



FAMU – FSU COLLEGE OF ENGINEERING
DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING
2525 Pottsdamer Street
Tallahassee, Florida



Tag Meeting No. 2
Monday, June 20, 2011
10:00 – 12:00, Room B202

Minutes

Project Title: Comparison of Onsite Biological and Physicochemical Systems for the Treatment of Landfill Leachate with High Ammonium Content

Tag Members: Peter Grasel, Lee Martin, Michael Watts, and Tim Vinson (Hinkley Center)

Principle Investigators: Gang Chen, Amy Chan Hilton, and Clayton Clark

A website has been developed for this research (www.eng.fsu.edu/~gchen). All the information regarding this project is uploaded to this site to facilitate the dissemination of the research discovery.

Agenda

1. Project Overview (Detailed information will be available at http://www.eng.fsu.edu/~gchen/index_files/Page486.htm)

2. Ammonium removal by magnesium ammonium phosphate (MAP, $MgNH_4PO_4 \cdot 6H_2O$ or struvite) precipitation

Results

Discussion

3. Ammonium removal by anaerobic ammonium oxidation (Anammox)

Results

Discussion

4. Possible applications

**5. Potential funding sources for the continuation of related research —
NSF/CBET/Environmental Engineering**

6. Discussion

The TAG members raised the question of the impact of pH of landfill leachate on iron precipitation. Elevated iron concentrations have been observed in the landfill leachate, especially landfill leachate collected from landfills located in Northwest Florida. Iron precipitation may have impact on ammonium removal. Specifically, iron precipitation may promote ammonium removal through MAP precipitation. On the other hand, iron precipitation may have adverse effect on Anammox. These questions will be addressed in the following up experiments.

It is suggested that the nitrogen production during Anammox be presented by normalizing with input nitrogen to better reflect the impact of initial ammonium concentration on the ammonium removal.

For MAP precipitation, the impact of alkalinity on MAP precipitation has been discussed. It seems alkalinity should play a key role in controlling MAP precipitation. In addition, alkalinity also plays an important role for Anammox. Overall, alkalinity is a very important parameter for ammonium removal from landfill leachate.

Another issue for MAP precipitation is the heavy metal accumulation in MAP precipitate, which may prevent it from being used as a fertilizer. The toxicity issue should be discussed.

It is recommended that the produced gas be characterized by a gas chromatography to identify and quantify N_2 and CO_2 .

Cost analysis is expected to compare the physicochemical and biological processes in treating the landfill leachate with high ammonium content.

The TAG members also mentioned that Florida may require liners for C&D landfills. High nitrogen content has also been observed from C&D landfills.