHTS (GRAMS/100 GRAMS)

MALE GROUP: 0.075 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	TESTES/ EPIDID.	THYMUS GLAND	ADRENAL GLANDS
44107	275.	0.651	3.298	0.855	0.364	0.251	1.000	1.473	0.135	0.026
44111	292.	0.630	3.144	0.860	0.384	0.205	0.479	1.479	0.148	0.017
44116	282.	0.624	3.401	0.784	0.379	0.206	1.082	1.369	0.127	0.020
44118	342.	0.547	2.754	0.816	0.395	0.208	0.459	1.392	0.112	0.021
44124	300.	0.677	3.557	0.907	0.453	0.197	0.593	1.460	0.085	0.021
44129	330.	0.555	2.867	0.812	0.412	0.158	0.694	1.388	0.172	0.027
44140	278.	0.727	3.406	0.885	0.410	0.234	1.040	1.493	0.124	0.020
44142	307.	0.593	4.059	0.801	0.450	0.212	0.459	1.427	0.108	0.015
44145	331.	0.580	4.399	0.949	0.390	0.254	0.468	1.562	0.117	0.023
44333	227.	0.797	3.551	0.837	0.374	0.181	0.643	1.617	0.201	0.032
MEAN	296.	0.638	3.444	0.851	0.401	0.211	0.692	1.466	0.133	0.022
S.D.	33.9	0.0787	0.4987	0.0516	0.0304	0.0297	0.2548	0.0785	0.0335	0.0050
N	10	10	10	10	10	10	10	10	10	10

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 75 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS RELATIVE TO FINAL BODY WEIGHTS (GRAMS/100 GRAMS)

MALE GROUP: 0.25 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	TESTES/ EPIDID.	THYMUS GLAND	ADRENAL GLANDS
44102	259.	0.699	3.263	0.981	0.398	0.216	0.533	1.602	0.146	0.027
44104	304.	0.612	2.822	0.826	0.444	0.201	0.553	1.500	0.102	0.023
44109	288.	0.660	3.833	0.917	0.431	0.177	0.688	1.375	0.089	0.021
44130	287.	0.683	2.822	0.721	0.432	0.178	0.652	1.631	0.139	0.024
44136	301.	0.645	2.811	0.867	0.399	0.196	0.475	1.389	0.105	0.022
44139	275.	0.709	3.036	0.818	0.465	0.255	0.535	1.582	0.123	0.025
44146	307.	0.616	2.720	0.792	0.564	0.189	0.450	1.420	0.091	0.020
44334	252.	0.690	3.187	0.849	0.520	0.194	0.758	1.484	0.118	0.021
44338	229.	0.738	2.703	0.795	0.402	0.192	0.563	1.520	0.203	0.025
MEAN	278.	0.672	3.022	0.841	0.451	0.200	0.579	1.500	0.124	0.023
S.D.	26.6	0.0426	0.3641	0.0757	0.0575	0.0238	0.1011	0.0931	0.0356	0.0023
N	9	9	9	9	9	9	9	9	9	9

FBW = FINAL BODY WEIGHT

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 75 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS RELATIVE TO FINAL BODY WEIGHTS (GRAMS/100 GRAMS)

FEMALE GROUP: 0.00 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	OVARIES	THYMUS GLAND	ADRENAL GLANDS
44154	246.	0.744	3.256	0.821	0.443	0.248	0.768	0.065	0.165	0.042
44164	231.	0.749	3.576	0.931	0.377	0.381	1.173	0.066	0.134	0.050
44178	213.	0.836	4.272	0.934	0.418	0.155	1.197	0.065	0.159	0.036
44181	230.	0.826	3.352	0.735	0.474	0.274	0.996	0.065	0.193	0.037
44204	193.	0.912	3.824	1.026	0.420	0.306	1.332	0.076	0.204	0.035
44207	191.	0.995	3.037	0.916	0.466	0.236	0.670	0.063	0.125	0.032
44346	186.	0.898	3.134	0.871	0.435	0.177	0.527	0.054	0.141	0.036
44352	194.	0.938	4.170	0.814	0.443	0.216	0.680	0.061	0.223	0.040
MEAN	211.	0.862	3.578	0.881	0.435	0.249	0.918	0.064	0.168	0.039
S.D.	22.8	0.0894	0.4686	0.0903	0.0304	0.0723	0.2961	0.0061	0.0354	0.0056
N	8	8	8	8	8	8	8	8	8	8

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 75 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS RELATIVE TO FINAL BODY WEIGHTS (GRAMS/100 GRAMS)

FEMALE GROUP: 0.025 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	OVARIES	THYMUS GLAND	ADRENAL GLANDS
44159	231.	0.827	3.281	0.745	0.411	0.238	0.970	0.059	0.129	0.037
44160	191.	0.927	3.403	0.927	0.455	0.220	0.634	0.065	0.191	0.040
44170	205.	0.883	3.376	0.873	0.459	0.332	0.751	0.074	0.247	0.048
44172	223.	0.803	3.960	0.807	0.435	0.215	1.121	0.058	0.215	0.035
44179	247.	0.810	3.879	0.745	0.348	0.259	0.992	0.050	0.158	0.044
44183	218.	0.784	3.266	0.766	0.349	0.229	0.569	0.055	0.170	0.037
44191	219.	0.826	4.498	1.023	0.447	0.279	1.274	0.057	0.147	0.033
44192	231.	0.866	3.545	0.952	0.494	0.277	0.619	0.064	0.205	0.033
44201	229.	0.808	3.576	0.873	0.445	0.301	0.908	0.075	0.163	0.036
MEAN	222.	0.837	3.643	0.857	0.427	0.261	0.871	0.062	0.181	0.038
S.D.	16.2	0.0458	0.4036	0.0987	0.0496	0.0396	0.2439	0.0084	0.0371	0.0051
N	9	9	9	9	9	9	9	9	9	9

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 75 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS RELATIVE TO FINAL BODY WEIGHTS (GRAMS/100 GRAMS)

FEMALE GROUP: 0.075 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	OVARIES	THYMUS GLAND	ADRENAL GLANDS
44150	218.	0.862	4.289	0.927	0.624	0.271	1.280	0.082	0.212	0.041
44152	234.	0.799	3.786	0.889	0.363	0.269	0.979	0.055	0.207	0.032
44161	267.	0.880	4.521	1.112	0.461	0.296	0.895	0.095	0.192	0.047
44169	235.	0.774	3.783	0.940	0.430	0.332	1.157	0.073	0.175	0.036
44171	201.	0.910	3.488	0.871	0.408	0.249	1.274	0.064	0.191	0.034
44197	228.	0.820	3.539	0.961	0.474	0.276	1.206	0.059	0.160	0.041
44202	209.	0.904	4.780	1.010	0.431	0.225	1.110	0.078	0.176	0.042
44344	157.	1.127	3.389	1.025	0.478	0.191	1.344	0.062	0.111	0.057
44347	169.	0.964	3.870	1.041	0.462	0.237	0.645	0.078	0.166	0.040
MEAN	213.	0.893	3.938	0.975	0.459	0.261	1.099	0.072	0.177	0.041
S.D.	34.1	0.1059	0.4857	0.0781	0.0718	0.0412	0.2237	0.0129	0.0302	0.0075
N	9	9	9	9	9	9	9	9	9	9

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 75 (WEEK 4 PRIMARY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS RELATIVE TO FINAL BODY WEIGHTS (GRAMS/100 GRAMS)

FEMALE GROUP: 0.25 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	OVARIES	THYMUS GLAND	ADRENAL GLANDS
44155	211.	0.848	3.820	0.820	0.469	0.270	0.592	0.082	0.191	0.043
44168	231.	0.818	3.104	0.848	0.411	0.242	0.610	0.074	0.152	0.036
44175	226.	0.814	3.155	0.889	0.513	0.283	0.584	0.077	0.165	0.041
44184	212.	0.835	3.288	0.958	0.467	0.226	0.642	0.058	0.162	0.040
44189	218.	0.844	3.248	0.881	0.362	0.216	0.940	0.063	0.166	0.040
44190	212.	0.830	3.208	0.896	0.392	0.259	1.236	0.048	0.185	0.037
MEAN	218.	0.832	3.304	0.882	0.436	0.249	0.767	0.067	0.170	0.040
S.D.	8.4	0.0136	0.2612	0.0470	0.0566	0.0259	0.2662	0.0129	0.0148	0.0026
N	6	6	6	6	6	6	6	6	6	6

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
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TABLE 76 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS RELATIVE TO FINAL BODY WEIGHTS (GRAMS/100 GRAMS)

MALE GROUP: 0.00 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	TESTES/ EPIDID.	THYMUS GLAND	ADRENAL GLANDS
44103	476.	0.395	3.246	0.824	0.332	0.176	0.368	1.143	0.130	0.010
44108	381.	0.546	2.921	0.730	0.349	0.189	0.430	1.102	0.112	0.015
44115	379.	0.515	2.823	0.741	0.309	0.201	0.346	1.158	0.152	0.021
44135	381.	0.512	2.916	0.727	0.354	0.223	0.675	1.181	0.150	0.017
44137	387.	0.522	3.044	0.649A	0.344	0.227	0.424	0.894B	0.142	0.019
MEAN	401.	0.498	2.990	0.756	0.338	0.203	0.449	1.146	0.137	0.016
S.D.	42.1	0.0591	0.1632	0.0461	0.0180	0.0218	0.1316	0.0332	0.0165	0.0042
N	5	5	5	4	5	5	5	4	5	5

FBW = FINAL BODY WEIGHT
A = RIGHT KIDNEY ONLY; NOT INCLUDED IN CALCULATION OF MEAN
B = RIGHT EPIDIDYMIS AND BOTH TESTES; NOT INCLUDED IN CALCULATION OF MEAN

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 76 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS RELATIVE TO FINAL BODY WEIGHTS (GRAMS/100 GRAMS)

MALE GROUP: 0.025 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	TESTES/ EPIDID.	THYMUS GLAND	ADRENAL GLANDS
44098	375.	0.507	2.856	0.781	0.440	0.192	0.467	1.245	0.128	0.018
44101	399.	0.496	3.296	0.922	0.358	0.201	0.381	1.248	0.136	0.014
44119	387.	0.556	2.731	0.786	0.416	0.152	0.390	1.209	0.082	0.020
44126	466.	0.438	2.790	0.775	0.300	0.178	0.395	1.052	0.120	0.014
44128	390.	0.487	3.436	0.946	0.336	0.208	0.472	1.249	0.093	0.013
MEAN	403.	0.497	3.022	0.842	0.370	0.186	0.421	1.201	0.112	0.016
S.D.	36.0	0.0423	0.3211	0.0845	0.0575	0.0222	0.0446	0.0847	0.0232	0.0030
N	5	5	5	5	5	5	5	5	5	5

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 76 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS RELATIVE TO FINAL BODY WEIGHTS (GRAMS/100 GRAMS)

MALE GROUP: 0.075 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	TESTES/ EPIDID.	THYMUS GLAND	ADRENAL GLANDS
44094	387.	0.475	3.114	0.809	0.385	0.155	0.380	1.140	0.170	0.017
44096	368.	0.543	3.139	0.813	0.364	0.247	0.467	1.128	0.141	0.016
44100	418.	0.495	2.931	0.773	0.364	0.189	0.455	1.342	0.104	0.018
44134	357.	0.538	3.406	0.891	0.501	0.252	0.518	1.350	0.173	0.021
44340	381.	0.556	3.656	0.864	0.339	0.199	0.488	1.121	0.109	0.015
MEAN	382.	0.521	3.249	0.830	0.391	0.208	0.462	1.216	0.139	0.017
S.D.	23.1	0.0346	0.2836	0.0471	0.0638	0.0409	0.0515	0.1187	0.0326	0.0023
N	5	5	5	5	5	5	5	5	5	5

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 76 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS RELATIVE TO FINAL BODY WEIGHTS (GRAMS/100 GRAMS)

MALE GROUP: 0.25 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	TESTES/ EPIDID.	THYMUS GLAND	ADRENAL GLANDS
44097	353.	0.558	3.232	0.688	0.368	0.246	0.484	1.286	0.196	0.017
44089	408.	0.483	3.159	0.877	0.355	0.213	0.417	1.076	0.087	0.016
44112	362.	0.561	2.986	0.782	0.392	0.268	0.445	1.414	0.104	0.018
44123	390.	0.528	3.364	0.956	0.397	0.185	0.741	1.215	0.138	0.018
44133	343.	0.551	3.510	0.901	0.397	0.227	0.458	1.216	0.124	0.021
MEAN	371.	0.536	3.250	0.841	0.382	0.228	0.509	1.241	0.130	0.018
S.D.	27.0	0.0324	0.1993	0.1061	0.0192	0.0316	0.1319	0.1230	0.0418	0.0019
N	5	5	5	5	5	5	5	5	5	5

FBW = FINAL BODY WEIGHT

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 73 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS RELATIVE TO FINAL BODY WEIGHTS (GRAMS/100 GRAMS)

FEMALE GROUP: 0.00 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	OVARIES	THYMUS GLAND	ADRENAL GLANDS
44149	198.	0.884	3.096	0.798	0.470	0.258	0.626	0.061	0.132	0.030
44151	246.	0.748	3.008	0.837	0.386	0.224	0.537	0.063	0.217	0.030
44156	244.	0.705	2.984	0.775	0.443	0.234	0.680	0.065	0.208	0.028
44176	247.	0.765	4.235	0.773	0.405	0.255	0.713	0.063	0.194	0.036
44180	226.	0.774	3.451	0.642	0.407	0.226	0.606	0.063	0.212	0.036
MEAN	232.	0.775	3.355	0.765	0.422	0.239	0.632	0.063	0.193	0.032
S.D.	21.0	0.0664	0.5265	0.0734	0.0337	0.0161	0.0682	0.0014	0.0349	0.0037
N	5	5	5	5	5	5	5	5	5	5

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 76 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS RELATIVE TO FINAL BODY WEIGHTS (GRAMS/100 GRAMS)

FEMALE GROUP: 0.025 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	OVARIES	THYMUS GLAND	ADRENAL GLANDS
44162	250.	0.768	3.400	0.808	0.372	0.252	0.556	0.064	0.206	0.033
44187	240.	0.754	3.471	0.863	0.508	0.346	0.613	0.075	0.205	0.039
44195	221.	0.778	3.258	0.882	0.357	0.208	1.018	0.060	0.206	0.036
44349	201.	0.871	3.433	0.746	0.423	0.219	0.562	0.057	0.230	0.034
44350	233.	0.742	3.442	0.867	0.292	0.193	0.562	0.047	0.099	0.034
MEAN	229.	0.783	3.401	0.833	0.390	0.244	0.662	0.061	0.189	0.035
S.D.	18.9	0.0513	0.0837	0.0562	0.0807	0.0612	0.2002	0.0102	0.0515	0.0024
N	5	5	5	5	5	5	5	5	5	5

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 76 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS RELATIVE TO FINAL BODY WEIGHTS (GRAMS/100 GRAMS)

FEMALE GROUP: 0.075 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	OVARIES	THYMUS GLAND	ADRENAL GLANDS
44165	239.	0.782	3.201	0.787	0.364	0.226	0.933	0.055	0.165	0.040
44186	235.	0.753	3.681	0.796	0.370	0.221	0.817	0.060	0.168	0.029
44196	231.	0.779	4.333	0.805	0.450	0.208	0.597	0.056	0.116	0.043
44200	214.	0.860	3.958	0.986	0.407	0.271	1.318	0.071	0.226	0.038
44206	206.	0.811	3.587	0.806	0.359	0.233	1.209	0.054	0.207	0.033
MEAN	225.	0.797	3.752	0.836	0.390	0.232	0.975	0.059	0.176	0.037
S.D.	14.3	0.0408	0.4230	0.0842	0.0385	0.0237	0.2924	0.0070	0.0426	0.0056
N	5	5	5	5	5	5	5	5	5	5

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

TABLE 76 (WEEK 6 RECOVERY NECROPSY)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
ORGAN WEIGHTS RELATIVE TO FINAL BODY WEIGHTS (GRAMS/100 GRAMS)

FEMALE GROUP: 0.25 MG/L

ANIMAL	FBW(G)	BRAIN	LIVER	KIDNEYS	HEART	SPLEEN	LUNGS	OVARIES	THYMUS GLAND	ADRENAL GLANDS
44167	233.	0.777	3.356	0.828	0.391	0.300	0.575	0.061	0.234	0.032
44182	270.	0.674	3.307	0.733	0.378	0.252	0.541	0.067	0.093	0.030
44198	228.	0.781	3.149	0.759	0.351	0.224	0.561	0.056	0.136	0.030
44205	218.	0.821	3.404	0.849	0.367	0.243	1.050	0.080	0.113	0.036
44345	221.	0.814	2.796	0.765	0.357	0.249	0.575	0.061	0.082	0.029
MEAN	234.	0.773	3.202	0.787	0.369	0.254	0.660	0.065	0.132	0.031
S.D.	21.0	0.0589	0.2466	0.0493	0.0161	0.0281	0.2182	0.0092	0.0608	0.0028
N	5	5	5	5	5	5	5	5	5	5

FBW = FINAL BODY WEIGHT

A 4-Week Inhalation Toxicity Study of Methane Sulfonic Acid in Albino Rats

APPENDIX A

Test Atmosphere Generation, Analytical, and Environmental Conditions During Exposure (WIL Research Laboratories, Inc.)

A 4-Week Inhalation Toxicity Study of Methane Sulfonic Acid in Albino Rats

APPENDIX A

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A 4-Week Inhalation Toxicity Study
of Methane Sulfonic Acid in Albino Rats

APPENDIX A

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I. Atmosphere Generation System

I. EXPOSURE METHODS

A. Inhalation Exposure System Description

Exposures were conducted utilizing four In-Tox Products (Albuquerque, NM) nose-flowpast nose-only units with 4 tiers (4 sections; 10 ports/section). One unit was dedicated for each exposure group for the duration of the study. Airflow through the chamber was monitored through the nose-only units by a Sierra Instruments (Monterey, CA) Top-Trak digital flowmeter which was calibrated under conditions of use with a Dry Test Meter (American Meter Company, Nebraska City, NE). Negative pressure was monitored by a Dwyer Magnehelic® Indicating Transmitter pressure gauge (0-2.0 inches of water). Treatment of exhaust air consisted of drawing the air through an in-line HEPA capsule filter (Gelman Sciences, Model 12144, Ann Arbor, MI), an activated charcoal bed and a HEPA filter. Hy-Cal Engineering (El Monte, CA) Model CT-839-A probes and transmitters were used to monitor chamber temperature and humidity.

B. Animal Acclimation, Transport and Placement

Prior to initiation of exposures (during the pre-test period), all available animals were acclimated to the restraint tubes by placing them in the tubes for increasing lengths of time in the days prior to the first exposure following this general schedule:

Days Prior to Exposure Initiation	Hours in Restraint Tubes
6	1.0
5	2.0
4	3.0
3	4.0
2	5.0
1	6.0

Animals were placed in tubes and the tubes placed in the home cages during acclimation.

All animals were housed in a normal animal colony room during non-exposure hours. On exposure days, one group of animals was loaded into the restraint tubes and transported to the exposure room at a time. The group loaded first was incremented by one each day to alleviate possible negative affects of being in the restraint tubes longer than the other groups. This group was unloaded first as well.

Placement of the animals onto the nose-only unit was done in an arbitrary manner for each group. The animals were then exposed for the requisite duration and returned to their home cages.

C. Exposure Environmental Conditions

Temperature, relative humidity, system flow rate, and negative pressure within the nose-only units were continually monitored and recorded every 30 minutes through the use of LabView for Windows data acquisition software from National Instruments (Austin, TX) and a 486 33DX computer with appropriate hardware. The protocol specified range for temperature and relative humidity were 22°±2°C and 40-60%, respectively. System flow rate was set to provide adequate volumes for the animals and for analytical sampling (>10 L/min).

Nose-only unit temperature, relative humidity, and flow rate daily means and study period grand means are presented in Tables 3-5 of this appendix. The following table summarizes the grand mean environmental conditions of exposure for all four study groups:

	Group 1	Group 2	Group 3	Group 4
Temperature Mean:	24	24	24	24
Standard Deviation:	0.4	0.6	0.4	0.5
C.V. (%):	1.83	2.40	1.60	2.15
Relative Humidity Mean:	38	40	36	40
Standard Deviation:	4.3	3.4	6.0	2.9
C.V. (%):	11.48	8.44	16.78	7.20
Chamber Flow Rate Mean:	15	18	14	17
Standard Deviation:	4.6	1.7	2.3	2.8
C.V. (%):	30.78	9.47	16.45	16.22

Nose-only unit temperatures were at the high end of the protocol specified range, while relative humidities were at or slightly below the low end of the protocol specified range. Considering the high percentage of dry compressed air needed for the generation systems, the relative humidities would have been much lower if special efforts were not taken to humidify this air.

II. TEST MATERIAL GENERATION METHODS

A. Method of Test Atmosphere Generation

Atmospheres of aerosolized methane sulfonic acid were generated using an Inspiron® Model 002305-A nebulizer (Intertech Resources, Inc., Lincolnshire, IL). The nebulizer was operated at a constant pressure of 40 pounds per square inch (psig) which was determined to deliver approximately 0.12 grams/minute output. Resulting aerosol was directed into a 0.5 m^3 glass and stainless-steel whole-body exposure chamber which was utilized as a primary dilution chamber. HEPA and charcoal filtered ventilation air was supplied to this dilution chamber at approximately 63 liters per minute (LPM) as monitored by the pressure drop across an orifice plate. The ventilation flow versus pressure was calibrated using a Kurz Model 505 Mass Airflow Meter (Kurz Instruments, Monterey, CA).

Exposure atmospheres were further diluted and delivered to the nose-only exposure units through the use of three venturi diluters fabricated in the laboratory. Each diluter was prepared by drilling out a 1/4" Swagelok "T" (Swagelok Co., Solon, OH) to accept 1/4" outer diameter (OD) stainless steel tubing. A critical insertion length was determined and fittings swaged to the tubing to maintain the setting. The opposite end of the venturis designated for the two lower levels were filled with epoxy and drilled with a small hole to limit flow. Humidified compressed air was delivered to the leg of the "T" at low pressure (generally less than 10 psig, see table below) which created a suction at the inlet of the tubing. The stainless-steel tubing inlet extended through the side and to the approximate center of the dilution chamber. Output from the venturi diluters was carried via 1/2" OD plastic tubing to the top inlet of the In-Tox Products nose-only exposure units. Negative pressure within the exposure units was maintained at approximately 1.0 inch of water during non-sampling periods (slightly higher during sampling) using vacuum from the laboratory vacuum system. Exposure unit exhaust was drawn through a HEPA capsule filter prior to being measured by a Top-Trak digital flowmeter which was calibrated under conditions of use with a Dry Test Meter. The following table summarizes operational parameters:

Group No.	Approximate Venturi Pressure	Approximate Output Flow	Nose-Only Unit Negative Pressure
1	NA	10-29 LPM	<1.0" H_2O
2	0.65-1.30 psig	15-21 LPM	1.0" H_2O
3	0.05-0.35 psig	10-20 LPM	1.0" H_2O
4	4.25-10 psig	13-28 LPM	1.0" H_2O

The generator reservoir, which has a capacity of 400 milliliters (ml), was filled with approximately 200 ml of test material each day prior to initiation of generation. The reservoir, with lid in place, was weighed prior to and following each generation period for test material accountability purposes. Test material

remaining in the reservoir on Friday following the day's exposure was discarded and fresh test material used on the following Monday. Figure I is a diagram of the atmosphere generation system.

III. METHODS FOR CHARACTERIZATION OF EXPOSURE ATMOSPHERES

A. Nominal Concentrations

Due to the type of generation system used for this study it was not possible to determine nominal exposure concentrations.

B. Actual Exposure Concentrations

1. Methods

Test atmospheres of aerosolized methane sulfonic acid were analyzed by collecting samples on Teflon® filters, extracting the test material collected into a solvent, and analyzing the resulting solution by ion chromatography.

Atmosphere samples were collected using two sampling regimens:

Short Sample Regimen

Group No.	Sampling Rate	Length of Sample	Filter Extraction Volume
2	1.0 LPM	10 minutes	12.5 ml
3	1.0 LPM	10 minutes	12.5 ml
4	1.0 LPM	5 minutes	12.5 ml

Long Sample Regimen

Group No.	Sampling Rate	Length of Sample	Filter Extraction Volume
1	0.50 LPM	150 minutes	20.0 ml
2	0.50 LPM	150 minutes	20.0 ml
3	0.25 LPM	150 minutes	30.0 ml
4	0.25 LPM	150 minutes	100.0 ml

Generally, at approximately ten minutes into each day's exposure, a short sample was collected and analyzed. Immediately upon receipt of results, adjustments to the system were made, if necessary, and the first of two long samples started. These short samples were recorded but were not reported as part of the daily mean exposure concentration.

Twenty five mm filters (0.2 μm pore size, catalog number FGLP-025-00, Millipore Corporation, Bedford, MA) were loaded into in-line filter holders which were subsequently plugged into the designated reference sampling port on the nose-only exposure unit to be sampled. After sampling, the filter was carefully removed and placed in a vessel of sufficient size to accommodate the extraction volume used. After a brief period of agitation (generally less than one minute), a liquid aliquot was removed and injected into the ion chromatograph (see Section IV for details of ion chromatography method) using a 1 cc plastic disposable syringe. Results were expressed in terms of active MSA, not the formulation.

2. Results

The overall arithmetic means for the 0.025 mg/L, 0.075 mg/L and 0.250 mg/L target concentrations were 0.026 mg/L, 0.073 mg/L, and 0.242 mg/L, respectively. Daily arithmetic means and study grand arithmetic means of exposure concentrations are presented in Table 6 of this appendix.

Concentration values reported for Group 1 (0.001 mg/L) are extremely low. These values do not represent MSA concentrations, only the limits of the analytical method.

C. Aerosol Particle Size Determinations

1. Methods

Due to the relatively low exposure concentrations, the sensitivity of the analytical method and the small volumes of exposure atmosphere available when using nose-flowpast exposure methods, it was not possible to collect aerosol size data during actual animal exposures. Data were collected during the method development phases to adequately define the aerosol size and its stability day-to-day. In addition, measurements were collected during the week prior to exposure initiation and again within a few days of the final animal exposure.

Aerosol particle size determination was conducted utilizing an In-Tox 7-stage cascade impactor operating at a flowrate of 1.8 L/min with glass fiber filters as the impaction substrate. Approximate sampling durations were as indicated in the following table:

Group No.	Sampling Time (minutes)
2	120
3	40
4	20

The filters were analyzed gravimetrically. Results were expressed in terms of the mass median aerodynamic diameter (MMAD) and the geometric standard deviation (GSD).

2. Results

The results of all aerosol particle size determinations are summarized in the table below:

	Group 2	Group 3	Group 4
Mean Mass Median Aerodynamic Diameter:	0.9	1.2	1.2
Standard Deviation:	0.05	0.11	0.10
C.V. (%):	6.18	9.29	7.93
Number of Samples:	7	7	7
Mean Geometric Standard Deviation:	1.7	1.9	1.9

For individual aerosol particle size determination data refer to Table 7 of this appendix.

D. Test Atmosphere Homogeneity Determination

1. Methods

During the conduct of the study, restraint tube port C-2 of each nose-only unit was designated for test atmosphere concentration sampling. For each nose-only unit homogeneity was shown by comparison of samples obtained from port C-2 with samples obtained from four other ports (test ports). Test atmosphere homogeneity determination was performed during the method development period prior to the initiation of the animal exposure phase.

Analytical results of concentrations determined from simultaneously obtained samples from the four test port locations were compared to those obtained from the designated reference port.

2. Results

The mean percentage absolute variation for the four test locations on each nose-only unit from the referenced port (C-2) was determined by averaging the differences obtained from each trial. The absolute mean percentages of difference were 8.42%, 4.69% and 4.21% for the Groups 2, 3 and 4, respectively.

Homogeneity data and mean differences between the reference port and the homogeneity locations are presented in Table 2 of this appendix.

E. Test Atmosphere Oxygen Determination

1. Methods

Oxygen content was measured, both prior to and after the animal exposure period, by use of a Mine Safety Appliance Co. (Pittsburgh, PA) Model 801608 Remote Sampling System (MSA-RSS) equipped with an oxygen cell. Samples of ambient exposure room air were used as a reference to calibrate the MSA-RSS to read approximately 20.9% as monitored on LabView for Windows.

Test atmosphere oxygen content was determined by sampling from the centrally located reference port on the nose-only units. Samples from each unit were taken, alternating between room air (reference) samples and nose-only unit samples. Each nose-only unit was sampled three times. The resulting oxygen content data for each unit and reference were averaged and compared.

2. Results

Results of the test atmosphere oxygen determination are shown below:

Pre-Exposure Oxygen Determination:

Sample Location	Mean Oxygen Content	Standard Deviation	C.V. (%)	% from Reference
Room Air	21.02	0.106	0.50	
Nose-Only Unit #1	21.02	0.110	0.52	0.00
Room Air	21.02	0.107	0.51	
Nose-Only Unit #2	21.05	0.066	0.31	0.14
Room Air	21.07	0.050	0.24	
Nose-Only Unit #3	21.07	0.044	0.21	0.00
Room Air	21.08	0.040	0.19	
Nose-Only Unit #4	21.08	0.035	0.16	0.00

Post-Exposure Oxygen Determination:

Sample Location	Mean Oxygen Content	Standard Deviation	C.V. (%)	% from Reference
Room Air	20.91	0.036	0.17	
Nose-Only Unit #1	20.89	0.042	0.20	-0.10
Room Air	20.89	0.071	0.34	
Nose-Only Unit #2	20.92	0.075	0.36	0.14
Room Air	20.90	0.076	0.37	
Nose-Only Unit #3	20.90	0.070	0.34	0.00
Room Air	20.89	0.076	0.37	
Nose-Only Unit #4	20.89	0.075	0.36	0.00

IV. ANALYTICAL METHOD FOR MEASURING AIRBORNE CONCENTRATIONS OF METHANE SULFONIC ACID

A. Introduction

In this study, methane sulfonic acid (MSA) was identified and quantitated by the use of ion exchange chromatography and electro-chemical conductivity detection. Standards of 99% MSA were prepared weekly with each fresh batch of mobile phase made and a three-level multipoint calibration was performed daily using the current working standards. Subsequently, concentration values were assigned based upon a least-square analysis developed from each calibration. Samples of airborne MSA were collected from chamber atmospheres on Teflon® filters, then diluted in an aqueous solution of Na_2CO_3 and NaOH (mobile phase). Approximately 0.5 cc of each sample was analyzed for MSA.

B. Instrumentation

Instrument:	Dionex DX500 equipped with an ED40 Electrochemical Detector, GP40 Gradient Pump, anion suppressor (self-regeneration) (ASRS-1, 4 mm); and a Spectra-Physics ChromJet Integrator.
Column:	Dionex IonPac AS4A-SC 4 mm, P/N 43174
Mobile Phase:	25 mM sodium carbonate/2.9 mM sodium hydroxide
Detection Mode:	Conductivity
Flow Rate:	1.5 ml/min
SRS:	300 mA
Range:	100 μS
Sample Size:	25 μl loop
Run Time:	2.00 min.
Retention Time:	~1.15 min
Integrator Parameters:	Attenuation: 1024 Peak Width: 8 Threshold: 1000 Chart Speed: 2 cm/min.

C. Analytical Method

Prior to initiating an analysis period, the pre-filled container of mobile phase was purged using helium gas with a pressure of approximately 5 psi at the instrument gauge. This purification process was also continued throughout the analysis period to prevent active gaseous contaminants such as oxygen from entering the ion chromatographic (IC) system.

After this short system purge, the conductivity detector was turned on by directly activating the self-regenerating suppressor (SRS). The setpoint for the SRS was established at 300 mA. The GP40 Gradient Pump was also turned on simultaneously with the SRS. The IC system, now with mobile phase passing through the column, was allowed to equilibrate for about 20-25 minutes.

