



SDIMI2013

30 June - 3 July



SUSTAINABLE DEVELOPMENT IN THE MINERALS INDUSTRY

6th International Conference

Milos Island, Greece



Case studies on effective quarry rehabilitation and biodiversity management:

***Awarded initiatives for Titan America in the Center Sand
(Florida), and Roanoke Cement (Virginia) operations***

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TITAN CEMENT COMPANY

July 3rd, 2013

The WBCSD/CSI Quarry Rehabilitation Guidelines

- **WBCSD's Cement Sustainability Initiative (CSI):**
A global effort by **25 leading cement producers with operations in more than 100 countries**, to address key sustainability issues voluntarily and proactively.
- CSI members, collectively accounting for around 30% of the world's cement production, have integrated sustainable development practices into their business strategies and operations.
- WBCSD/CSI published in 2011 the ***Guidelines on Quarry Rehabilitation***, which aim at:
 - ✓ Ensuring CSI members have common understanding of key performance indicators;
 - ✓ Support the process of quarry rehabilitation;
 - ✓ Achieve consistent reporting across members.
- Guidelines have been designed to complement rather than replace existing successful rehabilitation practices; feature **30 operational case studies** covering a wide range of quarry types and local habitats around the world.



Case Studies

Titan Quarry Rehabilitation & Biodiversity Management



➤ Center Sand, Florida (USA)

Gopher tortoise



➤ Roanoke Cement, Virginia (USA)



Trout Pond

Titan America Initiatives

Center Sand Gopher Tortoise

Location and situation

- **Center Sand aggregates quarry** of Titan/Tarmac America is located in Clermont, Lake County of Florida, USA, adjacent to a state preservation site.
- Alluvial deposits of fine sands provide a **280-hectare open pit mining area**, mostly already excavated and turned into a shallow man-made lake or lagoon.



Titan America Initiatives

Center Sand Gopher Tortoise



Location and situation



Titan America Initiatives

Center Sand Gopher Tortoise



Survey of Base Line in the Expansion Area

Gopher tortoise was a recent addition to the endangered species list (2008)

The active and inactive gopher tortoise burrows were counted and marked by the Biological Research Associates (Consultant)



Titan America Initiatives

Center Sand Gopher Tortoise

The Biodiversity Issue in Center Sand

- Under the mining plan, **operations would have to encroach on the burrows of Gopher Tortoise** (*Gopherus polyphemus*), which is a sand-burrowing threatened species in Florida State.
- The quarry had to plan and implement, beforehand, the **relocation of tortoises in a nearby and safe, 'no-mining' preservation area**

Gopher tortoise
'senior'



