

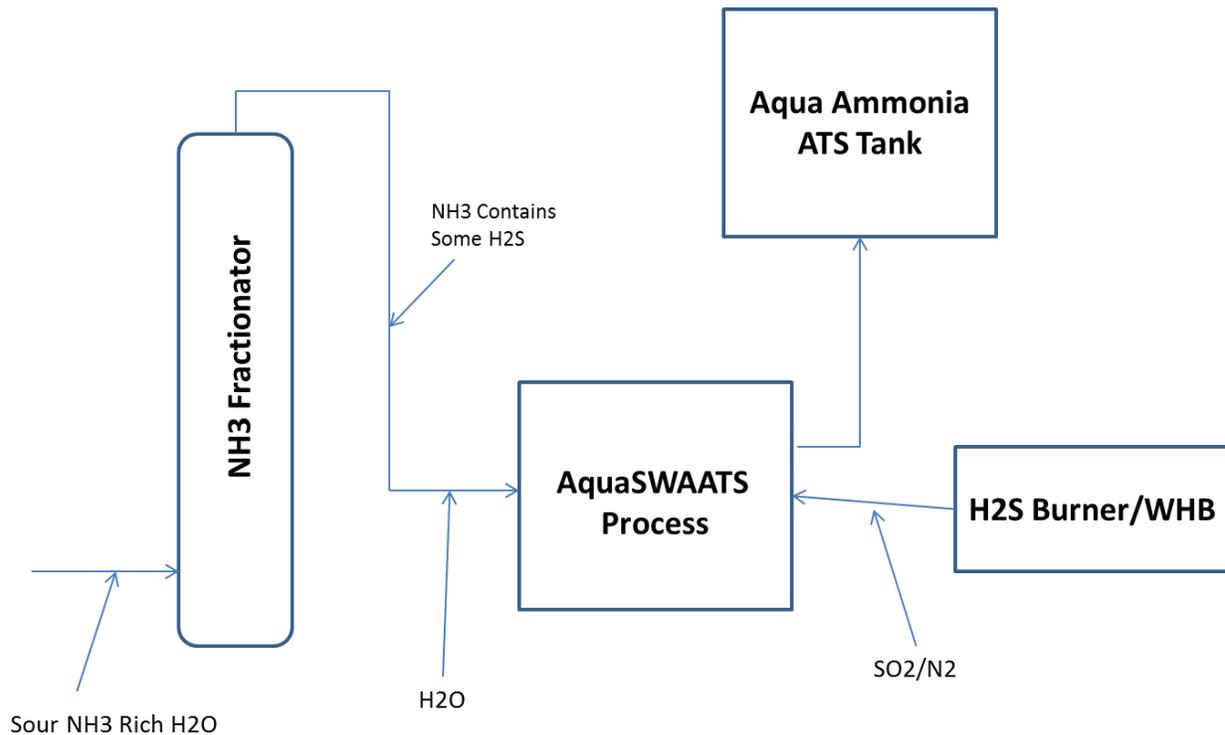
AquaSWAATS Process Overview

ThioSolv, LLC, Spring Branch, TX ph: 832-443-0952

AquaSWAATS Applications (Patent 8,491,798)

- Refining Applications – The process can be used to debottleneck existing ammonia fractionator, allowing more H₂S slip and no requirements for recycling. AquaSWAATS creates a fertilizer out of stripped ammonia that is burned.
- Processes sour ammonia from ammonia recovery units such as the Chevron WWT™ Process where a lower valued ammonia stream is produced “Isomax ammonia”. Ammonia stored from these fractionation processes can also be run through a AquaSWAATS process. The sulfur required for the fertilizer can be contained in the ammonia plus the SO₂ required to react the contained H₂S to thiosulfate or additional H₂S can be added along with additional SO₂ to complete the reaction.
- Biogas Applications – Biogas from anaerobic digestion of manure contains H₂S and the waste water often contains a significant amount of ammonia and some H₂S. The ammonia and H₂S from the digester liquids would be fractionated from the bulk of the H₂O and sent to the AquaSWAATS unit. Sulfur would then be burned for the SO₂ or if the biogas is used for fuel on site the AquaSWAATS unit would scrub the SO₂ from the vent gas to less than 100 ppmv.

AquaSWAATS Basic Block Flow Diagram



The AquaSWAATS Solution

- The AquaSWAATS solution is a fertilizer that can vary in N and S content based on the market requirements. Typical analysis would be 19.5-0-0-5 (N-P-K-S content). The solution requires adding water to the ammonia coming from the fractionator and either allowing more H₂S to slip to the ammonia fractionator or adding additional H₂S to react with SO₂ in solution.
- ThioSolv is in the fertilizer business provides transportation, marketing and sales, outside storage and credit. These services are either handled in-house or with an industry partner to assure the movement of the product.
- Product taken by ThioSolv is sold into the market and a portion of the revenue returned to the Licensor of the process.

Benefits of using AquaSWAATS Process

- An AquaSWAATS unit eliminates burning of the sour ammonia gas in Sulfur Recovery Units freeing up space for additional amine acid gas. The product uses the recovered ammonia and some sulfur to reduce the requirements of on-purpose ammonia.
- Reduces overall emissions and NO_x by significantly reducing the gas traffic to the Claus and TGT and removing the requirement to incinerate the ammonia.
- Converts a hazardous waste material to a marketable fertilizer. It does not get more green than tanking something that was being burned as a waste product and converting it into usable nutrients for the crops.