Once a sample was collected and appropriately diluted in aqueous mobile phase, an injection volume of approximately 1.0 cc was drawn into a 1.0 cc disposable syringe equipped with an injection needle adaptor. The needle was inserted into the

Rheodyne switch valve (RSV) in the closed position. As the injection volume approached 0.5 cc the RSV was quickly opened and the sample injected. This delivered an ample supply to the 25 μl loop. When the sample was injected, the integration was simultaneously initiated on the Spectra-Physics ChromJet Integrator.

D. Preparation of Mobile Phase Stock and Standard Solutions

1. Mobile Phase

To prepare one batch of mobile phase, 5.3 g of sodium carbonate (weighed using a AG245 Mettler/Toledo Balance, Hightstown, NJ) or equivalent and 40 ml of 1 N sodium hydroxide (measured using a graduated cylinder) was brought to volume with deionized water in a 2-liter volumetric flask. Each week five batches were combined and stored in a 10-liter plastic bulk container.

2. Stock Standard

Each week two new stock solutions were prepared by weighing approximately 75 mg (X in Equation 1) of 99% MSA (Aldrich Chemical Company, Milwaukee, WI) into a tared glass weigh-funnel. The MSA was then washed into a 0.250 L volumetric flask with mobile phase. The flask was then brought to volume with the same mobile phase. The concentrations of the stock solutions (M_1 in Equation 1) were calculated using Equation 1, below. The nominal for these stock solutions was 300 mg/L, but varied slightly depending on the actual weight of 99% MSA used.

$$\frac{\text{X mg of 99\% MSA}}{0.250\ \text{L}} = M_1\ \text{mg/L} \qquad \text{(Equation 1)}$$

From each of the two stock solutions, an 0.5 cc aliquot was injected into the IC to obtain an area count value (referred to as A_1 for the first sample and A_2 for the second in Equation 2). The areas obtained were used in Equation 2 to determine the range of error between the two stock solutions. The acceptable range of error was set at 10%. If the error between the two was greater than the 10% cutoff limit then another stock solution would be prepared and run on the IC. This procedure was continued until two samples were within range of one another, whereby, either acceptable stock solution was used to make the working standards.

Weight of 99% MSA in sample 1 $\div A_1 = X_1$
Weight of 99% MSA in sample 2 $\div A_2 = X_2$

$$X_1 - X_2 = \text{Difference in response} \qquad \text{(Equation 2)}$$

$$\frac{\text{Difference in response}}{X_1 \text{ or } X_2} \times 100 = \%\ \text{Error}$$

2. Working Standards

Aliquots of stock standard (above) were withdrawn using glass pipets, transferred to 25 ml volumetric flasks and brought to volume with bulk mobile phase. The final concentration of each standard solution shown in Table 1 was calculated using equation 3.

$$M_1 V_1 = M_2 V_2 \qquad \text{(Equation 3)}$$

Table 1. Data to Calculate Standard Concentrations

Aliquot Size V_1 (ml)	Final Volume V_2 (ml)	Nominal Concentration M_2 (mg/L)
1	25	12
5	25	60
10	25	120

E. Calibration of the Ion Chromatograph

Three standards with final concentrations ranging from approximately 12 mg/L to 120 mg/L were prepared each time a new bulk batch of mobile phase was made. Prior to daily atmosphere generation, each standard was analyzed on the ion chromatograph in triplicate. The average area count, standard deviation and coefficient of variance was quantitated and a least-square linear regression analysis was performed using Microsoft Excel® software installed on a personal computer.

F. Collected Samples

Samples were received on PTFE Membrane filters (0.2 μm pore size) then MSA was extracted using bulk mobile phase in an appropriately sized container (See Table 2). Each sample was then analyzed for methane sulfonic acid (MSA) on the IC (See Section B). The calculated concentration was evaluated by using equation 4 below. In addition to some atmosphere generation variables, Table 2 presents the anticipated analytical concentration (Z in equation 4) of MSA at each target level:

$$\frac{CDF}{V} \times \frac{(100\ ml)}{(1L)} = Z \qquad \text{(Equation 4)}$$

Table 2. Analyte Concentrations for Various MSA Exposure Levels Under Indicated Sampling Conditions

Group No.	Target Concentration C (mg/L)	Sampling Duration D (min.)	Sample Flow F (LPM)	Extraction Volume V (ml)	Expected Analyte Concentration Z (mg/L)
2	0.025	150	0.50	20	93.75
3	0.075	150	0.25	30	93.75
4	0.250	150	0.25	100	93.75

Prepared By:

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12-17-96
Date

Approved By:

David W. Livingston, B.S.
Group Supervisor - Inhalation

12-17-96
Date

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Director of Inhalation

Dec. 17, 96
Date

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

APPENDIX A (TABLE 1)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
DAILY ION CHROMATOGRAPH CALIBRATION DATA

DATE	STANDARD (MG/L)	MEAN PEAK AREA	STANDARD DEVIATION	C.V.(%)
METHOD DEVELOPMENT 11/06/95	12.18	506434	3746	0.74
	60.90	2959824	4087	0.14
	121.81	7105723	15046	0.21
METHOD DEVELOPMENT 11/07/95	12.18	395606	4069	1.03
	60.90	2319178	4798	0.21
	121.81	5648468	43765	0.77
METHOD DEVELOPMENT 11/08/95	12.18	546538	7127	1.30
	60.90	2987344	27624	0.92
	121.81	7127409	19749	0.28
METHOD DEVELOPMENT 11/13/95	12.54	579073	2400	0.41
	62.62	3156625	61428	1.95
	125.25	7145024	13798	0.19
METHOD DEVELOPMENT 11/14/95	12.54	594226	10240	1.72
	62.62	3176608	44218	1.39
	125.25	7170074	20027	0.28
ANIMAL EXPOSURE 11/16/95	12.54	607066	12959	2.13
	62.62	3249963	100984	3.11
	125.25	7304423	1239	0.02
ANIMAL EXPOSURE 11/17/95	12.54	588771	40131	6.82
	62.62	3211672	131486	4.09
	125.25	7271990	70953	0.98
ANIMAL EXPOSURE 11/20/95	12.16	617601	28009	4.54
	60.79	3333233	8128	0.24
	121.58	7051472	18996	0.27

APPENDIX A (TABLE 1)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
DAILY ION CHROMATOGRAPH CALIBRATION DATA

DATE	STANDARD (MG/L)	MEAN PEAK AREA	STANDARD DEVIATION	C.V.(%)
ANIMAL EXPOSURE 11/21/95	12.16	640934	12064	1.88
	60.79	3363016	3033	0.09
	121.58	7109828	13319	0.19
ANIMAL EXPOSURE 11/22/95	12.16	693966	4248	0.61
	60.79	3389390	15140	0.45
	121.58	7110662	5658	0.08
ANIMAL EXPOSURE 11/23/95	12.16	709712	17056	2.40
	60.79	3429729	23355	0.68
	121.58	7132353	37264	0.52
ANIMAL EXPOSURE 11/24/95	12.16	759028	32352	4.26
	60.79	3436750	8049	0.23
	121.58	7162039	20915	0.29
ANIMAL EXPOSURE 11/27/95	12.11	765767	10083	1.32
	60.55	3395610	16439	0.48
	121.10	7572502	27342	0.36
ANIMAL EXPOSURE 11/28/95	12.11	790611	11096	1.40
	60.55	3445653	12729	0.37
	121.10	7682054	5520	0.07
ANIMAL EXPOSURE 11/29/95	12.11	799617	10758	1.35
	60.55	3499713	5730	0.16
	121.10	7733303	4028	0.05
ANIMAL EXPOSURE 11/30/95	12.11	806891	12345	1.53
	60.55	3542364	14504	0.41
	121.10	7780482	13147	0.17

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

APPENDIX A (TABLE 1)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
DAILY ION CHROMATOGRAPH CALIBRATION DATA

DATE	STANDARD (MG/L)	MEAN PEAK AREA	STANDARD DEVIATION	C.V.(%)
ANIMAL EXPOSURE 12/01/95	12.11	831171	19903	2.39
	60.55	3496954	52463	1.50
	121.10	7778744	36838	0.47
ANIMAL EXPOSURE 12/04/95	12.14	632253	15164	2.40
	60.68	3119522	298027	9.55
	121.36	7072222	130629	1.85
ANIMAL EXPOSURE 12/05/95	12.14	664502	3218	0.48
	60.68	3319515	5852	0.18
	121.36	7215544	16826	0.23
ANIMAL EXPOSURE 12/06/95	12.14	672205	28598	4.25
	60.68	3374079	2129	0.06
	121.36	7334213	20023	0.27
ANIMAL EXPOSURE 12/07/95	12.14	681484	12297	1.80
	60.68	3372692	21463	0.64
	121.36	7320709	25198	0.34
ANIMAL EXPOSURE 12/08/95	12.14	674086	3453	0.51
	60.68	3398049	21466	0.63
	121.36	7294366	75466	1.03
ANIMAL EXPOSURE 12/11/95	12.04	654639	6653	1.02
	60.18	3239862	27696	0.85
	120.35	7201448	7552	0.10
ANIMAL EXPOSURE 12/12/95	12.04	667850	3814	0.57
	60.18	3258535	9184	0.28
	120.35	7215329	24967	0.35

APPENDIX A (TABLE 1)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
DAILY ION CHROMATOGRAPH CALIBRATION DATA

DATE	STANDARD (MG/L)	MEAN PEAK AREA	STANDARD DEVIATION	C.V.(%)
ANIMAL EXPOSURE	12.04	690092	12378	1.79
12/13/95	60.18	3320966	22642	0.68
	120.35	7271582	20351	0.28
ANIMAL EXPOSURE	12.04	716743	13847	1.93
12/14/95	60.18	3336675	32352	0.97
	120.35	7333359	12509	0.17
METHOD DEVELOPMENT	12.04	749411	23167	3.09
12/15/95	60.18	3382139	76605	2.26
	120.35	7497263	15492	0.21

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

APPENDIX A (TABLE 2)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
TEST ATMOSPHERE HOMOGENEITY DETERMINATION

TARGET: 0.025 MG/L

DATE: 11-8-95

SAMPLING LOCATION	TIME (HH:MM)	CONC.(MG/L)	% FROM REFERENCE
REFERENCE PORT	01:40	0.031	
REMOTE PORT (A-3)	01:40	0.032	3.23
REFERENCE PORT	02:00	0.029	
REMOTE PORT (B-9)	02:00	0.033	13.79
REFERENCE PORT	02:11	0.030	
REMOTE PORT (C-5)	02:11	0.028	(-)6.67
REFERENCE PORT	05:19	0.030	
REMOTE PORT (E-4)	05:19	0.033	10.00

ABSOLUTE MEAN = 8.42 %
N = 4

CONC. = CONCENTRATION TIME = TIME INTO ATMOSPHERE GENERATION

APPENDIX A (TABLE 2)

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC. TEST ATMOSPHERE HOMOGENEITY DETERMINATION

TARGET: 0.075 MG/L DATE: 11-7-95

SAMPLING LOCATION	TIME (HH:MM)	CONC.(MG/L)	% FROM REFERENCE
REFERENCE PORT	00:49	0.084	
REMOTE PORT (A-2)	00:49	0.093	10.71
REFERENCE PORT	01:00	0.068	
REMOTE PORT (B-9)	01:00	0.065	(-)4.41
REFERENCE PORT	01:34	0.075	
REMOTE PORT (C-5)	01:34	0.074	(-)1.33
REFERENCE PORT	01:54	0.085	
REMOTE PORT (E-3)	01:54	0.087	2.35

ABSOLUTE MEAN = 4.70 %
N = 4

CONC. = CONCENTRATION TIME = TIME INTO ATMOSPHERE GENERATION

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

APPENDIX A (TABLE 2)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
TEST ATMOSPHERE HOMOGENEITY DETERMINATION

TARGET: 0.250 MG/L

DATE: 11-6-95

SAMPLING LOCATION	TIME (HH:MM)	CONC.(MG/L)	% FROM REFERENCE
REFERENCE PORT	00:43	0.238	
REMOTE PORT (A-2)	00:43	0.240	0.84
REFERENCE PORT	00:50	0.226	
REMOTE PORT (B-9)	00:50	0.232	2.65
REFERENCE PORT	01:00	0.277	
REMOTE PORT (C-5)	01:00	0.248	(-)10.47
REFERENCE PORT	01:08	0.315	
REMOTE PORT (E-3)	01:08	0.324	2.86

ABSOLUTE MEAN = 4.21 %
N = 4

CONC. = CONCENTRATION TIME = TIME INTO ATMOSPHERE GENERATION

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

APPENDIX A (TABLE 3)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
DAILY CHAMBER TEMPERATURE MEANS (DEGREES CELSIUS)

DATE	GROUP: 0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
11/16/95	24	24	24	24
11/17/95	24	24	24	24
11/20/95	24	25	24	24
11/21/95	24	24	24	24
11/22/95	24	24	24	24
11/23/95	24	24	24	24
11/24/95	24	24	24	24
11/27/95	25	25	25	25
11/28/95	24	24	24	24
11/29/95	24	24	24	24
11/30/95	24	23	25	24
12/01/95	24	24	24	24
12/04/95	24	24	24	24
12/05/95	24	24	24	24
12/06/95	24	24	24	24
12/07/95	24	24	24	24
12/08/95	24	23	24	23
12/11/95	23	23	24	23
12/12/95	23	23	24	23
12/13/95	23	23	24	23
12/14/95	24	24	23	23
GRAND MEAN	24	24	24	24
S.D.	0.4	0.6	0.4	0.5
C.V.(%)	1.83	2.40	1.60	2.15
N	21	21	21	21

APPENDIX A (TABLE 4)

PROJECT NO.:WIL-160033

A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC.

DAILY CHAMBER RELATIVE HUMIDITY MEANS (%)

DATE	GROUP: 0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
11/16/95	38	36	39	39
11/17/95	37	49	42	39
11/20/95	31	42	46	41
11/21/95	29	42	43	41
11/22/95	28	41	44	38
11/23/95	41	38	31	38
11/24/95	38	38	30	37
11/27/95	35	41	36	44
11/28/95	38	42	36	40
11/29/95	38	40	36	39
11/30/95	42	38	33	41
12/01/95	38	38	33	49
12/04/95	36	44	34	43
12/05/95	39	41	31	42
12/06/95	40	38	27	36
12/07/95	36	39	29	40
12/08/95	38	39	30	38
12/11/95	37	34	30	42
12/12/95	43	37	39	40
12/13/95	44	36	39	37
12/14/95	44	44	48	42
GRAND MEAN	38	40	36	40
S.D.	4.3	3.4	6.0	2.9
C.V.(%)	11.48	8.44	16.78	7.20
N	21	21	21	21

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

APPENDIX A (TABLE 5)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
DAILY CHAMBER AIRFLOW RATE MEANS (LPM)

DATE	GROUP: 0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
11/16/95	19	20	13	20
11/17/95	19	18	13	25
11/20/95	23	17	11	19
11/21/95	27	15	11	20
11/22/95	23	14	16	23
11/23/95	16	17	13	15
11/24/95	16	17	12	14
11/27/95	16	16	14	15
11/28/95	13	19	16	16
11/29/95	12	21	20	16
11/30/95	12	18	15	16
12/01/95	12	17	13	**
12/04/95	11	17	14	18
12/05/95	11	17	14	17
12/06/95	11	19	11	18
12/07/95	11	20	12	16
12/08/95	14	19	13	16
12/11/95	13	19	18	16
12/12/95	13	17	15	15
12/13/95	12	17	13	16
12/14/95	12	18	13	16
GRAND MEAN	15	18	14	17
S.D.	4.6	1.7	2.3	2.8
C.V.(%)	30.78	9.47	16.45	16.22
N	21	21	21	20

LPM = LITERS PER MINUTE
** = MASS AIRFLOW RATE NOT RECORDED ON THIS DATE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

APPENDIX A (TABLE 6)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
DAILY MEAN TEST ATMOSPHERE CONCENTRATIONS

GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
NOSE-ONLY UNIT:	# 1	# 2	# 3	# 4
STUDY DAY: 0				
MEAN	0.002	0.015	0.063	0.231
SD	0.0014	0.0000	0.0057	0.0304
CV(%)	70.71068	0.00000	8.97914	13.13416
N	2	2	2	2
STUDY DAY: 1				
MEAN	0.002	0.017	0.065	0.238
SD	0.0007	0.0057	0.0354	0.0177
CV(%)	47.14045	33.27561	54.39283	7.41202
N	2	2	2	2
STUDY DAY: 4				
MEAN	0.001	0.019	0.064	0.236
SD	0.0000	0.0057	0.0247	0.0403
CV(%)	0.00000	29.77292	38.97439	17.04231
N	2	2	2	2
STUDY DAY: 5				
MEAN	0.001	0.028	0.061	0.260
SD	0.0000	0.0007	0.0028	0.0290
CV(%)	0.00000	2.57130	4.63677	11.12913
N	2	2	2	2
STUDY DAY: 6				
MEAN	0.001	0.023	0.086	0.251
SD	0.0007	0.0028	0.0255	0.0445
CV(%)	141.42136	12.29751	29.59982	17.71281
N	2	2	2	2

CONCENTRATION IN MILLIGRAMS/LITER

APPENDIX A (TABLE 6)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
DAILY MEAN TEST ATMOSPHERE CONCENTRATIONS

GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
NOSE-ONLY UNIT:	# 1	# 2	# 3	# 4
STUDY DAY: 7				
MEAN	0.000	0.032	0.069	0.194
SD	0.0000	0.0000	0.0311	0.0255
CV(%)	0.00000	0.00000	45.09087	13.12157
N	2	2	2	2
STUDY DAY: 8				
MEAN	0.000	0.032	0.109	0.228
SD	0.0000	0.0035	0.0219	0.0495
CV(%)	0.00000	11.22392	20.20305	21.70942
N	2	2	2	2
STUDY DAY: 11				
MEAN	0.001	0.033	0.089	0.240
SD	0.0000	0.0014	0.0057	0.0205
CV(%)	0.00000	4.28550	6.35602	8.52644
N	2	2	2	2
STUDY DAY: 12				
MEAN	0.001	0.023	0.075	0.250
SD	0.0000	0.0014	0.0212	0.0255
CV(%)	0.00000	6.14876	28.28428	10.18234
N	2	2	2	2
STUDY DAY: 13				
MEAN	0.001	0.021	0.070	0.234
SD	0.0000	0.0007	0.0177	0.0191
CV(%)	0.00000	3.28887	25.43550	8.14153
N	2	2	2	2

CONCENTRATION IN MILLIGRAMS/LITER

APPENDIX A (TABLE 6)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
DAILY MEAN TEST ATMOSPHERE CONCENTRATIONS

GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
NOSE-ONLY UNIT:	# 1	# 2	# 3	# 4
STUDY DAY: 14				
MEAN	0.001	0.028	0.064	0.205
SD	0.0000	0.0014	0.0057	0.0177
CV(%)	0.00000	5.05076	8.83884	8.60227
N	2	2	2	2
STUDY DAY: 15				
MEAN	0.001	0.023	0.083	0.230
SD	0.0000	0.0014	0.0226	0.0601
CV(%)	0.00000	6.14876	27.26195	26.07552
N	2	2	2	2
STUDY DAY: 18				
MEAN	0.001	0.030	0.086	0.260
SD	0.0000	0.0014	0.0000	0.0085
CV(%)	0.00000	4.71405	0.00000	3.26357
N	2	2	2	2
STUDY DAY: 19				
MEAN	0.001	0.028	0.064	0.230
SD	0.0000	0.0007	0.0028	0.0382
CV(%)	0.00000	2.57130	4.41942	16.60164
N	2	2	2	2
STUDY DAY: 20				
MEAN	0.001	0.019	0.042	0.282
SD	0.0000	0.0028	0.0276	0.0778
CV(%)	0.00000	14.88645	64.88744	27.58218
N	2	2	2	2

CONCENTRATION IN MILLIGRAMS/LITER

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

APPENDIX A (TABLE 6)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
DAILY MEAN TEST ATMOSPHERE CONCENTRATIONS

GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
NOSE-ONLY UNIT:	# 1	# 2	# 3	# 4
STUDY DAY: 21				
MEAN	0.001	0.029	0.084	0.259
SD	0.0000	0.0007	0.0113	0.0198
CV(%)	0.00000	2.48107	13.46870	7.64440
N	2	2	2	2
STUDY DAY: 22				
MEAN	0.001	0.029	0.074	0.242
SD	0.0000	0.0007	0.0085	0.0198
CV(%)	0.00000	2.39697	11.46659	8.18140
N	2	2	2	2
STUDY DAY: 25				
MEAN	0.001	0.024	0.071	0.242
SD	0.0000	0.0007	0.0064	0.0177
CV(%)	0.00000	3.00897	9.02690	7.31995
N	2	2	2	2
STUDY DAY: 26				
MEAN	0.001	0.028	0.084	0.255
SD	0.0000	0.0014	0.0219	0.0219
CV(%)	0.00000	5.05076	25.94120	8.57938
N	2	2	2	2
STUDY DAY: 27				
MEAN	0.001	0.031	0.082	0.231
SD	0.0000	0.0014	0.0064	0.0014
CV(%)	0.00000	4.56198	7.80854	0.61221
N	2	2	2	2

CONCENTRATION IN MILLIGRAMS/LITER

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

APPENDIX A (TABLE 6)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
DAILY MEAN TEST ATMOSPHERE CONCENTRATIONS

GROUP:	0.00 MG/L	0.025 MG/L	0.075 MG/L	0.25 MG/L
NOSE-ONLY UNIT:	# 1	# 2	# 3	# 4
STUDY DAY: 28				
MEAN	0.001	0.030	0.057	0.279
SD	0.0000	0.0007	0.0035	0.0177
CV(%)	0.00000	2.31838	6.14875	6.34746
N	2	2	2	2
ALL TEST PERIODS COMBINED:				
MEAN	0.001	0.026	0.073	0.242
SD	0.0004	0.0053	0.0143	0.0209
CV(%)	44.72136	20.63420	19.52546	8.64567
N	21	21	21	21

CONCENTRATION IN MILLIGRAMS/LITER

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

APPENDIX A (TABLE 7)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
AEROSOL PARTICLE SIZE DETERMINATIONS

GROUP:	0.025 MG/LITER	0.075 MG/LITER	0.250 MG/LITER
	NOSE-ONLY #2	NOSE-ONLY #3	NOSE-ONLY #4
DATE: 11-3-95			
MASS MEDIAN AERODYNAMIC DIAMETER (MMAD)	0.8765	1.0458	1.1352
GEOMETRIC STANDARD DEVIATION	1.6114	1.8031	1.8280
DATE: 11-6-95			
MASS MEDIAN AERODYNAMIC DIAMETER (MMAD)	0.8975	1.1361	1.1785
GEOMETRIC STANDARD DEVIATION	1.6580	1.8202	1.9272
DATE: 11-7-95			
MASS MEDIAN AERODYNAMIC DIAMETER (MMAD)	0.9150	1.1258	1.1163
GEOMETRIC STANDARD DEVIATION	1.7010	1.8301	1.8957
DATE: 11-8-95			
MASS MEDIAN AERODYNAMIC DIAMETER (MMAD)	0.8549	1.2714	1.2049
GEOMETRIC STANDARD DEVIATION	1.6610	1.9440	1.8802
DATE: 11-9-95			
MASS MEDIAN AERODYNAMIC DIAMETER (MMAD)	0.8162	1.2555	1.2424
GEOMETRIC STANDARD DEVIATION	1.6212	1.9556	1.9796
DATE: 11-10-95			
MASS MEDIAN AERODYNAMIC DIAMETER (MMAD)	0.8567	1.3419	NA
GEOMETRIC STANDARD DEVIATION	1.5837	1.9534	NA

MMAD IN MICRONS
NA = NOT APPLICABLE; NO PARTICLE SIZE TAKEN ON THIS DAY

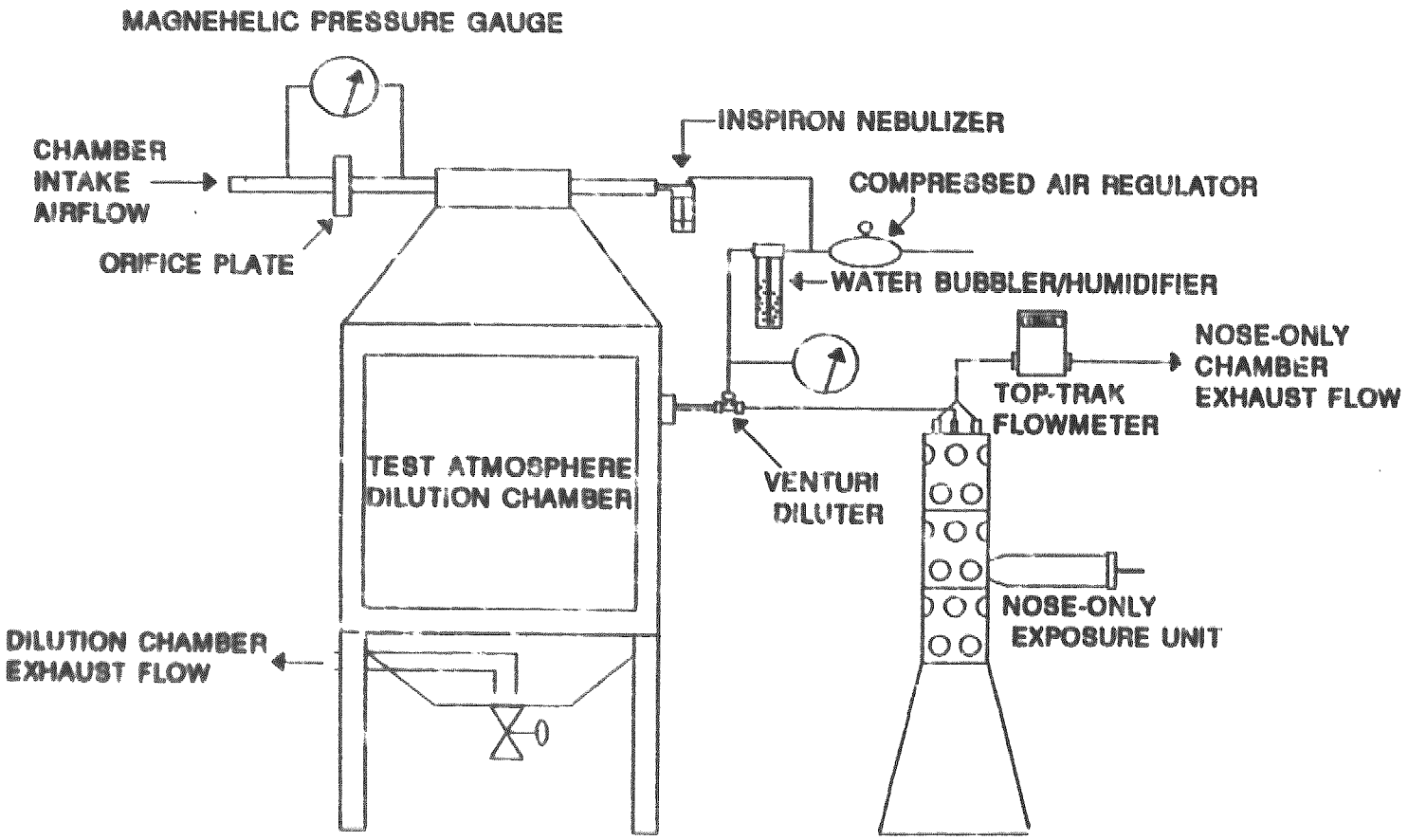
PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

APPENDIX A (TABLE 7)
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
AEROSOL PARTICLE SIZE DETERMINATIONS

GROUP:	0.025 MG/LITER	0.075 MG/LITER	0.250 MG/LITER
	NOSE-ONLY #2	NOSE-ONLY #3	NOSE-ONLY #4
DATE: 12-15-95 *			
MASS MEDIAN AERODYNAMIC DIAMETER (MMAD)	0.9873	1.3275	1.3819
GEOMETRIC STANDARD DEVIATION	1.7813	1.9878	1.9651
MEAN MMAD	0.8863	1.2149	1.2099
S.D.	0.0548	0.1128	0.0959
C.V.(%)	6.18	9.29	7.93
N	7	7	6
MEAN GEOMETRIC STANDARD DEVIATION	1.6597	1.8992	1.9126

MMAD IN MICRONS
* = PARTICLE SIZE DETERMINED FOLLOWING FINAL ANIMAL EXPOSURE

FIGURE I : ATMOSPHERE GENERATION SYSTEM



A 4-Week Inhalation Toxicity Study
of Methane Sulfonic Acid in Albino Rats

APPENDIX B

Pretest Clinical Observations

----- M A L E -----

TABLE RANGE: 11-02-95 TO 11-15-95

GROUP:	1
NORMAL	
-NO SIGNIFICANT CLINICAL OBSERVATIONS	166/ 53
DISPOSITION	
-DIED DURING ACCLIMATION PERIOD	2/ 2
EYES/EARS/NOSE	
-OPACITY RIGHT EYE	2/ 1
-DRIED BROWN MATERIAL AROUND NOSE	4/ 4
DERMAL OBS	
-SCABBING FACIAL AREA	2/ 1
-SCABBING CRANIAL AREA	1/ 1
-HAIR LOSS FACIAL AREA	1/ 1
-HAIR LOSS CRANIAL AREA	1/ 1
BODY/INTEGUMENT	
-MECHANICAL INJURY TO DISTAL END OF TAIL	1/ 1

1- PRETEST

----- F E M A L E -----

TABLE RANGE: 11-02-95 TO 11-15-95

GROUP:	1
NORMAL	
-NO SIGNIFICANT CLINICAL OBSERVATIONS	174/ 60
DISPOSITION	
-DIED DURING ACCLIMATION PERIOD	2/ 2
DERMAL OBS	
-SCABBING FACIAL AREA	2/ 1
-SCABBING CRANIAL AREA	2/ 2
-MOIST ALOPECIA RIGHT LATERAL NECK AREA	1/ 1

1- PRETEST

A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE: 11-09-95 TO 11-15-95
GROUP: 1

NORMAL
-NO SIGNIFICANT CLINICAL OBSERVATIONS 20/ 10

1- PRETEST

A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE: 11-09-95 TO 11-15-95
GROUP: 1

NORMAL	
-NO SIGNIFICANT CLINICAL OBSERVATIONS	19/ 10
DISPOSITION	
-DIED DURING ACCLIMATION PERIOD	1/ 1

1- PRETEST

A 4-Week Inhalation Toxicity Study of Methane Sulfonic Acid in Albino Rats

APPENDIX C

Animal Assignment in Study Replicates

ANIMAL ASSIGNMENT IN STUDY REPLICATES

REPLICATE NUMBER: 1

ANIMAL NUMBER	SEX	GROUP
44098	M	2
44132	M	1
44207	F	1
44159	F	2
44146	M	4
44123	M	4
44180	F	1
44200	F	3
44202	F	3
44342	M	2
44181	F	1
44100	M	3
44333	M	3
44204	F	1
44143	M	2
44112	M	4
44179	F	2
44167	F	4
44170	F	2
44109	M	4
44135	M	1
44338	M	4
44124	M	3
44197	F	3
44099	M	1
44134	M	3

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
M = MALE F = FEMALE

ANIMAL ASSIGNMENT IN STUDY REPLICATES

REPLICATE NUMBER: 1

ANIMAL NUMBER	SEX	GROUP
44347	F	3
44337	M	1
44092	M	2
44150	F	3
44156	F	1
44138	M	2
44118	M	3
44097	M	4
44350	F	2
44189	F	4
44194	F	2
44352	F	1
44133	M	4
44191	F	2
44120	M	4
44163	F	4
44096	M	3
44131	M	1
44119	M	2
44184	F	4
44160	F	2
44345	F	4
44168	F	4
44148	F	3
44164	F	1
44108	M	1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
M = MALE F = FEMALE

ANIMAL ASSIGNMENT IN STUDY REPLICATES

REPLICATE NUMBER: 1

ANIMAL NUMBER	SEX	GROUP
44107	M	3
44178	F	1
44171	F	3
44182	F	4
44144	M	2
44152	F	3
44093	M	2
44115	M	1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
M = MALE F = FEMALE

ANIMAL ASSIGNMENT IN STUDY REPLICATES

REPLICATE NUMBER: 2

ANIMAL NUMBER	SEX	GROUP
44089	M	4
44188	F	4
44348	F	4
44113	M	2
44166	F	1
44173	F	4
44140	M	3
44151	F	1
44126	M	2
44192	F	2
44157	F	1
44136	M	4
44339	M	2
44187	F	2
44125	M	1
44149	F	1
44111	M	3
44344	F	3
44201	F	2
44102	M	4
44141	M	1
44142	M	3
44195	F	2
44114	M	1
44346	F	1
44091	M	1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
M = MALE F = FEMALE

REPLICATE NUMBER: 2

ANIMAL NUMBER	SEX	GROUP
44094	M	3
44154	F	1
44206	F	3
44161	F	3
44176	F	1
44198	F	4
44147	M	2
44139	M	4
44103	M	1
44137	M	1
44172	F	2
44130	M	4
44101	M	2
44104	M	4
44205	F	4
44169	F	3
44129	M	3
44335	M	1
44190	F	4
44334	M	4
44186	F	3
44165	F	3
44155	F	4
44128	M	2
44110	M	2
44121	M	1

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
M = MALE F = FEMALE

REPLICATE NUMBER: 2

ANIMAL NUMBER	SEX	GROUP
44340	M	3
44183	F	2
44162	F	2
44175	F	4
44196	F	3
44145	M	3
44116	M	3
44349	F	2

1- 0.00 MG/L 2- 0.025 MG/L 3- 0.075 MG/L 4- 0.25 MG/L
M = MALE F = FEMALE

A 4-Week Inhalation Toxicity Study of Methane Sulfonic Acid in Albino Rats

APPENDIX D

Scoring Criteria for Functional Observational Battery

Scoring Criteria for the Functional Observational Battery

Definition:

The Functional Observational Battery (FOB) is a procedure used to detect gross functional deficits in test animals.

