



SDIMI2013

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SUSTAINABLE DEVELOPMENT IN THE MINERALS INDUSTRY

6th International Conference

Milos Island, Greece



Agarta quarry, Idilos

***Water Resources Management, Risk
Assessment, and Mitigation:
A 5-year program for Titan Cement in Zlatna Panega
Plant, Bulgaria***

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TITAN CEMENT COMPANY

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What are the issues?

- **Availability of freshwater** per capita is steadily **decreasing** on global level.
- Many regions of the world are reaching a point of “**water stress**”, where water resources can no longer support the demands of human populations.
- The trend will inevitably continue as the world’s population swells towards 9 billion, emerging economies increase consumption levels and climate change unfolds. **Water demand is predicted to increase by 55% worldwide between 2000 and 2050.**

The future of business and society depend on the sustainability of water resources

- The global business community has begun to address the water challenges, in order to meet the stakeholder high concerns and expectations for **corporate water management**.
- The **World Business Council for Sustainable Development (WBCSD)** has been actively working on water issues for over 10 years, in order to help member companies integrate water issues in their strategic planning, map their water use and assess risks relative to their global operations and supply chain.

- The cement industry's overall water footprint is relatively small compared to other sectors
- Cement production requires water for
 - cooling the mechanical equipment and exhaust gases,
 - emission control and treatment systems
 - preparing slurry in wet process kilns (however wet process is now being replaced by modern dry processes, thus significantly reducing water usage)
 - environmental purposes (dust suppression, irrigation, cleaning and washing equipments and trucks, etc.)
- Water recycling is largely applied
- The aggregates business (when applying wet screening and aggregates washing) and also ready-mix concrete production require significant quantities of water.

- Industry-specific initiative under WBCSD with **24 member cement companies world-wide**
- A common matrix for companies' water performance measurement has been established with the following **Key Performance Indicators (KPIs)**:
 - ✓ **Water withdrawal by source**
 - ✓ **Water discharge by quality and destination**
 - ✓ **Water consumption**
 - ✓ **Percentage of sites with water recycling system**
- Ongoing work:
 - ✓ **Protocol for Water Reporting**
 - ✓ **Guidance on Good Practices for Water Accounting**
 - ✓ **Risk Assessment Tools: *Global Water Tool (GWT), Local Water Tool (LWT), Water Risk Filter***

