

[www.planteco.com](http://www.planteco.com)

**CORPORATE:**

337 S. Milledge Ave  
 Suite 200  
 Athens, Georgia 30605  
 Phone (706) 316-3525  
 Fax (706) 353-9270

**FLORIDA OFFICE:**

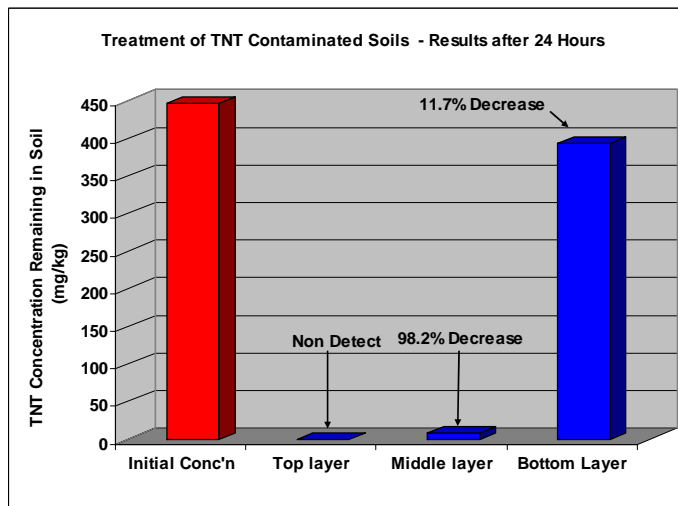
9204 34<sup>th</sup> Way  
 Pinellas Park, Florida 33782  
 Phone (850) 559-1241

PLANTECO Environmental Consultants, LLC is registered as an 8(a), Hubzone, SDB in the United States Central Contractor Registration (CCR). PLANTECO is recognized as a leader in providing sustainable technology consulting and engineered green remediation product applications. Dr. Valentine Nzengung, president of PLANTECO, has recently developed MUNNOX<sup>®</sup>, a rapid in-situ chemical treatment process for munitions constituents in soils and groundwater (Patent Pending).

MUNNOX<sup>®</sup> consists of selected bulk reductants that, when mixed with water, generate free radicals that react very rapidly to completely degrade oxidized organic compounds, such as nitroaromatics and chlorinated solvents. Sulfide species generated during the reaction precipitate metals as metal sulfides. Thus, degradation of oxidized organics is coupled with the precipitation/immobilization of metals. The very short cleanup time and closeout associated with this technology eliminates the O&M costs associated with other remediation technologies.

**FEASIBILITY TESTS**

The University of Georgia and PLANTECO have completed feasibility tests using munitions contaminated soils from multiple field sites with very different geological settings. The graph below shows the results of 24-hour tests conducted in 2-ft long columns packed with TNT-contaminated soil treated with MUNNOX<sup>®</sup>.



Composite samples were taken from the top, middle and bottom of the treated soil column and analyzed for the parent compounds and their potential breakdown products. No intermediate degradation products were identified in extracts of the treated soils using LC/MS analysis. X-ray diffraction of the mineral phase confirmed the formation of metal sulfides.

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PLANTECO has also developed and tested an aqueous solution of MUNNOX<sup>®</sup> that can be applied as a decontamination "wash" to eliminate residuals from munitions cases.

**POTENTIAL APPLICATIONS**

1. Simultaneous in-situ degradation of munitions constituents in soil & groundwater.
2. Range sustainment and management - At grenade ranges, areas lying near the surface are amendable to quick remediation and closeout.
3. Decontamination of munitions casings prior to recycle.
4. Treatment of decaying underwater ordnance (UWUXO). Also, munitions that have cracked can be rapidly neutralized.
5. Destruction of munitions constituents in Militarization/Demilitarization wastewater.

**Pilot and Full Scale Soil, Groundwater & Munitions Casings Demonstrations Are Currently Being Sought.**

**PLANTECO is an  
 8(a) HubZone  
 Small  
 Disadvantaged  
 Business**