Description:

The FOB consists of a series of tests. The tests are categorized into home cage, handling, open field, sensory, neuromuscular and physiological observations and are as follows:

1. Home Cage Observations

    a. Posture
    b. Convulsions
    c. Tremors
    d. Biting
    e. Palpebral (eyelid) closure
    f. Feces Consistency

2. Handling Observations

    a. Ease of removal from cage
    b. Ease of handling animal in hand
    c. Lacrimation
    d. Chromodacryorrhea
    e. Salivation
    f. Piloerection
    g. Fur appearance
    h. Palpebral closure
    i. Respiratory rate
    j. Respiratory character
    k. Red deposits
    l. Crusty deposits
    m. Mucous membranes/eye/skin color
    n. Eye prominence
    o. Muscle tone

3. Open Field Observations

   a. Time to first step (seconds)
   b. Rearing
   c. Mobility
   d. Backing
   e. Grooming
   f. Gait
   g. Convulsions
   h. Tremors
   i. Gait Score
   j. Arousal
   k. Bizarre/Stereotypic behavior
   l. Urination
   m. Defecation

4. Sensory Observations

   a. Approach response
   b. Touch response
   c. Startle response
   d. Tail pinch
   e. Olfactory orientation
   f. Pupil response
   g. Eyeblink response
   h. Forelimb extension
   i. Hindlimb extension
   j. Air righting reflex

5. Neuromuscular Observations

   a. Hindlimb extensor strength
   b. Grip strength-hind and forelimb
   c. Rotarod performance
   d. Hindlimb foot splay

6. Physiological Observations

   a. Catalepsy
   b. Body Temperature
   c. Body Weight

Procedure

The FOB will be undertaken on those study days specified in the study protocol. Test animals will be removed from their cages one at a time on the designated day of testing, and unless specified in the study protocol will be taken through the FOB in the following order: FOB1 (inclusive of categories 1a-1f and 2a), FOB2 (inclusive of categories 2b-2o, 3a-3m and 4a-4j) and FOB3 (inclusive of categories 5a-5d and 6a-6c).

Testing will be performed by trained technicians, who will not know the animals group assignment, i.e. dosage concentration. A description of, and scoring criteria for each test is provided below:

1. HOME CAGE OBSERVATIONS

Observations are made of animal in its home cage and while opening it.

a. Posture

Sitting or standing normally	1
Asleep, lying on side or curled up	2
Alert, oriented toward observer	3
Sitting, head held low	4
Flattened, limbs may be extended	5
Lying on side, limbs in air	6
Immobile	7
Rearing	8

b. Convulsions

I. Clonic

Absent	1
Repetitive movement of mouth and jaws	2
Clonic tremors of the limbs (contraction followed by relaxation)	3
Whole body tremors	4
Clonic convulsions	5
Wet Dog Shakes	6

II. Tonic

Absent	1
Tonic: contraction of extensors such that limbs are rigid and extended	2
Opisthotonus: head, body and limbs rigidly arched backwards	3
Emprosthotonus: head, body and limbs extended forward	4
'Popcorn seizure': animal repeatedly jumps or bounces in air	5
Asphyxial: bouts of severe clonic-tonic convulsions	6

c. Tremors

None	1
Slight (1.5 mm)	2
Moderately coarse (3 mm), slight impairment of locomotion	3
Markedly coarse (4.5 mm), moderate/marked impairment of locomotion	4
Extremely coarse (6 mm), locomotion impossible	5

d. Biting

None	1
Biting of cage	2
Biting of self	3

e. Palpebral (eyelid) closure

Eyelids wide open	1
Eyelids slightly drooping	2
Drooping eyelids (half closed)	3
Eyelids completely shut	4

f. Feces Consistency

Pellets	1
Pellets, partially formed	2
Unformed, diarrhea	3
Pellets absent	4

2. HANDLING OBSERVATIONS

Remove animal from cage, observe as follows:

a. Ease of removal from cage

Very easy: animal sits quietly, allows investigator to pick it up	1
Easy: with or without vocalization, without resistance or slight resistance to being picked up	2
Moderately difficult: animal rears, often following investigators hand	3
Freezes: with or without vocalization	4
Difficult: runs around cage, is hard to grab, with or without vocalization	5
Very difficult: tail and throat rattles with or without vocalization, may attack hand	6

b. Ease of handling animal in hand

Low: no resistance, animal is easy to handle	1
Moderately low: slight resistance to being handled, with or without vocalization	2
Moderately high: rat may freeze, or be tense or rigid in hand, with or without vocalization	3
High: squirming, twisting, attempting to bite with or without vocalization	4

c. Lacrimation

None	1
Slight	2
Severe	3

d. Chromodacryorrhea

Absent	1
Present	2

e. Salivation

None	1
Slight	2
Severe	3

f. Piloerection

None	1
Slight	2
Severe	3

g. Fur Appearance

Normal: clean and groomed	1
Slightly soiled	2
Very soiled, crusty	3

h. Palpebral closure

Eyelids wide open	1
Eyelids slightly drooping	2
Drooping eyelids (half closed)	3
Eyelids completely shut	4

i. Respiratory Rate

Normal: by observation (80-110/min.)	1
Decreased: below 80/min.	2
Increased: above 110/min.	3

j. Respiratory Character

Normal	1
Rales: abnormal sound accompanying breathing	2
Retching	3
Dyspneic: short of breath	4
Gasping	5

k. Red Deposits - eyes, nose, mouth

Present	1
Absent	2

l. Crusty Deposits - eyes, nose, mouth

Present	1
Absent	2

m. Mucous membranes/eye/skin color

Pink	1
Pale	2
Darkened	3
Darkened, brown	4
Bright, deep red flush	5

n. Eye Prominence

Normal	1
Exophthalmus	2
Enophthalmus	3

o. Muscle Tone (Musculature of the limbs is palpated between the thumb and forefinger)

Muscle is firm but not hard (normal)	1
Muscle is soft and flabby,	2
Muscle is tense and hard	3

3. OPEN FIELD OBSERVATIONS

Animal is placed in open field arena (constructed from Plexiglas® and painted black, dimensions: 24" x 24" x 6"), and evaluated over a 2 minute observation period as follows:

a. Time to first step (seconds)

The time taken for the animal to take its first step in the open field arena is recorded in seconds.

b. Rearing

Number of times animal rears back onto its hind legs and stands up with both front paws raised off the surface is recorded over 2 minute observation period in open field arena.

c. Mobility (Score within 30 seconds of placing animal in open field arena)

Normal	1
Slightly Impaired	2
Moderately Impaired	3
Totally Impaired, Locomotion impossible	4

d. Backing

Number of times animal takes three or more backward steps over 2 minute observation period in open field arena is recorded.

e. Grooming

Number of times animal grooms itself over 2 minute observation period in open field arena is recorded. Grooming includes washing face and head with forepaws. Scratching head or body with hind paw and biting the fur.

f. Gait

Normal, head horizontal, abdomen just above surface, slight up and down movement with each step	1
Walks on tiptoes	2
Body drags, abdomen makes contact with surface, body sway	3
Hindlimbs splayed or dragging, unable to support weight	4

f. Gait (Continued)

Hunched body, bottom up, nose held down, arched back	5
Ataxia, excessive sway, rocks or lurches as animal proceeds forward	6

g. Convulsions

I. Clonic

Absent	1
Repetitive movement of mouth and jaws	2
Clonic tremors of the limbs (contraction followed by relaxation)	3
Whole body tremors	4
Clonic convulsions	5
Wet Dog Shakes	6

II. Tonic

Absent	1
Tonic: contraction of extensors such that limbs are rigid and extended	2
Opisthotonus: head, body and limbs rigidly arched backwards	3
Emprosthotonus: head, body and limbs arched forward	4
'Popcorn seizure': animal repeatedly jumps or bounces in air	5
Asphyxial: bouts of severe clonic-tonic convulsions	6

h. Tremors

None	1
Slight (1.5mm)	2
Moderately coarse (3 mm), slight impairment of locomotion	3
Markedly coarse (4.5 mm), moderate/marked impairment of locomotion	4
Extremely coarse (6 mm), locomotion impossible	5

i. Gait Score: Ability to locomote despite abnormalities in gait

Normal	1
Slight impairment, but definite	2
Considerable impairment, without falling	3
Marked impairment, falls every 4 to 6 steps	4
Severe impairment, cannot walk without falling	5

j. Arousal

Very low: Stupor, coma, little or no responsiveness	1
Low: Somewhat stuporous	2
Normal: Alert, exploratory movements	3
Somewhat high: Slight excitement, tense, excited sudden darting or freezing	4
Very high: Hyperalert, excited, sudden bouts of running or body movements	5

k. Bizarre/Stereotypic Behavior

None	1
Head Flick: head shaking or backward flip of head	2
Head Search: stereotyped, repetitive turning of head from side to side as though searching the environment	3
Hallucinatory: animal appears to be responding to objects not present	
Compulsive licking or biting	
Prancing: restless shifting from one forelimb to other, with slight turning of the body from side to side	6
Upright walking: on hindlimbs only	7
Aimless wandering: progressive, slow, plodding movements about environment, with no apparent purpose	8
Circling: tendency to move in circles around and along objects, or in an open environment	9
Waltzing: rapid turning in circles	10
Retropulsion: where animal walks backwards	11
Spatial disorientation: walking or stumbling into objects	12
Side to side rocking	13
Straub tail: increased tail elevation	14
Vertical Jumping	15
Pacing without purpose	16
Head bobbing	17

k. Bizarre/Stereotypic Behavior (continued)

Writhing: lying down, wavelike movement of abdomen, alternating limb movements 18

l. Urination

Number of pools of urine are counted in open field arena.

m. Defecation

Number of fecal boli are counted in open field arena.

4. SENSORY OBSERVATIONS

Perform tests in open field arena as follows:

a. Approach Response

Approach animal head on with blunt object held approximately 3 cm from face for a 4 second period.

No reaction	1
Slow approach, sniffing or turning away	2
More energetic than (2) may include vocalization	3
Freezes, actual muscle contraction	4
Bizarre reaction: jumps, bites or attacks	5

b. Touch Response

Coming in from the side, touch rump with blunt object

No reaction	1
Animal may slowly turn, walk away	2
More energetic response than (2), may include vocalization	3
Freezes, actual muscle contraction	4
Bizarre reaction: jumps, bites or attacks	5

c. Startle Response

Position clicker (childrens toy animal clicker) approximately 5 cm above the animal's head and make a sudden sound.

No reaction	1
Slight reaction, ear flick or some evidence that snap was heard	2
More energetic response than (2), may include vocalization	3
Freezes, actual muscle contraction	4
Bizarre reactions: jumps, attacks, bites	5

d. Tail Pinch

Metal tweezers are used to squeeze tail approximately 2-3 cm from tip.

No reaction	1
Animal may turn or walk away	2
More energetic than (2), may include vocalization	3
Freezes, actual muscle contraction	4
Bizarre reaction: jumps, attacks or bites	5

e. Olfactory Orientation

Using forceps dip cotton swab into jar containing commercially available homogenized baby food. Remove swab from jar. Approach animal from behind bringing swab approximately 4-5 cm from side of animals head.

No reaction present	1
Reaction present, animal approaches swab making sniffing movements with nose, may lick swab	2

f. Pupil Response

The beam from a pen light is brought in from the side of the animals head to approximately 5 mm from the surface of the eye. Changes in pupil size are noted.

No pupil response	1
Pupil response present	2

g. Eyeblink Response

The corner of the eye is touched gently with a blunt object.

No eyeblink response	1
Eyeblink response present	2

h. Forelimb Extension

The animal is held by tail and lowered towards a table top. The presence or absence of normal forelimb extension is noted.

No forelimb extension	1
Forelimb extension present	2

i. Hindlimb Extension

Animal is placed on table top and lifted by the tail, and presence of normal hindlimb extension is noted.

No hindlimb extension	1
Hindlimb extension present	2

j. Air Righting Reflex

Hold animal in supine position, drop from approximately 30 cm and score ease of landing.

Normal	1
Slightly uncoordinated	2
Lands on side	3
Lands on back	4

5. NEUROMUSCULAR OBSERVATIONS

a. Hindlimb Extensor Strength

Pick animal up and apply slight pressure to its hindlimbs; normal response is for animal to extend its hindlimbs against the pressure.

a. Hindlimb Extensor Strength (continued)

Hindlimb resistance absent	1
Reduced hindlimb resistance, animal shows some weakness	2
Hindlimb resistance present	3

b. Grip Strength-hind and forelimb

Forelimb and hindlimb grip strength are measured using a device similar to the one described by Meyer et al (Neurobehav. Toxicol. 1:233-239, 1979). The animal is allowed to grip a T-shaped grip bar with its forepaws and is pulled back gently along a platform until its grip is broken. As the backward locomotion continues, the animal's hindpaws reach a T-shaped rearlimb grip bar, which it is allowed to grasp and then forced to release by continued pulling. Chatillon push-pull strain gauges (J.A. King, Greensboro, North Carolina) are used to record the maximum strain required to break forelimb and hindlimb grip. The average of three valid measurements is taken as the animal's score for each grip strength measure.

c. Rotarod Performance

Before study commencement, animals are trained to walk a rotating rod (diameter 7.0 cm, rotation rate 12 rpm; Omnitech Electronics, Inc., Columbus, Ohio) for a 2-minute period. For testing purposes, measure the duration of time each animal remains on the rotarod up to a maximum time of 120 seconds.

d. Hindlimb Foot Splay

The heel pads of the hindfeet of each animal are painted with a non-toxic water based paint. Animals are dropped from a horizontal position approximately 30 cm above a table onto the Hindlimb Foot Splay Test sheet. Measure the distance (to the nearest millimeter) between the inner edge of the ink blots made by each foot. Repeat the test two more times and calculate the average score, to the nearest millimeter, of the latter two trials.

6. PHYSIOLOGICAL OBSERVATIONS

a. Catalepsy

Place animal on four Plexiglas® platforms (35 mm high and 40 mm in diameter) that are a distance of 100 mm from each other between fore and hind feet and 60 mm between right and left feet (when measured from center to center of the platforms). The time each animal remains on the four platforms is recorded. The duration of immobility is measured up to a maximum time of 60 seconds.

b. Body Temperature

Following thermometer insertion into rectum (insert approximately 2 cm), body temperature is recorded after an equilibration period of approximately 30 seconds.

c. Bodyweight

Animal is weighed.

The Functional Observational Battery is normally recorded on-line via the "IFOB" program in NT-module. In the event that the Data Management System is unavailable for on-line data collection, data are hand-recorded on the Functional Observational Battery Individual Data Sheets (T1-228, as revised). When appropriate, the hand-recorded data are late entered into the Data Management System.

A 4-Week Inhalation Toxicity Study of Methane Sulfonic Acid in Albino Rats

APPENDIX E

Clinical Pathology Methods, Procedures and References

CLINICAL PATHOLOGY METHODS, PROCEDURES AND REFERENCES

Serum Chemistry - Hitachi 911

Albumin - Bromcresol Green (BCG) Method, Modification of the Doumas reaction. Hitachi 911 Application Code 012. Boehringer Mannheim Reagent, catalog number 450011.

A/G Ratio - Calculated from Albumin and Globulin Results.

Alkaline Phosphatase - Kinetic reaction measuring the rate of p-nitrophenol liberation. Hitachi 911 Application Code 016. Boehringer Mannheim Reagent, catalog number 450012.

Alanine Aminotransferase - Modification of the International Federation of Clinical Chemistry (IFCC) recommended method. Hitachi 911 Application Code 018. Boehringer Mannheim Reagent, catalog number 450017.

Aspartate Aminotransferase - Kinetic method based on the International Federation of Clinical Chemistry (IFCC) recommendations. Hitachi 911 Application Code 036. Boehringer Mannheim Reagent, catalog number 450018.

Bilirubin (Total) - Diazo method developed by Wahlefeld *et al.* Scand J Clin Lab Invest 1972; 29: Supplement 126. Hitachi 911 Application Code 051. Boehringer Mannheim Reagent, catalog number 1039034.

Blood Urea Nitrogen (BUN) - A urease triggered methodology based upon the method of Talke and Schubert Klin Wschr, 1965; 43:174. Hitachi 911 Application Code 053. Boehringer Mannheim Reagent, catalog number 450021.

Calcium - Modified method using a gamma-amino-butyric acid (GABA) buffer. Hitachi 911 Application Code 059. Boehringer Mannheim Reagent, catalog number 450020.

Chloride - An ion-selective electrode that measures the electrical potential of the ions present in solution. Hitachi 911 Application Codes 097, 098, and 099. Boehringer Mannheim Reagent, catalog numbers 450041, 450042, and 450043.

Cholesterol - Enzymatic reaction as described by Trinder. Ann Clin Biochem 1974; 12:266. Hitachi 911 Application Code 072. Boehringer Mannheim Reagent, catalog number 450026.

Serum Chemistry (continued)

Creatinine - Modified Jaffe reaction based on the work of Poper *et al* and Seelig and Wuest. Biochem Z 1937; 291:354. Aerztl Labor 1969; 15:34. Hitachi 911 Application Code 077. Boehringer Mannheim Reagent, catalog number 450019.

Gamma-Glutamyltransferase (GGT) - Method based on the studies of Persijn and Van der Slik, J Clin Chem Biochem, 1976; 14:421. Hitachi 911 Application Code 093. Boehringer Mannheim Reagent, catalog number 450027.

Globulin - Calculation obtained by subtracting the albumin from the total protein.

Glucose - Glucose hexokinase method based on the work of Schmidt and Peterson and Young. Klin Wschr 1961; 39:1244. Methods of Enzymatic Analysis, Eng ed 2, HU Bergmeyer. New York, Academic Press, 1974, p. 1196. Analy Biochemistry 1958; 23:301. Hitachi 911 Application Code 095. Boehringer Mannheim Reagent, catalog number 450015.

Potassium - An ion-selective electrode that measures the electrical potential of the ions present in solution. Hitachi 911 Application Codes 097, 098, and 099. Boehringer Mannheim Reagent, catalog numbers 450041, 450042, and 450043.

Phosphorus - Method involves the formation of ammonium phosphomolyldate. Hitachi 911 Application Code 133. Boehringer Mannheim Reagent, catalog number 450024.

Total Protein - Endpoint biuret method that utilizes a sample blank. Hitachi 911 Application Code 155. Boehringer Mannheim Reagent, catalog number 450023.

Sodium - An ion-selective electrode that measure the electrical potential of the ions present in solution. Hitachi 911 Application Codes 097, 098, and 099. Boehringer Mannheim Reagent, catalog number 450041, 450042, and 450043.

Hematology - CELL-DYN® 3500

HCT - The Hematocrit is the ratio of red blood cells to plasma and is expressed as a percentage of the whole blood volume. The HCT is calculated from the red blood cell count and the mean cell volume as follows:

$$HCT = (RBC \times MCV)/10$$

CELL-DYN® 3500 Operator's Manual. Abbott Diagnostics.

Hematology - CELL-DYN® 3500 (continued)

HGB - The Hemoglobin concentration is measured using a modified hemoglobincyanide method. A filtered LED with a wavelength of 540 nm is the light source. A photodetector measures the light that is transmitted. The Hemoglobin is directly measured and expressed in grams of hemoglobin per deciliter of whole blood. CELL-DYN® 3500 Operator's Manual. Abbott Diagnostics.

MCV - The Mean Cell Volume is the average volume of the individual red blood cells. The MCV is derived form the RBC size distribution data and is expressed in femtoliters. CELL-DYN® 3500 Operator's Manual. Abbott Diagnostics.

MCH - The Mean Corpuscular Hemoglobin is the average amount of hemoglobin contained in the red blood cell expressed in picograms. The MCH is calculated from the RBC and HGB as follows:

$$MCH = (HGB/RBC) \times 10$$

CELL-DYN® 3500 Operator's Manual. Abbott Diagnostics.

MCHC - The Mean Corpuscular Hemoglobin Concentration is the ratio of the weight of hemoglobin to the volume of the average red blood cell expressed in percent. It is calculated from the HGB and the HCT as follows:

$$MCHC = (HGB/HCT) \times 100$$

CELL-DYN® 3500 Operator's Manual. Abbot Diagnostics.

PLT - Platelets are counted and sized by the Aperture Impedance method. The Platelet Count is derived from the histogram after the PLT data has been analyzed by the platelet algorithm. The Platelet Count is expressed as $\#x10^3/\mu l$. CELL-DYN® 3500 Operator's Manual. Abbott Diagnostics.

RBC Count - The Red Blood Cells are counted and sized by the Aperture Impedance method. The Red Blood Cell Count is directly measured and given the number of RBC's. The RBC Count is expressed as $\#x10^6/\mu l$. CELL-DYN® 3500 Operator's Manual. Abbott Diagnostics.

WBC Count - The White Blood Cell Count is analyzed in two separate channels. Both an optical and impedance analysis are performed. Combining both methodologies minimizes any interference caused by the presence of fragile WBCs, NRBCs or lyse-resistant RBCs. The WBC Count is expressed as $\#x10^3/\mu L$. CELL-DYN® 3500 Operator's Manual. Abbott Diagnostics.

Hematology - CELL-DYN® 3500 (continued)

WBC Differential Count - The light scatter information is graphically presented in the form of scatterplots. Each cell analyzed is represented by a dot on the scatterplot. The dots are plotted at a point determined by the intersection of the channel information designated on the X and Y axes. The scatter information may be plotted in various combinations to yield different information. The CELL-DYN® 3500 uses the scatterplots to differentiate the WBCs into five subpopulations: Neutrophils, Eosinophils, Lymphocytes, Basophils and Monocytes. CELL-DYN® 3500 Operator's Manual. Abbott Diagnostics.

Hematology - Manual Methods

White Cell Differential - Manual Method of Counting 100 White Cells Stained with Wright Giemsa On-Line to Computer.

Urine Chemistry

Macroscopic

Color and Appearence - Characteristics that are visually inspected and entered via on-line into the data files.

Specific Gravity - Measurement obtained by use of hand refractometer which allows for direct determination of specific gravity of urine. ATAGO Urine Specific Gravity Refractometer which allows for direct determination of specific gravity of urine. ATAGO Urine Specific Gravity Refractometer. NSG Pression Cells, Inc. Farmington, New York.

Microscopic

Examination of urine sediment under a microscope and directly entering findings into the computer system.

Urine Chemistry (Qualitative)

Semiquantitative Analysis Using Chemistrip 9.

A 4-Week Inhalation Toxicity Study of Methane Sulfonic Acid in Albino Rats

APPENDIX F

Individual Clinical Observations

WEEKLY PHYSICAL EXAMINATIONS/DISPOSITIONS

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC.

INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 11-16-95 TO 12-28-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44091	M	0.00 MG/L	DISPOSITION	12-14-95	8:39	P	PRIMARY NECROPSY
44099	M	0.00 MG/L	DISPOSITION	12-14-95	8:37	P	PRIMARY NECROPSY
44103	M	0.00 MG/L	DISPOSITION	12-28-95	10:02	P	RECOVERY NECROPSY
44108	M	0.00 MG/L	DISPOSITION	12-28-95	10:02	P	RECOVERY NECROPSY
44114	M	0.00 MG/L	DISPOSITION	12-15-95	9:48	P	PRIMARY NECROPSY
44115	M	0.00 MG/L	DISPOSITION	12-28-95	10:02	P	RECOVERY NECROPSY
44121	M	0.00 MG/L	DISPOSITION	12-15-95	9:32	P	PRIMARY NECROPSY
44125	M	0.00 MG/L	DISPOSITION	11-21-95	14:44	P	FOUND DEAD
44131	M	0.00 MG/L	DISPOSITION	12-14-95	8:37	P	PRIMARY NECROPSY
44132	M	0.00 MG/L	DISPOSITION	12-15-95	9:32	P	PRIMARY NECROPSY
44135	M	0.00 MG/L	DISPOSITION	12-28-95	10:02	P	RECOVERY NECROPSY
44137	M	0.00 MG/L	DISPOSITION	12-28-95	10:03	P	RECOVERY NECROPSY
44141	M	0.00 MG/L	DISPOSITION	12-14-95	8:38	P	PRIMARY NECROPSY
44335	M	0.00 MG/L	DISPOSITION	11-22-95	12:21	P	FOUND DEAD
44337	M	0.00 MG/L	DISPOSITION	12-15-95	9:31	P	PRIMARY NECROPSY
44092	M	0.025 MG/L	DISPOSITION	12-14-95	8:37	P	PRIMARY NECROPSY
44093	M	0.025 MG/L	DISPOSITION	12-14-95	8:36	P	PRIMARY NECROPSY
44098	M	0.025 MG/L	DISPOSITION	12-28-95	10:04	P	RECOVERY NECROPSY
44101	M	0.025 MG/L	DISPOSITION	12-28-95	10:04	P	RECOVERY NECROPSY
44110	M	0.025 MG/L	DISPOSITION	12-15-95	9:31	P	PRIMARY NECROPSY
44113	M	0.025 MG/L	DISPOSITION	12-15-95	9:31	P	PRIMARY NECROPSY
44119	M	0.025 MG/L	DISPOSITION	12-28-95	10:04	P	RECOVERY NECROPSY
44126	M	0.025 MG/L	DISPOSITION	12-28-95	10:04	P	RECOVERY NECROPSY
44128	M	0.025 MG/L	DISPOSITION	12-28-95	10:04	P	RECOVERY NECROPSY
44138	M	0.025 MG/L	DISPOSITION	12-14-95	8:39	P	PRIMARY NECROPSY
44143	M	0.025 MG/L	DISPOSITION	12-15-95	9:32	P	PRIMARY NECROPSY
44144	M	0.025 MG/L	DISPOSITION	12-15-95	9:33	P	PRIMARY NECROPSY
44147	M	0.025 MG/L	DISPOSITION	12-14-95	8:37	P	PRIMARY NECROPSY
44339	M	0.025 MG/L	DISPOSITION	12-15-95	9:33	P	PRIMARY NECROPSY

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

WEEKLY PHYSICAL EXAMINATIONS/DISPOSITIONS
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-28-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44342	M	0.025 MG/L	DISPOSITION	12-14-95	8:38	P	PRIMARY NECROPSY
44094	M	0.075 MG/L	DISPOSITION	12-28-95	10:05	P	RECOVERY NECROPSY
44096	M	0.075 MG/L	DISPOSITION	12-28-95	10:05	P	RECOVERY NECROPSY
44100	M	0.075 MG/L	DISPOSITION	12-28-95	10:05	P	RECOVERY NECROPSY
44107	M	0.075 MG/L	DISPOSITION	12-14-95	8:35	P	PRIMARY NECROPSY
44111	M	0.075 MG/L	DISPOSITION	12-15-95	9:34	P	PRIMARY NECROPSY
44116	M	0.075 MG/L	DISPOSITION	12-15-95	9:31	P	PRIMARY NECROPSY
44118	M	0.075 MG/L	DISPOSITION	12-14-95	8:36	P	PRIMARY NECROPSY
44124	M	0.075 MG/L	DISPOSITION	12-14-95	8:39	P	PRIMARY NECROPSY
44129	M	0.075 MG/L	DISPOSITION	12-14-95	8:35	P	PRIMARY NECROPSY
44134	M	0.075 MG/L	DISPOSITION	12-28-95	10:05	P	RECOVERY NECROPSY
44140	M	0.075 MG/L	DISPOSITION	12-14-95	8:38	P	PRIMARY NECROPSY
44142	M	0.075 MG/L	DISPOSITION	12-15-95	9:34	P	PRIMARY NECROPSY
44145	M	0.075 MG/L	DISPOSITION	12-15-95	9:35	P	PRIMARY NECROPSY
44333	M	0.075 MG/L	DISPOSITION	12-15-95	9:35	P	PRIMARY NECROPSY
44340	M	0.075 MG/L	DISPOSITION	12-28-95	10:05	P	RECOVERY NECROPSY
44097	M	0.25 MG/L	DISPOSITION	12-28-95	10:06	P	RECOVERY NECROPSY
44102	M	0.25 MG/L	DISPOSITION	12-14-95	8:37	P	PRIMARY NECROPSY
44104	M	0.25 MG/L	DISPOSITION	12-15-95	9:34	P	PRIMARY NECROPSY
44089	M	0.25 MG/L	DISPOSITION	12-28-95	10:06	P	RECOVERY NECROPSY
44109	M	0.25 MG/L	DISPOSITION	12-14-95	8:38	P	PRIMARY NECROPSY
44112	M	0.25 MG/L	DISPOSITION	12-28-95	10:06	P	RECOVERY NECROPSY
44120	M	0.25 MG/L	DISPOSITION	11-21-95	14:21	P	FOUND DEAD
44123	M	0.25 MG/L	DISPOSITION	12-28-95	10:06	P	RECOVERY NECROPSY
44130	M	0.25 MG/L	DISPOSITION	12-14-95	8:39	P	PRIMARY NECROPSY
44133	M	0.25 MG/L	DISPOSITION	12-28-95	10:06	P	RECOVERY NECROPSY
44136	M	0.25 MG/L	DISPOSITION	12-15-95	9:34	P	PRIMARY NECROPSY
44139	M	0.25 MG/L	DISPOSITION	12-14-95	8:39	P	PRIMARY NECROPSY
44146	M	0.25 MG/L	DISPOSITION	12-15-95	9:32	P	PRIMARY NECROPSY

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

WEEKLY PHYSICAL EXAMINATIONS/DISPOSITIONS

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC.

INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 11-16-95 TO 12-28-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44334	M	0.25 MG/L	DISPOSITION	12-14-95	8:36	P	PRIMARY NECROPSY
44338	M	0.25 MG/L	DISPOSITION	12-15-95	9:34	P	PRIMARY NECROPSY
44149	F	0.00 MG/L	DISPOSITION	12-28-95	10:03	P	RECOVERY NECROPSY
44151	F	0.00 MG/L	DISPOSITION	12-28-95	10:03	P	RECOVERY NECROPSY
44154	F	0.00 MG/L	DISPOSITION	12-14-95	8:39	P	PRIMARY NECROPSY
44156	F	0.00 MG/L	DISPOSITION	12-28-95	10:03	P	RECOVERY NECROPSY
44157	F	0.00 MG/L	DISPOSITION	11-22-95	13:46	P	FOUND DEAD
44164	F	0.00 MG/L	DISPOSITION	12-15-95	9:34	P	PRIMARY NECROPSY
44166	F	0.00 MG/L	DISPOSITION	11-28-95	8:27	P	FOUND DEAD
44176	F	0.00 MG/L	DISPOSITION	12-28-95	10:03	P	RECOVERY NECROPSY
44178	F	0.00 MG/L	DISPOSITION	12-15-95	9:34	P	PRIMARY NECROPSY
44180	F	0.00 MG/L	DISPOSITION	12-28-95	10:03	P	RECOVERY NECROPSY
44181	F	0.00 MG/L	DISPOSITION	12-15-95	9:32	P	PRIMARY NECROPSY
44204	F	0.00 MG/L	DISPOSITION	12-14-95	8:45	P	PRIMARY NECROPSY
44207	F	0.00 MG/L	DISPOSITION	12-14-95	8:39	P	PRIMARY NECROPSY
44346	F	0.00 MG/L	DISPOSITION	12-14-95	8:38	P	PRIMARY NECROPSY
44352	F	0.00 MG/L	DISPOSITION	12-15-95	9:32	P	PRIMARY NECROPSY
44159	F	0.025 MG/L	DISPOSITION	12-14-95	8:38	P	PRIMARY NECROPSY
44160	F	0.025 MG/L	DISPOSITION	12-14-95	8:39	P	PRIMARY NECROPSY
44162	F	0.025 MG/L	DISPOSITION	12-28-95	10:04	P	RECOVERY NECROPSY
44170	F	0.025 MG/L	DISPOSITION	12-14-95	8:36	P	PRIMARY NECROPSY
44172	F	0.025 MG/L	DISPOSITION	12-15-95	9:33	P	PRIMARY NECROPSY
44179	F	0.025 MG/L	DISPOSITION	12-15-95	9:33	P	PRIMARY NECROPSY
44183	F	0.025 MG/L	DISPOSITION	12-14-95	8:36	P	PRIMARY NECROPSY
44187	F	0.025 MG/L	DISPOSITION	12-28-95	10:04	P	RECOVERY NECROPSY
44191	F	0.025 MG/L	DISPOSITION	12-15-95	9:31	P	PRIMARY NECROPSY
44192	F	0.025 MG/L	DISPOSITION	12-15-95	9:35	P	PRIMARY NECROPSY
44194	F	0.025 MG/L	DISPOSITION	11-30-95	10:15	P	FOUND DEAD
44195	F	0.025 MG/L	DISPOSITION	12-28-95	10:04	P	RECOVERY NECROPSY

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

WEEKLY PHYSICAL EXAMINATIONS/DISPOSITIONS

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC.

INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 11-16-95 TO 12-28-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44201	F	0.025 MG/L	DISPOSITION	12-15-95	9:31	P	PRIMARY NECROPSY
44349	F	0.025 MG/L	DISPOSITION	12-28-95	10:04	P	RECOVERY NECROPSY
44350	F	0.025 MG/L	DISPOSITION	12-28-95	10:05	P	RECOVERY NECROPSY
44148	F	0.075 MG/L	DISPOSITION	11-22-95	14:37	P	FOUND DEAD
44150	F	0.075 MG/L	DISPOSITION	12-14-95	8:37	P	PRIMARY NECROPSY
44152	F	0.075 MG/L	DISPOSITION	12-15-95	9:33	P	PRIMARY NECROPSY
44161	F	0.075 MG/L	DISPOSITION	12-15-95	9:33	P	PRIMARY NECROPSY
44165	F	0.075 MG/L	DISPOSITION	12-28-95	10:05	P	RECOVERY NECROPSY
44169	F	0.075 MG/L	DISPOSITION	12-14-95	8:35	P	PRIMARY NECROPSY
44171	F	0.075 MG/L	DISPOSITION	12-14-95	8:37	P	PRIMARY NECROPSY
44186	F	0.075 MG/L	DISPOSITION	12-28-95	10:05	P	RECOVERY NECROPSY
44196	F	0.075 MG/L	DISPOSITION	12-28-95	10:06	P	RECOVERY NECROPSY
44197	F	0.075 MG/L	DISPOSITION	12-15-95	9:33	P	PRIMARY NECROPSY
44200	F	0.075 MG/L	DISPOSITION	12-28-95	10:06	P	RECOVERY NECROPSY
44202	F	0.075 MG/L	DISPOSITION	12-14-95	8:35	P	PRIMARY NECROPSY
44206	F	0.075 MG/L	DISPOSITION	12-28-95	10:06	P	RECOVERY NECROPSY
44344	F	0.075 MG/L	DISPOSITION	12-14-95	8:38	P	PRIMARY NECROPSY
44347	F	0.075 MG/L	DISPOSITION	12-15-95	9:35	P	PRIMARY NECROPSY
44155	F	0.25 MG/L	DISPOSITION	12-15-95	9:35	P	PRIMARY NECROPSY
44163	F	0.25 MG/L	DISPOSITION	11-22-95	14:53	P	FOUND DEAD
44167	F	0.25 MG/L	DISPOSITION	12-28-95	10:06	P	RECOVERY NECROPSY
44168	F	0.25 MG/L	DISPOSITION	12-15-95	9:32	P	PRIMARY NECROPSY
44173	F	0.25 MG/L	DISPOSITION	12-11-95	12:45	P	FOUND DEAD
44175	F	0.25 MG/L	DISPOSITION	12-14-95	8:36	P	PRIMARY NECROPSY
44182	F	0.25 MG/L	DISPOSITION	12-28-95	10:07	P	RECOVERY NECROPSY
44184	F	0.25 MG/L	DISPOSITION	12-15-95	9:32	P	PRIMARY NECROPSY
44188	F	0.25 MG/L	DISPOSITION	11-24-95	9:10	P	FOUND DEAD
44189	F	0.25 MG/L	DISPOSITION	12-14-95	8:38	P	PRIMARY NECROPSY
44190	F	0.25 MG/L	DISPOSITION	12-14-95	8:35	P	PRIMARY NECROPSY

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

WEEKLY PHYSICAL EXAMINATIONS/DISPOSITIONS

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC.

INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 11-16-95 TO 12-28-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44198	F	0.25 MG/L	DISPOSITION	12-28-95	10:07	P	RECOVERY NECROPSY
44205	F	0.25 MG/L	DISPOSITION	12-28-95	10:07	P	RECOVERY NECROPSY
44345	F	0.25 MG/L	DISPOSITION	12-28-95	10:07	P	RECOVERY NECROPSY
44348	F	0.25 MG/L	DISPOSITION	12-11-95	14:46	P	FOUND DEAD

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PRIOR TO EXPOSURE

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC.

INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44103	M	0.00 MG/L	EXCRETA	12-14-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
				12-14-95	15:16	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
44114	M	0.00 MG/L	EXCRETA	11-24-95	6:26	P	BROWN MATTING AROUND ANUS
				12-14-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
44125	M	0.00 MG/L	EXCRETA	11-20-95	7:45	P	SOFT STOOL
44135	M	0.00 MG/L	EXCRETA	11-24-95	6:28	P	BROWN MATTING AROUND ANUS
44137	M	0.00 MG/L	EXCRETA	12-14-95	15:17	P	WET YELLOW UROGENITAL AREA MATTING
				12-14-95	15:17	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
44337	M	0.00 MG/L	EXCRETA	12-14-95	15:17	P	WET YELLOW UROGENITAL AREA MATTING
44092	M	0.025 MG/L	CARDIO-PULMONARY	11-23-95	6:46	P	RALES
44098	M	0.025 MG/L	CARDIO-PULMONARY	12-14-95	15:19	P	RALES
44098	M	0.025 MG/L	ORAL/DENTAL	12-12-95	7:18	P	DRIED YELLOW CRANIAL AREA MATTING
44101	M	0.025 MG/L	EXCRETA	12-14-95	15:19	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
44113	M	0.025 MG/L	ORAL/DENTAL	12-12-95	7:19	P	DRIED YELLOW CRANIAL AREA MATTING
44128	M	0.025 MG/L	EXCRETA	12-14-95	15:19	P	WET YELLOW UROGENITAL AREA MATTING
44143	M	0.025 MG/L	EXCRETA	12-14-95	15:20	P	WET YELLOW UROGENITAL AREA MATTING
44144	M	0.025 MG/L	EXCRETA	12-14-95	15:20	P	WET YELLOW UROGENITAL AREA MATTING
44094	M	0.075 MG/L	EXCRETA	12-14-95	15:22	P	WET YELLOW UROGENITAL AREA MATTING
44096	M	0.075 MG/L	EXCRETA	12-14-95	15:22	P	WET YELLOW UROGENITAL AREA MATTING
44100	M	0.075 MG/L	EXCRETA	12-14-95	15:22	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
44116	M	0.075 MG/L	EXCRETA	12-14-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
44129	M	0.075 MG/L	EXCRETA	11-23-95	6:26	P	DRIED YELLOW UROGENITAL AREA MATTING
				11-27-95	7:11	P	DRIED YELLOW UROGENITAL AREA MATTING
				12-12-95	7:14	P	BROWN MATTING AROUND ANUS
44142	M	0.075 MG/L	CARDIO-PULMONARY	12-14-95	15:24	P	RALES
44145	M	0.075 MG/L	EXCRETA	12-14-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
				12-14-95	15:23	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
44333	M	0.075 MG/L	EXCRETA	11-23-95	6:28	P	BROWN MATTING AROUND ANUS
				11-24-95	6:11	P	BROWN MATTING AROUND ANUS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PRIOR TO EXPOSURE

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC.

INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44333	M	0.075 MG/L	EXCRETA	12-14-95	15:23	P	WET BROWN UROGENITAL AREA MATTING
44340	M	0.075 MG/L	EXCRETA	11-16-95	7:58	P	SOFT STOOL
				12-14-95	15:23	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
44097	M	0.25 MG/L	EXCRETA	12-14-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING
44102	M	0.25 MG/L	CARDIO-PULMONARY	12-11-95	7:03	P	RALES
44102	M	0.25 MG/L	EXCRETA	11-24-95	6:16	P	DRIED YELLOW UROGENITAL AREA MATTING
				11-24-95	6:16	P	DRIED YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-24-95	6:16	P	DRIED YELLOW VENTRAL THORACIC AREA MATTING
44104	M	0.25 MG/L	EXCRETA	12-14-95	15:26	P	WET YELLOW UROGENITAL AREA MATTING
44089	M	0.25 MG/L	EXCRETA	12-14-95	15:26	P	WET YELLOW UROGENITAL AREA MATTING
44109	M	0.25 MG/L	CARDIO-PULMONARY	11-27-95	6:54	P	RALES
44112	M	0.25 MG/L	CARDIO-PULMONARY	12-14-95	15:27	P	RALES
44112	M	0.25 MG/L	EXCRETA	12-14-95	15:26	P	WET BROWN UROGENITAL AREA MATTING
44123	M	0.25 MG/L	EXCRETA	12-14-95	15:26	P	WET YELLOW UROGENITAL AREA MATTING
44130	M	0.25 MG/L	CARDIO-PULMONARY	12-11-95	7:07	P	RALES
44133	M	0.25 MG/L	CARDIO-PULMONARY	11-23-95	6:46	P	RALES
44133	M	0.25 MG/L	EXCRETA	12-14-95	15:26	P	WET YELLOW UROGENITAL AREA MATTING
				12-14-95	15:26	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
44139	M	0.25 MG/L	CARDIO-PULMONARY	12-06-95	7:01	P	RALES
				12-07-95	7:08	P	RALES
44139	M	0.25 MG/L	BODY/INTEGUMENT	11-22-95	7:30	P	DRIED GREEN CRANIAL AREA MATTING
				11-24-95	6:19	P	DRIED GREEN CRANIAL AREA MATTING
				12-12-95	7:12	P	DRIED GREEN CRANIAL AREA MATTING
44334	M	0.25 MG/L	EXCRETA	11-23-95	6:36	P	BROWN MATTING AROUND ANUS
				11-24-95	6:20	P	DRIED YELLOW DORSAL ABDOMINAL AREA MATTING
44338	M	0.25 MG/L	CARDIO-PULMONARY	12-14-95	15:27	P	RALES
44338	M	0.25 MG/L	EXCRETA	11-23-95	6:37	P	BROWN MATTING AROUND ANUS
				11-24-95	6:21	P	BROWN MATTING AROUND ANUS
				12-14-95	15:27	P	WET YELLOW UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PRIOR TO EXPOSURE

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC.

INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44338	M	0.25 MG/L	EXCRETA	12-14-95	15:27	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-14-95	15:27	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
44156	F	0.00 MG/L	EXCRETA	12-14-95	15:17	P	WET BROWN UROGENITAL AREA MATTING
				12-14-95	15:17	P	WET BROWN DORSAL POSTERIOR MATTING
44178	F	0.00 MG/L	EXCRETA	12-14-95	15:18	P	WET YELLOW UROGENITAL AREA MATTING
				12-14-95	15:18	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-14-95	15:18	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-14-95	15:18	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
44181	F	0.00 MG/L	EXCRETA	12-14-95	15:18	P	WET YELLOW UROGENITAL AREA MATTING
44204	F	0.00 MG/L	EXCRETA	11-24-95	6:30	P	DRIED YELLOW UROGENITAL AREA MATTING
44352	F	0.00 MG/L	EXCRETA	11-24-95	6:31	P	BROWN MATTING AROUND ANUS
				11-24-95	6:31	P	DRIED YELLOW UROGENITAL AREA MATTING
				12-14-95	15:18	P	WET YELLOW UROGENITAL AREA MATTING
44162	F	0.025 MG/L	EXCRETA	12-14-95	15:20	P	WET BROWN UROGENITAL AREA MATTING
				12-14-95	15:20	P	WET BROWN DORSAL POSTERIOR MATTING
44192	F	0.025 MG/L	EXCRETA	12-14-95	15:21	P	WET YELLOW UROGENITAL AREA MATTING
				12-14-95	15:21	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
44195	F	0.025 MG/L	EXCRETA	12-14-95	15:21	P	WET YELLOW UROGENITAL AREA MATTING
				12-14-95	15:21	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
44349	F	0.025 MG/L	EXCRETA	11-27-95	7:09	P	DRIED YELLOW UROGENITAL AREA MATTING
				12-14-95	15:21	P	WET YELLOW UROGENITAL AREA MATTING
				12-14-95	15:21	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-14-95	15:21	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
44171	F	0.075 MG/L	EXCRETA	12-12-95	7:14	P	BROWN MATTING AROUND ANUS
44197	F	0.075 MG/L	EXCRETA	11-27-95	7:14	P	DRIED YELLOW UROGENITAL AREA MATTING
				12-14-95	15:24	P	WET BROWN UROGENITAL AREA MATTING
44200	F	0.075 MG/L	EXCRETA	11-24-95	6:13	P	DRIED YELLOW DORSAL ABDOMINAL AREA MATTING
				11-27-95	7:15	P	DRIED YELLOW UROGENITAL AREA MATTING
				12-12-95	7:13	P	BROWN MATTING AROUND ANUS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PRIOR TO EXPOSURE

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC.

INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44200	F	0.075 MG/L	EXCRETA	12-14-95	15:25	P	WET BROWN UROGENITAL AREA MATTING
				12-14-95	15:25	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-14-95	15:25	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				12-14-95	15:25	P	WET BROWN DORSAL POSTERIOR MATTING
44202	F	0.075 MG/L	EXCRETA	11-24-95	6:14	P	DRIED YELLOW UROGENITAL AREA MATTING
				11-24-95	6:14	P	DRIED YELLOW DORSAL ABDOMINAL AREA MATTING
				11-27-95	7:15	P	DRIED YELLOW UROGENITAL AREA MATTING
44344	F	0.075 MG/L	EXCRETA	11-23-95	6:31	P	BROWN MATTING AROUND ANUS
				11-24-95	6:15	P	BROWN MATTING AROUND ANUS
				12-12-95	7:13	P	BROWN MATTING AROUND ANUS
44347	F	0.075 MG/L	EXCRETA	11-23-95	6:30	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-23-95	6:30	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				12-14-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING
				12-14-95	15:25	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-14-95	15:25	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				12-14-95	15:25	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
44155	F	0.25 MG/L	EXCRETA	12-14-95	15:28	P	WET BROWN UROGENITAL AREA MATTING
				12-14-95	15:28	P	WET BROWN DORSAL POSTERIOR MATTING
44163	F	0.25 MG/L	EXCRETA	11-17-95	7:07	P	DRIED YELLOW UROGENITAL AREA MATTING
				11-17-95	7:07	P	DRIED YELLOW VENTRAL ABDOMINAL AREA MATTING
44168	F	0.25 MG/L	CARDIO-PULMONARY	11-29-95	7:15	P	RALES
				12-05-95	7:04	P	RALES
				12-07-95	7:08	P	RALES
44168	F	0.25 MG/L	EXCRETA	12-14-95	15:28	P	WET BROWN UROGENITAL AREA MATTING
				12-14-95	15:28	P	WET BROWN DORSAL POSTERIOR MATTING
				12-14-95	15:28	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
44182	F	0.25 MG/L	EXCRETA	12-14-95	15:28	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
44184	F	0.25 MG/L	EXCRETA	11-24-95	6:22	P	DRIED YELLOW VENTRAL ABDOMINAL AREA MATTING
44188	F	0.25 MG/L	EXCRETA	11-24-95	6:23	P	DRIED YELLOW UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PRIOR TO EXPOSURE

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC.

INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44345	F	0.25 MG/L	EXCRETA	11-24-95	6:24	P	DRIED YELLOW UROGENITAL AREA MATTING
				11-24-95	6:24	P	DRIED YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-24-95	6:24	P	DRIED YELLOW VENTRAL THORACIC AREA MATTING
				12-14-95	15:29	P	WET YELLOW UROGENITAL AREA MATTING
				12-14-95	15:29	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
44348	F	0.25 MG/L	EXCRETA	11-24-95	6:25	P	DRIED YELLOW UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC.

INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44091	M	0.00 MG/L	EXCRETA	11-21-95	15:20	P	WET YELLOW UROGENITAL AREA MATTING
				11-22-95	15:12	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:47	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:24	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:42	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
44099	M	0.00 MG/L	EXCRETA	11-16-95	15:41	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:47	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:21	P	WET YELLOW UROGENITAL AREA MATTING
				11-22-95	15:12	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:27	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:27	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-05-95	15:47	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:46	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:46	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-12-95	15:42	P	WET YELLOW UROGENITAL AREA MATTING
44103	M	0.00 MG/L	EXCRETA	11-21-95	15:21	P	WET YELLOW UROGENITAL AREA MATTING
				11-22-95	15:12	P	WET YELLOW UROGENITAL AREA MATTING
				11-22-95	15:12	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-24-95	14:48	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				11-29-95	15:24	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:24	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-29-95	15:24	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-30-95	15:19	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-01-95	15:14	P	WET YELLOW UROGENITAL AREA MATTING
				12-01-95	15:14	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				12-04-95	15:13	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-06-95	15:24	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:24	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE

A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44103	M	0.00 MG/L	EXCRETA	12-07-95	15:21	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-07-95	15:21	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				12-11-95	15:46	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-13-95	15:14	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
44114	M	0.00 MG/L	BEHAVIOR/CNS	11-24-95	14:49	P	GENERALLY UNKEMPT APPEARANCE
44114	M	0.00 MG/L	EXCRETA	11-20-95	15:47	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:21	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:21	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-22-95	15:13	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:28	P	WET BROWN UROGENITAL AREA MATTING
				11-24-95	14:48	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:48	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-24-95	14:48	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-24-95	14:48	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-24-95	14:48	P	WET YELLOW DORSAL THORACIC AREA MATTING
				12-05-95	15:48	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING
				12-07-95	15:21	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:46	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:43	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				12-13-95	15:15	P	WET YELLOW UROGENITAL AREA MATTING
44114	M	0.00 MG/L	ORAL/DENTAL	11-24-95	14:48	P	WET YELLOW CRANIAL AREA MATTING
44115	M	0.00 MG/L	EXCRETA	12-04-95	15:13	P	WET YELLOW UROGENITAL AREA MATTING
44121	M	0.00 MG/L	EXCRETA	11-16-95	15:42	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	15:04	P	BROWN MATTING AROUND ANUS
				11-20-95	15:48	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:21	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:21	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-22-95	15:13	P	WET YELLOW UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44121	M	0.00 MG/L	EXCRETA	11-22-95	15:13	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-04-95	15:13	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:48	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:25	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-06-95	15:25	P	WET BROWN DORSAL POSTERIOR MATTING
				12-06-95	15:25	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				12-06-95	15:25	P	WET YELLOW DORSAL THORACIC AREA MATTING
				12-07-95	15:22	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:47	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:43	P	WET YELLOW UROGENITAL AREA MATTING
44125	M	0.00 MG/L	EXCRETA	11-16-95	15:42	P	WET YELLOW UROGENITAL AREA MATTING
44131	M	0.00 MG/L	EXCRETA	11-21-95	15:21	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-21-95	15:21	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-21-95	15:21	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-23-95	15:28	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:20	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:20	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-29-95	15:24	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:24	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-04-95	15:13	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:25	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-13-95	15:15	P	WET YELLOW UROGENITAL AREA MATTING
44131	M	0.00 MG/L	ORAL/DENTAL	11-27-95	15:20	P	WET YELLOW CRANIAL AREA MATTING
44132	M	0.00 MG/L	BEHAVIOR/CNS	11-27-95	15:20	P	GENERALLY UNKEMPT APPEARANCE
44132	M	0.00 MG/L	EXCRETA	11-16-95	15:42	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:49	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-27-95	15:20	P	WET YELLOW UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44132	M	0.00 MG/L	EXCRETA	11-27-95	15:20	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-27-95	15:20	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-30-95	15:20	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:13	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:43	P	WET YELLOW UROGENITAL AREA MATTING
44135	M	0.00 MG/L	EXCRETA	11-16-95	15:42	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:21	P	WET YELLOW UROGENITAL AREA MATTING
				11-22-95	15:13	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:29	P	WET BROWN UROGENITAL AREA MATTING
				11-23-95	15:29	P	WET BROWN DORSAL POSTERIOR MATTING
				11-28-95	15:19	P	WET YELLOW UROGENITAL AREA MATTING
44137	M	0.00 MG/L	EXCRETA	11-16-95	15:43	P	WET YELLOW UROGENITAL AREA MATTING
				11-16-95	15:43	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-17-95	15:06	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	15:06	P	SOFT STOOL
				11-17-95	15:06	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-17-95	15:06	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-20-95	15:48	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:21	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:29	P	WET BROWN UROGENITAL AREA MATTING
				11-24-95	14:50	P	DRIED YELLOW UROGENITAL AREA MATTING
				11-27-95	15:20	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:19	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:19	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-28-95	15:19	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-28-95	15:19	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-29-95	15:24	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-29-95	15:24	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-29-95	15:24	P	WET YELLOW DORSAL THORACIC AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44137	M	0.00 MG/L	EXCRETA	11-29-95	15:24	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-29-95	15:24	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-29-95	15:24	P	WET YELLOW MATTING VENTRAL NECK
				11-30-95	15:20	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:20	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-05-95	15:48	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:21	P	WET YELLOW UROGENITAL AREA MATTING
44137	M	0.00 MG/L	ORAL/DENTAL	11-29-95	15:25	P	WET YELLOW CRANIAL AREA MATTING
44335	M	0.00 MG/L	BEHAVIOR/CNS	11-21-95	15:22	P	GENERALLY UNKEMPT APPEARANCE
44335	M	0.00 MG/L	EXCRETA	11-16-95	15:43	P	WET YELLOW UROGENITAL AREA MATTING
				11-16-95	15:43	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-17-95	15:06	P	WET BROWN UROGENITAL AREA MATTING
				11-17-95	15:06	P	WET BROWN DORSAL POSTERIOR MATTING
				11-20-95	15:49	P	WET BROWN UROGENITAL AREA MATTING
				11-20-95	15:49	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-20-95	15:49	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-21-95	15:22	P	WET BROWN UROGENITAL AREA MATTING
44337	M	0.00 MG/L	EXCRETA	11-29-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:21	P	WET YELLOW UROGENITAL AREA MATTING
				12-01-95	15:15	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:14	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:22	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:22	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-12-95	15:44	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-13-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
44092	M	0.025 MG/L	CARDIO-PULMONARY	12-13-95	15:18	P	RALES
44092	M	0.025 MG/L	EXCRETA	11-22-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
				11-22-95	15:16	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-27-95	15:26	P	WET YELLOW DORSAL POSTERIOR AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44092	M	0.025 MG/L	EXCRETA	11-28-95	15:22	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:15	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:15	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-05-95	15:29	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-06-95	15:28	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:28	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				12-11-95	15:28	P	WET BROWN DORSAL POSTERIOR MATTING
				12-11-95	15:28	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-11-95	15:28	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				12-12-95	15:46	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:46	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-12-95	15:46	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
44093	M	0.025 MG/L	EXCRETA	11-21-95	15:24	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:54	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:26	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:26	P	WET BROWN DORSAL POSTERIOR MATTING
				11-28-95	15:22	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:10	P	WET YELLOW UROGENITAL AREA MATTING
				12-01-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:16	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
44098	M	0.025 MG/L	EXCRETA	11-21-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING
				11-22-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:54	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:22	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:10	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:29	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:29	P	WET YELLOW DORSAL POSTERIOR AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44098	M	0.025 MG/L	EXCRETA	12-12-95	15:46	P	WET YELLOW UROGENITAL AREA MATTING
44101	M	0.025 MG/L	CARDIO-PULMONARY	12-12-95	15:47	P	RALES
44101	M	0.025 MG/L	EXCRETA	11-17-95	14:47	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:08	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-29-95	15:10	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:16	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-05-95	15:30	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:30	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-11-95	15:29	P	WET YELLOW UROGENITAL AREA MATTING
44110	M	0.025 MG/L	EXCRETA	11-23-95	15:08	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:10	P	WET YELLOW UROGENITAL AREA MATTING
				12-01-95	15:17	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:30	P	WET YELLOW UROGENITAL AREA MATTING
44113	M	0.025 MG/L	EXCRETA	11-17-95	14:47	P	WET YELLOW UROGENITAL AREA MATTING
44113	M	0.025 MG/L	ORAL/DENTAL	12-08-95	15:25	P	WET RED CRANIAL AREA MATTING
44119	M	0.025 MG/L	EXCRETA	11-16-95	15:48	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	14:47	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:20	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING
				11-22-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:08	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:27	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:10	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:29	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:29	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-06-95	15:29	P	WET YELLOW VENTRAL THORACIC AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44119	M	0.025 MG/L	EXCRETA	12-06-95	15:29	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-06-95	15:29	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				12-06-95	15:29	P	WET YELLOW DORSAL THORACIC AREA MATTING
				12-12-95	15:47	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
44119	M	0.025 MG/L	ORAL/DENTAL	12-06-95	15:29	P	WET YELLOW CRANIAL AREA MATTING
44126	M	0.025 MG/L	EXCRETA	11-24-95	14:55	P	WET YELLOW DORSAL THORACIC AREA MATTING
44128	M	0.025 MG/L	EXCRETA	11-17-95	14:47	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:20	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:20	P	DRIED YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-23-95	15:09	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:09	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-04-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:30	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:26	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:26	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-11-95	15:30	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-12-95	15:48	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:48	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-13-95	15:19	P	WET YELLOW UROGENITAL AREA MATTING
44138	M	0.025 MG/L	EXCRETA	11-27-95	15:27	P	WET YELLOW DORSAL THORACIC AREA MATTING
44143	M	0.025 MG/L	EXCRETA	11-17-95	14:48	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	14:48	P	WET BROWN DORSAL POSTERIOR MATTING
				11-20-95	15:21	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:21	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-20-95	15:21	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-21-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:25	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-22-95	15:17	P	WET YELLOW UROGENITAL AREA MATTING
				11-22-95	15:17	P	WET YELLOW DORSAL POSTERIOR AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44143	M	0.025 MG/L	EXCRETA	11-24-95	14:55	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:16	P	WET BROWN UROGENITAL AREA MATTING
				11-29-95	15:11	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:24	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:24	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-01-95	15:17	P	WET YELLOW UROGENITAL AREA MATTING
				12-01-95	15:17	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-04-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:16	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-05-95	15:30	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-05-95	15:30	P	WET YELLOW UROGENITAL AREA MATTING
				12-07-95	15:26	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:26	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:26	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-11-95	15:30	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:49	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:49	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-12-95	15:49	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				12-13-95	15:20	P	WET YELLOW UROGENITAL AREA MATTING
44143	M	0.025 MG/L	ORAL/DENTAL	11-20-95	15:22	P	WET YELLOW CRANIAL AREA MATTING
44144	M	0.025 MG/L	EXCRETA	11-21-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:09	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:09	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-27-95	15:28	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:17	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:17	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-06-95	15:30	P	WET YELLOW UROGENITAL AREA MATTING
				12-07-95	15:26	P	WET YELLOW UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE

PROJECT NO.:WIL-160033
SPONSOR:ELF ATOCHEM INC.

