

## SECTION 9

### LIMING

#### 9.1 INTRODUCTION

This chapter reviews the potential of adding neutralizing or buffering materials to correct or modify the adverse effects associated with acidic deposition. Such activities are commonly called "liming" and they are limited in practice to correcting to some degree adverse effects on aquatic, terrestrial and drinking water systems. It is not possible to use liming to mitigate effects on materials, visibility, and adverse health effects resulting from direct inhalation of airborne pollutants. Each section of this chapter discusses the effectiveness of liming for the particular system and then the unit cost associated with liming that system.

#### 9.2 AQUATIC

It has been shown in many areas of the world that acid loadings due to long range transport are capable of acidifying surface waters. In theory however, even the most acidic loadings could periodically be neutralized if limestone were added to the affected systems in amounts ranging from 50 to 100 kg/ha.yr. In areas with calcareous soils, this amount of neutralizing capacity is available inherently for very long periods of time (i.e., 1 cm of soil covering 1 ha is about 150 metric tons, which is capable of neutralizing present maximum acid loading for about 3,000 years). In hard rock areas with little or no calcareous soil some present acid loadings cannot be neutralized fast enough resulting in acidic runoff. In order to reverse or prevent the resulting effect, at least five different jurisdictions (Sweden, Norway, New York State, Nova Scotia, and Ontario) have added neutralizing agents to surface water systems. The numbers of lakes and rivers treated and the methods used in the application of neutralizing agents vary greatly from area to area. Limestone is most often used although other chemicals have been tried. The term "liming" is used to describe artificial neutralization regardless of the chemical or chemicals actually used.

##### 9.2.1 Liming as a Mitigative Measure

In certain cases, a species or a unique race of organisms may be threatened by acidification of its natural habitat. In these cases, liming or other mitigative measures might be undertaken on lakes, rivers or parts of rivers in order to preserve a population of the endangered organism. Very small populations become inbred and so the preserved habitat must be large enough to support a reasonably