**Water consumption =
Water withdrawal – Water discharge**

**Water recycling is not part
of Water withdrawal,
consumption or discharge**

Titan Group Water Road Map

Vision

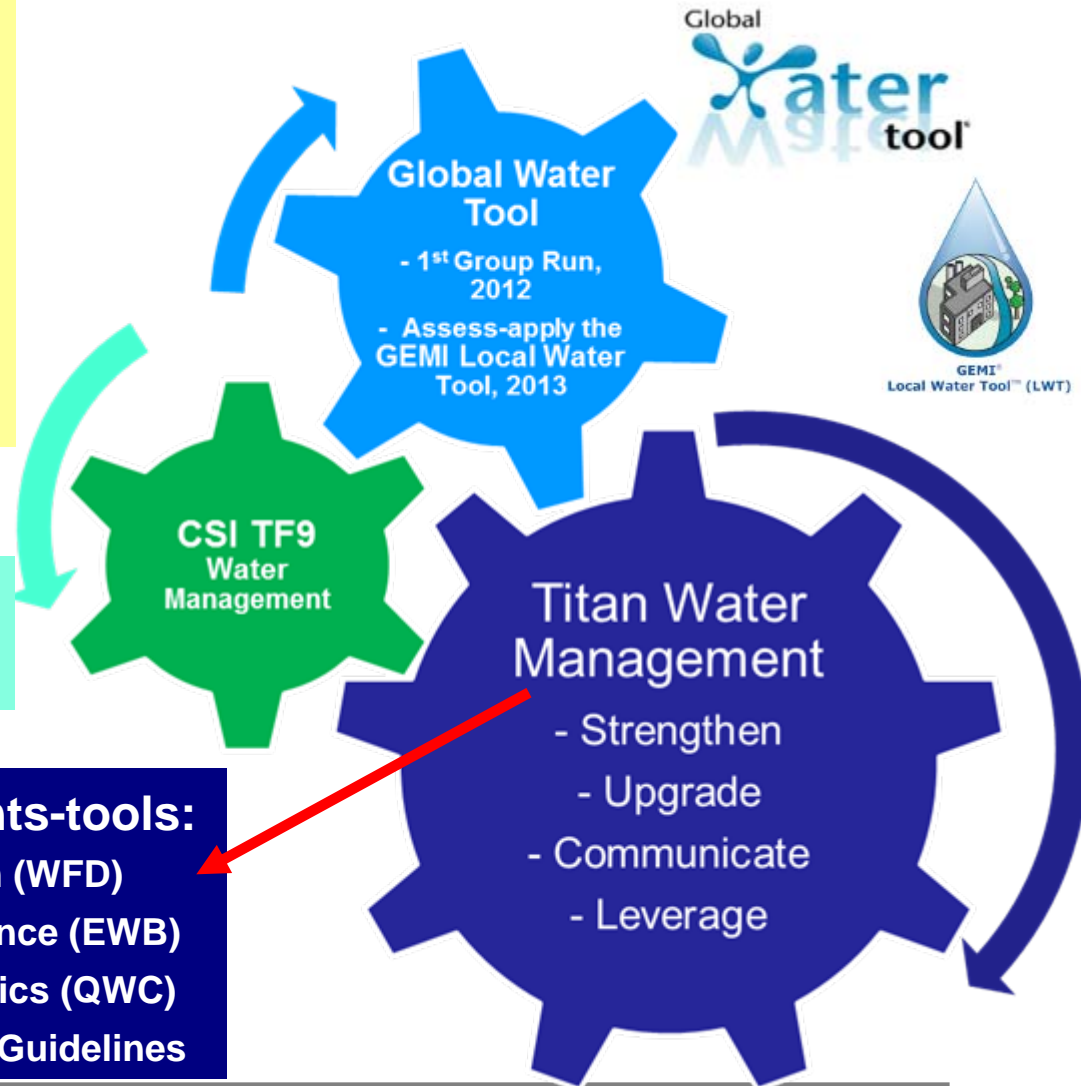
- Increase Awareness : Conserve Water
- Improve Efficiency by Decreasing Withdrawal & Consumption
- Assess, Mitigate & Manage Water Risk
- Align with WBCSD/CSI on Reporting & Best Practices
- Lead by Example

- Water KPIs Definitions
- Measurement practices
- Risk Assessment



System components-tools:

1. Water Flow Diagram (WFD)
2. External Water Balance (EWB)
3. Quality Characteristics (QWC)
4. Water Management Guidelines