A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44144	M	0.025 MG/L	EXCRETA	12-08-95	15:26	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:26	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-12-95	15:49	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:49	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
44147	M	0.025 MG/L	EXCRETA	11-16-95	15:48	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:23	P	DRIED YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-20-95	15:23	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				12-04-95	15:17	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:31	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:30	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:32	P	WET YELLOW UROGENITAL AREA MATTING
44339	M	0.025 MG/L	EXCRETA	11-21-95	15:26	P	WET YELLOW UROGENITAL AREA MATTING
44342	M	0.025 MG/L	EXCRETA	11-23-95	15:10	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:56	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:49	P	WET YELLOW UROGENITAL AREA MATTING
44094	M	0.075 MG/L	EXCRETA	11-16-95	15:51	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	14:51	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:32	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:29	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:13	P	WET BROWN UROGENITAL AREA MATTING
				11-23-95	15:13	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:13	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-24-95	14:31	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:31	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-28-95	15:26	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:13	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:13	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44094	M	0.075 MG/L	EXCRETA	11-30-95	15:07	P	WET YELLOW UROGENITAL AREA MATTING
				12-01-95	15:19	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:19	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:34	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:34	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-06-95	15:15	P	WET BROWN UROGENITAL AREA MATTING
				12-06-95	15:15	P	WET BROWN DORSAL POSTERIOR MATTING
				12-07-95	15:29	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:30	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:33	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:33	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-12-95	15:29	P	WET YELLOW UROGENITAL AREA MATTING
44094	M	0.075 MG/L	ORAL/DENTAL	11-24-95	14:32	P	WET YELLOW CRANIAL AREA MATTING
44096	M	0.075 MG/L	EXCRETA	11-16-95	15:51	P	WET YELLOW UROGENITAL AREA MATTING
				11-16-95	15:51	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-17-95	14:52	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	14:52	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-20-95	15:32	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-21-95	15:29	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:29	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-21-95	15:29	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-21-95	15:29	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-22-95	15:21	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:14	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:32	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:32	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-27-95	15:32	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:32	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-28-95	15:26	P	WET YELLOW UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44096	M	0.075 MG/L	EXCRETA	11-28-95	15:26	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-29-95	15:14	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:07	P	WET YELLOW UROGENITAL AREA MATTING
				12-01-95	15:19	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:19	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:19	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				12-05-95	15:34	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:34	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-06-95	15:15	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:15	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-07-95	15:29	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:30	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:33	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:29	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-13-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
44100	M	0.075 MG/L	EXCRETA	11-21-95	15:29	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:29	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-21-95	15:29	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-23-95	15:14	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-24-95	14:32	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-24-95	14:32	P	WET YELLOW DORSAL THORACIC AREA MATTING
				12-04-95	15:19	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:19	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-04-95	15:19	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				12-04-95	15:19	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				12-11-95	15:34	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-12-95	15:30	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
44100	M	0.075 MG/L	ORAL/DENTAL	11-24-95	14:32	P	WET YELLOW CRANIAL AREA MATTING
44107	M	0.075 MG/L	EXCRETA	11-16-95	15:51	P	WET BROWN UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44107	M	0.075 MG/L	EXCRETA	11-21-95	15:29	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:29	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-22-95	15:21	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:33	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:26	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:14	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:07	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:07	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-01-95	15:19	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:20	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:34	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:16	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-08-95	15:30	P	WET BROWN UROGENITAL AREA MATTING
				12-12-95	15:30	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:30	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-13-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
				12-13-95	15:23	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
44111	M	0.075 MG/L	EXCRETA	11-21-95	15:30	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:30	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-21-95	15:30	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-21-95	15:30	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-24-95	14:33	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:34	P	WET YELLOW UROGENITAL AREA MATTING
44111	M	0.075 MG/L	ORAL/DENTAL	11-21-95	15:30	P	WET YELLOW CRANIAL AREA MATTING
44116	M	0.075 MG/L	EXCRETA	11-17-95	14:52	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	14:52	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-20-95	15:33	P	WET YELLOW UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44116	M	0.075 MG/L	EXCRETA	11-21-95	15:30	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:30	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-21-95	15:30	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-21-95	15:30	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-22-95	15:21	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:14	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:14	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-24-95	14:33	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-28-95	15:27	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:14	P	WET YELLOW UROGENITAL AREA MATTING
				12-01-95	15:19	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:20	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:20	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-05-95	15:35	P	.WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:30	P	WET BROWN UROGENITAL AREA MATTING
				12-12-95	15:30	P	WET YELLOW UROGENITAL AREA MATTING
				12-13-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
44118	M	0.075 MG/L	EXCRETA	11-20-95	15:33	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:33	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-21-95	15:30	P	WET BROWN UROGENITAL AREA MATTING
				11-21-95	15:30	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-21-95	15:30	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-21-95	15:30	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-21-95	15:30	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-21-95	15:30	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-22-95	15:21	P	WET YELLOW UROGENITAL AREA MATTING
				11-22-95	15:21	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-22-95	15:21	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44118	M	0.075 MG/L	EXCRETA	11-23-95	15:14	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:14	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-23-95	15:15	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-24-95	14:33	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:33	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-24-95	14:33	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-27-95	15:33	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:33	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-30-95	15:07	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:07	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-30-95	15:07	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				12-01-95	15:19	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:20	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:20	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-05-95	15:35	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:35	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-05-95	15:35	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				12-05-95	15:35	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-05-95	15:35	P	WET YELLOW DORSAL THORACIC AREA MATTING
				12-06-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:16	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-08-95	15:31	P	BROWN MATTING AROUND ANUS
				12-11-95	15:34	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:34	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-11-95	15:34	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				12-11-95	15:34	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
44118	M	0.075 MG/L	ORAL/DENTAL	11-21-95	15:31	P	WET YELLOW CRANIAL AREA MATTING
				11-24-95	14:33	P	WET YELLOW CRANIAL AREA MATTING
44124	M	0.075 MG/L	EXCRETA	11-21-95	15:31	P	WET YELLOW UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44124	M	0.075 MG/L	EXCRETA	11-21-95	15:31	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-21-95	15:31	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-21-95	15:31	P	WET YELLOW DORSAL THORACIC AREA MATTING
				12-04-95	15:21	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:35	P	WET YELLOW UROGENITAL AREA MATTING
44124	M	0.075 MG/L	ORAL/DENTAL	11-21-95	15:31	P	WET YELLOW CRANIAL AREA MATTING
44129	M	0.075 MG/L	EXCRETA	11-16-95	15:51	P	WET BROWN UROGENITAL AREA MATTING
				11-17-95	14:52	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:31	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:31	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-21-95	15:31	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-23-95	15:15	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:27	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:21	P	WET BROWN UROGENITAL AREA MATTING
				12-05-95	15:35	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:35	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-11-95	15:35	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-12-95	15:31	P	WET YELLOW UROGENITAL AREA MATTING
44134	M	0.075 MG/L	EXCRETA	11-20-95	15:33	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:32	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:32	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-21-95	15:32	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-21-95	15:32	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-21-95	15:32	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-23-95	15:15	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-24-95	14:34	P	WET YELLOW UROGENITAL AREA MATTING
44140	M	0.075 MG/L	EXCRETA	11-16-95	15:52	P	WET BROWN UROGENITAL AREA MATTING
				11-16-95	15:52	P	WET YELLOW DORSAL POSTERIOR AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44140	M	0.075 MG/L	EXCRETA	11-17-95	14:52	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	14:52	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-17-95	14:52	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-21-95	15:32	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:32	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-22-95	15:22	P	WET YELLOW UROGENITAL AREA MATTING
				11-22-95	15:22	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-22-95	15:22	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-22-95	15:22	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-23-95	15:15	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:15	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-23-95	15:15	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-24-95	14:34	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:34	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-27-95	15:33	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:33	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-28-95	15:27	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:27	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-28-95	15:27	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-29-95	15:15	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:08	P	WET YELLOW UROGENITAL AREA MATTING
				12-01-95	15:20	P	WET YELLOW UROGENITAL AREA MATTING
				12-01-95	15:20	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-04-95	15:21	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:21	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-04-95	15:21	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-05-95	15:36	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:36	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-06-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44140	M	0.075 MG/L	EXCRETA	12-07-95	15:29	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:32	P	WET BROWN UROGENITAL AREA MATTING
				12-11-95	15:35	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				12-12-95	15:31	P	WET YELLOW UROGENITAL AREA MATTING
				12-13-95	15:24	P	WET YELLOW UROGENITAL AREA MATTING
44142	M	0.075 MG/L	CARDIO-PULMONARY	12-08-95	15:32	P	RALES
				12-12-95	15:31	P	RALES
				12-13-95	15:25	P	RALES
44142	M	0.075 MG/L	EXCRETA	11-21-95	15:32	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:32	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-21-95	15:32	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-21-95	15:32	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-28-95	15:27	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
44145	M	0.075 MG/L	EXCRETA	11-21-95	15:32	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-21-95	15:32	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-21-95	15:32	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-23-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:16	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-23-95	15:16	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-24-95	14:34	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:34	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-24-95	14:34	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-27-95	15:33	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:33	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-28-95	15:28	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:28	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-29-95	15:15	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:15	P	WET YELLOW DORSAL POSTERIOR AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

906

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44145	M	0.075 MG/L	EXCRETA	12-04-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:23	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				12-04-95	15:23	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-07-95	15:30	P	WET YELLOW UROGENITAL AREA MATTING
				12-07-95	15:30	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				12-08-95	15:32	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:32	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-11-95	15:36	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:36	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-11-95	15:36	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				12-11-95	15:36	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				12-12-95	15:32	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-12-95	15:32	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				12-12-95	15:32	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:32	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-13-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING
				12-13-95	15:25	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-13-95	15:25	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-13-95	15:25	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
44145	M	0.075 MG/L	ORAL/DENTAL	11-24-95	14:34	P	WET YELLOW CRANIAL AREA MATTING
44333	M	0.075 MG/L	EXCRETA	11-17-95	14:53	P	SOFT STOOL
				11-17-95	14:53	P	WET BROWN UROGENITAL AREA MATTING
				11-21-95	15:32	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:32	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-21-95	15:32	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-22-95	15:22	P	WET BROWN UROGENITAL AREA MATTING
				11-23-95	15:16	P	WET BROWN UROGENITAL AREA MATTING
				11-24-95	14:35	P	WET BROWN UROGENITAL AREA MATTING
				11-24-95	14:35	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44333	M	0.075 MG/L	EXCRETA	11-24-95	14:35	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-24-95	14:35	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-24-95	14:35	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-27-95	15:34	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:28	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:36	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:17	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:32	P	WET YELLOW UROGENITAL AREA MATTING
44333	M	0.075 MG/L	ORAL/DENTAL	11-24-95	14:35	P	WET YELLOW CRANIAL AREA MATTING
44340	M	0.075 MG/L	EXCRETA	11-20-95	15:34	P	WET BROWN UROGENITAL AREA MATTING
				11-20-95	15:34	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-21-95	15:33	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:33	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-22-95	15:22	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-23-95	15:17	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:17	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-24-95	14:35	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:28	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:15	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:09	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:09	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-30-95	15:09	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				12-04-95	15:29	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-04-95	15:29	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				12-05-95	15:36	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:33	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:33	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-11-95	15:36	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:32	P	WET YELLOW UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44097	M	0.25 MG/L	EXCRETA	11-16-95	15:55	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	14:55	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:38	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:13	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-22-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING
				11-22-95	15:25	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-23-95	15:21	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:21	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-24-95	14:39	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:12	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:31	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:31	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-29-95	15:18	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-04-95	15:37	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:37	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-04-95	15:37	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-04-95	15:37	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				12-05-95	15:38	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:19	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:36	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:39	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:35	P	WET YELLOW UROGENITAL AREA MATTING
				12-13-95	15:09	P	WET YELLOW UROGENITAL AREA MATTING
44102	M	0.25 MG/L	CARDIO-PULMONARY	11-21-95	15:14	P	RALES
				11-22-95	15:25	P	RALES
				11-24-95	14:40	P	RALES
				12-07-95	15:16	P	RALES
44102	M	0.25 MG/L	EXCRETA	11-17-95	14:56	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:14	P	WET YELLOW UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44102	M	0.25 MG/L	EXCRETA	11-21-95	15:14	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-21-95	15:14	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-22-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING
				11-22-95	15:25	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-22-95	15:25	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-23-95	15:21	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-23-95	15:21	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-24-95	14:39	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:39	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-24-95	14:39	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-27-95	15:12	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:12	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-27-95	15:12	P	WET BROWN DORSAL POSTERIOR MATTING
				11-28-95	15:31	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-28-95	15:31	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-29-95	15:18	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:12	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:12	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-04-95	15:38	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:38	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-04-95	15:38	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-06-95	15:19	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:35	P	WET YELLOW UROGENITAL AREA MATTING
44104	M	0.25 MG/L	CARDIO-PULMONARY	11-21-95	15:14	P	RALES
				11-22-95	15:26	P	RALES
44104	M	0.25 MG/L	EXCRETA	11-16-95	15:55	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	14:56	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:14	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:14	P	WET YELLOW DORSAL POSTERIOR AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44104	M	0.25 MG/L	EXCRETA	11-22-95	15:26	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:21	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:21	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-24-95	14:40	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:12	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:18	P	WET YELLOW UROGENITAL AREA MATTING
				12-01-95	15:10	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:38	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:38	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-06-95	15:19	P	WET YELLOW UROGENITAL AREA MATTING
				12-07-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:36	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:39	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:35	P	WET YELLOW UROGENITAL AREA MATTING
				12-13-95	15:09	P	WET YELLOW UROGENITAL AREA MATTING
44089	M	0.25 MG/L	CARDIO-PULMONARY	11-22-95	15:26	P	RALES
				12-05-95	15:39	P	RALES
				12-13-95	15:10	P	RALES
44089	M	0.25 MG/L	EXCRETA	11-16-95	15:55	P	WET YELLOW UROGENITAL AREA MATTING
				11-22-95	15:26	P	WET BROWN UROGENITAL AREA MATTING
				11-24-95	14:40	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:40	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-28-95	15:32	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:13	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:20	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:20	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-07-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:40	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:40	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44089	M	0.25 MG/L	EXCRETA	12-11-95	15:40	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				12-11-95	15:40	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-11-95	15:40	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				12-12-95	15:36	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
44109	M	0.25 MG/L	CARDIO-PULMONARY	11-21-95	15:14	P	RALES
				11-22-95	15:26	P	RALES
				12-08-95	15:37	P	RALES
				12-12-95	15:36	P	RALES
44109	M	0.25 MG/L	EXCRETA	11-17-95	14:56	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	14:56	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-17-95	14:56	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-17-95	14:56	P	WET YELLOW MATTING VENTRAL NECK
				11-17-95	14:56	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-17-95	14:56	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-28-95	15:32	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-11-95	15:40	P	WET BROWN UROGENITAL AREA MATTING
				12-11-95	15:40	P	WET BROWN DORSAL POSTERIOR MATTING
44112	M	0.25 MG/L	CARDIO-PULMONARY	11-21-95	15:15	P	RALES
				11-22-95	15:26	P	RALES
				11-23-95	15:22	P	RALES
44112	M	0.25 MG/L	EXCRETA	11-16-95	15:55	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	14:57	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:39	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:14	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:14	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-22-95	15:26	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:22	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:41	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:13	P	WET YELLOW UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44112	M	0.25 MG/L	EXCRETA	11-28-95	15:33	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:33	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-29-95	15:19	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:19	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-01-95	15:11	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:39	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:39	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-04-95	15:39	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-05-95	15:39	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:20	P	WET YELLOW UROGENITAL AREA MATTING
				12-07-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:37	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:37	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-11-95	15:41	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:36	P	WET BROWN UROGENITAL AREA MATTING
				12-13-95	15:10	P	WET YELLOW UROGENITAL AREA MATTING
44120	M	0.25 MG/L	CARDIO-PULMONARY	11-17-95	14:57	P	RALES
				11-20-95	15:40	P	RALES
44120	M	0.25 MG/L	EXCRETA	11-17-95	14:57	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	14:57	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-17-95	14:57	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-17-95	14:57	P	WET YELLOW MATTING VENTRAL NECK
				11-17-95	14:57	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-17-95	14:57	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-20-95	15:40	P	WET YELLOW UROGENITAL AREA MATTING
44123	M	0.25 MG/L	EXCRETA	11-17-95	14:58	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:15	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:15	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-22-95	15:26	P	WET YELLOW UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44123	M	0.25 MG/L	EXCRETA	11-22-95	15:26	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-23-95	15:22	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:41	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:41	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-28-95	15:33	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-29-95	15:18	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:18	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-30-95	15:13	P	WET BROWN UROGENITAL AREA MATTING
				12-01-95	15:11	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:39	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:20	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:37	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:41	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:36	P	WET YELLOW UROGENITAL AREA MATTING
				12-13-95	15:10	P	WET YELLOW UROGENITAL AREA MATTING
				12-13-95	15:10	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
44130	M	0.25 MG/L	CARDIO-PULMONARY	11-22-95	15:27	P	RALES
				12-12-95	15:39	P	RALES
44130	M	0.25 MG/L	EXCRETA	11-21-95	15:15	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:15	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-05-95	15:40	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:20	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:20	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-08-95	15:38	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:41	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:37	P	WET YELLOW UROGENITAL AREA MATTING
				12-13-95	15:10	P	WET YELLOW UROGENITAL AREA MATTING
44133	M	0.25 MG/L	CARDIO-PULMONARY	11-20-95	15:41	P	RALES
				11-27-95	15:14	P	RALES

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44133	M	0.25 MG/L	CARDIO-PULMONARY	12-04-95	15:40	P	RALES
				12-05-95	15:40	P	RALES
				12-06-95	15:21	P	RALES
44133	M	0.25 MG/L	EXCRETA	11-16-95	15:55	P	WET YELLOW UROGENITAL AREA MATTING
				11-16-95	15:55	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-17-95	14:58	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:41	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:15	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:15	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-22-95	15:27	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:41	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:32	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:15	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:14	P	WET YELLOW UROGENITAL AREA MATTING
				12-01-95	15:10	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:40	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:40	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:40	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-06-95	15:20	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:41	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:41	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-12-95	15:37	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:37	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-13-95	15:11	P	WET YELLOW UROGENITAL AREA MATTING
44133	M	0.25 MG/L	ORAL/DENTAL	11-24-95	14:41	P	WET YELLOW CRANIAL AREA MATTING
44136	M	0.25 MG/L	CARDIO-PULMONARY	11-22-95	15:27	P	RALES
44136	M	0.25 MG/L	EXCRETA	11-17-95	14:58	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:15	P	WET YELLOW UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44136	M	0.25 MG/L	EXCRETA	11-21-95	15:15	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-22-95	15:27	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:41	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:14	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:34	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:19	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:41	P	WET YELLOW UROGENITAL AREA MATTING
44139	M	0.25 MG/L	CARDIO-PULMONARY	11-22-95	15:27	P	RALES
				11-23-95	15:23	P	RALES
				12-06-95	15:21	P	RALES
				12-07-95	15:18	P	RALES
				12-08-95	15:39	P	RALES
				12-11-95	15:42	P	RALES
44139	M	0.25 MG/L	EXCRETA	11-16-95	15:55	P	WET YELLOW UROGENITAL AREA MATTING
				11-16-95	15:55	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-16-95	15:55	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-16-95	15:55	P	WET YELLOW MATTING VENTRAL NECK
				11-16-95	15:55	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-17-95	14:58	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	14:58	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-17-95	14:58	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-17-95	14:58	P	WET YELLOW MATTING VENTRAL NECK
				11-17-95	14:59	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-17-95	14:59	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-17-95	14:59	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-20-95	15:41	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:41	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-20-95	15:41	P	WET YELLOW VENTRAL THORACIC AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44139	M	0.25 MG/L	EXCRETA	11-20-95	15:41	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-20-95	15:41	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-21-95	15:15	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:15	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-22-95	15:27	P	WET BROWN UROGENITAL AREA MATTING
				11-22-95	15:27	P	WET BROWN DORSAL POSTERIOR MATTING
				11-23-95	15:23	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-23-95	15:23	P	WET BROWN DORSAL POSTERIOR MATTING
				11-23-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:23	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-24-95	14:42	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:42	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-24-95	14:42	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-24-95	14:42	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-24-95	14:42	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-27-95	15:14	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:34	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:34	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-28-95	15:34	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-28-95	15:34	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-29-95	15:19	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:19	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-29-95	15:19	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-30-95	15:15	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:15	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-30-95	15:15	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				12-01-95	15:11	P	WET YELLOW UROGENITAL AREA MATTING
				12-01-95	15:11	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-04-95	15:41	P	WET YELLOW UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44139	M	0.25 MG/L	EXCRETA	12-04-95	15:41	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-04-95	15:41	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-05-95	15:41	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:41	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-05-95	15:41	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-06-95	15:21	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:21	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-06-95	15:21	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				12-06-95	15:21	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-07-95	15:17	P	WET BROWN UROGENITAL AREA MATTING
				12-07-95	15:17	P	WET BROWN DORSAL POSTERIOR MATTING
				12-08-95	15:39	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:39	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-08-95	15:39	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				12-08-95	15:39	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-11-95	15:42	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:42	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-11-95	15:42	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				12-11-95	15:42	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-12-95	15:37	P	WET YELLOW UROGENITAL AREA MATTING
				12-13-95	15:11	P	WET BROWN UROGENITAL AREA MATTING
				12-13-95	15:11	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
44139	M	0.25 MG/L	ORAL/DENTAL	11-16-95	15:56	P	WET YELLOW FACIAL AREA MATTING
				11-17-95	14:58	P	WET YELLOW FACIAL AREA MATTING
				11-17-95	14:58	P	WET YELLOW CRANIAL AREA MATTING
				11-20-95	15:42	P	WET YELLOW CRANIAL AREA MATTING
				11-23-95	15:23	P	DRIED YELLOW CRANIAL AREA MATTING
44139	M	0.25 MG/L	BODY/INTEGUMENT	11-21-95	15:15	P	DRIED GREEN CRANIAL AREA MATTING
				11-22-95	15:27	P	DRIED GREEN CRANIAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44139	M	0.25 MG/L	BODY/INTEGUMENT	11-24-95	14:42	P	WET GREEN CRANIAL AREA MATTING
				11-27-95	15:14	P	WET GREEN CRANIAL AREA MATTING
				12-08-95	15:39	P	WET GREEN CRANIAL AREA MATTING
44146	M	0.25 MG/L	CARDIO-PULMONARY	11-23-95	15:24	P	RALES
				11-30-95	15:15	P	RALES
				12-11-95	15:42	P	RALES
44146	M	0.25 MG/L	EXCRETA	11-21-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:14	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:34	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:19	P	WET YELLOW UROGENITAL AREA MATTING
				12-01-95	15:11	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:41	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:41	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-05-95	15:41	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:22	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:42	P	WET YELLOW UROGENITAL AREA MATTING
44334	M	0.25 MG/L	EXCRETA	11-16-95	15:57	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	15:00	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	15:00	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-20-95	15:42	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:42	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-20-95	15:42	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-21-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:16	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-21-95	15:16	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-21-95	15:16	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-22-95	15:28	P	WET BROWN UROGENITAL AREA MATTING
				11-22-95	15:28	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-22-95	15:28	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44334	M	0.25 MG/L	EXCRETA	11-23-95	15:24	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:24	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-23-95	15:24	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-24-95	14:43	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:43	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-24-95	14:43	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-24-95	14:43	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-24-95	14:43	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-27-95	15:15	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:15	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-29-95	15:20	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:20	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-29-95	15:20	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-29-95	15:20	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-29-95	15:20	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-30-95	15:15	P	WET YELLOW UROGENITAL AREA MATTING
				12-01-95	15:11	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-04-95	15:42	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-05-95	15:42	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:42	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-05-95	15:42	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				12-12-95	15:38	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:38	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-13-95	15:11	P	WET BROWN UROGENITAL AREA MATTING
44334	M	0.25 MG/L	ORAL/DENTAL	11-20-95	15:42	P	WET YELLOW CRANIAL AREA MATTING
				11-24-95	14:43	P	WET YELLOW CRANIAL AREA MATTING
44338	M	0.25 MG/L	EXCRETA	11-17-95	15:00	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:16	P	WET YELLOW DORSAL POSTERIOR AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44338	M	0.25 MG/L	EXCRETA	11-22-95	15:28	P	WET BROWN UROGENITAL AREA MATTING
				11-22-95	15:28	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-22-95	15:28	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-22-95	15:28	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-23-95	15:24	P	WET BROWN UROGENITAL AREA MATTING
				11-24-95	14:43	P	WET BROWN UROGENITAL AREA MATTING
				11-24-95	14:43	P	DRIED YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-27-95	15:15	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:15	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-27-95	15:15	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-28-95	15:34	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:20	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:20	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-30-95	15:15	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:15	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-04-95	15:44	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:42	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:42	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-06-95	15:22	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:40	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:43	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:39	P	WET YELLOW UROGENITAL AREA MATTING
				12-13-95	15:12	P	WET YELLOW UROGENITAL AREA MATTING
44338	M	0.25 MG/L	ORAL/DENTAL	11-24-95	14:44	P	WET YELLOW CRANIAL AREA MATTING
44338	M	0.25 MG/L	BODY/INTEGUMENT	11-27-95	15:15	P	WET GREEN CRANIAL AREA MATTING
44149	F	0.00 MG/L	EXCRETA	11-23-95	15:29	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:29	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-24-95	14:50	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:50	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44149	F	0.00 MG/L	EXCRETA	11-24-95	14:50	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-28-95	15:20	P	WET BROWN DORSAL POSTERIOR MATTING
				12-06-95	15:26	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:48	P	WET YELLOW UROGENITAL AREA MATTING
44149	F	0.00 MG/L	ORAL/DENTAL	11-24-95	14:50	P	WET YELLOW CRANIAL AREA MATTING
44151	F	0.00 MG/L	EXCRETA	11-20-95	15:50	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:50	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-20-95	15:50	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-21-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:30	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:30	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-23-95	15:30	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-24-95	14:51	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:21	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:25	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-06-95	15:27	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:48	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
44151	F	0.00 MG/L	ORAL/DENTAL	11-20-95	15:50	P	WET YELLOW CRANIAL AREA MATTING
44154	F	0.00 MG/L	EXCRETA	11-23-95	15:30	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:20	P	WET BROWN UROGENITAL AREA MATTING
				11-28-95	15:20	P	WET BROWN DORSAL POSTERIOR MATTING
				11-29-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:21	P	WET YELLOW UROGENITAL AREA MATTING
				12-01-95	15:15	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:14	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:49	P	WET BROWN UROGENITAL AREA MATTING
				12-11-95	15:48	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:44	P	WET BROWN DORSAL POSTERIOR MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44154	F	0.00 MG/L	EXCRETA	12-13-95	15:16	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
44156	F	0.00 MG/L	EXCRETA	11-16-95	15:45	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	15:07	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:50	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:50	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-22-95	15:14	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:30	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:30	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-23-95	15:30	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-28-95	15:20	P	WET BROWN UROGENITAL AREA MATTING
				11-28-95	15:20	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				11-29-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:14	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:44	P	WET YELLOW UROGENITAL AREA MATTING
44157	F	0.00 MG/L	EXCRETA	11-20-95	15:50	P	WET YELLOW UROGENITAL AREA MATTING
44157	F	0.00 MG/L	ORAL/DENTAL	11-20-95	15:51	P	WET YELLOW CRANIAL AREA MATTING
44164	F	0.00 MG/L	EXCRETA	11-17-95	15:07	P	WET YELLOW UROGENITAL AREA MATTING
44166	F	0.00 MG/L	EXCRETA	11-16-95	15:45	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	15:07	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:23	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-27-95	15:22	P	WET YELLOW UROGENITAL AREA MATTING
44176	F	0.00 MG/L	EXCRETA	11-21-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
44178	F	0.00 MG/L	EXCRETA	11-17-95	15:07	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:51	P	WET BROWN UROGENITAL AREA MATTING
				11-21-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:23	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-22-95	15:15	P	WET YELLOW UROGENITAL AREA MATTING
				11-22-95	15:15	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44178	F	0.00 MG/L	EXCRETA	11-23-95	15:31	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:31	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-23-95	15:31	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-24-95	14:51	P	WET BROWN UROGENITAL AREA MATTING
				11-27-95	15:22	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:22	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-27-95	15:22	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-28-95	15:21	P	WET BROWN UROGENITAL AREA MATTING
				11-29-95	15:26	P	WET BROWN UROGENITAL AREA MATTING
				11-29-95	15:26	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-30-95	15:22	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:22	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-30-95	15:22	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				12-01-95	15:15	P	WET YELLOW UROGENITAL AREA MATTING
				12-01-95	15:15	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-01-95	15:15	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-04-95	15:14	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:49	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:49	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-06-95	15:27	P	WET BROWN UROGENITAL AREA MATTING
				12-06-95	15:27	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-06-95	15:27	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				12-07-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
				12-07-95	15:23	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-07-95	15:23	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				12-08-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:23	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-11-95	15:48	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:48	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44178	F	0.00 MG/L	EXCRETA	12-11-95	15:48	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				12-11-95	15:48	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-12-95	15:45	P	WET BROWN UROGENITAL AREA MATTING
				12-13-95	15:17	P	WET YELLOW UROGENITAL AREA MATTING
				12-13-95	15:17	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
44178	F	0.00 MG/L	ORAL/DENTAL	11-28-95	15:21	P	WET RED CRANIAL AREA MATTING
44181	F	0.00 MG/L	BEHAVIOR/CNS	11-21-95	15:24	P	GENERALLY UNKEMPT APPEARANCE
44181	F	0.00 MG/L	EXCRETA	11-16-95	15:45	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	15:07	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	15:07	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-17-95	15:07	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-20-95	15:52	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:24	P	WET BROWN UROGENITAL AREA MATTING
				11-23-95	15:31	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:31	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-24-95	14:52	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:22	P	WET BROWN DORSAL POSTERIOR MATTING
				11-29-95	15:26	P	WET BROWN UROGENITAL AREA MATTING
				12-11-95	15:49	P	WET BROWN UROGENITAL AREA MATTING
				12-12-95	15:45	P	WET BROWN UROGENITAL AREA MATTING
44204	F	0.00 MG/L	EXCRETA	11-16-95	15:46	P	WET YELLOW UROGENITAL AREA MATTING
				11-22-95	15:15	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:31	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:31	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-24-95	14:52	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:52	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-24-95	14:52	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-24-95	14:52	P	WET YELLOW DORSAL THORACIC AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44204	F	0.00 MG/L	EXCRETA	12-01-95	15:16	P	WET BROWN UROGENITAL AREA MATTING
				12-01-95	15:16	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				12-05-95	15:50	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:50	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-08-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:23	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-08-95	15:23	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				12-08-95	15:23	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-11-95	15:49	P	WET BROWN UROGENITAL AREA MATTING
44204	F	0.00 MG/L	ORAL/DENTAL	11-24-95	14:52	P	WET YELLOW CRANIAL AREA MATTING
44207	F	0.00 MG/L	EXCRETA	11-16-95	15:46	P	WET YELLOW UROGENITAL AREA MATTING
				11-16-95	15:46	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-16-95	15:46	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-17-95	15:08	P	WET BROWN UROGENITAL AREA MATTING
				11-20-95	15:52	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:52	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-20-95	15:52	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-21-95	15:24	P	WET YELLOW UROGENITAL AREA MATTING
				11-22-95	15:15	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:52	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:25	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-29-95	15:26	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:22	P	WET BROWN UROGENITAL AREA MATTING
				12-01-95	15:16	P	WET BROWN UROGENITAL AREA MATTING
				12-04-95	15:15	P	WET BROWN UROGENITAL AREA MATTING
				12-04-95	15:15	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-06-95	15:27	P	WET YELLOW UROGENITAL AREA MATTING
				12-07-95	15:23	P	WET BROWN UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44207	F	0.00 MG/L	EXCRETA	12-08-95	15:24	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:45	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:45	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
44346	F	0.00 MG/L	EXCRETA	11-23-95	15:32	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-24-95	14:52	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:52	P	DRIED YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-24-95	14:52	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-28-95	15:21	P	WET BROWN UROGENITAL AREA MATTING
				12-05-95	15:50	P	DRIED YELLOW UROGENITAL AREA MATTING
				12-06-95	15:28	P	WET YELLOW UROGENITAL AREA MATTING
				12-07-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
				12-07-95	15:23	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-11-95	15:49	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:49	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-12-95	15:46	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
44346	F	0.00 MG/L	ORAL/DENTAL	11-24-95	14:53	P	WET YELLOW CRANIAL AREA MATTING
44352	F	0.00 MG/L	BEHAVIOR/CNS	11-21-95	15:24	P	GENERALLY UNKEMPT APPEARANCE
44352	F	0.00 MG/L	EXCRETA	11-16-95	15:46	P	WET BROWN UROGENITAL AREA MATTING
				11-17-95	15:08	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	15:08	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-17-95	15:08	P	WET BROWN DORSAL POSTERIOR MATTING
				11-20-95	15:52	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:24	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:24	P	WET BROWN DORSAL POSTERIOR MATTING
				11-21-95	15:24	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-22-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:32	P	WET BROWN UROGENITAL AREA MATTING
				11-24-95	14:53	P	WET BROWN UROGENITAL AREA MATTING
				11-27-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44352	F	0.00 MG/L	EXCRETA	11-28-95	15:21	P	WET BROWN UROGENITAL AREA MATTING
				11-28-95	15:21	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				11-29-95	15:26	P	WET BROWN UROGENITAL AREA MATTING
				11-29-95	15:26	P	WET BROWN DORSAL POSTERIOR MATTING
				11-29-95	15:26	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				11-30-95	15:22	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:22	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-01-95	15:16	P	WET BROWN UROGENITAL AREA MATTING
				12-05-95	15:50	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:28	P	WET YELLOW UROGENITAL AREA MATTING
				12-07-95	15:24	P	WET BROWN UROGENITAL AREA MATTING
				12-08-95	15:24	P	WET BROWN UROGENITAL AREA MATTING
				12-11-95	15:49	P	WET BROWN UROGENITAL AREA MATTING
				12-12-95	15:46	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:46	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-13-95	15:17	P	WET BROWN UROGENITAL AREA MATTING
44352	F	0.00 MG/L	ORAL/DENTAL	11-24-95	14:53	P	WET YELLOW CRANIAL AREA MATTING
44139	F	0.025 MG/L	EXCRETA	11-20-95	15:24	P	WET BROWN UROGENITAL AREA MATTING
				11-21-95	15:26	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:26	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-22-95	15:18	P	WET BROWN UROGENITAL AREA MATTING
				11-22-95	15:18	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-23-95	15:10	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:56	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:56	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-24-95	14:56	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-24-95	14:56	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-24-95	14:56	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-27-95	15:28	P	WET YELLOW UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44159	F	0.025 MG/L	EXCRETA	11-28-95	15:24	P	DRIED YELLOW UROGENITAL AREA MATTING
				11-29-95	15:11	P	WET BROWN UROGENITAL AREA MATTING
				12-04-95	15:17	P	WET BROWN UROGENITAL AREA MATTING
				12-06-95	15:30	P	WET BROWN UROGENITAL AREA MATTING
				12-06-95	15:30	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				12-06-95	15:30	P	WET BROWN VENTRAL THORACIC AREA MATTING
				12-11-95	15:31	P	WET BROWN UROGENITAL AREA MATTING
44159	F	0.025 MG/L	ORAL/DENTAL	11-24-95	14:56	P	WET YELLOW CRANIAL AREA MATTING
44160	F	0.025 MG/L	EXCRETA	11-21-95	15:26	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:26	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
44162	F	0.025 MG/L	EXCRETA	11-17-95	14:48	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	14:48	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-20-95	15:25	P	WET BROWN UROGENITAL AREA MATTING
				11-20-95	15:25	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				11-20-95	15:25	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-21-95	15:26	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:26	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-21-95	15:26	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-23-95	15:10	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:10	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-23-95	15:10	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-24-95	14:56	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:56	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-24-95	14:56	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-27-95	15:29	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:24	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:11	P	WET BROWN UROGENITAL AREA MATTING
				11-30-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING
				12-01-95	15:18	P	WET YELLOW UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44162	F	0.025 MG/L	EXCRETA	12-04-95	15:17	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:32	P	WET YELLOW UROGENITAL AREA MATTING
				12-07-95	15:26	P	WET BROWN UROGENITAL AREA MATTING
				12-08-95	15:27	P	WET BROWN UROGENITAL AREA MATTING
				12-08-95	15:27	P	WET BROWN DORSAL POSTERIOR MATTING
				12-12-95	15:50	P	WET BROWN UROGENITAL AREA MATTING
				12-13-95	15:20	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
44162	F	0.025 MG/L	ORAL/DENTAL	11-20-95	15:25	P	WET YELLOW CRANIAL AREA MATTING
				11-24-95	14:57	P	WET YELLOW CRANIAL AREA MATTING
44170	F	0.025 MG/L	EXCRETA	11-22-95	15:19	P	WET BROWN UROGENITAL AREA MATTING
				11-23-95	15:11	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:11	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-24-95	14:57	P	WET BROWN UROGENITAL AREA MATTING
				11-24-95	14:57	P	DRIED YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-29-95	15:11	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:32	P	WET BROWN UROGENITAL AREA MATTING
44172	F	0.025 MG/L	EXCRETA	11-20-95	15:26	P	WET BROWN UROGENITAL AREA MATTING
				11-20-95	15:26	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-20-95	15:26	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-22-95	15:19	P	WET BROWN UROGENITAL AREA MATTING
				11-22-95	15:19	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-23-95	15:11	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-24-95	14:57	P	WET BROWN UROGENITAL AREA MATTING
				11-24-95	14:57	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-24-95	14:57	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				12-11-95	15:32	P	WET YELLOW UROGENITAL AREA MATTING
44172	F	0.025 MG/L	ORAL/DENTAL	11-24-95	14:57	P	WET YELLOW CRANIAL AREA MATTING
44179	F	0.025 MG/L	EXCRETA	11-16-95	15:49	P	WET YELLOW UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE

