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In Situ Groundwater Remediation: New Processes to Effectively and Economically Remove Ammonia and Nitrates from Groundwater

Reference Number 642.1BV

Background

A new process to remediate ammonia and nitrate contaminated groundwater has been developed and field tested in Calgary, Alberta. This is a two-step process whose end product is nitrogen gas.

Stage 1: Comprised of in situ biologically mediated nitrification. This process converts ammonia to nitrate.

Stage 2: Comprised of in situ biologically mediated denitrification. This process converts nitrate to nitrogen gas. This process can be used in conjunction with Stage 1 or by itself. It is applicable to the same areas of application.

Areas of Application

- High permeability soils contaminated with ammonia and/or nitrate
- The technology is specific to nitrogen contaminated sites or where there is secondary discharge of water from treatment facilities (nitrate-loaded water is discharged):
 - Fertilizer plants and animal feeding operations
 - Sewage treatment plants
 - Agricultural operations
 - Airports (De-icing)

Competitive Advantages

- This is an in situ remediation method. This means decreased liability and lower costs for landowner and operator as compared to when ex situ methods are employed
- Cheaper than the standard “pump and treat” method
- No large infrastructure needed (lower capital outlays) as compared to standard methods

Stage of Development

- Has been field tested in Calgary, Alberta

Intellectual Property Status

- [US 7,407,583](#)
- [CA 2,610,722](#)