juvenile

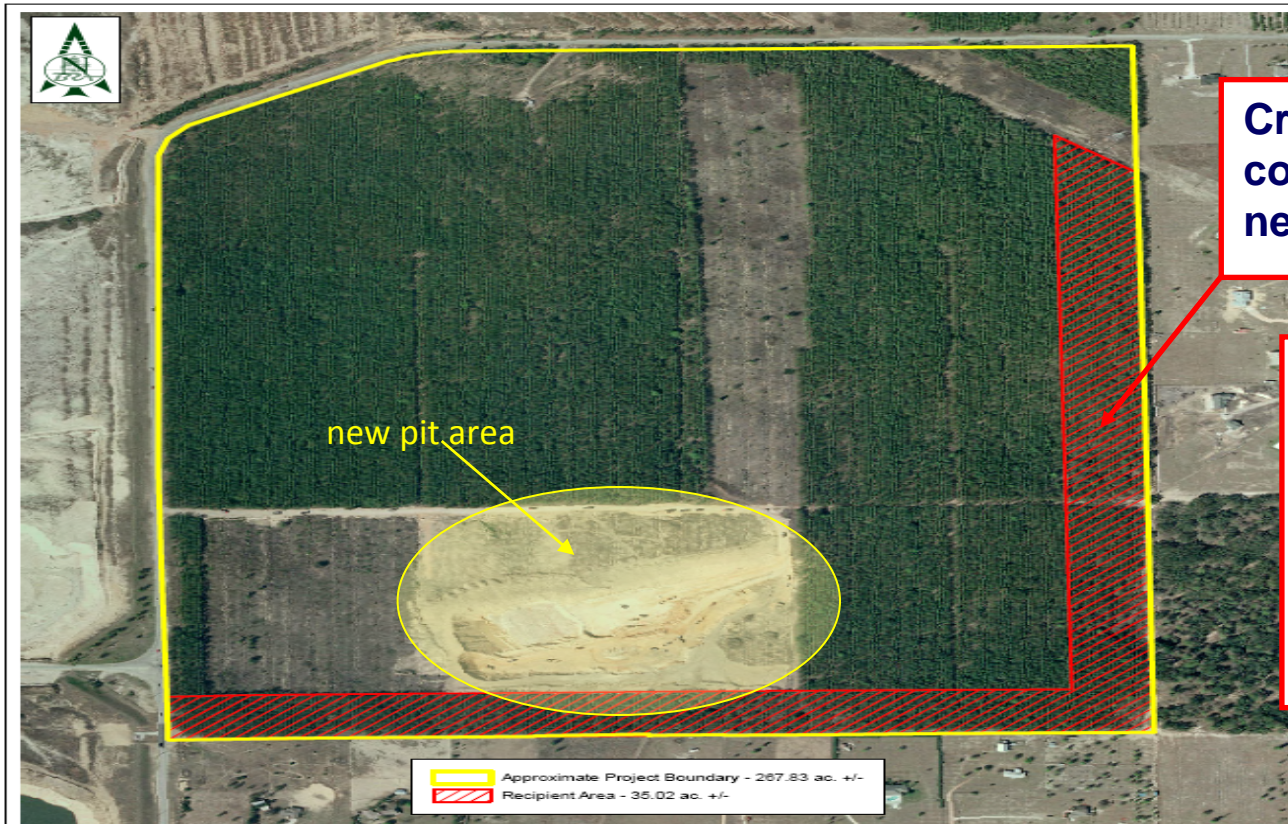


Titan America Initiatives

Center Sand Gopher Tortoise



Conservation Area - Development



Creation of a 35-acre conservation area that will never be mined

56 gopher tortoises were relocated to the conservation area in July 08 (case of a biodiversity management plan)

Titan America Initiatives

Center Sand Gopher Tortoise



Actions undertaken

- **Site surveys** with specialized personnel, equipment and instrumentation.
- Creation of a **new 14.2 hectare nature reservation habitat** adjacent to the mining property.
- **Hog-fencing**, removing of pine trees and **reseeding** the preservation area with foraging plants suitable for the tortoises.
- Excavation to reach burrows and **capture the tortoise**, with special care to avoid destroying burrows and eggs.
- **56 tortoises** (22 male, 24 female, 10 immature) were manually moved from the planned mining area and **placed in their new protected habitat**.



Titan America Initiatives

Center Sand Gopher Tortoise



Actions undertaken (Experts: Biological Research Associates (Florida))



Titan America Initiatives

Center Sand Gopher Tortoise

Actions undertaken



**'Thinning' of trees and flora in the
area of the nature preserve habitat**

Titan America Initiatives

Center Sand Gopher Tortoise



The aftermath & stakeholders involved



- The **project**, including licensing, studies and field work, took approximately one year. **Major stakeholders: Florida Fish and Wildlife Conservation Commission.** **Sensitive**, tedious and **complex** project, where the contribution of experts in the field and specialized scientific crew of ecologists plays a crucial role.
- Ongoing program of **monitoring** the gopher tortoise preservation area.
- **Joint partnership between Center Sand and Florida Forestry Service** to control invasive grass in the gopher tortoise preserve and enhance the environment.
- Titan America was awarded with **the Florida Mining Association Environmental Award** for developing the Conservation Area.