A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44179	F	0.025 MG/L	EXCRETA	11-16-95	15:49	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-17-95	14:49	P	DRIED YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-17-95	14:49	P	DRIED YELLOW VENTRAL THORACIC AREA MATTING
				11-17-95	14:49	P	WET BROWN UROGENITAL AREA MATTING
				11-20-95	15:26	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:26	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-20-95	15:26	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-20-95	15:26	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-21-95	15:26	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:26	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-24-95	14:57	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:29	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:29	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-27-95	15:29	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-27-95	15:29	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-28-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:25	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-30-95	15:26	P	WET BROWN UROGENITAL AREA MATTING
				11-30-95	15:26	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				11-30-95	15:26	P	WET BROWN VENTRAL THORACIC AREA MATTING
				12-04-95	15:18	P	WET YELLOW UROGENITAL AREA MATTING
				12-07-95	15:26	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:28	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:28	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-12-95	15:51	P	WET BROWN UROGENITAL AREA MATTING
				12-12-95	15:51	P	WET BROWN DORSAL POSTERIOR MATTING
				12-12-95	15:51	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-12-95	15:51	P	WET YELLOW VENTRAL THORACIC AREA MATTING
44183	F	0.025 MG/L	EXCRETA	11-24-95	14:57	P	WET YELLOW UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RAT'

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44183	F	0.025 MG/L	ORAL/DENTAL	11-24-95	14:58	P	WET YELLOW CRANIAL AREA MATTING
44187	F	0.025 MG/L	EXCRETA	11-17-95	14:49	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:27	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:27	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-21-95	15:26	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:26	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-21-95	15:26	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-24-95	14:58	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:58	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-29-95	15:12	P	WET YELLOW UROGENITAL AREA MATTING
44187	F	0.025 MG/L	ORAL/DENTAL	11-24-95	14:58	P	WET YELLOW CRANIAL AREA MATTING
44191	F	0.025 MG/L	EXCRETA	11-16-95	15:49	P	WET YELLOW UROGENITAL AREA MATTING
				11-16-95	15:49	P	WET BROWN UROGENITAL AREA MATTING
				11-16-95	15:49	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-16-95	15:49	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-20-95	15:28	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:27	P	WET YELLOW UROGENITAL AREA MATTING
				11-22-95	15:19	P	WET BROWN UROGENITAL AREA MATTING
				11-23-95	15:11	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-23-95	15:11	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:30	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:27	P	WET BROWN UROGENITAL AREA MATTING
				12-01-95	15:18	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:32	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:32	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-12-95	15:52	P	WET YELLOW UROGENITAL AREA MATTING
44192	F	0.025 MG/L	EXCRETA	11-20-95	15:28	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:28	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-20-95	15:28	P	WET YELLOW VENTRAL THORACIC AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44192	F	0.025 MG/L	EXCRETA	11-20-95	15:28	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-21-95	15:27	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:27	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-22-95	15:20	P	WET BROWN UROGENITAL AREA MATTING
				11-23-95	15:12	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:12	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-24-95	14:58	P	WET BROWN UROGENITAL AREA MATTING
				11-27-95	15:30	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:30	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-27-95	15:30	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-27-95	15:30	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-27-95	15:30	P	BROWN MATTING AROUND ANUS
				11-28-95	15:24	P	WET BROWN UROGENITAL AREA MATTING
				11-28-95	15:24	P	WET BROWN DORSAL POSTERIOR MATTING
				11-30-95	15:27	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:27	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-06-95	15:31	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:31	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-08-95	15:28	P	WET YELLOW UROGENITAL AREA MATTING
				12-13-95	15:22	P	WET BROWN UROGENITAL AREA MATTING
				12-13-95	15:22	P	WET BROWN DORSAL POSTERIOR MATTING
44194	F	0.025 MG/L	EXCRETA	11-16-95	15:51	P	WET YELLOW UROGENITAL AREA MATTING
				11-16-95	15:51	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-17-95	14:49	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	14:49	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-20-95	15:29	P	WET BROWN UROGENITAL AREA MATTING
				11-21-95	15:27	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:27	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-21-95	15:27	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44194	F	0.025 MG/L	EXCRETA	11-22-95	15:20	P	WET BROWN UROGENITAL AREA MATTING
				11-23-95	15:12	P	WET BROWN UROGENITAL AREA MATTING
				11-23-95	15:12	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-24-95	14:58	P	WET BROWN UROGENITAL AREA MATTING
				11-27-95	15:31	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:12	P	WET YELLOW UROGENITAL AREA MATTING
44195	F	0.025 MG/L	EXCRETA	11-16-95	15:50	P	WET YELLOW UROGENITAL AREA MATTING
				11-16-95	15:50	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-20-95	15:29	P	WET BROWN UROGENITAL AREA MATTING
				11-21-95	15:27	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:12	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:59	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:29	P	WET YELLOW UROGENITAL AREA MATTING
44201	F	0.025 MG/L	EXCRETA	11-16-95	15:50	P	WET BROWN UROGENITAL AREA MATTING
				11-16-95	15:50	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-16-95	15:50	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-17-95	14:50	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	14:50	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-17-95	14:50	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-17-95	14:50	P	WET YELLOW MATTING VENTRAL NECK
				11-17-95	14:50	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-20-95	15:29	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:29	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-20-95	15:29	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-20-95	15:29	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-20-95	15:29	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-21-95	15:28	P	WET YELLOW UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44201	F	0.025 MG/L	EXCRETA	11-21-95	15:28	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-21-95	15:28	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-21-95	15:28	P	WET YELLOW MATTING VENTRAL NECK
				11-21-95	15:28	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-21-95	15:28	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-21-95	15:28	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-23-95	15:12	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:59	P	WET BROWN UROGENITAL AREA MATTING
				11-27-95	15:31	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:31	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-28-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:12	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:12	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-01-95	15:19	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:18	P	WET BROWN UROGENITAL AREA MATTING
				12-06-95	15:31	P	WET YELLOW UROGENITAL AREA MATTING
44201	F	0.025 MG/L	ORAL/DENTAL	11-20-95	15:30	P	WET YELLOW CRANIAL AREA MATTING
				11-21-95	15:28	P	WET YELLOW CRANIAL AREA MATTING
				11-21-95	15:28	P	WET YELLOW FACIAL AREA MATTING
				11-24-95	14:59	P	WET YELLOW CRANIAL AREA MATTING
44349	F	0.025 MG/L	BEHAVIOR/CNS	11-22-95	15:20	P	GENERALLY UNKEMPT APPEARANCE
44349	F	0.025 MG/L	EXCRETA	11-16-95	15:50	P	WET BROWN UROGENITAL AREA MATTING
				11-16-95	15:50	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-16-95	15:50	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-16-95	15:50	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-17-95	14:51	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	14:51	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-20-95	15:30	P	WET BROWN UROGENITAL AREA MATTING
				11-20-95	15:30	P	DRIED YELLOW VENTRAL ABDOMINAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44349	F	0.025 MG/L	EXCRETA	11-20-95	15:30	P	DRIED YELLOW DORSAL ABDOMINAL AREA MATTING
				11-21-95	15:28	P	WET BROWN UROGENITAL AREA MATTING
				11-21-95	15:28	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-21-95	15:28	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-21-95	15:28	P	WET YELLOW MATTING VENTRAL NECK
				11-21-95	15:28	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-21-95	15:28	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-22-95	15:20	P	WET YELLOW UROGENITAL AREA MATTING
				11-22-95	15:20	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-23-95	15:13	P	WET BROWN UROGENITAL AREA MATTING
				11-23-95	15:13	P	WET BROWN DORSAL POSTERIOR MATTING
				11-23-95	15:13	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-24-95	14:59	P	WET BROWN UROGENITAL AREA MATTING
				11-24-95	14:59	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-24-95	14:59	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-24-95	14:59	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-24-95	14:59	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-27-95	15:31	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:31	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-27-95	15:31	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-28-95	15:26	P	WET BROWN DORSAL POSTERIOR MATTING
				11-28-95	15:26	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:26	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-28-95	15:26	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-29-95	15:13	P	WET BROWN UROGENITAL AREA MATTING
				11-29-95	15:13	P	WET BROWN DORSAL POSTERIOR MATTING
				11-29-95	15:13	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-29-95	15:13	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-29-95	15:13	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44349	F	0.025 MG/L	EXCRETA	11-30-95	15:27	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-01-95	15:18	P	WET YELLOW UROGENITAL AREA MATTING
				12-01-95	15:18	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-01-95	15:18	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-01-95	15:18	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				12-04-95	15:18	P	WET BROWN UROGENITAL AREA MATTING
				12-04-95	15:18	P	WET BROWN DORSAL POSTERIOR MATTING
				12-05-95	15:33	P	WET BROWN UROGENITAL AREA MATTING
				12-05-95	15:33	P	WET BROWN DORSAL POSTERIOR MATTING
				12-05-95	15:33	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				12-05-95	15:33	P	WET BROWN VENTRAL THORACIC AREA MATTING
				12-06-95	15:31	P	WET BROWN UROGENITAL AREA MATTING
				12-07-95	15:27	P	DRIED YELLOW UROGENITAL AREA MATTING
				12-07-95	15:27	P	DRIED YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-07-95	15:27	P	DRIED YELLOW VENTRAL THORACIC AREA MATTING
				12-07-95	15:27	P	DRIED YELLOW DORSAL POSTERIOR AREA MATTING
				12-08-95	15:29	P	WET BROWN DORSAL POSTERIOR MATTING
				12-12-95	15:53	P	WET BROWN UROGENITAL AREA MATTING
				12-12-95	15:53	P	WET BROWN DORSAL POSTERIOR MATTING
				12-12-95	15:53	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				12-12-95	15:53	P	WET YELLOW DORSAL THORACIC AREA MATTING
				12-12-95	15:53	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-12-95	15:53	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				12-12-95	15:53	P	WET YELLOW MATTING VENTRAL NECK
44349	F	0.025 MG/L	ORAL/DENTAL	11-21-95	15:29	P	WET YELLOW FACIAL AREA MATTING
				11-21-95	15:29	P	WET YELLOW CRANIAL AREA MATTING
				11-23-95	15:13	P	WET YELLOW CRANIAL AREA MATTING
				11-24-95	14:59	P	WET YELLOW CRANIAL AREA MATTING
				12-06-95	15:31	P	WET YELLOW CRANIAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44349	F	0.025 MG/L	ORAL/DENTAL	12-12-95	15:53	P	WET YELLOW CRANIAL AREA MATTING
44350	F	0.025 MG/L	EXCRETA	11-17-95	14:51	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:29	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:29	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-24-95	14:59	P	WET YELLOW UROGENITAL AREA MATTING
				12-13-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
44148	F	0.075 MG/L	EXCRETA	11-16-95	15:52	P	WET BROWN UROGENITAL AREA MATTING
				11-16-95	15:52	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-16-95	15:52	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-16-95	15:52	P	WET YELLOW MATTING VENTRAL NECK
				11-17-95	14:53	P	WET BROWN UROGENITAL AREA MATTING
				11-17-95	14:53	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-17-95	14:53	P	WET BROWN DORSAL POSTERIOR MATTING
				11-20-95	15:35	P	WET BROWN UROGENITAL AREA MATTING
				11-21-95	15:33	P	BROWN MATTING AROUND ANUS
44150	F	0.075 MG/L	CARDIO-PULMONARY	12-08-95	15:35	P	RALES
44150	F	0.075 MG/L	EXCRETA	11-22-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:17	P	WET BROWN UROGENITAL AREA MATTING
				11-27-95	15:34	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:34	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-13-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING
44165	F	0.075 MG/L	EXCRETA	11-16-95	15:52	P	WET YELLOW UROGENITAL AREA MATTING
				11-16-95	15:52	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-20-95	15:35	P	WET BROWN UROGENITAL AREA MATTING
				11-20-95	15:35	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-21-95	15:33	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:33	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-21-95	15:33	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-23-95	15:17	P	WET YELLOW DORSAL POSTERIOR AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44165	F	0.075 MG/L	EXCRETA	11-24-95	14:36	P	WET BROWN UROGENITAL AREA MATTING
				11-24-95	14:36	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				11-24-95	14:36	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-27-95	15:34	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:34	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-27-95	15:34	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-30-95	15:10	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:10	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-30-95	15:10	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-01-95	15:20	P	WET YELLOW UROGENITAL AREA MATTING
				12-01-95	15:20	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-04-95	15:29	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:37	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-06-95	15:17	P	WET YELLOW UROGENITAL AREA MATTING
				12-07-95	15:30	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-11-95	15:37	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:37	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-11-95	15:37	P	WET YELLOW VENTRAL THORACIC AREA MATTING
44165	F	0.075 MG/L	ORAL/DENTAL	11-21-95	15:33	P	WET YELLOW CRANIAL AREA MATTING
				11-24-95	14:36	P	WET YELLOW CRANIAL AREA MATTING
				11-27-95	15:34	P	WET YELLOW CRANIAL AREA MATTING
				12-01-95	15:20	P	WET YELLOW CRANIAL AREA MATTING
44169	F	0.075 MG/L	EXCRETA	11-16-95	15:53	P	WET BROWN UROGENITAL AREA MATTING
				11-20-95	15:36	P	WET BROWN UROGENITAL AREA MATTING
				11-21-95	15:34	P	WET BROWN UROGENITAL AREA MATTING
				11-21-95	15:34	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-21-95	15:34	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-22-95	15:23	P	WET BROWN UROGENITAL AREA MATTING
				11-23-95	15:18	P	WET BROWN UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44169	F	0.075 MG/L	EXCRETA	11-23-95	15:18	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-27-95	15:35	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:10	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:29	P	WET BROWN UROGENITAL AREA MATTING
				12-04-95	15:29	P	WET BROWN DORSAL POSTERIOR MATTING
44171	F	0.075 MG/L	EXCRETA	11-21-95	15:34	P	WET BROWN UROGENITAL AREA MATTING
				11-22-95	15:23	P	WET BROWN UROGENITAL AREA MATTING
				11-23-95	15:18	P	WET BROWN UROGENITAL AREA MATTING
				11-24-95	14:36	P	WET BROWN UROGENITAL AREA MATTING
				11-24-95	14:36	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-24-95	14:36	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-28-95	15:28	P	WET BROWN UROGENITAL AREA MATTING
				11-28-95	15:28	P	WET BROWN DORSAL POSTERIOR MATTING
				11-29-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:10	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:10	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-01-95	15:20	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:30	P	WET BROWN UROGENITAL AREA MATTING
				12-04-95	15:30	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-04-95	15:30	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				12-04-95	15:30	P	WET BROWN DORSAL POSTERIOR MATTING
				12-04-95	15:30	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				12-04-95	15:31	P	WET YELLOW MATTING VENTRAL NECK
				12-05-95	15:37	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:37	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-06-95	15:17	P	WET BROWN UROGENITAL AREA MATTING
				12-07-95	15:30	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:34	P	WET BROWN UROGENITAL AREA MATTING
				12-08-95	15:34	P	WET BROWN DORSAL POSTERIOR MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44171	F	0.075 MG/L	EXCRETA	12-11-95	15:37	P	WET BROWN UROGENITAL AREA MATTING
				12-11-95	15:37	P	WET BROWN DORSAL POSTERIOR MATTING
				12-12-95	15:33	P	WET YELLOW UROGENITAL AREA MATTING
				12-13-95	15:26	P	WET YELLOW UROGENITAL AREA MATTING
				12-13-95	15:26	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
44186	F	0.075 MG/L	CARDIO-PULMONARY	11-30-95	15:10	P	RALES
44186	F	0.075 MG/L	EXCRETA	11-21-95	15:34	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:34	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-30-95	15:10	P	WET YELLOW UROGENITAL AREA MATTING
44196	F	0.075 MG/L	EXCRETA	11-17-95	14:54	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:34	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:34	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-24-95	14:37	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:35	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:11	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-01-95	15:21	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:18	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-08-95	15:34	P	WET BROWN DORSAL POSTERIOR MATTING
				12-12-95	15:33	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:33	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
44197	F	0.075 MG/L	EXCRETA	11-17-95	14:54	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:37	P	WET BROWN UROGENITAL AREA MATTING
				11-21-95	15:34	P	WET BROWN UROGENITAL AREA MATTING
				11-21-95	15:34	P	WET BROWN DORSAL POSTERIOR MATTING
				11-21-95	15:34	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-21-95	15:34	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-22-95	15:24	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:18	P	WET BROWN UROGENITAL AREA MATTING
				11-23-95	15:18	P	WET BROWN DORSAL POSTERIOR MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44197	F	0.075 MG/L	EXCRETA	11-24-95	14:37	P	WET BROWN UROGENITAL AREA MATTING
				11-24-95	14:37	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-24-95	14:37	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-28-95	15:29	P	WET BROWN UROGENITAL AREA MATTING
				11-28-95	15:29	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				12-01-95	15:21	P	WET BROWN UROGENITAL AREA MATTING
				12-01-95	15:21	P	WET BROWN DORSAL POSTERIOR MATTING
				12-04-95	15:33	P	WET BROWN UROGENITAL AREA MATTING
				12-06-95	15:18	P	WET BROWN UROGENITAL AREA MATTING
				12-06-95	15:18	P	WET BROWN DORSAL POSTERIOR MATTING
				12-08-95	15:34	P	WET BROWN UROGENITAL AREA MATTING
				12-08-95	15:34	P	WET BROWN DORSAL POSTERIOR MATTING
				12-12-95	15:34	P	WET BROWN UROGENITAL AREA MATTING
				12-12-95	15:34	P	WET BROWN DORSAL POSTERIOR MATTING
				12-13-95	15:26	P	WET BROWN UROGENITAL AREA MATTING
				12-13-95	15:26	P	WET BROWN DORSAL POSTERIOR MATTING
44197	F	0.075 MG/L	ORAL/DENTAL	11-24-95	14:37	P	WET YELLOW CRANIAL AREA MATTING
44200	F	0.075 MG/L	EXCRETA	11-16-95	15:53	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	14:54	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	14:54	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-20-95	15:37	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:35	P	WET BROWN UROGENITAL AREA MATTING
				11-21-95	15:35	P	WET BROWN DORSAL POSTERIOR MATTING
				11-21-95	15:35	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				11-23-95	15:19	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:19	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-24-95	14:37	P	WET BROWN UROGENITAL AREA MATTING
				11-24-95	14:37	P	DRIED YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-27-95	15:36	P	WET YELLOW UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44200	F	0.075 MG/L	EXCRETA	11-27-95	15:36	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-28-95	15:29	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:29	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-29-95	15:17	P	WET BROWN DORSAL POSTERIOR MATTING
				11-30-95	15:11	P	WET YELLOW UROGENITAL AREA MATTING
				11-30-95	15:11	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-01-95	15:21	P	WET BROWN UROGENITAL AREA MATTING
				12-01-95	15:21	P	WET BROWN DORSAL POSTERIOR MATTING
				12-04-95	15:33	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-05-95	15:37	P	WET BROWN UROGENITAL AREA MATTING
				12-05-95	15:37	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-05-95	15:37	P	WET BROWN DORSAL POSTERIOR MATTING
				12-06-95	15:18	P	WET BROWN UROGENITAL AREA MATTING
				12-06-95	15:18	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				12-06-95	15:18	P	WET BROWN DORSAL POSTERIOR MATTING
				12-07-95	15:33	P	WET YELLOW UROGENITAL AREA MATTING
				12-07-95	15:33	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-07-95	15:33	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				12-07-95	15:33	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-08-95	15:35	P	WET BROWN UROGENITAL AREA MATTING
				12-08-95	15:35	P	WET BROWN DORSAL POSTERIOR MATTING
				12-11-95	15:38	P	WET BROWN UROGENITAL AREA MATTING
				12-11-95	15:38	P	WET BROWN DORSAL POSTERIOR MATTING
				12-12-95	15:34	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
44202	F	0.075 MG/L	EXCRETA	11-16-95	15:53	P	WET BROWN UROGENITAL AREA MATTING
				11-16-95	15:53	P	WET BROWN DORSAL POSTERIOR MATTING
				11-17-95	14:54	P	WET BROWN UROGENITAL AREA MATTING
				11-17-95	14:54	P	WET BROWN DORSAL POSTERIOR MATTING
				11-20-95	15:37	P	WET BROWN UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44202	F	0.075 MG/L	EXCRETA	11-20-95	15:37	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-21-95	15:35	P	SOFT STOOL
				11-21-95	15:35	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:35	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-21-95	15:35	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-22-95	15:24	P	WET BROWN UROGENITAL AREA MATTING
				11-23-95	15:19	P	WET BROWN UROGENITAL AREA MATTING
				11-23-95	15:19	P	WET BROWN DORSAL POSTERIOR MATTING
				11-23-95	15:19	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-23-95	15:19	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-24-95	14:38	P	WET BROWN UROGENITAL AREA MATTING
				11-24-95	14:38	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-27-95	15:36	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:30	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:30	P	DRIED YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-28-95	15:30	P	DRIED YELLOW VENTRAL THORACIC AREA MATTING
				11-29-95	15:17	P	WET BROWN DORSAL POSTERIOR MATTING
				11-30-95	15:11	P	WET BROWN UROGENITAL AREA MATTING
				12-01-95	15:21	P	WET BROWN UROGENITAL AREA MATTING
				12-04-95	15:34	P	DRIED BROWN DORSAL POSTERIOR AREA MATTING
				12-05-95	15:38	P	WET BROWN UROGENITAL AREA MATTING
				12-05-95	15:38	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				12-06-95	15:18	P	WET BROWN UROGENITAL AREA MATTING
				12-06-95	15:18	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				12-06-95	15:18	P	WET BROWN DORSAL POSTERIOR MATTING
				12-07-95	15:33	P	WET BROWN UROGENITAL AREA MATTING
				12-07-95	15:33	P	WET BROWN DORSAL POSTERIOR MATTING
				12-08-95	15:35	P	WET BROWN UROGENITAL AREA MATTING
				12-11-95	15:38	P	WET BROWN UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44202	F	0.075 MG/L	EXCRETA	12-13-95	15:27	P	WET BROWN UROGENITAL AREA MATTING
44202	F	0.075 MG/L	ORAL/DENTAL	11-24-95	14:38	P	WET YELLOW CRANIAL AREA MATTING
44206	F	0.075 MG/L	EXCRETA	11-30-95	15:11	P	WET BROWN UROGENITAL AREA MATTING
				12-13-95	15:27	P	WET BROWN UROGENITAL AREA MATTING
44344	F	0.075 MG/L	CARDIO-PULMONARY	12-08-95	15:36	P	RALES
44344	F	0.075 MG/L	EXCRETA	11-16-95	15:54	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	14:55	P	WET BROWN UROGENITAL AREA MATTING
				11-17-95	14:55	P	WET BROWN DORSAL POSTERIOR MATTING
				11-17-95	14:55	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-17-95	14:55	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-17-95	14:55	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-20-95	15:37	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:37	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-20-95	15:37	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-20-95	15:38	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-20-95	15:38	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-21-95	15:35	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:35	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				11-22-95	15:24	P	WET BROWN UROGENITAL AREA MATTING
				11-22-95	15:24	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				11-22-95	15:24	P	WET BROWN VENTRAL THORACIC AREA MATTING
				11-22-95	15:24	P	WET BROWN DORSAL POSTERIOR MATTING
				11-22-95	15:24	P	WET YELLOW MATTING VENTRAL NECK
				11-23-95	15:20	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:20	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-23-95	15:20	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-23-95	15:20	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-24-95	14:38	P	WET BROWN UROGENITAL AREA MATTING
				11-24-95	14:38	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44344	F	0.075 MG/L	EXCRETA	11-24-95	14:38	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-24-95	14:38	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-27-95	15:36	P	WET BROWN UROGENITAL AREA MATTING
				11-27-95	15:36	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-27-95	15:36	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-28-95	15:31	P	BROWN MATTING AROUND ANUS
				11-29-95	15:17	P	WET BROWN DORSAL POSTERIOR MATTING
				11-29-95	15:17	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				11-29-95	15:17	P	WET BROWN VENTRAL THORACIC AREA MATTING
				11-30-95	15:12	P	WET BROWN UROGENITAL AREA MATTING
				11-30-95	15:12	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				11-30-95	15:12	P	WET BROWN DORSAL POSTERIOR MATTING
				12-01-95	15:21	P	WET BROWN UROGENITAL AREA MATTING
				12-01-95	15:21	P	WET BROWN DORSAL POSTERIOR MATTING
				12-04-95	15:36	P	WET BROWN UROGENITAL AREA MATTING
				12-04-95	15:36	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				12-04-95	15:36	P	WET BROWN VENTRAL THORACIC AREA MATTING
				12-04-95	15:36	P	WET BROWN DORSAL POSTERIOR MATTING
				12-05-95	15:38	P	WET BROWN UROGENITAL AREA MATTING
				12-05-95	15:38	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				12-05-95	15:38	P	WET YELLOW DORSAL THORACIC AREA MATTING
				12-05-95	15:38	P	WET BROWN DORSAL POSTERIOR MATTING
				12-06-95	15:19	P	WET BROWN UROGENITAL AREA MATTING
				12-06-95	15:19	P	WET BROWN DORSAL POSTERIOR MATTING
				12-06-95	15:19	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				12-06-95	15:19	P	WET BROWN VENTRAL THORACIC AREA MATTING
				12-07-95	15:31	P	WET BROWN DORSAL POSTERIOR MATTING
				12-07-95	15:31	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-07-95	15:31	P	WET YELLOW VENTRAL THORACIC AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44344	F	0.075 MG/L	EXCRETA	12-07-95	15:31	P	WET BROWN UROGENITAL AREA MATTING
				12-08-95	15:35	P	WET BROWN UROGENITAL AREA MATTING
				12-08-95	15:35	P	WET BROWN DORSAL POSTERIOR MATTING
				12-08-95	15:35	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				12-08-95	15:35	P	WET BROWN VENTRAL THORACIC AREA MATTING
				12-11-95	15:38	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:38	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-11-95	15:38	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				12-12-95	15:34	P	WET BROWN UROGENITAL AREA MATTING
				12-13-95	15:27	P	WET YELLOW UROGENITAL AREA MATTING
				12-13-95	15:27	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-13-95	15:27	P	WET YELLOW VENTRAL THORACIC AREA MATTING
44344	F	0.075 MG/L	ORAL/DENTAL	11-20-95	15:38	P	WET YELLOW CRANIAL AREA MATTING
				11-22-95	15:25	P	WET YELLOW CRANIAL AREA MATTING
				11-24-95	14:39	P	WET YELLOW CRANIAL AREA MATTING
44347	F	0.075 MG/L	EXCRETA	11-16-95	15:54	P	WET YELLOW UROGENITAL AREA MATTING
				11-16-95	15:54	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-17-95	14:55	P	WET BROWN UROGENITAL AREA MATTING
				11-21-95	15:35	P	WET BROWN UROGENITAL AREA MATTING
				11-21-95	15:35	P	WET BROWN DORSAL POSTERIOR MATTING
				11-22-95	15:25	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:21	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-24-95	14:39	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:39	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-24-95	14:39	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-27-95	15:36	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:31	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:31	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-30-95	15:12	P	WET YELLOW UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44347	F	0.075 MG/L	EXCRETA	12-01-95	15:21	P	WET BROWN UROGENITAL AREA MATTING
				12-01-95	15:21	P	WET BROWN DORSAL POSTERIOR MATTING
				12-04-95	15:37	P	WET BROWN UROGENITAL AREA MATTING
				12-04-95	15:37	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-05-95	15:38	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:19	P	WET BROWN UROGENITAL AREA MATTING
				12-06-95	15:19	P	WET BROWN DORSAL POSTERIOR MATTING
				12-06-95	15:19	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				12-06-95	15:19	P	WET BROWN VENTRAL THORACIC AREA MATTING
				12-07-95	15:31	P	WET BROWN UROGENITAL AREA MATTING
				12-07-95	15:31	P	WET BROWN DORSAL POSTERIOR MATTING
				12-08-95	15:36	P	WET BROWN UROGENITAL AREA MATTING
				12-08-95	15:36	P	WET BROWN DORSAL POSTERIOR MATTING
				12-11-95	15:39	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:39	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-13-95	15:27	P	WET BROWN UROGENITAL AREA MATTING
44155	F	0.25 MG/L	CARDIO-PULMONARY	11-30-95	15:16	P	RALES
44155	F	0.25 MG/L	EXCRETA	11-21-95	15:17	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:24	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:44	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:15	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:36	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:21	P	WET BROWN UROGENITAL AREA MATTING
				11-29-95	15:21	P	WET BROWN DORSAL POSTERIOR MATTING
				11-30-95	15:16	P	WET BROWN UROGENITAL AREA MATTING
				12-13-95	15:12	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
44163	F	0.25 MG/L	EXCRETA	11-16-95	15:58	P	WET YELLOW UROGENITAL AREA MATTING
				11-16-95	15:58	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-16-95	15:58	P	WET YELLOW VENTRAL THORACIC AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44163	F	0.25 MG/L	EXCRETA	11-16-95	15:58	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-17-95	15:00	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-17-95	15:00	P	WET BROWN UROGENITAL AREA MATTING
				11-20-95	15:43	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:43	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-21-95	15:17	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:17	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-21-95	15:17	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-21-95	15:17	P	WET YELLOW DORSAL THORACIC AREA MATTING
44167	F	0.25 MG/L	CARDIO-PULMONARY	11-22-95	15:29	P	RALES
				12-04-95	15:44	P	RALES
44167	F	0.25 MG/L	EXCRETA	11-17-95	15:00	P	WET BROWN DORSAL POSTERIOR MATTING
				11-20-95	15:43	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:17	P	WET YELLOW UROGENITAL AREA MATTING
				11-22-95	15:28	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:44	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:36	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:44	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:42	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:40	P	WET BROWN UROGENITAL AREA MATTING
				12-11-95	15:43	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:39	P	WET BROWN UROGENITAL AREA MATTING
				12-12-95	15:39	P	WET BROWN DORSAL POSTERIOR MATTING
				12-13-95	15:12	P	WET YELLOW UROGENITAL AREA MATTING
				12-13-95	15:12	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-13-95	15:12	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
44167	F	0.25 MG/L	ORAL/DENTAL	11-24-95	14:44	P	WET YELLOW CRANIAL AREA MATTING
44168	F	0.25 MG/L	CARDIO-PULMONARY	11-20-95	15:44	P	RALES
				11-28-95	15:35	P	RALES