Titan Group Water Management System



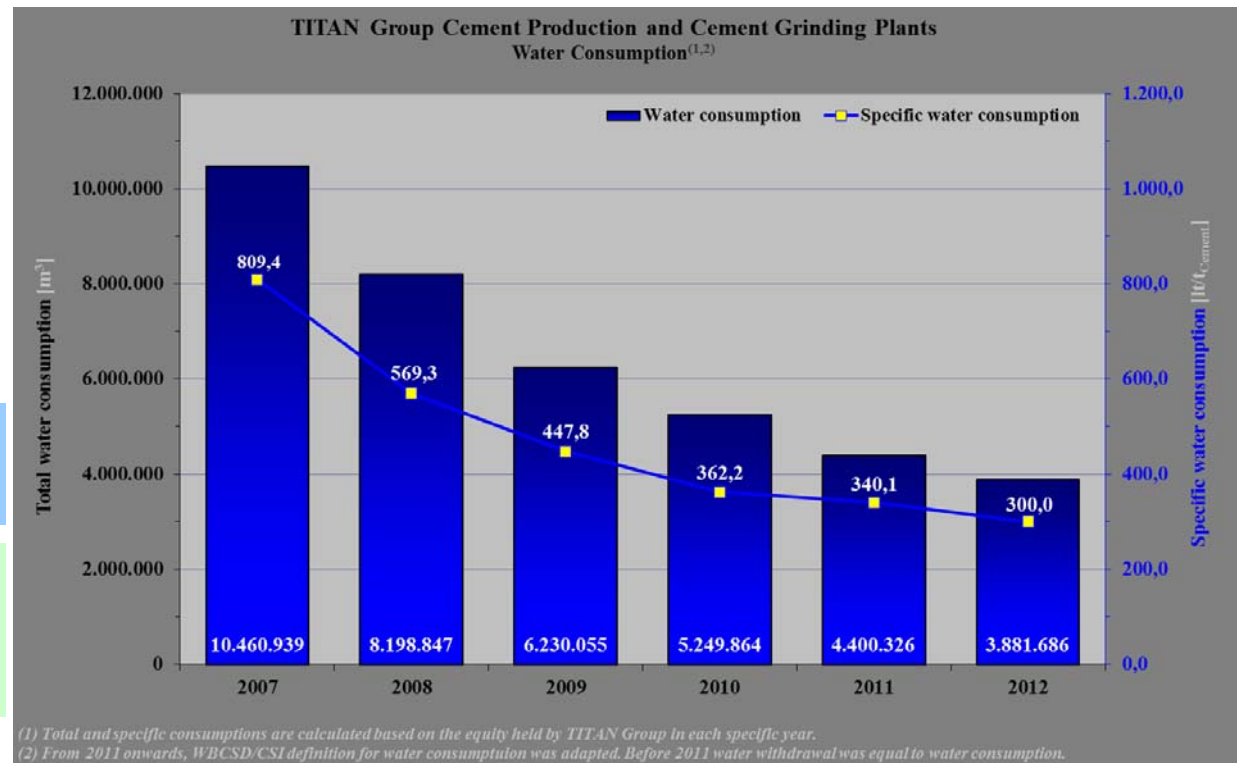
Initiatives/investments for efficient water management:

- ❖ Replacement of any old wet-process production lines with a dry-process modern method
- ❖ Closed circuit water recycling systems for cooling equipment purposes
- ❖ Water treatment facilities and water re-use
- ❖ Rain water harvesting

Continuous improvement with decrease of the total water consumption and the specific water consumption (L/ton cement) by the Group's Cement Plants

300L/ton in 2012
(cement sector benchmarks)

Water Recycling volume is twice the volume of Water Withdrawal



Three levels of water risk assessment

1. Global Risk Assessment of Portfolios



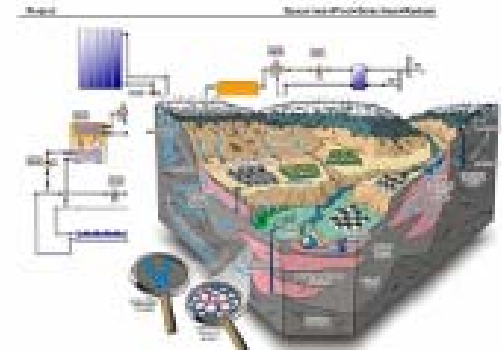
- Top-down approach
- Mapping of company's water use
- Relative water risks in company's portfolio, to prioritize action
- GWT is being customized for the Cement Sector

2. Local Risk Assessment of Specific Site



- Bottom-up approach
- Assessment of:
 - ✓ Site operation impacts
 - ✓ Risks to businesswith regards to local watersheds and communities
- Management Plans

