

**FACT SHEET**  
**Sulfur Fire at the Mishraq State Sulfur Mine Near Mosul, Iraq**

**NOTICE TO VA EXAMINERS**  
**VA Considers this Veteran Exposed to Sulfur Dioxide and Hydrogen Sulfide**

In June 2003, a fire ignited at the Mishraq State Sulfur Mine in northern Iraq. The sulfur mine is the largest in the world and resulted in the largest manmade sulfur fire in recorded history. It burned for approximately 3 weeks and caused the release of roughly 42 million pounds of sulfur dioxide (SO<sub>2</sub>) per day; hydrogen sulfide (H<sub>2</sub>S) was also released.

In early 2007, medical personnel from the U.S. Army Center for Health Promotion and Preventative Medicine visited Ft Campbell, Kentucky, which is the U.S. home base for the 101<sup>st</sup> Airborne Division. Members of the 101<sup>st</sup> were firefighters at the Mishraq State Sulfur Mine fire. The medical personnel learned that from late 2004 through February 2007, 41 soldiers, citing exposures to the sulfur fire and reporting unexplained shortness of breath on exertion, had been referred by the Blanchfield Medical Center to a pulmonary specialist at the Vanderbilt Medical Center. As of February 2007, nineteen (19) personnel had an open lung biopsy and were all diagnosed with constrictive bronchiolitis. Constrictive bronchiolitis is an inflammatory and fibrotic lesion of the terminal bronchioles of the lungs. This diagnosis is very uncommon and has been associated with inhalation exposures, organ transplantation, certain drugs, and collagen vascular disorders. Individuals with this finding typically have shortness of breath on exertion, but may have normal chest X-rays and inconclusive findings on pulmonary function testing. Due to some similarities, symptoms of constrictive bronchiolitis may be attributed to asthma or chronic obstructive pulmonary disease (COPD).

Examiners may have a difficult time evaluating this population. In most cases, the affected soldiers are comfortable at rest and are able to perform the activities of daily living. They have normal or near normal pulmonary function tests, but at the same time they become short of breath on slight physical exertion, cannot meet physical training requirements, and are considered unfit for deployment. This unique circumstance challenges those who must determine a disability rating.

While individual exposure levels cannot be accurately determined, DoD considers constrictive bronchiolitis (initially diagnosed as "bronchiolitis obliterans") to be plausibly associated with exposure to the 2003 Mishraq State sulfur fire event. This health effect has been scientifically associated with high exposures to SO<sub>2</sub>.

Both sulfur dioxide and hydrogen sulfide are gases that can produce irritation and reddening of the nose and throat, eye irritation/pain, and coughing. At high levels, sulfur dioxide can burn the skin and can cause severe airway obstruction, hypoxemia, pulmonary edema, and even death. The firefighters involved with suppressing this fire experienced irritation, minor burns, and other effects such as blood-tinged nasal mucous. Some have been found to have long-term respiratory conditions such as “constrictive bronchiolitis.”

**Note:** If the claim is for a respiratory condition possibly related to the sulfur fire exposure consider requesting tests for “bronchiolitis” be conducted in addition to other respiratory testing, while noting that many standard test results may be normal.

This information is not meant to influence examiners rendering opinions concerning the etiology of any particular disability; but rather to ensure that such opinions are fully informed based on all known objective facts. Therefore, when rendering opinions requested by rating authorities for a disability potentially related to such exposure, please utilize this information objectively and together with the remaining evidence, including lay evidence, in the Veteran’s record.

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Adjudication Authority