

SECTION 1 EXECUTIVE SUMMARY

Introduction

In this first phase of activities under the MOI, the Impact Assessment Work Group has concentrated its resources on identifying the key physical and biological impacts resulting from pollution associated with transboundary air movement. In the interim report the acid precipitation component has been emphasized but other important problems such as oxidants are identified where there is presently a well documented concern. Other aspects will be dealt with in the second phase.

Acid deposition is currently being observed in most of eastern North America. Within this half-continent are large areas in which the surface soil material and bedrock types have little buffering capacity for acid inputs and are identified as "potentially sensitive". These areas include some of the most unique, unspoiled and biologically productive environments in North America. The potential is high for environmental degradation from the deposition of acid and other pollutants.

During atmospheric transport of sulphur oxides (SO_x) and nitrogen oxides (NO_x) in large scale air mass movements, conversion to their acid components takes place. Measurements of the present level of chemical constituents in precipitation show that large areas of North America receive about 40 times more acid than normal*. This excessive loading is deposited in precipitation as wet fallout, and in, dry fallout, as dust particles, and in gaseous forms. Like some components of acid precipitation, ozone is a secondary pollutant, not being emitted directly, but formed in the atmosphere in the presence of sunlight as a result of chemical transformations of nitrogen dioxide and reactive hydrocarbons.

Terrestrial Effects

Ozone injury to vegetation and yield reductions have been well documented on many crop species in the eastern U.S. and Ontario. These crops include tobacco, white beans, soybeans, corn, potatoes, grapes, onion, cucumber, celery, pumpkin, squash and radish. At ambient concentrations of 0.05 to 0.10 ppm during continuous or intermittent exposure periods, loss of plant tissue may approach 15-30% and yield losses of 5-10% may occur for the most susceptible crops. Direct effects of acid precipitation, have been demonstrated under experimental conditions and may be of potential concern especially on crops

*For the purpose of this report, normal is considered to be the acidity of precipitation in equilibrium with background atmospheric conditions, or pH 5.6. It is recognized that varying natural conditions can result in a pH of rainfall higher or lower than this value.