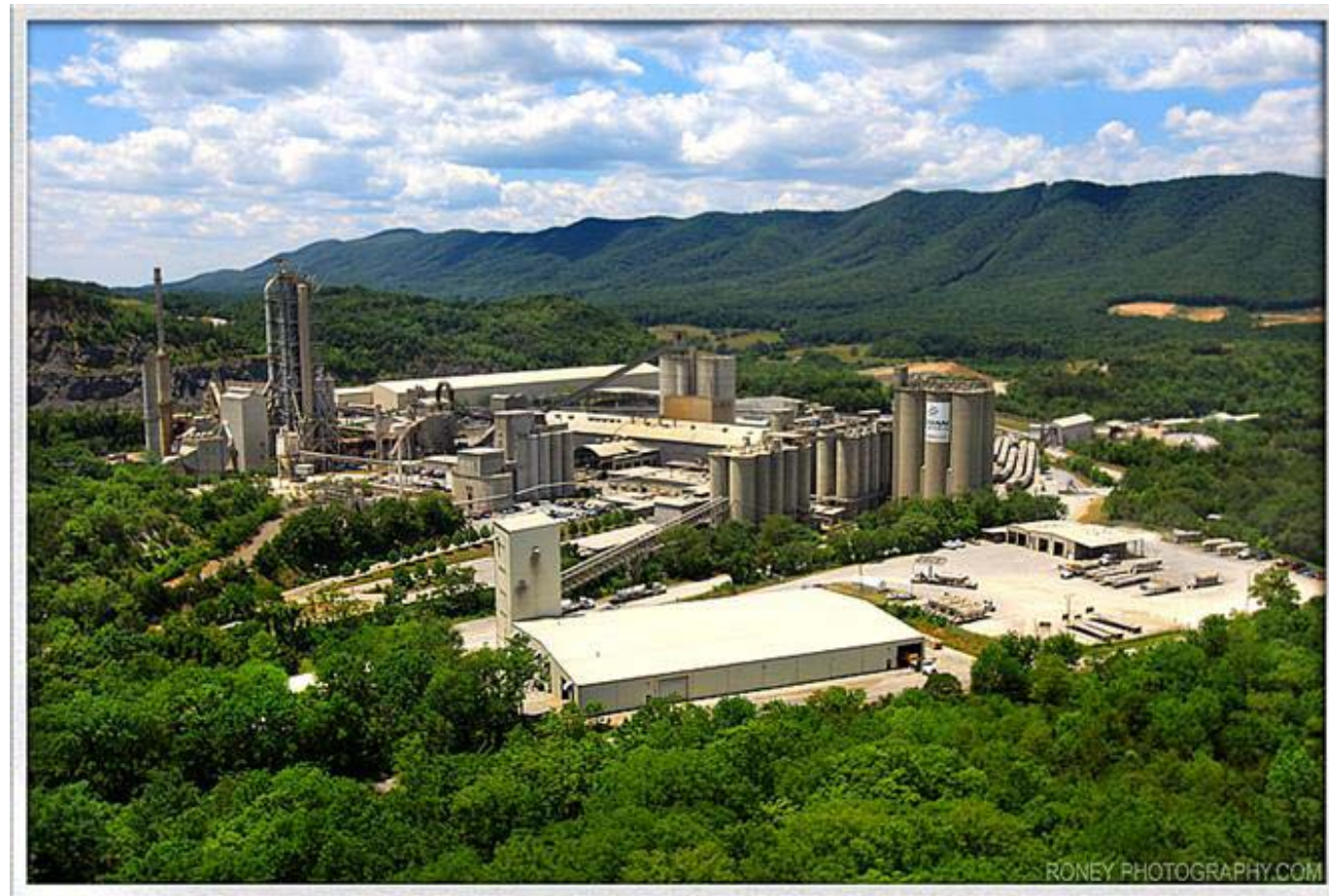
Titan America Initiatives

Roanoke Cement Rainbow Trout



Location and situation

- Roanoke Cement Company (RCC) is located in Cloverdale, Virginia, USA.



Titan America Initiatives

Roanoke Cement Rainbow Trout

Location and situation

- Old limestone pit turned into a pond filled by groundwater inflows and rainfall, and has become **ideal for hosting rainbow trout** (*Oncorhynchus mykiss*), which is an environmentally sensitive species.



Titan America Initiatives

Roanoke Cement Rainbow Trout



Location and situation

- The **Trout Pond Restoration Project** started in 2008 through a partnership with the '**Trout Unlimited**' organization, and was developed to create a sustainable ecosystem rich in biodiversity.
- The area adjacent to the pond was restored with soil and planted with native species, based on the results of a **biodiversity study**, made in collaboration with the **Roanoke College**.



Titan America Initiatives

Roanoke Cement Rainbow Trout



Actions undertaken

- Released of 350 *rainbow trout* into the quarry pond.
- Construction of an **eco-friendly fishing pier** with floating dock, allowing visitors to fish or view wildlife.



Titan America Initiatives

Roanoke Cement Rainbow Trout



Actions undertaken

RCC Hosts Third Annual Fishing Day



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Titan America Initiatives

Roanoke Cement Rainbow Trout



Actions undertaken

- Leveling and placing clay soil for **planting native species** over the adjacent area and along the bank of the pond to bring in more native wildflowers.
- Installation of **bird feeders and birdhouses** to lure native species back to the area that were impacted by mining activity.
- The restored trout pond provides now an **excellent habitat** for dragonflies and other species, and attracts native birds by providing freshwater, food and nesting materials.
- Creation of important wetland habitat for migratory birds.



Baby Bluebirds on
RCC Property



Titan America Initiatives

Roanoke Cement Rainbow Trout



Actions undertaken

- Dedication to **Catawba Creek** through voluntary clean-ups and water quality monitoring.
- Partnerships with '**Trout Unlimited**' and '**Virginia Save Our Streams**' to educate students and the community "Trout in the Classroom" School Awareness Program.



