May 2, 2012

[redacted]
St. Paul MN 55114

Dear Mr. [redacted]:

Re: [redacted], Plaintiff vs. [redacted], Inc; [redacted], Inc.; [redacted], Inc.; and [redacted] Inc. in the Greenup Circuit Court, Commonwealth of Kentucky, Civil Action [redacted]
Our File: L12-832

At your request I have evaluated the above-referenced matter and will provide my comments and opinions. I begin by presenting my credentials for the Court.

QUALIFICATIONS

I, Richard A. Parent, PhD, DABT, FATS, RAC, ERT, am a board certified toxicologist with over 12 years' experience in the field of industrial toxicology and an additional 28 years' experience in litigation support for both the plaintiff and defense. I have testified in local and federal courts as an expert in toxicology and have given expert testimony in the disciplines of toxicology and chemistry. During my career, I have spent 10 years in research on organic chemicals at American Cyanamid Company. In the field of toxicology, I have initiated and carried out an active program in product safety relating to toxicology for the Xerox Corporation. I have directed two contract toxicology laboratories: Food and Drug Research Laboratories, Inc. and Gulf South Research Institute, Life Sciences Division. In 1984, I established Consultox, Limited, a toxicology consulting firm, and have since consulted in product safety for various industries and have designed toxicology studies to assess the safety of materials being considered for use in a variety of products. For litigants, I have provided toxicological support and have addressed causation issues for the plaintiff as well as the defense. I am board

certified by the American Board of Toxicology, the Academy of Toxicological Sciences, and the Regulatory Affairs Professional Society. I am a recognized expert in toxicology in France and the European Community. I present myself to the Court as an expert in the fields of toxicology and chemistry. For the Court's information, I offer my curriculum vitae in Attachment A, references for the citations in this report in Attachment B, and a list of my testimony for the past 4 years in depositions and trials in Attachment C.

MATERIALS REVIEWED

- Medical Evaluation Report by [redacted] MD, dated April 29, 2008
- Deposition of [redacted] dated April 14, 2009
- Medical Records from [redacted] dated October 30, 2007
- Medical Records of Dr. [redacted] from October 2007
- Medical Records from King's Daughters Medical Center from October 11, 2007, to March 24, 2011
- Medical Records from Our Lady of Bellefonte Hospital from February 27, 2008, to May 12, 2011
- Medical Records from Dr. [redacted] Northwest Forensic Inc, October 1, 2008
- Medical Records; Sleep Study Dr. [redacted] dated June 3, 2008
- Medical Records Ashland Medical Group, dated November 12, 2008
- Medical Records from Johnson Chiropractic from May 11, 2005, to August 13, 2008
- CSX report of October 10, 2007, on Mr. [redacted] - chemical exposure
- Extensive literature on the Toxicological Effects of Chlorine

INTRODUCTION

It is my understanding that Mr. [redacted] while performing his duties as a carman for CSX Transportation, on two occasions was exposed to gases or vapors that apparently escaped from railroad tank cars that he was servicing. I am not aware that the nature of the first exposure on October 8, 2007, but the exposure two days later on October 10, 2007, was identified as a chlorine release. Mr. [redacted] now contends that his exposures on both occasions contributed to his respiratory problems for which he was prescribed an inhaler and his eye problems for which he has been prescribed eye drops. He further describes severe nasal irritation subsequent to his exposures and that has been confirmed medically. Dr. [redacted] extensive evaluation of Mr. [redacted] describes deficits in pulmonary function tests, shortness of breath, coughing, upper respiratory tract blockage, headaches, and eye irritation. He makes a note that the ENT doctor scoped Mr. [redacted]'s nose and pharynx and found extensive inflammation. He also notes that a chest xray taken on October 11, 2007, showed air trapping without infiltrates. Dr. [redacted]

diagnosed Mr. [redacted] with RADS, chronic sinusitis, rhinitis, bronchitis, and asthma. Exposure to chlorine gas is certainly capable of causing these conditions as indicated below.

Note that neither Mr. [redacted] nor his wife are smokers and that there are no obvious familial medical problems. There are no prior occupational exposures that would influence the health problems that he experienced as a result of his exposure to chlorine gas.

