

# Webinar

## Low Impact Development on Military Lands



UNITED STATES ARMY



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**ARMY STRONG.**



- General Introduction of US Army LID Technical User Guide
- LID Background
- Research Implementation of LID on Training Lands





- Collaborative Effort: USACE NAB, USACE Fort Worth, ERDC CERL & EL, The Low Impact Development Center
- USACE Baltimore District: Ms. Sharron Madden, Baltimore Project Manager, Mr. Mike Schuster, Program Manager.
- Components of the Program include:
  - LID Technical User Guide
  - LID Engineering Design Standards and Construction Specifications
  - LID Training Workshops
  - LID Standard Operating Procedure
  - LID Performance Plan
- ERDC CERL and EL Support to Baltimore District: LID Technical User Guide development and training
  - Mr. Pat Deliman, Dr. Sharif Muhammad, Dr. Billy Johnson, Ms. Angela Rhodes, ERDC Project Manager
  - The Low Impact Development Center
- Training Workshops: Ms. Rumanda Young, USACE Fort Worth



- [http://www.usace.army.mil/Portals/2/docs/Sustainability/Hydrology\\_LID/Army\\_LID\\_Technical\\_User\\_Guide\\_January2013.pdf](http://www.usace.army.mil/Portals/2/docs/Sustainability/Hydrology_LID/Army_LID_Technical_User_Guide_January2013.pdf)
- In support of the Army Policy for Sustainable Design and Development and EISA Section 438, OACSIM has requested USACE lead an initiative to provide Army Installation DPW and USACE tools to ensure the implementation and compliance with LID policy.
- The Army LID Technical User Guide provides the user with the necessary background information on pertinent legislature, stormwater and LID; a toolbox of LID best management practices (BMP); a hydrologic modeling and simulation tool for applying LID BMPs; and design and construction considerations for common LID BMPs. The Army LID Technical User Guide is designed for use by many different disciplines involved with the planning, design and construction of an Army Construction project; this includes garrison commanders and staff, facility planning and design personnel, engineers, stormwater managers, facility maintenance personnel, and regional management agencies.



- The Army LID Technical User Guide is organized to take the user through an Army Construction planning and design process.
- Chapter 1 – Background, governing policies and regulations.
- Chapter 2 - Provides the user with a LID toolbox of LID BMPs that can be applied to construction projects on an installation, background on the hydrologic processes that these practices are used to manage.
- Chapter 3 - the user is taken through the planning process to integrate LID into the construction process to meet the requirements of EISA Section 438.
- Chapter 4 provides a hydrologic modeling and simulation tool for the user to determine the volume of stormwater runoff that needs to be managed on-site to meet EISA Section 438 and assists in approximating the size of structural LID BMP necessary to manage the required stormwater volume.
- Chapter 5 - Design, construction and maintenance objectives and considerations are detailed for common structural LID BMPs.



- The goal of Low Impact Development (LID) is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source.
- Conservation
- Small-scale controls
- Direct run-off to natural areas
- Customized site design
- Maintenance, pollution prevention and education



- Army Regulation (AR) 200-1, “Environmental Protection and Enhancement,” August 2007.
- Department of the Army, Commander’s Guide: Army Installations Standards. October 2002.
- Department of the Navy (DON), “Low Impact Development (LID) Policy,” November 2007.
- Clean Water Act of 1972 and Amendments of 1987: National Pollution Discharge Elimination System (NPDES) Phase II & III Stormwater Management Program.
- Energy Independence and Security Act of 2007, Section 438, Storm Water Runoff Requirements for Federal Development Projects.
- Executive Order 13423, “Strengthening Federal Environmental, Energy, and Transportation Management,” January 2007.
- Federal Responsibility to Pay for Stormwater Management Programs, Congressional Act of 2010, 111-3481, amendment to Section 313 of the Federal Water Pollution Control Act



# What is a Range?





- Ranges can have similar issues as cantonment:
  - Management of Ranges are impacted by: storm water runoff, energy use and accessibility, waste, etc
- Training lands may have the additional pressures:
  - TES, Hunting, Invasive Species, Fire Management, etc
- Forefront of integrating LID





- SRP is continually assessing how ranges are designed, built and the footprint of the range on the environment.
- Land Managers and Researchers are looking for low impact approaches to utilize to decrease the overall footprint of ranges while maintaining Mission





- Land Rehabilitation and Maintenance
  - Provides preventative and corrective land rehabilitation and maintenance to sustain land condition and training requirements
  - LRAM is the shop for: design, construction and maintenance:
    - Range complex, re-configuration, trails, crossings, etc.
  - Provide input into Land Management decisions





