**Section 391.411 Nitrogen**

In the short range (five years), nitrogen in the sludge is usually considered to be the limiting factor. The maximum loading rates of sludge applied to the land is based on the nitrogen required for growing a crop. Projects that apply sludge in excess of the nitrogen agronomic rate must show what additional precautions or circumstances are present to prevent potential surface or groundwater pollution or violations of the Act. The following figures for nitrogen availability to plants shall be utilized in the agronomic calculations unless additional research and site specific information is provided:

a) Ammonia Nitrogen

1) Surface application without incorporation

A) Sandy and non-sandy soil – 50% NH3 availability

B) Tight clay soil – 25% NH3 availability

2) Surface application with chisel plowing, disking or equivalent

A) Sandy soil – 50% NH3 availability

B) Non-sandy soil – 80% NH3 availability

3) Subsurface application (injection)

A) Sandy soil – 50% NH3 availability

B) Non-sandy soil – 100% NH3 availability

4) Due to additional losses such as volatilization, nitrification, denitrification, etc., no carry over of available ammonia nitrogen is expected. The above figures are to be used for that particular year's application rate calculations.

b) Organic Nitrogen

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Table I  Organic Nitrogen Availability for Crops  (read down for that particular year of sludge application) | | | | | | |
|  |  | 1st | 2nd | 3rd | 4th | 5th |
| Sludge  Application  Year | 1st | 20% | 10% | 5% | 2.5% | 1.25% |
| 2nd |  | 20% | 10% | 5% | 2.5% |
| 3rd |  |  | 20% | 10% | 5% |
| 4th |  |  |  | 20% | 10% |
| 5th |  |  |  |  | 20% |

After the 5th year crop, additional organic nitrogen is not expected to be available to the crops from the sludge which was applied more than 5 years past.