DISCUSSION

The Toxicology of Chlorine Gas

In man, WWI exposures to chlorine were many, but documentation of the persistent effects of inhaling the gas is not particularly good. Some reports described chronic asthma,[1-2], chronic bronchitis,[1-3] anoxemia,[1], emphysema,[2,4] pulmonary edema,[5] and bronchopneumonia.[6] Cardiovascular effects also were noted in some exposed individuals.[1]

Human exposure to chlorine is known to result in obstructive, restrictive, and reactive respiratory effects.[7-9] Obstructive effects include chronic obstructive pulmonary disease or COPD,[10-14] bronchitis,[1-3,12,15-17] tracheobronchitis,[15,18,19] chronic bronchitis,[20,21] bronchoconstriction,[22] airway obstruction,[7,10-12,14] and mucus membrane damage in upper respiratory tract.[23,24] In addition, exposure to high levels of chlorine results in deep lung changes such as in restrictive pulmonary function effects. These changes include atelectasis resulting in hypoxemia,[24,25] pulmonary edema,[15,19,23,26-30] pneumonia,[19] abnormal chest radiograms including mottling, and patches of irregular densities with atelectasis,[25] patchy infiltrates of the lung,[31] permanent damage to the pulmonary parenchyma and alveolar capillaries,[12] and death.[19,27,32,33] One study involving a train derailment and several deaths resulted in significant airway damage and inflammation in survivors.[34,35]

Acute exposures to chlorine result in signs and symptoms that are fairly consistent in the reported literature. The following symptoms are reported to be related to acute exposure to chlorine: cough,[7,12,18,25,29,36-42] dyspnea,[12,18,21,29,37,38] eye irritation,[18,21,25,29,36,37,40,41] chest tightness,[7,12,37,39,41] throat irritation and horseness,[7,12,21,25,29,36,38] nausea/vomiting,[7,18,25,40] yellow purulent sputum,[32] among other symptoms as indicated in the numerous reviews on the subject.[16,23,28,32,33,43,44]

Persistent symptomatology in man exposed to chlorine include persistent cough,[7,16-18,20,25,26,30,37-40,45] dyspnea,[11,13,18,23,30,37,38,46,47] shortness of breath,[4,20,39] anoxia,[22] hypoxemia,[11,12,19,24,31,37,48] decreased ability to detect odor,[36] bronchospasm,[24,29,31] wheezing,[46] Reactive Airways Disease Syndrome (RADS),[15,42,49-55] hyperreactive airways,[50,56]chronic rhinitis[57] and chronic asthma.[1,23,47,51,58-60] Additional symptomatology noted includes greenish-yellow purulent sputum production,[4,25,46] and decreased pulmonary function parameters including air flow and residual volume.[14,23,40,61] It also has been reported that smokers are

more responsive to the adverse effects of chlorine versus non-smokers.[23]

Studies of animals exposed to chlorine provide some aid in determining the mechanism of action and the associated pathology resulting from controlled exposures at different concentrations of chlorine. Animals exposed to chlorine have demonstrated a variety of responses. Fisher 344 rats, after being exposed to low levels of chlorine, have been reported to show hyperplasia and hypertrophy of epithelial cells of the respiratory bronchioles, alveolar ducts, and alveolae,[62] while rabbits have demonstrated anatomical emphysema with distortion of the alveolar architecture at higher levels of exposure.[63] Exposed Swiss mice showed squamous metaplasia, exfoliation, erosion, ulceration, and necrosis of the respiratory epithelium.[64] In addition, terminal bronchiolitis also has been reported.[64] Another study in rats and mice reported similar findings.[65] Exposed monkeys again showed loss of cilia, decreased goblet cells, emphysema, bronchiolitis obliterans, and pneumonia.[66] Cattle inadvertedly exposed to chlorine, on autopsy, showed emphysema, chronic tracheitis, alveolar edema, hemorrhage, and atelectasis.[67] One study of 28 patients involved bronchial brushings after chlorine exposures and at Day 5 showed basal cell and goblet cell hyperplasia, acute inflammation, and chromatolysis of columnar epithelium with fibrotic repair processes noted by Days 15 and 25.[21]

CONCLUSION

It is clear from the above discussion that exposure to chlorine gas is capable of causing most of the medical problems described by Mr. [redacted] and his doctors. It also is clear that Mr. [redacted] was exposed to chlorine while performing his duties as Carman for the CSF railroad on October 10, 2007. I therefore opine that Mr. [redacted]'s exposure to chlorine gas did cause his eye and nasal irritation and may have caused or contributed to his other respiratory problems .

Sincerely,

Richard A. Parent, PhD, DABT, FATS, RAC, ERT
President

RAP/ecp

Attachments

[redacted]