- Use of soft engineering or BMP's to:
  - Reduce off-site impacts
  - Decrease costs
  - Improve site stability





- Investigation of methods to improve native seed establishment
  - Seed Bombs
  - Pre-Germination Treatments
  - Germination and Dormancy identification by Varietal and Species
- Site appropriate Landscaping material and species
  - Locally adapted species and sources
- Seed Mix ID for Low-Growth
  - Reduced Maintenance
  - Improved Range Quality
- Mowing maintenance
  - reduced labor & gas & maintenance





# Low Water Crossings



- LWX install with re-used tank tracks.
- Difficult to harden, past efforts blown out during rain events:
  - 5' culverts.
  - 12" plus riprap.
  - Concrete pads.
  - Existing underground stream and sink hole.





- Excessively eroded DZ's were re-evaluated and designed with back-cut terracing system:
  - Decreased overland flow
  - Increased retention
  - Increased infiltration





- LID for Ranges
  - Gray water re-use
  - Energy and water efficient re-configurations
- CVWR/TVWF POL wetland treatment
- Biosite - POL composting treatment
- Living Greenwalls
  - Rainwater & HVAC condensate collection and reuse

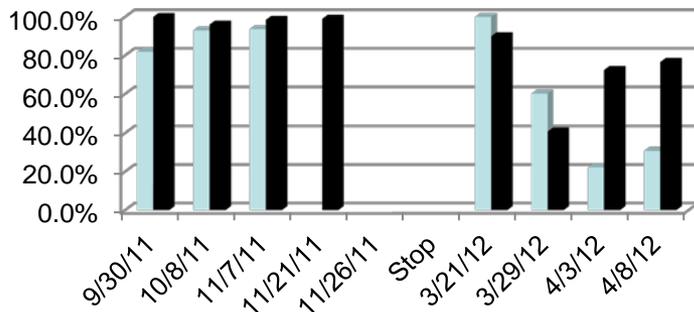




- Investigating on-site SW treatment

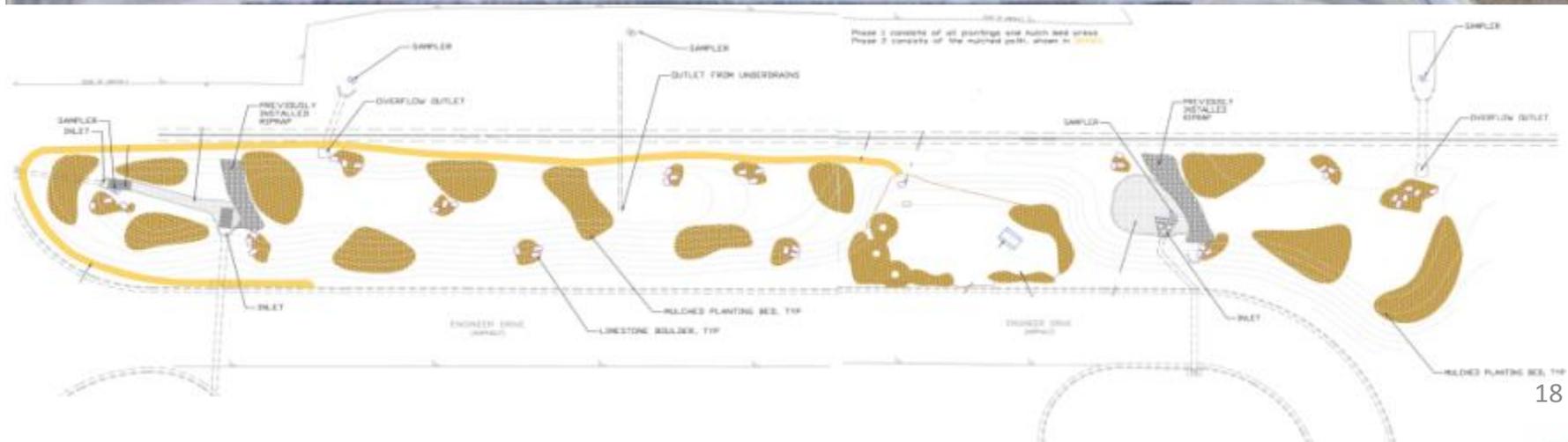


**Effectiveness with TSS**





- Demonstration of Bioswale
  - Fort Hood
  - Landscaped for DPW Engineering recreational use





- Installation erosion & design assessments
- Product evaluation and demonstration
- Erosion Control & Sediment Control Planning (NPDES)





Maximize the utility of land areas. *The Army Strategy for the Environment* identifies that poor planning and use of resources can adversely impact the Army mission.