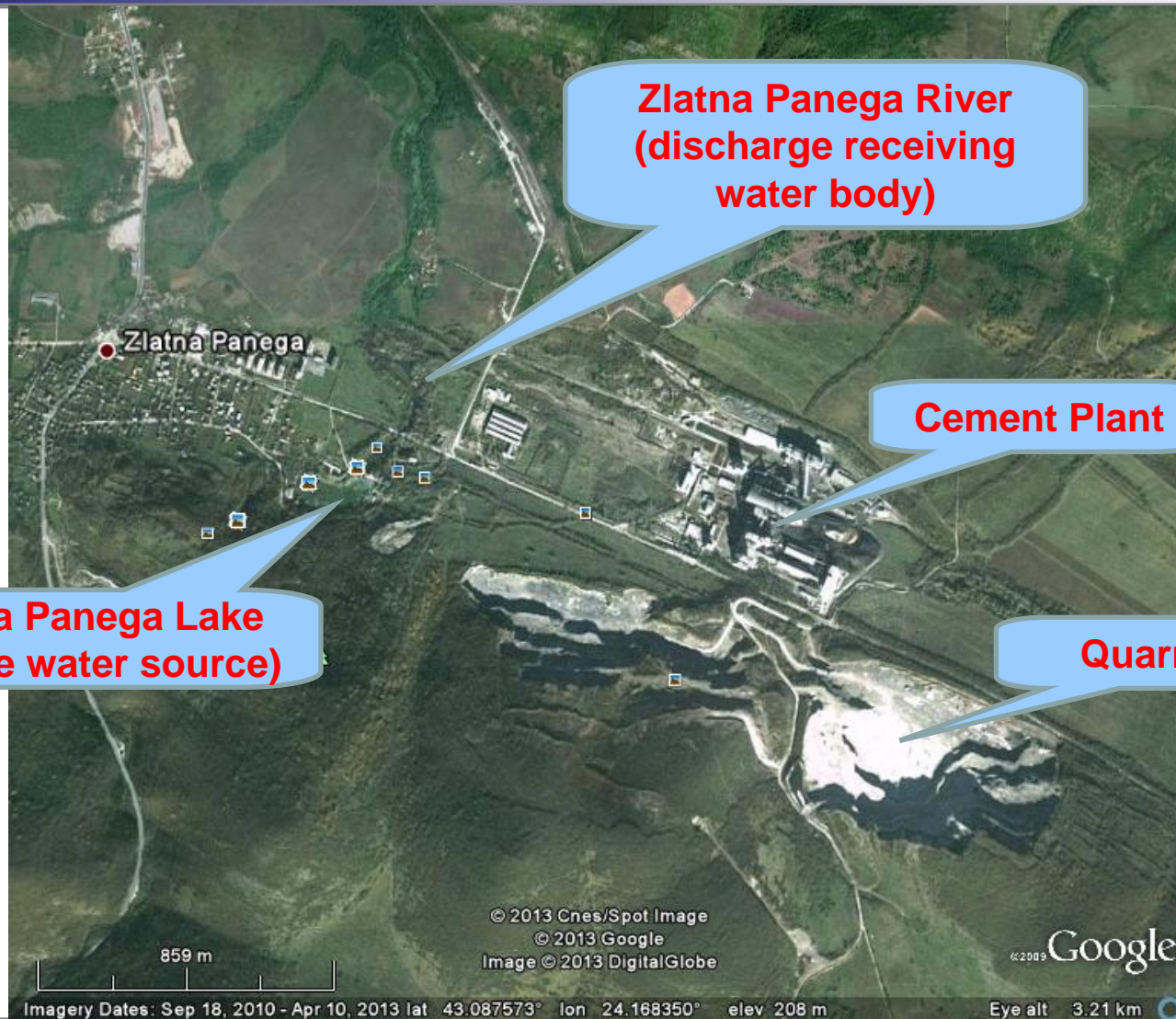
3. Detailed Water Modeling of Specific Site



- Detailed study/modeling at specific site
- Understanding of local watershed and hydrogeology
- Site's water withdrawal vs. annual replenishment of natural resources
- Sustainability in water use

