

operation of the sulfur dioxide reduction process, and later the availability of by-product oxygen and substantially pure sulfur dioxide made possible the development of the cyclic process of sulfuric acid manufacture. The 15 years prior to 1943 witnessed the development of processes and installation of fertilizer plants at Trail, with the result that sulfur dioxide has changed from a waste material to a valuable raw material in short supply. To meet the demand for acid for fertilizer production, roasting of iron concentrates for acid recovery became necessary in 1943. At present all roaster and sintering plant gas is treated for sulfur recovery, and iron concentrate is roasted intermittently, depending on the demand for acid and the availability of customs zinc concentrates. Total current loss to the atmosphere from Trail operations is less than 9 per cent of the sulfur charged. The sulfur released to the atmosphere annually in 1947 and 1948 was less than in any other year since 1904.

AUTHOR'S SUMMARY.

OBSERVATIONS ON THE EFFECT OF LOCOMOTIVE HAULAGE ON ENVIRONMENTAL CONDITIONS IN MINES. A. E. CROOK, Tr. Inst. Mining Engineers **109:147** (Nov.) 1949.

There has been a great increase in the extent of mechanized mining in Britain, and as a part of that development wire rope haulage is gradually being superseded by the use of diesel or battery locomotives underground. Already more than 170 diesel and 15 battery locomotives are at work, 200 are on order, and hundreds more may be introduced during the next 10 years—in the Ruhr, with an area of about half the size of the British aggregate, over 3,000 are in use underground.

This paper reports on a study of the rate of production of heat and water vapor, and of noxious gases, by diesel locomotives, and of heat by trolley locomotives. There is consideration of the maximum permissible concentrations of noxious gases in working places, and of ventilation rates.

The diesel locomotive produces $2\frac{1}{8}$ to $2\frac{1}{4}$ times as much heat as the trolley locomotive, working under the same conditions, but the dry bulb temperature of the air is raised to about the same extent by both types of locomotive because the diesel used much of its waste heat to cool its exhaust gas by the evaporation of water. The rise in wet bulb temperature with the diesel is about twice that with the trolley locomotive.

When these locomotives are used on level roads which are also used for main ventilation, the temperature increments are small, but they are appreciable on adverse gradients. As examples, on a level road with ventilation at the rate of 66,000 cu. ft. per minute the dry bulb and wet bulb temperature increments due to a diesel locomotive were both 1.1 F., but with the ventilation reduced to about one sixth (10,500 cu. ft. per minute) the dry bulb temperature rose by 7.0 F. and the wet bulb by 6.1 F. In a deep and hot mine such increases in temperature may be serious, and for such places compressed air locomotives, which introduce no heat, may have to be considered.

The diesel locomotive gives off oxides of nitrogen, which must be diluted so that their concentration is below the harmful level. Emphasis is placed on the need for a high standard of inspection and maintenance of these locomotives when they are used underground.

Appendixes to the paper give detailed computations of heat production, and the relationship between heat, ventilation and temperature.

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DANGER OF CARBON MONOXIDE POISONING IN THE CONVERSION OF HYDROCARBONS AND THE MANUFACTURE OF METAL CARBONYLS. B. RÈME, Arch. d. med. profess. **8:459**, 1947.

The conversion of hydrocarbons and the manufacture of metal carbonyls give rise to the production of large quantities of carbon monoxide, in proportions of up to 30 per cent. Experience has shown the danger of carbon monoxide poisoning, and that the general, individual and medical preventive measures used in gas plants should be applied in these industries also.

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