19.0 OTHER ADVERSE NON-CANCER HEALTH OUTCOMES

STATEMENT TO THE PUBLIC

**Depression and Electrical Sensitivity**

The reviewers found the evidence linking EMFs with depression and alleged electrical sensitivity to be "inadequate" and did not develop a degree of certainty for them different from their priors. This agreed with the assessment of the National Institutes of Environmental Health Sciences workgroup.

The reviewers found that the evidence pertaining to leukemia subtypes, CNS (except brain), lymphoma, cardiovascular disease (except acute myocardial infarction), and motor neuron disorders (other than ALS) was inadequate to carry out an evaluation. They also agreed with the NIEHS (1998) that the available evidence pertaining to depression and electrical sensitivity was "inadequate" to implicate electric or magnetic fields as causative agents. However, having the benefit of additional recent literature, the reviewers are in a position to offer a few caveats pertaining to these two endpoints.

**Depression:** Ahlbom (Ahlbom, 2001) reviewed the literature related to depression, including the studies of Dowson (Dowson, 1988), Perry (Perry, Pearl & Binns, 1989), Poole (Poole et al., 1993), Savitz (Savitz et al., 1994), McMahan (McMahan et al., 1994), and Verkasalo (Verkasalo et al., 1997). Ahlbom concluded that the literature was inconsistent with Poole (Poole et al., 1993) (positive), and McMahan (McMahan et al., 1994) and Savitz (Savitz et al., 1994) (primarily null). He did not review the Beale (Beale, 1998) study, which came out after he had completed his review. Beale shows some relation between mood scales and magnetic field exposure to transmission lines. The reviewers remain close to their prior degree of certainty with regard to depression but believe that this is an area worthy of further study, particularly since it may shed mechanistic light on the EMF/suicide association.

**Electrical Sensitivity:** The reviewers conducted a study, as part of the California Department of Health Services routine random-digit-dial survey, to assess the prevalence of people who believe that they are unusually allergic or sensitive to electrical appliances or power lines. About 3% of 2,000 respondents alleged this sensitivity (see Appendix 3). A review of the literature (see Appendix 4), which includes a number of double-blind challenges of allegedly sensitive subjects, did not suggest that magnetic field exposure was responsible for the symptoms. There are some reports from the old Soviet Union of increased rates of symptomatic complaints in utility workers (Jerabek & et al., 1979), (Asanova & Rakov, 1975) and health complaints have been related to climactic and air ionization changes (Gad Sulman, 1980). Other aspects of the EMF mixture, such as contact currents, have not been systematically evaluated. If these complaints were to be linked causally to exposure to some part of the EMF mixture, one would need to ask how the pathophysiology of this syndrome was related to the pathophysiology of conditions like the leukemias, adult brain cancer, ALS, or miscarriage, which the authors of this document were inclined to believe to be linked to EMF exposure. The belief in electrical sensitivity led to changing jobs in 0.5% of Californians polled. Judging by anecdotal reports, an additional unknown number of people suffer from severe debilitating symptoms that they believe to be triggered by being close to appliances, power lines and the like. So this syndrome is impacting peoples’ lives regardless of its etiology and requires further study. The null double-blind exposure studies have been criticized for not objectively selecting subjects or following their reactions long enough. If subjects could be found who reliably developed symptoms or physiological changes from EMF exposures that challenged biophysical assumptions under double-blind conditions, this would have implications for the interpretation of the literature pertaining to other health endpoints. Nonetheless the reviewers remain at their prior degree of certainty with regard to EMF and this self-defined syndrome.