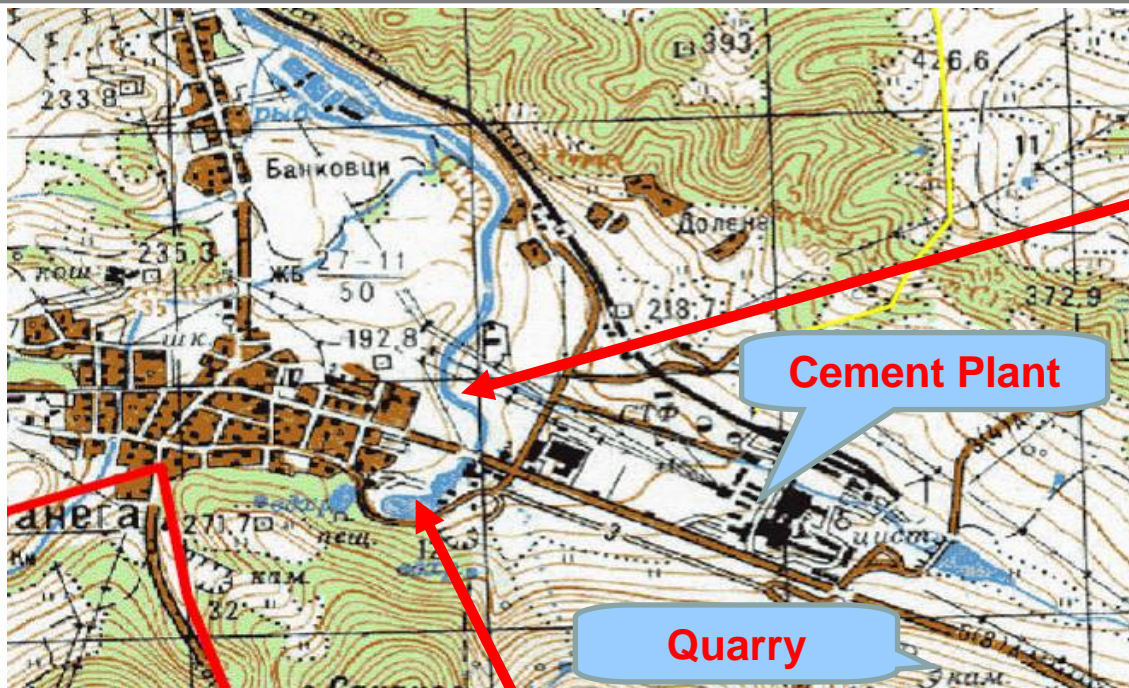
Zlatna Panega Operations

Identification of natural water bodies



Zlatna Panega Operations

Identification of natural water bodies



Zlatna Panega River

- ❖ Receptor of Plant's water discharges
- ❖ Fed by Glava Panega Lake

Cement Plant

Quarry

Glava Panega Lake

- ❖ Main source of freshwater for Plant operations
- ❖ Fed by an underground natural spring
- ❖ Source for drinking water for the local communities

Both the lake and the river are within the 'Karlukovo karst' NATURA 2000 protection area

Actions undertaken by Zlatna Panega Plant, under a 5-year plan:

- ❖ Installation of a **closed recycling system** for the water used for mechanical cooling of the equipment, thus reducing the freshwater withdrawal and consumption.
- ❖ Upgrade of the **water distribution network** inside the plant to minimize water losses.
- ❖ Installation of **waste water treatment facility and sedimentation ponds** to treat water before discharging to Zlatna Panega River. Part of the treated water is reused for irrigation and other environmental purposes.
- ❖ Installation of **flow meters** in the withdrawal points and in the major consumption positions inside the Plant for accurate monitoring of water flows.
- ❖ Development of **Water Management System**, integrated under the overall ISO 14000 EMS of the Plant, assigning roles and responsibilities for a reliable monitoring, data collection and reporting of the Cement Plant water balance and quality

**Significant decrease in the specific water consumption (L/ton cement):
5 times less compared to 2007**

- **Hydrological and Hydrogeological survey** of surface water and groundwater: a 2-year program
 - ❑ Coverage of the **local watershed of Zlatna Panega**, including the Cement Plant, the nearby Quarry, and the surrounding residential areas
 - ❑ Investigation of the **surface and groundwater flows**, the **infiltration** of precipitation water in the Plant and the quarry areas and potential **sources of water contamination**.
 - ❑ **Very low risk** for the plant and quarry operations **to have a negative effect on quality and quantity** of both the groundwater and the surface water, whereas greater risk for water pollution present the other human activities in the surrounding areas.