7th Annual Catawba Creek Clean Up

Titan America Initiatives

Roanoke Cement Rainbow Trout



Earth Week, Fishburn Park Elementary, April 2012
Roanoke Cement Company, Troutville Plant, Troutville, VA

The aftermath

- The old quarry was brought “back to life” with restoration and biodiversity.
- Trout species are preserved and enhanced inside a sustainable ecosystem.
- Raised awareness on preserving watershed resources.
- Water-level control and water quality monitoring, in order to preserve the lake conditions and ensure trout survival, while meeting aquatic habitat requirements.
- Roanoke Cement Company was recognized:
 - **2011:** by the **Virginia DMME** with the “**Best Quarry**” **Reclamation Award**.
 - **2012: Wildlife Habitat Council Certification**
 - **2013:** by the **PCA**, for its commitment to further improving and protecting the environment.

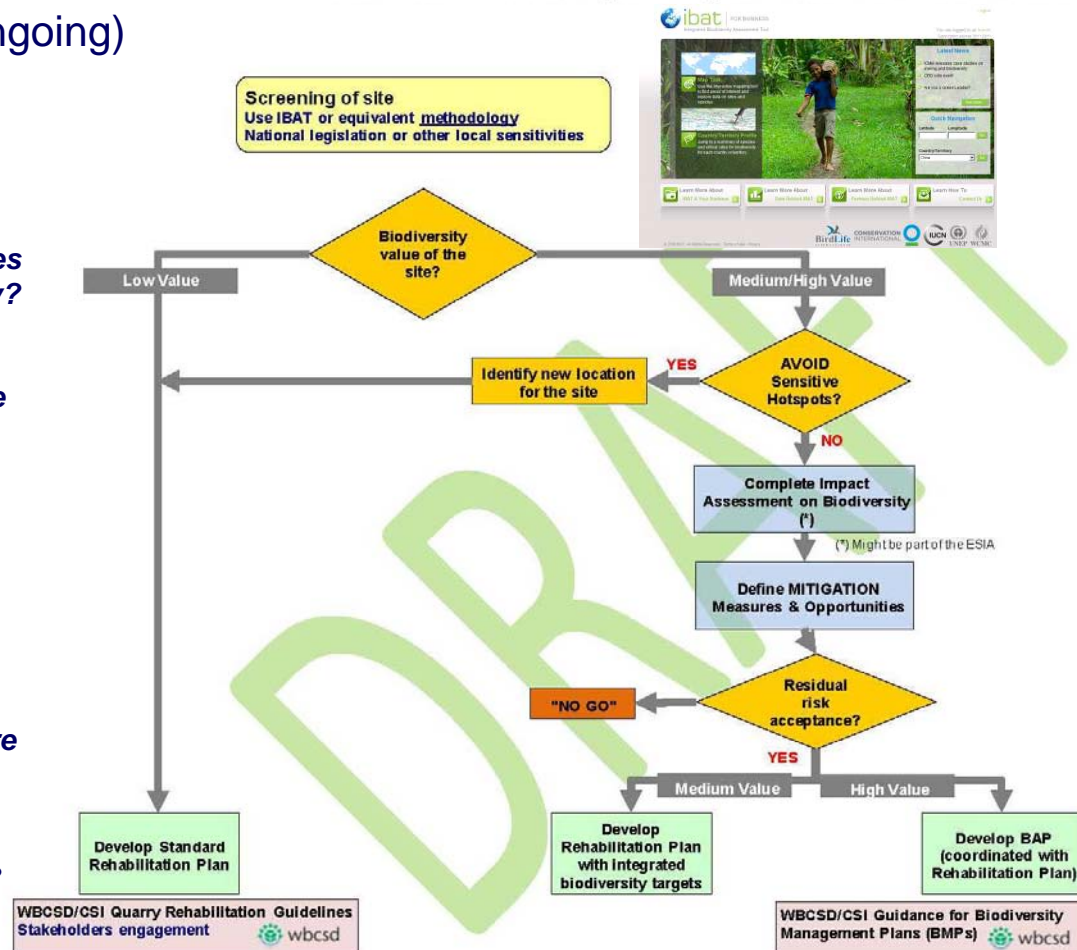
The WBCSD/CSI Biodiversity Management Plan Guidance (BMP)

- **WBCSD/CSI** continues effort with the BMP Guidance (ongoing)

This document raises and addresses the following fundamental questions:

1. *Why should cement companies be concerned about biodiversity?*
2. *What are the key biodiversity management challenges that the cement sector should be addressing?*
3. *What information do I need to address these issues?*
4. *Where and how do I start?*
5. *Where can I learn more about tackling these issue and what are the tools available to me?*
6. *How can I learn from the experience of other companies?*

Annex II: Biodiversity Management Plan Decision Tree



The Mitigation Hierarchy



Thank you