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44168	F	0.25 MG/L	CARDIO-PULMONARY	11-29-95	15:21	P	RALES
				12-04-95	15:44	P	RALES
				12-05-95	15:43	P	RALES
				12-06-95	15:22	P	RALES
				12-12-95	15:40	P	RALES
				12-13-95	15:12	P	RALES
44168	F	0.25 MG/L	EXCRETA	11-16-95	15:57	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	15:00	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:44	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:17	P	WET BROWN UROGENITAL AREA MATTING
				11-22-95	15:29	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				11-22-95	15:29	P	WET BROWN DORSAL POSTERIOR MATTING
				11-22-95	15:29	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:25	P	WET BROWN UROGENITAL AREA MATTING
				11-23-95	15:25	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				11-23-95	15:25	P	WET BROWN VENTRAL THORACIC AREA MATTING
				11-23-95	15:25	P	WET BROWN DORSAL POSTERIOR MATTING
				11-24-95	14:44	P	WET BROWN UROGENITAL AREA MATTING
				11-24-95	14:44	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-24-95	14:44	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-24-95	14:44	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-24-95	14:44	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-27-95	15:15	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:15	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-27-95	15:15	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-27-95	15:15	P	WET BROWN DORSAL POSTERIOR MATTING
				11-28-95	15:35	P	WET BROWN UROGENITAL AREA MATTING
				11-28-95	15:35	P	WET BROWN DORSAL POSTERIOR MATTING
				11-28-95	15:35	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44168	F	0.25 MG/L	EXCRETA	11-28-95	15:35	P	WET BROWN VENTRAL THORACIC AREA MATTING
				11-29-95	15:21	P	WET BROWN UROGENITAL AREA MATTING
				11-29-95	15:21	P	WET BROWN DORSAL POSTERIOR MATTING
				11-29-95	15:21	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				11-29-95	15:21	P	WET BROWN VENTRAL THORACIC AREA MATTING
				11-30-95	15:16	P	WET BROWN UROGENITAL AREA MATTING
				12-01-95	15:12	P	WET BROWN UROGENITAL AREA MATTING
				12-01-95	15:12	P	WET BROWN DORSAL POSTERIOR MATTING
				12-04-95	15:44	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:42	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:42	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-06-95	15:22	P	WET BROWN UROGENITAL AREA MATTING
				12-06-95	15:22	P	WET BROWN DORSAL POSTERIOR MATTING
				12-06-95	15:22	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				12-07-95	15:18	P	WET BROWN UROGENITAL AREA MATTING
				12-07-95	15:18	P	WET BROWN DORSAL POSTERIOR MATTING
				12-08-95	15:40	P	WET BROWN DORSAL POSTERIOR MATTING
				12-11-95	15:44	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:44	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-12-95	15:40	P	WET BROWN UROGENITAL AREA MATTING
				12-12-95	15:40	P	WET BROWN DORSAL POSTERIOR MATTING
				12-12-95	15:40	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				12-13-95	15:12	P	WET YELLOW UROGENITAL AREA MATTING
				12-13-95	15:12	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-13-95	15:12	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
44168	F	0.25 MG/L	ORAL/DENTAL	11-24-95	14:44	P	WET YELLOW CRANIAL AREA MATTING
44173	F	0.25 MG/L	EXCRETA	11-16-95	15:57	P	WET BROWN UROGENITAL AREA MATTING
				11-21-95	15:17	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:25	P	WET YELLOW DORSAL POSTERIOR AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44173	F	0.25 MG/L	EXCRETA	11-28-95	15:34	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:34	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-29-95	15:21	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:21	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-30-95	15:16	P	WET BROWN UROGENITAL AREA MATTING
				11-30-95	15:16	P	WET BROWN DORSAL POSTERIOR MATTING
				12-05-95	15:43	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:23	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				12-08-95	15:41	P	WET YELLOW UROGENITAL AREA MATTING
44175	F	0.25 MG/L	EXCRETA	11-20-95	15:44	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:44	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-20-95	15:44	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-27-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:16	P	BROWN MATTING AROUND ANUS
				11-28-95	15:36	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:36	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-28-95	15:36	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-28-95	15:36	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-29-95	15:22	P	WET BROWN UROGENITAL AREA MATTING
				11-29-95	15:22	P	WET BROWN DORSAL POSTERIOR MATTING
				11-30-95	15:16	P	WET BROWN UROGENITAL AREA MATTING
				11-30-95	15:16	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				12-01-95	15:12	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:45	P	WET BROWN UROGENITAL AREA MATTING
				12-04-95	15:45	P	WET BROWN DORSAL POSTERIOR MATTING
				12-05-95	15:43	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
				12-07-95	15:18	P	WET YELLOW UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44175	F	0.25 MG/L	EXCRETA	12-08-95	15:41	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:41	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-11-95	15:44	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:44	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-11-95	15:44	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-12-95	15:40	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:40	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-13-95	15:12	P	WET YELLOW UROGENITAL AREA MATTING
				12-13-95	15:12	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
44182	F	0.25 MG/L	EXCRETA	11-16-95	15:58	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	15:01	P	WET BROWN UROGENITAL AREA MATTING
				11-20-95	15:44	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:18	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-24-95	14:45	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:36	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:36	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-29-95	15:22	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:22	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-01-95	15:13	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:43	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:43	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-06-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:23	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-06-95	15:23	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-12-95	15:40	P	WET YELLOW UROGENITAL AREA MATTING
44184	F	0.25 MG/L	CARDIO-PULMONARY	11-28-95	15:36	P	RALES
				12-08-95	15:41	P	RALES
44184	F	0.25 MG/L	EXCRETA	11-16-95	15:58	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:18	P	WET YELLOW UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44184	F	0.25 MG/L	EXCRETA	11-23-95	15:26	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-23-95	15:26	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-24-95	14:45	P	DRIED YELLOW UROGENITAL AREA MATTING
				11-27-95	15:16	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:22	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-29-95	15:22	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:43	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
				12-07-95	15:19	P	WET YELLOW UROGENITAL AREA MATTING
				12-07-95	15:19	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-07-95	15:19	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				12-13-95	15:13	P	WET YELLOW UROGENITAL AREA MATTING
44184	F	0.25 MG/L	BODY/INTEGUMENT	11-16-95	15:58	P	WET GREEN DORSAL ABDOMINAL AREA MATTING
44188	F	0.25 MG/L	CARDIO-PULMONARY	11-21-95	15:18	P	RALES
44188	F	0.25 MG/L	EXCRETA	11-16-95	15:59	P	WET YELLOW UROGENITAL AREA MATTING
				11-16-95	15:59	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-16-95	15:59	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-17-95	15:01	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:18	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:18	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-21-95	15:18	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-23-95	15:26	P	WET BROWN UROGENITAL AREA MATTING
44189	F	0.25 MG/L	EXCRETA	12-01-95	15:13	P	WET YELLOW UROGENITAL AREA MATTING
				12-08-95	15:42	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:41	P	WET YELLOW UROGENITAL AREA MATTING
44190	F	0.25 MG/L	CARDIO-PULMONARY	11-30-95	15:18	P	RALES
44190	F	0.25 MG/L	EXCRETA	11-17-95	15:01	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	15:01	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-17-95	15:01	P	DRIED YELLOW VENTRAL ABDOMINAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44190	F	0.25 MG/L	EXCRETA	11-17-95	15:01	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-20-95	15:45	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:19	P	WET YELLOW UROGENITAL AREA MATTING
				11-21-95	15:19	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-21-95	15:19	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-24-95	14:46	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:46	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
44190	F	0.25 MG/L	ORAL/DENTAL	11-24-95	14:46	P	WET YELLOW CRANIAL AREA MATTING
44198	F	0.25 MG/L	EXCRETA	11-16-95	16:00	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	15:02	P	WET YELLOW UROGENITAL AREA MATTING
				11-22-95	15:29	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:17	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:17	P	BROWN MATTING AROUND ANUS
				11-27-95	15:17	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-28-95	15:37	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:23	P	SOFT STOOL
				11-29-95	15:23	P	WET BROWN UROGENITAL AREA MATTING
				12-04-95	15:45	P	WET BROWN UROGENITAL AREA MATTING
				12-11-95	15:45	P	WET BROWN UROGENITAL AREA MATTING
44205	F	0.25 MG/L	EXCRETA	11-16-95	16:00	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-16-95	16:00	P	WET BROWN UROGENITAL AREA MATTING
				11-20-95	15:46	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:46	P	DRIED YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-22-95	15:30	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:26	P	WET BROWN DORSAL POSTERIOR MATTING
				11-24-95	14:46	P	WET YELLOW UROGENITAL AREA MATTING
				11-24-95	14:46	P	DRIED YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-27-95	15:17	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:17	P	WET BROWN DORSAL POSTERIOR MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44205	F	0.25 MG/L	EXCRETA	11-28-95	15:37	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:41	P	WET YELLOW UROGENITAL AREA MATTING
44345	F	0.25 MG/L	CARDIO-PULMONARY	11-22-95	15:30	P	RALES
				12-05-95	15:44	P	RALES
44345	F	0.25 MG/L	EXCRETA	11-17-95	15:02	P	WET BROWN UROGENITAL AREA MATTING
				11-17-95	15:02	P	WET BROWN DORSAL POSTERIOR MATTING
				11-17-95	15:02	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				11-17-95	15:02	P	WET BROWN VENTRAL THORACIC AREA MATTING
				11-20-95	15:46	P	WET BROWN UROGENITAL AREA MATTING
				11-21-95	15:19	P	WET BROWN UROGENITAL AREA MATTING
				11-22-95	15:30	P	WET BROWN UROGENITAL AREA MATTING
				11-22-95	15:30	P	WET BROWN DORSAL POSTERIOR MATTING
				11-23-95	15:27	P	WET BROWN UROGENITAL AREA MATTING
				11-23-95	15:27	P	WET BROWN DORSAL POSTERIOR MATTING
				11-24-95	14:47	P	WET BROWN UROGENITAL AREA MATTING
				11-24-95	14:47	P	DRIED YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-24-95	14:47	P	DRIED YELLOW VENTRAL THORACIC AREA MATTING
				11-27-95	15:17	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:17	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-27-95	15:17	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-27-95	15:17	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-28-95	15:37	P	BROWN MATTING AROUND ANUS
				11-29-95	15:23	P	WET YELLOW UROGENITAL AREA MATTING
				11-29-95	15:23	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-30-95	15:18	P	WET BROWN UROGENITAL AREA MATTING
				12-01-95	15:13	P	WET BROWN UROGENITAL AREA MATTING
				12-05-95	15:44	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:24	P	WET YELLOW UROGENITAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44345	F	0.25 MG/L	EXCRETA	12-07-95	15:19	P	WET YELLOW UROGENITAL AREA MATTING
				12-11-95	15:45	P	WET YELLOW UROGENITAL AREA MATTING
				12-12-95	15:42	P	WET BROWN UROGENITAL AREA MATTING
				12-12-95	15:42	P	WET BROWN DORSAL POSTERIOR MATTING
				12-13-95	15:14	P	WET BROWN UROGENITAL AREA MATTING
				12-13-95	15:14	P	WET BROWN DORSAL POSTERIOR MATTING
44345	F	0.25 MG/L	ORAL/DENTAL	11-27-95	15:18	P	WET YELLOW CRANIAL AREA MATTING
44348	F	0.25 MG/L	CARDIO-PULMONARY	12-07-95	15:20	P	RALES
44348	F	0.25 MG/L	EXCRETA	11-16-95	15:59	P	WET YELLOW UROGENITAL AREA MATTING
				11-17-95	15:03	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:46	P	WET YELLOW UROGENITAL AREA MATTING
				11-20-95	15:46	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-20-95	15:46	P	DRIED YELLOW VENTRAL THORACIC AREA MATTING
				11-21-95	15:20	P	WET BROWN DORSAL POSTERIOR MATTING
				11-22-95	15:30	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				11-22-95	15:30	P	WET BROWN UROGENITAL AREA MATTING
				11-22-95	15:30	P	WET BROWN DORSAL POSTERIOR MATTING
				11-23-95	15:27	P	WET YELLOW UROGENITAL AREA MATTING
				11-23-95	15:27	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-24-95	14:47	P	WET BROWN UROGENITAL AREA MATTING
				11-24-95	14:47	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				11-24-95	14:47	P	WET YELLOW DORSAL ABDOMINAL AREA MATTING
				11-24-95	14:47	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-24-95	14:47	P	WET YELLOW DORSAL THORACIC AREA MATTING
				11-27-95	15:18	P	WET YELLOW UROGENITAL AREA MATTING
				11-27-95	15:18	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				11-28-95	15:37	P	WET BROWN DORSAL POSTERIOR MATTING
				11-28-95	15:37	P	WET YELLOW UROGENITAL AREA MATTING
				11-28-95	15:37	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44348	F	0.25 MG/L	EXCRETA	11-28-95	15:37	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				11-29-95	15:22	P	WET BROWN UROGENITAL AREA MATTING
				11-29-95	15:22	P	WET BROWN DORSAL POSTERIOR MATTING
				11-29-95	15:22	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				11-29-95	15:22	P	WET BROWN VENTRAL THORACIC AREA MATTING
				11-30-95	15:18	P	WET BROWN UROGENITAL AREA MATTING
				11-30-95	15:18	P	WET BROWN DORSAL POSTERIOR MATTING
				11-30-95	15:18	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				12-01-95	15:13	P	WET BROWN UROGENITAL AREA MATTING
				12-01-95	15:13	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				12-04-95	15:47	P	WET BROWN DORSAL POSTERIOR MATTING
				12-04-95	15:47	P	WET YELLOW UROGENITAL AREA MATTING
				12-04-95	15:47	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-05-95	15:44	P	WET BROWN DORSAL POSTERIOR MATTING
				12-05-95	15:44	P	WET YELLOW UROGENITAL AREA MATTING
				12-05-95	15:44	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-05-95	15:44	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				12-06-95	15:24	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-06-95	15:24	P	WET YELLOW UROGENITAL AREA MATTING
				12-06-95	15:24	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-06-95	15:24	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				12-07-95	15:20	P	WET YELLOW UROGENITAL AREA MATTING
				12-07-95	15:20	P	WET YELLOW VENTRAL ABDOMINAL AREA MATTING
				12-07-95	15:20	P	WET YELLOW VENTRAL THORACIC AREA MATTING
				12-07-95	15:20	P	WET YELLOW DORSAL POSTERIOR AREA MATTING
				12-08-95	15:43	P	WET BROWN UROGENITAL AREA MATTING
				12-08-95	15:43	P	WET BROWN VENTRAL ABDOMINAL AREA MATTING
				12-08-95	15:43	P	WET BROWN VENTRAL THORACIC AREA MATTING
				12-08-95	15:43	P	WET BROWN DORSAL POSTERIOR MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

1-HOUR POST-EXPOSURE
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS
TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
4434B	F	0.25 MG/L	ORAL/DENTAL	11-24-95	14:47	P	WET YELLOW CRANIAL AREA MATTING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

NONEXPOSURE DAYS

PROJECT NO.:WIL-160033 A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS

SPONSOR:ELF ATOCHEM INC.

INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 11-16-95 TO 12-14-95

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
44103	M	0.00 MG/L	EYES/EARS/NOSE	12-09-95	12:35	P	DRIED RED MATERIAL AROUND NOSE
44102	M	0.25 MG/L	BEHAVIOR/CNS	11-25-95	9:20	P	GENERALLY UNKEMPT APPEARANCE
44102	M	0.25 MG/L	CARDIO-PULMONARY	12-09-95	12:25	P	RALES
44139	M	0.25 MG/L	CARDIO-PULMONARY	12-09-95	12:33	P	RALES
44139	M	0.25 MG/L	ORAL/DENTAL	11-18-95	12:46	P	DRIED RED CRANIAL AREA MATTING
44162	F	0.025 MG/L	EYES/EARS/NOSE	11-18-95	12:42	P	DRIED RED MATERIAL AROUND NOSE

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

DAILY EXAMINATIONS - RECOVERY PERIOD
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
PHYSICAL EXAMINATION - GENERAL COMMENTS

DATE	TIME	GENERAL COMMENT
12-15-95	11:34	ALL ANIMALS WERE OBSERVED AND THERE WERE NO SIGNIFICANT CLINICAL FINDINGS.
12-16-95	9:36	ALL ANIMALS WERE OBSERVED AND THERE WERE NO SIGNIFICANT CLINICAL FINDINGS.
12-17-95	12:35	ALL ANIMALS WERE OBSERVED AND THERE WERE NO SIGNIFICANT CLINICAL FINDINGS.
12-18-95	10:56	ALL ANIMALS WERE OBSERVED AND THERE WERE NO SIGNIFICANT CLINICAL FINDINGS.
12-19-95	14:28	ALL ANIMALS WERE OBSERVED AND THERE WERE NO SIGNIFICANT CLINICAL FINDINGS.
12-20-95	8:10	ALL ANIMALS WERE OBSERVED AND THERE WERE NO SIGNIFICANT CLINICAL FINDINGS.
12-21-95	13:28	ALL ANIMALS WERE OBSERVED AND THERE WERE NO SIGNIFICANT CLINICAL FINDINGS.
12-22-95	8:12	ALL ANIMALS WERE OBSERVED AND THERE WERE NO SIGNIFICANT CLINICAL FINDINGS.
12-23-95	7:19	ALL ANIMALS WERE OBSERVED AND THERE WERE NO SIGNIFICANT CLINICAL FINDINGS.
12-24-95	8:10	ALL ANIMALS WERE OBSERVED AND THERE WERE NO SIGNIFICANT CLINICAL FINDINGS.
12-25-95	8:17	ALL ANIMALS WERE OBSERVED AND THERE WERE NO SIGNIFICANT CLINICAL FINDINGS.

DAILY EXAMINATIONS - RECOVERY PERIOD
A 4-WEEK INHALATION TOX STUDY OF METHANE SULFONIC ACID IN RATS
PHYSICAL EXAMINATION - GENERAL COMMENTS

DATE	TIME	GENERAL COMMENT
12-26-95	14:56	ALL ANIMALS WERE OBSERVED AND THERE WERE NO SIGNIFICANT CLINICAL FINDINGS.
12-27-95	15:12	ALL ANIMALS WERE OBSERVED AND THERE WERE NO SIGNIFICANT CLINICAL FINDINGS.

A 4-Week Inhalation Toxicity Study of Methane Sulfonic Acid in Albino Rats

APPENDIX G

Study Protocol

Study Number: WIL-160033

PROTOCOL AMENDMENT IV

Sponsor: Elf Atochem North America, Inc.

A. Title of Study:

A 4-Week Inhalation Toxicity Study of Methane Sulfonic Acid in Albino Rats

B. Protocol Modification:

1) Sampling times for the aerosol particle size determinations should be as follows:

Group No.	Sampling Time (minutes)
2	120
3	40
4	20

C. Reason for Protocol Modification:

1) To correct typographical error.

Approved By:

Elf Atochem North America, Inc.
2000 Market Street
Philadelphia, PA 19103

Roy M. Bannister, Ph.D.
Senior Toxicologist

July 10, 1996
Date

Prepared By:

WIL Research Laboratories, Inc.
Ashland, OH 44805-9281

C.E. Ulrich
Charles E. Ulrich, B.S.
Study Director

June 28, 96
Date

Study Number: WIL-160033

PROTOCOL AMENDMENT III

Sponsor: Elf Atochem North America, Inc.

A. Title of Study:

A 4-Week Inhalation Toxicity Study of Methane Sulfonic Acid in Albino Rats

B. Protocol Modification:

1) VII. EXPERIMENTAL DESIGN

F. Test Material Generation Methods

The output flow rates of the generation system will be varied as necessary to maintain the target exposure levels.

2) VIII. EXPERIMENTAL OBSERVATIONS

C. Detailed Physical Examinations

FOB observations will be conducted during the recovery phase only if test material-related effects are noted during the exposure phase observations.

C. Reason for Protocol Modification:

1) This change was necessary to achieve the most stable exposure concentrations.

2) Added for clarification.

Approved By:	Prepared By:
Elf Atochem North America, Inc. 2000 Market Street Philadelphia, PA 19103	WIL Research Laboratories, Inc. Ashland, OH 44805-9281
Roy M. Bannister, Ph.D. Senior Toxicologist	Charles E. Ulrich, B.S. Study Director
June 25, 1996 Date	June 14, 1996 Date

Study Number: WIL-160033

PROTOCOL AMENDMENT II

Sponsor: Elf Atochem North America, Inc.

A. Title of Study:

A 4-Week Inhalation Toxicity Study of Methane Sulfonic Acid in Albino Rats

B. Protocol Modification:

The following corrections should be made to the indicated sections:

1) IV. TEST MATERIAL DATA

C. Purity: 69.86%

E. Physical Description: water white

2) Attached is a study calendar which relates study and exposure days to calendar dates.

C. Reason for Protocol Modification:

1) To correct the purity and physical description information for the given lot of test material.
2) Addition of Study Calendar to protocol.

Approved By:	Prepared By:
Elf Atochem North America, Inc. 2000 Market Street Philadelphia, PA 19103	WIL Research Laboratories, Inc. Ashland, OH 44805-9281
Roy M. Bannister, Ph.D. Senior Toxicologist	C. E. Ulrich Charles E. Ulrich, B.S. Study Director
12/4/95 Date	Nov. 28, 95 Date

STUDY CALENDAR FOR STUDY NO. WIL-160033

	Date	Study Day	Study Week	Days of Exposure
Thursday	11/09/95	-7	-1	
Friday	11/10/95	-6	-1	
Saturday	11/11/95	-5	-1	
Sunday	11/12/95	-4	-1	
Monday	11/13/95	-3	-1	
Tuesday	11/14/95	-2	-1	
Wednesday	11/15/95	-1	-1	
Thursday	11/16/95	0	0	1
Friday	11/17/95	1	0	2
Saturday	11/18/95	2	0	
Sunday	11/19/95	3	0	
Monday	11/20/95	4	0	3
Tuesday	11/21/95	5	0	4
Wednesday	11/22/95	6	0	5
Thursday	11/23/95	7	1	6
Friday	11/24/95	8	1	7
Saturday	11/25/95	9	1	
Sunday	11/26/95	10	1	
Monday	11/27/95	11	1	8
Tuesday	11/28/95	12	1	9
Wednesday	11/29/95	13	1	10
Thursday	11/30/95	14	2	11
Friday	12/01/95	15	2	12
Saturday	12/02/95	16	2	
Sunday	12/03/95	17	2	
Monday	12/04/95	18	2	13
Tuesday	12/05/95	19	2	14
Wednesday	12/06/95	20	2	15
Thursday	12/07/95	21	3	16
Friday	12/08/95	22	3	17
Saturday	12/09/95	23	3	
Sunday	12/10/95	24	3	
Monday	12/11/95	25	3	18
Tuesday	12/12/95	26	3	19
Wednesday	12/13/95	27	3	20
Thursday	12/14/95	28	3	21

Study Number: WIL-160033

PROTOCOL AMENDMENT I

Sponsor: Elf Atochem North America, Inc.

A. Title of Study:

A 4-Week Inhalation Toxicity Study of Methane Sulfonic Acid in Albino Rats

B. Protocol Modification:

1) VII. EXPERIMENTAL DESIGN

The following is added to the information contained in the main protocol.

E. Exposure Methods

Add the following to the information contained in the main protocol:

Prior to initiation of exposures, (during the pre-test period) all available animals will be acclimated to the restraint tubes by placing them in the tubes for increasing lengths of time in the days prior to the first exposure following this general schedule:

Days Prior to Exposure Initiation	Hours in Restraint Tubes
6	1.0
5	2.0
4	3.0
3	4.0
2	5.0
1	6.0

Animals will be placed in tubes and the tubes placed in the home cages during acclimation.

On exposure days, one group of animals will be loaded into the restraint tubes and placed on the appropriate exposure unit at a time. The group loaded first will increment by one each day to alleviate possible negative affects of being in the restraint tubes longer than other groups. This group will be unloaded first as well.

F. Test Material Generation Methods

Atmospheres of aerosolized methane sulfonic acid will be generated using an Inspiron® Model 002305-A nebulizer (Intertech Resources, Inc., Lincolnshire, IL). The nebulizer will be operated at a constant pressure of 40 pounds per square inch (psi) which has been determined to deliver approximately 0.12 grams/minute output. Resulting aerosol will be directed into a 0.5 m^3 glass and stainless-steel whole-body exposure chamber which will be utilized as a primary dilution chamber. HEPA and charcoal filtered ventilation air will be supplied to his dilution chamber at approximately 63 liters per minute (LPM) as monitored by the pressure drop across an orifice plate. The ventilation flow vs. pressure will be calibrated using Kurz model 505 Mass Airflow Meter (Kurz Instruments, Monterey, CA).

Exposure atmospheres will be further diluted and delivered to the nose-only exposure units through the use of three venturi diluters fabricated in the laboratory. Output from the venturi diluter is carried via 1/2" OD plastic tubing to the top inlet of the InTox Products (Albuquerque, NM) nose-only exposure units. Negative pressure within the exposure units will be maintained at approximately 1.0 inches of water during non-sampling periods (slightly higher during sampling) using vacuum from the laboratory vacuum system. Exposure unit exhaust will be drawn through a HEPA capsule filter (model 12144, Gelman Sciences, Ann Arbor, MI) prior to being measured by a Top-Trak digital flowmeter (Sierra Instruments, Inc., Monterey, CA) which will be calibrated under conditions of use with a Dry Test Meter (American Meter Company, Nebraska City, NE). The following table summarizes operational parameters:

Group No.	Venturi Pressure	Output Flow	Nose-Only Unit Negative Pressure
1	NA	19 LPM	0.2 "H_2O
2	~ 1.0 psi	19 LPM	1.0 "H_2O
3	0.25 psi	13 LPM	1.0 "H_2O
4	~ 10.0 psi	13 LPM	1.0 "H_2O

The generator reservoir, which has a capacity of 400 milliliters (ml), will be filled with approximately 200 ml of test material each day prior to initiation of generation. The reservoir, with lid in place, will be weighed prior to and following each generation period for test material accountability purposes. Test material remaining in the reservoir on Friday following the day's exposure will be discarded and fresh test material used on the following Monday.

G. Methods for Characterization of Exposure Atmospheres

1. Nominal Concentrations

Due to the type of generation system used for this study it will not be possible to determine nominal exposure concentrations.

2. Actual Exposure Concentrations

Test atmospheres of aerosolized methane sulfonic acid were analyzed by collecting samples on filters, extracting the test material collected into a solvent, and analyzing the resulting solution by ion chromatography.

Atmosphere samples will be collected using one of two sampling regimens:

Short Sample Regimen

Group No.	Sampling Rate	Length of Sample	Filter Extraction Volume
2	1.0 LPM	10 minutes	12.5 ml
3	1.0 LPM	10 minutes	12.5 ml
4	1.0 LPM	5 minutes	12.5 ml

Long Sample Regimen

Group No.	Sampling Rate	Length of Sample	Filter Extraction Volume
1	0.50 LPM	150 minutes	20.0 ml
2	0.50 LPM	150 minutes	20.0 ml
3	0.25 LPM	150 minutes	30.0 ml
4	0.25 LPM	150 minutes	100.0 ml

Generally, at approximately ten minutes into each day's exposure, a short sample will be collected and analyzed. Immediately upon receipt of results, adjustments to the system will be made, if necessary, and the first of two long samples started. These short samples will be recorded but will not be reported as part of the daily mean exposure concentration.

25 mm filters (0.2μm pore size, catalog number FGLP-025-00, Millipore Corporation, Bedford, MA) will be loaded into in-line filter holders which will be subsequently plugged into the designated reference sampling port on the nose-only exposure unit to be sampled. After sampling, the filter will be carefully removed and placed in a vessel of sufficient size to accommodate the extraction volume used. After a brief period of agitation (generally less than one minute), a liquid aliquot will be removed and injected into the ion chromatograph (see attached for details of ion chromatography method) using a 1 cc plastic disposable syringe. Results will be expressed in terms of active MSA, not the formulation.

3. Aerosol Particle Size Determinations

Due to the relatively low exposure concentrations, the sensitivity of the analytical method and the small volumes of exposure atmosphere available when using nose-flow-past exposure methods, it will not be possible to collect aerosol size data during actual animal exposures. Data will be collected during the methods development phase to adequately define the aerosol size and its stability day-to-day. In addition, measurements will be collected during the week prior to exposure initiation and again within a few days of the final animal exposure.

Aerosol size determination will be conducted utilizing and InTox 7-stage cascade impactor operating at a flowrate of 1.8 L/min with glass fiber filters as the impaction substrate. Approximate sampling duration's will be as indicated in the following table:

Group No.	Sampling Time (minutes)
2	20
3	40
4	120

The filters will be analyzed gravimetrically. Results will be expressed in terms of the mass median aerodynamic diameter (MMAD) and the geometric standard deviation (GSD).

2) III. STUDY SCHEDULE DATA

A. Proposed Experimental Start Date: November 16, 1995

B. Proposed Necropsy Date(s): December 14 and 15, 1995 for main study animals
December 28, 1995 for recovery animals

C. Proposed Experimental Termination Date: April 10, 1996

D. Proposed Audited Draft Report Date: May 1996

VIII. EXPERIMENTAL OBSERVATIONS

3) B. Clinical Observations

The following is added to this section in the main protocol.

On days when animals undergo neurotoxicity evaluations, these animals will not also undergo clinical observations.

4) F. Clinical Pathology

The following is added to this section of the main protocol.

At the recovery interval, only those groups and only those parameters showing an effect will be evaluated.

G. Anatomic Pathology

3. Microscopic Examination

The following is added to this section in the main protocol.

At the recovery interval, only those groups and only those tissues showing on effect will be evaluated.

C. Reason for Protocol Modification:

1) To place exposure methods, exposure atmosphere generation, and exposure atmosphere analytical methods under protocol control.
2) Addition of study schedule data.
3) To prevent the duplication of clinical observation data.
4) To clarify when data should be collected from recovery animals.

Approved By:	Prepared By:
Elf Atochem North America, Inc. 2000 Market Street Philadelphia, PA 19103	WIL Research Laboratories, Inc. Ashland, OH 44805-9281
Roy M. Bannister, Ph.D. Senior Toxicologist	Charles E. Ulrich, B.S. Study Director
11/27/95 Date	Nov. 17, 95 Date

ANALYTICAL METHOD FOR MEASURING AIRBORNE CONCENTRATIONS OF METHANE SULFONIC ACID FOR WIL STUDY NO. 160033

A. Introduction:

In this study, methane sulfonic acid (MSA) is identified and quantitated by the use of ion exchange chromatography and electro-chemical conductivity detection. Standards of 99% MSA are prepared weekly with each fresh batch of mobile phase made and a three-level multipoint calibration is performed daily using the current working standards. Subsequently, concentration values are assigned based upon a least-square analysis developed from each calibration. Samples of airborne MSA are collected from chamber atmospheres on teflon filters, then diluted in an aqueous solution of Na_2CO_3 and NaOH (mobile phase). Approximately 0.5 cc of each sample is analyzed for MSA.

B. Instrumentation:

Instrument:	Dionex DX500 equipped with an ED40 Electrochemical Detector, GP40 Gradient Pump, anion suppressor (self-regeneration) (ASRS-1, 4 mm); and a Spectra-Physics Chromjet Integrator.
Column:	IonPac AS4A-SC 4 mm, P/N 43174
Mobile Phase:	25 mM sodium carbonate/2.9 mM sodium hydroxide
Detection Mode:	Conductivity
Flow Rate:	1.5 ml/min
SRS:	ON; 300 mA
Range:	100 μS
Sample Size:	25 μl loop
Run Time:	2.00 min.
Retention Time:	1.22 min.
Integrator Parameters:	Attenuation: 1024 Peak Width: 8 Threshold: 1000 Chart Speed: 2cm/min

C. Analytical Method:

1. Prior to initiating an analysis, the pre-filled container of eluent or mobile phase is purged using helium gas with a pressure of about 5 psi at the instrument gauge. This purification process should also be continued during analysis to prevent active gaseous contaminants such as oxygen from entering the ion chromatographic (IC) system.