- Application of the **Local Water Tool**

Zlatna Panega Water Risk Assessment



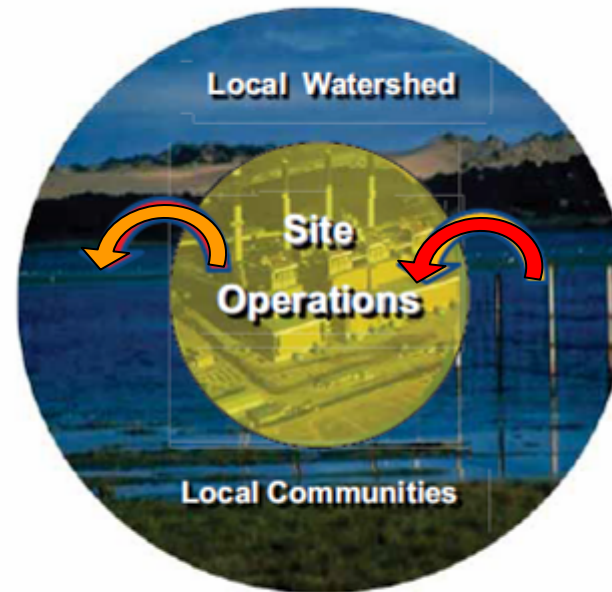
Application of the Local Water Tool



Impact

Extent to which the volume and/or quality of water used or discharged by an organization in a specific watershed affects the availability of that water for other uses or harms human health or ecosystems in any other way.

Organizations with few water impacts may face many water-related risks.



Risk

Potential business liabilities faced by site as a result of impacts and external water-related drivers and constraints.

Opportunity

Potential top line business enhancements created by voluntary sustainable water management actions.

Identify and rank:

- **Specific Impacts**
- **Specific Risks**

Calculate:

- **Site-Level Metrics**

Document:

- **Management Plans**
- **Opportunities**

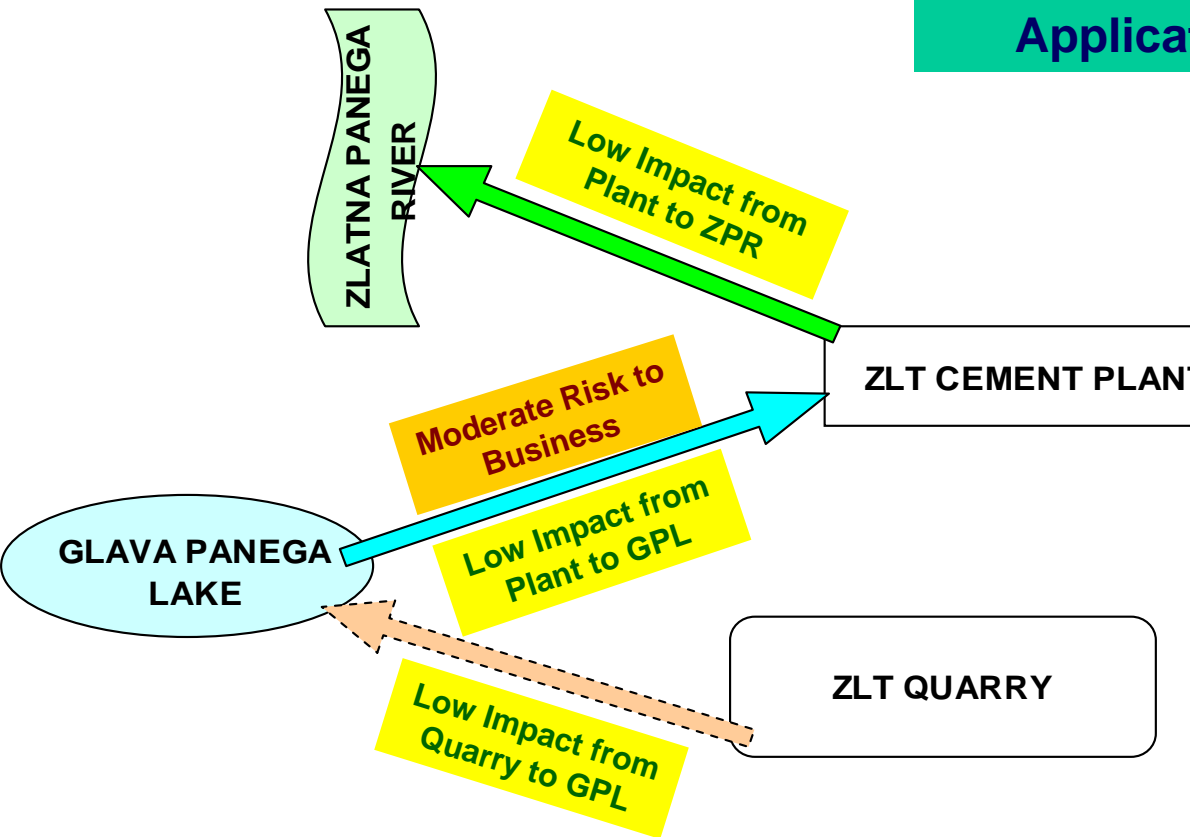
Application of the Local Water Tool

- ❑ Local Consultant involved; data from Hydrogeological Study and other local sources used; tool translated into Bulgarian
- ❑ Assessment of the **local external conditions for each water natural body**, covering twenty water issues in the categories of:
 - ✓ Physical source characteristics and supply reliability;
 - ✓ Ecosystems;
 - ✓ Regulations;
 - ✓ Economics;
 - ✓ Social context
- ❑ Combination of the external conditions with the importance level of each water body determined the **risk level for our business**.
- ❑ In the similar way, the **site's external impacts** on the influent sources and the receiving water bodies were identified and ranked.

Zlatna Panega Water Risk Assessment



Application of the Local Water Tool



Zlatna Panega 'road-map' for water sustainable management to mitigate impacts and risks:

- Local stakeholders and water-relevant NGO's awareness, engagement and partnership.
- Further improvement in performance (increase recycled and reused water or rain water harvesting)
- Efficient water and overall environmental management in the Plant and Quarry.
- Monitoring of groundwater quality through piezometric holes.

- **Future of business and society depend on the sustainability of Earth's water resources**, which are increasingly under pressure.
- **Corporate water management** is a complex, iterative process that requires companies to assess the water situation associated risks, evaluate their impacts, and determine the best course of action on a continual basis.
- **Water risks are different from water impacts for a company**, since one company's risks can depend as much as what happens outside their fence line as what happens within it.
- It is crucial that **businesses, communities, and other stakeholder groups work together to manage the water resources effectively**.
- **Titan Cement** has set targets and takes actions for the **sustainable water management** in its Group Operations, with a view to **increase awareness, improve efficiency in terms of water conservation, assess, decrease and manage/mitigate water risk**.
- Zlatna Panega Cement Plant in Bulgaria is a perfect example of how the strategy and dedication towards a target, combined with proper assessment and understanding of water issues (risks and impacts), planning and implementation of actions, can lead to **improvement in the water performance efficiency** and to the overall **sustainable water management that meets the expectations and needs of all stakeholders**.

A dynamic splash of clear blue water with numerous bubbles, set against a white background. The water is captured in mid-air, creating a sense of movement and freshness.

***Thank You For Your
Attention!!!***