2. The GP40 gradient pump is then turned on at the ON/OFF button (See "h" Figure 1).

3. The conductivity detector is turned on by directly activating the self-regenerating suppressor (SRS). Located in "method 1", the setpoint for the SRS is established at 300 mA, then saved back to "method 1". Refer to Figure 1 for details and selections for the following procedures:

   a. Select "Menu" ("d"), then choose method by using the move buttons ("g"). Move again to the section labelled "SRS", then use the select button ("c") to choose 300 mA.
   b. Move to the section labelled "save" and press "enter" ("e") ensuring the method number is 1.
   c. Press "menu" then choose "main". At this point, the LCD screen should read SRS 300 mA.

4. The system, now with mobile phase passing through the column, is allowed to equilibrate for about 20 minutes.

5. About 1 cc of sample is drawn into a disposable 1 cc syringe equipped with an injection needle adaptor.

6. The needle is inserted into the Rheodyne switch valve (RSV) (in the closed position) then injected. As the injection volume approaches 0.5 cc quickly turn the RSV clockwise. This delivers an ample supply to the 25 μl loop.

7. The integrator is automatically started when the RSV is turned.

D. Preparation of Mobile Phase Stock and Standard Solutions:

1. Mobile Phase:

   To prepare one batch of mobile phase, 5.3 g of sodium carbonate (weighed using a AG245 Mettler/Toledo Balance, Hightstown, NJ) or equivalent and 40 ml of 1 N sodium hydroxide (measured using a graduated cylinder) is brought to volume with deionized water in a 2-liter volumetric flask. Each week five batches are combined and stored in a 10-liter plastic bulk container.

2. Stock Standard:

Each week a stock solution used for preparing standards is made by weighing approximately 75 mg (X in equation 1) of 99% MSA (Aldrich, Milwaukee, WI) into a tared weigh-funnel then washed into a 0.250L volumetric flask with bulk mobile phase. The flask is then brought to volume with the same mobile phase. The concentration of the stock solution (M_1 in equation 1) is calculated using equation 1. The nominal is 300 mg/L, but will vary slightly depending on the acutal weight of 99% MSA taken.

$$\frac{X \text{ mg of } 99\% \text{ MSA}}{0.250L} = M_1 \text{ mg/L} \qquad \text{Equation 1}$$

3. Working Standards:

Aliquots of stock standard (above) are withdrawn using "Class A" glass pipets, transferred to 25-ml volumetric flasks and brought to volume with bulk mobile phase. The final concentration of each standard solution shown in table 1 is calculated using equation 2.

$$M_1 V_1 = M_2 V_2 \qquad \text{Equation 2}$$

Table 1. Data to Calculate Standard Concentrations

Aliquot Size V_1, (ml)	Final Volume V_2, (ml)	Nominal Concentration M_2, (mg/L)
1	25	12
5	25	60
10	25	120

E. Calibration of the Instrument:

Three standards with final concentrations ranging from approximately 10 mg/L to 125 mg/L are prepared each time a new bulk batch of mobile phase is made. Prior to atmosphere generation, each standard is analyzed daily on the ion chromatograph in triplicate. The average area count, standard deviation and coefficient of variance is quantitated and a linear regression analysis is performed using Microsoft Excel software installed on a 386DX computer. After a session of atmosphere generation is complete, the three standards are analyzed for a fourth time to examine the stability of the system during the course of daily use.

F. Collected Samples:

Samples are received on PTFE Membrane filters (0.2 um, 25 mm dia., Millipore, Bedford, MA) then MSA is extracted using bulk mobile phase in an appropriately sized container (See table 2). Each sample is then analyzed for methane sulfonic acid (MSA) (See Section B). The calculated concentration can be evaluated by using equation 3 below. In addition to some atmosphere generation variables, table 2 presents the anticipated analytical concentration (Z in equation 3) of MSA at each target level:

$$\frac{C,\ mg/L\ D,\ min.\ F,\ L/min}{V,\ ml} \times \frac{(1000\ ml)}{(1L)} = Z\ mg/L \qquad \text{Equation 3}$$

Table 2 Analyte Concentrations for Various MSA Exposure Levels Under Indicated Sampling Conditions

Group No.	Target Concentration C. (mg/L)	Sampling Duration D. (min.)	Sample Flow F. (LPM)	Extraction Volume V. (ml)	Expected Analyte Concentration Z. (mg/L)
2	0.025	150	0.50	20	93.75
3	0.075	150	0.25	30	93.75
4	0.250	150	0.25	100	93.75

PROTOCOL

A 4-Week Inhalation Toxicity Study of Methane Sulfonic Acid in Albino Rats

Study No.: WIL-160033

For

Elf Atochem North America, Inc.
2000 Market Street
Philadelphia, PA 19103

By

WIL Research Laboratories, Inc.
Ashland, Ohio 44805-9281

November 6, 1995

A 4-WEEK INHALATION TOXICITY STUDY OF METHANE SULFONIC ACID IN ALBINO RATS

WIL Study No.: WIL-_____ Sponsor Project No.:_____

I. OBJECTIVE OF STUDY

To evaluate potential subchronic toxic effects of the test material when administered via inhalation to rats for 28 days.

This protocol has been designed and the study will be conducted in accordance with The Organization for Economic Cooperation and Development Health Effects Test Guidelines, Section 412, adopted May 12, 1981, the European Community (EC) testing guidelines, method B8 (29.12.92) and in general accordance with the U.S. Toxic Substance Control Act (TSCA) Health Effects Test Guideline, 40 CFR, 798.2450.

This protocol was designed and the study will be conducted in compliance with U.S. Environmental Protection Agency (EPA) Good Laboratory Practice (GLP) regulations, 40 CFR Part 792 and the OECD Good Laboratory Practices C (81) 30 (Final) Annex 2.

II. PERSONNEL INVOLVED IN THE STUDY

A. Sponsor Representative

Roy M. Bannister, Ph.D., D.A.B.T.
Senior Toxicologist

B. WIL Study Director

Charles E. Ulrich, B.S.
Director, Inhalation Toxicology

C. WIL Toxicology Department Responsibilities

1. E. Crosby Tompkins, Ph.D., D.A.B.T.
   Vice President, Director of Toxicology

2. James L. Schardein, M.S., A.T.S.
   Senior Vice President, Director of Research

3. Gary R. Kiplinger, B.S.
   Manager of General Toxicology

4. Kerin Clevidence, B.S.
   Group Supervisor of Gross Pathology and Developmental Toxicology Laboratory

II. PERSONNEL INVOLVED IN THE STUDY (continued)

5. Ken D. Miller, B.A., M.T. (ASCP)
Supervisor of Clinical Pathology

6. Lynn Myers, A.S.
Group Supervisor, Histology

7. Stanley E. Kopp
Systems Manager

8. Sally Keets, A.S.
Manager of Vivarium

9. Deborah L. Little
Manager of Quality Assurance

10. John F. Knapp, B.S.
Manager of Pharmacy

11. Charlene Lindsey, M.A.
Manager of Technical Report Writing

12. Loren W. Severs, M.S.
Manager of Analytical Chemistry

13. Robert Dahlgren, D.V.M., Ph.D., Diplomate A.C.V.P.
Director of Pathology and Veterinary Medicine

III. STUDY SCHEDULE DATA

A. Proposed Experimental Start Date: To be added by protocol amendment.

B. Proposed Necropsy Date(s): To be added by protocol amendment.

C. Proposed Experimental Termination Date: To be added by protocol amendment.

D. Proposed Audited Draft Report Date: To be added by protocol amendment.

IV. TEST MATERIAL DATA

A. Identification:	70% Methane Sulfonic Acid (MSA)
B. Lot Number:	M12E.
C. Purity:	69.9%
D. Stability:	Stable under normal ambient conditions. Avoid contact with strong alkalis.
E. Physical Description:	Pale yellow liquid.
F. Storage Conditions:	Normal indoor ambient conditions.
G. Personnel Safety Data:	See attached MSDS.
H. Reserve Samples:	Retention sample(s) will be collected according to WIL standard operating procedures and stored in the Archives at WIL Research Laboratories, Inc.

V. TEST SYSTEM

A. Species:	Rat
B. Strain:	Sprague-Dawley Crl:CD®BR
C. Source:	The Charles River Breeding Laboratories, Inc. 9801 Shaver Road Portage, Michigan 49081
D. Number on Study:	At initiation of exposure: 60 males and 60 females. A minimum of 70 males and 70 females will be purchased.
E. Approximate Age:	Animals will be approximately 5 to 6 weeks of age when received, and 6 to 8 weeks of age at initiation of exposure.

V. TEST SYSTEM (continued)

F. Identification System: Animals will be uniquely identified by a Monel metal eartag displaying the animal number. Individual cage cards will be affixed to each cage and will display the study number, group number, animal number, exposure level, sex, date of arrival and initiation of exposure.

G. Justification for Selection: This species and strain of animal is recognized to be appropriate for subchronic inhalation studies.

VI. SPECIFIC (NONEXPOSURE PERIOD) MAINTENANCE SCHEDULE

A. Animal Housing

Animals will be housed individually in an environmentally controlled room in clean suspended wire-mesh cages. The cages will be elevated above cage-board or other suitable material which will be changed at least three times each week. The cages will be subject to routine cleaning at a frequency consistent with maintaining good animal health.

B. Environmental Conditions

Controls will be set to maintain room temperature at 72° ± 4°F and relative humidity at approximately 30-70%. Fluorescent lighting controlled by light timers will provide illumination for a 12-hour light/dark photoperiod. Temperature and relative humidity will be recorded once daily.

C. Drinking Water

Tap water will be available *ad libitum*. Filters servicing the automatic watering system will be changed regularly according to WIL Standard Operating Procedures. Water supplying the laboratory will be analyzed according to WIL Standard Operating Procedures.

D. Basal Diet

Purina® Certified Rodent Chow #5002 will be offered *ad libitum* during the study. Analyses of the certified feed for the presence of heavy metals and pesticides will be provided by the manufacturer.

VII. EXPERIMENTAL DESIGN

A. Animal Receipt and Quarantine

Each animal will be inspected by a qualified technician upon receipt. Animals judged to be in good health and suitable as test subjects will be placed immediately in quarantine for approximately seven to ten days. All animals will be sexed, weighed and assigned a permanent animal number. During the quarantine period, each animal will be observed twice daily for changes in general appearance and behavior. The animals will be conditioned to the exposure restraint tubes on an incremental basis prior to randomization. All animals will receive a detailed physical examination at the time of animal selection for randomization.

The animals will be allowed a pretest period of at least 5 days during which food consumption, body weight and general health will be monitored but they will not be exposed to the test material.

B. Randomization

At the conclusion of the pretest period, animals judged to be suitable for testing will be assigned to groups using stratified randomization based on body weight. At this time, the animal numbers and corresponding body weights will be entered into WIL's Computer Data Management System and a printout containing the animal numbers and individual exposure group assignments will be generated. Animals will then be arranged into the groups according to the printout. Body weights at randomization will be within ± 20% of the mean for each sex. If after randomization significant differences between groups exist, new randomization will be generated until group mean body weights are homogeneous.

C. Organization of Test Groups, Exposure Levels and Treatment Regimen

1. Organization of Test Groups

The following table presents the study group arrangement.

VII. EXPERIMENTAL DESIGN (continued)

Group Number	Test Material	Target Exposure Level (mg/L)	Number of Animals Males	Females
1	Control Material	0	15	15
2	MSA	0.025	15	15
3	MSA	0.075	15	15
4	MSA	0.25	15	15

The control and test materials will be administered as daily six-hour, nose-only exposures on a five days per week basis for four consecutive weeks (minimum of 20 total exposures). After 4 weeks of exposure, 10 males and 10 females from each group will be euthanized and necropsied. The remaining 5 males and 5 females in each group will be maintained for a 2-week post-exposure recovery period, and then euthanized and necropsied.

D. Route and Rationale of Test Material Administration

The route of administration will be inhalation exposure. The inhalation route is an anticipated route of exposure for the general population. The nose-only method will be employed to minimize potential oral and dermal exposure.

E. Exposure Methods

Exposures will be conducted utilizing In-Tox nose-flow-past nose-only exposure systems. One system will be dedicated for each group for the duration of the study.

Air flow rate through the system will be set to provide adequate volumes for the animals and for analytical sampling. Daily average chamber temperature and relative humidity will be 22±2°C and 40-60%, respectively. These parameters will be monitored continuously and recorded approximately every 30 minutes during each day's exposure. Oxygen content of the exposure atmosphere will be measured during the methods development phase of the study and will be at least 19%.

All animals will be housed in normal animal colony rooms during non-exposure hours. For each day's exposure, the animals will be placed in restraint tubes, transported to the exposure room, exposed for the requisite duration and returned to their home cages.

VII. EXPERIMENTAL DESIGN (continued)

F. Test Material Generation Methods

Details of generation system methodologies cannot be defined until the exposure levels are defined and the physical and chemical characteristics of the test material are known. Therefore, this information will be added as a protocol amendment after preliminary methods evaluations are conducted.

G. Methods for Characterization of Exposure Atmospheres

1. Nominal Concentrations

Nominal exposure concentrations will be calculated for all exposures.

2. Actual Exposure Concentrations

Details concerning specific methods to be used and the frequency of determination cannot be defined until the test material and the target exposure levels are defined. Therefore, this information will be added as a protocol amendment after preliminary methods evaluations are conducted. Homogeneity of exposure concentrations over the available nose-only system ports will be defined during the pre-study methods development work.

3. Aerosol Particle Size Determinations

Aerosol particle size determinations will be conducted utilizing an In-Tox cascade impactor. The aerosol size will be expressed in terms of the mass median aerodynamic diameter (MMAD) and geometric standard deviation (GSD). Details concerning specific methods to be used and the frequency of determinations cannot be defined until the test material and the target exposure levels are defined. Therefore, this information will be added as a protocol amendment after preliminary methods evaluations are conducted.

VIII. EXPERIMENTAL OBSERVATIONS

A. Viability Observations

All animals will be observed for mortality/moribundity twice daily, at the time the animals are placed into the restraint tubes and again upon removal. Moribund animals will be euthanized to ensure that tissues will not be lost due to autolysis.

VIII. EXPERIMENTAL OBSERVATIONS (continued)

B. Clinical Observations

On days of exposure, a clinical examination will be performed twice daily for all animals. This will be performed prior to placement into the tubes and approximately 1-2 hours after completion of exposure. On non-dosing days, including the recovery period, clinical examinations will be performed once daily. Observations will include but are not limited to changes in the skin, fur, eyes and mucous membranes, respiratory, circulatory, autonomic and central nervous systems function, somatomotor activity and behavior patterns. Findings noted at the clinical examinations will be recorded for individual animals; the condition of animals without signs will be documented in a general comment.

C. Detailed Physical Examinations

Detailed physical examinations will be performed weekly beginning one week prior to initiation of test material exposure and just prior to the scheduled necropsy. These evaluations will include handling and open field observations as described in WIL SOP T1-112, as revised, (sections 2 and 3). Observations will be made in such that the observers are unaware of treatment groups.

D. Individual Body Weights

Individual body weights will be recorded weekly, beginning one week prior to initiation of test material exposure and prior to terminal necropsy.

E. Individual Food Consumption

Individual food consumption will be recorded weekly for all animals, beginning one week prior to initiation of test material exposure.

F. Clinical Pathology

The following clinical pathology parameters will be evaluated on all animals just prior to their scheduled necropsy. The animals will be fasted overnight before taking blood samples. Blood will be collected from a lateral tail vein just prior to the scheduled necropsy.

VIII. EXPERIMENTAL OBSERVATIONS (continued)

1. Hematology

Hemoglobin	Platelet count
Hematocrit	MCH
Erythrocyte count	MCV
Total leukocyte count	MCHC
Differential leukocyte count[a]	

a = To be done initially on control and high exposure level groups. If a potential test material related effect is observed, this examination may be extended to the other groups.

2. Blood Chemistry

Serum alanine aminotransferase	Total bilirubin
Serum aspartate aminotransferase	Total protein
Serum alkaline phosphatase	Albumin
Phosphorus	Globulin (by calculation)
Glucose	A/G ratio (by calculation)
Blood urea nitrogen	Calcium
Blood creatinine	Chloride
Total cholesterol	Potassium
Gamma glutamyl transpeptidase	Sodium
Bile acids	

3. Urinalysis

The animals will be placed in metabolism cages overnight (for approximately 16 hours) for collection of urine. The following parameters will be analyzed:

Volume	Ketones
Color and appearance	Bilirubin
Specific gravity	Nitrites
pH	Leukocytes
Occult blood	Microscopy of sediment
Glucose	Urobilinogen
Protein	

VIII. EXPERIMENTAL OBSERVATIONS (continued)

G. Anatomic Pathology

1. Macroscopic Examination

A complete necropsy will be conducted on all animals dying spontaneously, euthanized *in extremis* or at study termination. Animals euthanized *in extremis* or at study termination will be anesthetized with an intravenous injection of sodium pentobarbital and exsanguinated. Necropsy will include examination of the external surface, all orifices and the cranial, thoracic, abdominal and pelvic cavities including viscera. At the time of necropsy the following tissues and organs will be collected and placed in 10% neutral buffered formalin:

- Adrenals (2)
- Aorta
- Bone with marrow (sternebrae)
- Brain (forebrain, mid-brain, hindbrain)
- Bronchial lymph node
- Eyes with optic nerve (2)
- Gastrointestinal tract
  - Esophagus
  - Stomach
  - Duodenum
  - Jejunum
  - Ileum
  - Cecum
  - Colon
  - Rectum
- Heart
- Kidneys (2)
- Liver (sections of two lobes)
- Lungs (including bronchi, fixed by inflation with fixative)
- Mesenteric lymph node
- Mammary gland (females only)
- Nasal turbinates
- Ovaries with oviducts (2)
- Pancreas
- Parathyroids (if present)
- Peripheral nerve (sciatic)
- Pituitary
- Prostate
- Salivary glands [submaxillary (2)]
- Seminal vesicles (2)
- Skeletal muscle (vastus medialis)
- Skin
- Spinal cord (3 sections - cervical, midthoracic, lumbar)
- Spleen
- Suprapharyngeal lymph node
- Testes with epididymides (2)
- Thymus
- Thyroids
- Trachea
- Urinary bladder
- Uterus with vagina
- All gross lesions

VIII. EXPERIMENTAL OBSERVATIONS (continued)

2. Organs Weights

The following organs from all animals at the terminal necropsy will be weighed: (Paired organs will be weighed together).

Adrenals	Lungs
Brain	Ovaries
Heart	Testes with epididymides
Kidneys	Thymus
Liver	Spleen

Organ to body weight ratios will be calculated.

3. Microscopic Examination

Microscopic examination of the nasal cavities will be performed on all animals. Following fixation, the skulls will be decalcified until soft. Six cross sections of the nasal turbinates will be prepared for microscopic examination in accordance with the method described by Morgan[1].

Microscopic examination of hematoxylin - eosin stained paraffin sections will be performed on the other tissues listed in protocol section VIII.G.1. for all animals in the control and high level groups and from all rats that die or are euthanized *in extremis*. The lungs, trachea, liver, kidneys and gross lesions will be examined from animals in the low and mid level groups. If a potential target organ is noted in the high dose group, that tissue will be examined in the low and mid level groups (additional cost).

IX. STATISTICAL METHODS

All analyses will be two-tailed for significance levels of 5% and 1%. All means will be presented with standard deviations. All statistical tests will be performed by a Digital® Equipment Corporation computer with appropriate programming. Weekly body weights, body weight changes and food consumption as well as clinical pathology values (excluding white cell differential counts other than lymphocytes and segmented neutrophils), and absolute and relative organ weights will be analyzed by a one-way analysis of variance comparison of the control group to each treated group by Dunnett's test(2).

X. QUALITY ASSURANCE

The study will be audited by the WIL Quality Assurance Unit while in progress to assure compliance with Good Laboratory Practice Regulations, adherence to the protocol and to WIL Standard Operating Procedures. The raw data and draft report will be audited by the WIL Quality Assurance Unit prior to submission to the Sponsor to assure that the report accurately describes the conduct and the findings of the study.

This is a regulated study and will be included on the master schedule.

XI. RECORDS TO BE MAINTAINED

All original raw data, as defined by WIL SOPs and the applicable GLPs, will be maintained in permanently bound notebooks or in loose-leaf notebooks and at study completion will be stored in the Archives at WIL Research Laboratories, Inc.

XII. WORK PRODUCT

Sponsor will have title to all documentation records, raw data, specimens or other work products generated during the performance of the study. ~~Within six months~~ following submission of the final report all work products (including tissues, blocks and slides) will be transferred to the Sponsor. In the event the Sponsor cannot accommodate transfer of all or part of the work product such materials will be retained in the archives at WIL Research Laboratories indefinitely as directed by the Sponsor. WIL Research Laboratories will charge a standard annual storage fee for the retention of such work product. Raw data in magnetic form will be retained by WIL Research Laboratories in compliance with regulatory requirements.

OCL 6-11-96

XIII. REPORTS

The report will contain all information necessary to conform with current EPA/TSCA and OECD specifications.

The final report will include the following: summary, objective, test material data; a methods section containing the methods for test atmosphere generation and characterization and the methods for all evaluations conducted; a results section containing both text and tabular data presenting the study results; and a discussion and conclusion section. Appropriate appendices will be provided for summarized and individual data.

Two copies of the final report will be provided.

XIV. PROTOCOL MODIFICATION

Modification of the protocol may be accomplished during the course of this investigation. However, no changes will be made in the study design without the verbal or written permission of the Sponsor. In the event that the Sponsor verbally requests or approves changes in the protocol, such changes will be made by appropriate documentation in the form of protocol amendments. All alterations of the protocol and reasons for the modification(s) will be signed by the Study Director and Sponsor Representative.

XV. ANIMAL WELFARE ACT COMPLIANCE

This study will comply with all applicable sections of the Final Rules of the Animal Welfare Act regulations (9 CFR). The Sponsor should make particular note of the following:

1. The Sponsor signature on this protocol documents for the Study Director the Sponsor's assurance that the study described in this protocol does not unnecessarily duplicate previous experiments.

2. Whenever possible, procedures used in this study have been designed to avoid or minimize discomfort, distress or pain to animals. All methods are described in this study protocol or in written laboratory standard operating procedures.

3. Animals that experience severe or chronic pain or distress that cannot be relieved will be painlessly euthanized as deemed appropriate by the veterinary staff and Study Director. The Sponsor will be advised by the Study Director of all circumstances which could lead to this action in as timely a manner as possible.

4. Methods of euthanasia used during this study are in conformance with the above referenced regulation.

XVI. PROTOCOL APPROVAL

Elf Atochem North America, Inc. 2000 Market Street Philadelphia, PA 19103	WIL Research Laboratories, Inc. Ashland, Ohio 44805-9281
Roy M. Sanbister, Ph.D., D.A.B.T. Senior Toxicologist	Charles E. Ulrich, B.S. Study Director
Nov 9th, 1995 Date	Nov. 14, 1995 Date

References

1. Approaches to the Identification and Recording of Nasal Lesions in Toxicology Studies, Morgan, Kevin T., Toxicology Pathology, Vol. 14, No. 4 (Part 1): 337-351 (1991).

2. BMDP-79 Biomedical Computer Programs, University of California Press, Berkeley, California, 1979.

elf atochem
ATO

Elf Atochem North America, Inc.
900 First Avenue, P.O. Box 1536
King of Prussia, PA 19406

PRODUCT SAFETY AND TOXICOLOGY
CONFIDENTIAL
DATE:

TEST ARTICLE DESCRIPTION

METHANE SULFONIC ACID

IDENTITY: Product Code 01756

Components: METHANESULFONIC ACID AND WATER
Chemical name: Methane Sulfonic Acid, MSA
CAS number: ~~7732-18-5~~ 75-75-2
Concentration: 70 %
Origin and Batch: L-04-0
Lot/Laboratory page number: —

PHYSICAL AND CHEMICAL PROPERTIES

Appearance: PALE YELLOW LIQUID
Freezing Point: -60 °C
Boiling point: N/A
Vapor Pressure: 3.8 @ 20 °C (est).
Specific gravity: 1.345-1.360 @ 20 °C
Solubility: IN H_2O COMPLETELY MISCIBLE

TOXICOLOGY INFORMATION/ACUTE HANDLING HAZARDS

See MSDS
Corrosive to Eyes and Skin

STORAGE AND DISPOSAL

Storage conditions: Room temp.
Expiration date: 12-30-94
Disposal: Return to: Elf Atochem North America, Inc.,
17168 West Jefferson,
Riverview, MI 48192

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MATERIAL SAFETY DATA SHEET

ATOCHEM NORTH AMERICA
ORGANIC CHEMICALS
[illegible]EE PARKWAY
PHILADELPHIA, PA 19102

EMERGENCY PHONE NUMBERS
BUSINESS HRS.: 215-587-7291
OTHER HOURS: 313-285-9200
OTHER HOURS 800-424-9300
CHEMTREC: 800-424-9300

****

PRODUCT IDENTIFICATION

PRODUCT NAME: CAS NO.: 75-75-2
METHANE SULFONIC ACID
SYNONYMS:
MSA, METHYL SULFONIC ACID
CHEMICAL NAME:
METHANESULFONIC ACID
MOLECULAR FORMULA:
CH4O3S
CHEMICAL FAMILY: SULFONIC ACID

RECEIVED APR 1992

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INGREDIENTS----HAZARD CLASSIFICATIONS

COMPONENTS-HAZARDOUS:	CAS NO.:	%	COMMENTS:	
THANE SULFONIC ACID	75-75-2	70.0	OSHA: CORROSIVE	NFPA: 3-1-1
WATER	7732-18-5	30.0		

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SHIPPING INFORMATION

ALKANESULFONIC ACID SOLUTION; CORROSIVE MATERIAL; UN 2584

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PHYSICAL PROPERTIES

BOILING POINT/RANGE: NA	MELTING POINT: NA	FREEZING POINT: -60 C -76 F
MOLECULAR WEIGHT: 96.10	SPECIFIC GRAVITY(H2O=1): 1.345-1.360 @ 20 C	VAPOR PRESSURE(MM HG): 3(EST) @ 20 C, 68 F
VAPOR DENSITY(AIR=1): 3.3	SOLUBILITY IN H2O: COMPLETELY MISCIBLE	% VOLATILES BY VOLUME: ESSENTIAL NONVOLATIL

APPEARANCE AND ODOR:
PALE YELLOW LIQUID; NONE TO FAINT SO3 ODOR.

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FIRE AND EXPLOSION DATA

FLASH POINT:	FLAMMABLE LIMITS:		AUTOIGNITION TEMP
FLASH POINT.	LOWER: NA	UPPER: NA	NA

EXTINGUISHING MEDIA: NA

SPECIAL FIRE FIGHTING PROCEDURES: NA

UNUSUAL FIRE AND EXPLOSION HAZARDS: NA

REACTIVITY DATA

STABILITY: STABLE

CONDITIONS CONTRIBUTING TO INSTABILITY: NA

INCOMPATIBILITY-AVOID CONTACT WITH:
STRONG
ALKALIS

HEAT RELEASE OR SPATTERING MAY OCCUR.

HAZARDOUS DECOMPOSITION THERMAL AND OTHER:

SULFUR DIOXIDE AND SULFUR TRIOXIDE (THERMAL).

CONDITIONS TO AVOID:
HEAT

TOXICITY

ROUTE:	ANIMAL:	DATA:
ORAL	MOUSE	SEE TOXICITY SECTION.
DERMAL	RABBIT	SEE SKIN EFFECTS SECTION
INHALATION	MOUSE	SATURATED ATMOSPHERE NO EFFE

TOXIC EFFECTS/ROUTES OF ENTRY

EYE EFFECTS: CORROSIVE

CORROSIVE (RABBITS).
MAY CAUSE IRREVERSIBLE BLINDNESS.

SKIN EFFECTS: CORROSIVE

DERMAL: LD50: <2000 MG/KG (RABBIT) 24 HOUR EXP. & 7 DAY OBSV. CORROSIVE TO SKIN.

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TOXICITY - CONTINUED

OTHER TOXIC EFFECTS:

NA

TARGET ORGAN TOXIN:
EYE, SKIN, MUCOUS MEMBRANES

TOXICITY COMMENTS:
ORAL: LD50: 6200 MG/KG (SODIUM SALT OF THE ACID USED FOR TOXICITY) MOUSE.
METHANE SULFONIC ACID IS NOT LISTED AS A CARCINOGEN BY OSHA, NTP, OR IARC. PRINCIPAL ROUTE OF EXPOSURE IS BY SKIN CONTACT. CONTACT WITH SKIN MAY CAUSE BLISTERS AND BURNS. CONTACT WITH EYES MAY CAUSE BLINDNESS.

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HEALTH HAZARD INFORMATION

PERMISSIBLE EXPOSURE LIMITS:

(1989) NONE AVAILABLE

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EMERGENCY FIRST AID

INGESTION:

DO NOT INDUCE VOMITING	GIVE PLENTY OF WATER	GET MEDICAL ATTENTION

DERMAL:

WASH WITH SOAP AND WATER	GET MEDICAL ATTENTION	CONTAMINATED CLOTHING - REMOVE AND LAUNDER	CONTAMINATED SHOES - DESTR

EYE CONTACT:

FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES	GET MEDICAL ATTENTION

HOLD EYELIDS OPEN WHEN FLUSHING.

INHALATION: NA

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SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS:

CONSULT AN INDUSTRIAL HYGIENIST OR ENVIRONMENTAL HEALTH SPECALIST	USE WITH ADEQUATE VENTILATION

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SPECIAL PROTECTION INFORMATION - CONTINUED

EYE:
ACE SHIELD GOGGLES

HAND(GLOVE TYPE):
SYNTHETIC RUBBER ANY NON-PERMEABLE TO PRODUCT

RESPIRATOR TYPE:

SELF-CONTAINED IF PRODUCT INVOLVED IN FIRE.

OTHER PROTECTIVE EQUIPMENT: RUBBER BOOTS APRON

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SPECIAL HANDLING AND STORAGE CONDITIONS

WASH THOROUGHLY AFTER HANDLING

DO NOT GET IN EYES, ON SKIN OR CLOTHING

DO NOT BREATHE DUST,VAPOR,MIST,GAS

EMPTY CONTAINER MAY CONTAIN HAZARDOUS RESIDUES

1. DO NOT ADD WATER TO ACID WHILE IN CONTAINER BECAUSE HEAT RELEASE MAY CAUSE SPATTERING.
2. NEVER USE PRESSURE TO EMPTY DRUM.
3. RINSE EMPTIED CONTAINER WITH PLENTY OF WATER BEFORE DISCARDING.

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SPILL MANAGEMENT

PREVENT SPREAD OF SPILL

DIKE TO PREVENT SPREAD OF SPILL. DILUTE WITH WATER TO TWICE THE VOLUME AND NEUTRALIZE WITH SODA ASH OR LIME. THEN DISPOSE IN ACCORDANCE WITH LOCAL, STATE OR FEDERAL REGULATIONS.
CAUTION: SPATTERING MAY OCCUR. WEAR PROTECTIVE GEAR LISTED UNDER SPECIAL PROTECTION INFORMATION.

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DISPOSAL PROCEDURES

DIKE TO PREVENT SPREAD OF SPILL. CAREFULLY POUR INTO AN EXCESS AMOUNT OF WATER SOLUTION, THEN NEUTRALIZE WITH SODIUM CARBONATE OR BICARBONATE. STIR AND ALLOW TO STAND UNTIL COOL AND BUBBLING HAS STOPPED.

CONSULT FEDERAL, STATE, OR LOCAL AUTHORITIES FOR PROPER DISPOSAL PROCEDURES.

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ADDITIONAL INFORMATION

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MSDS PREPARED BY JOHN R. HARRIS

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