- Promote Multiple Land-Use

Example: Ag-outleasing non-traditional lands such as road right-of-ways for biofuels eliminates costly mowing and helps meet energy goals.

- Coordinate Master Plans with Neighbors

Example: Integrating on-post and off-post transportation plans reduces parking requirements and gate congestion.

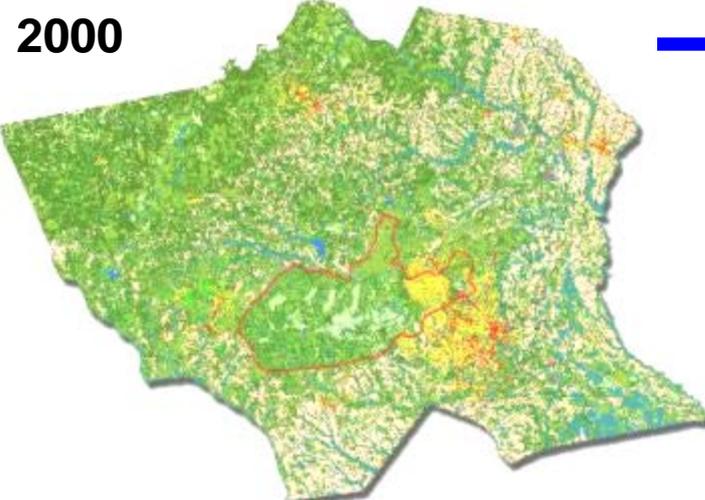
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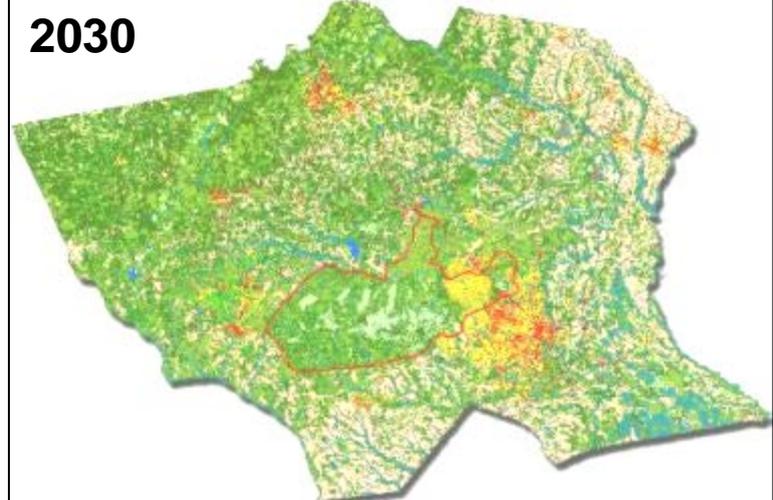
# Regional Urban Growth

2000



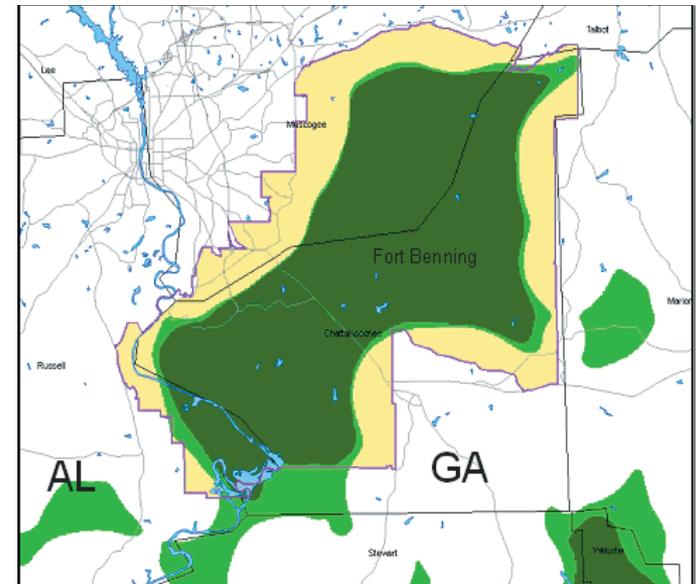
- + 500,000 population
- + 200,000 households
- + 260 million sq. ft. of commercial/industrial
- 19,000 acres of agriculture
- 34,000 acres of forest

2030



- Forecasting Urban Regional Growth
- Forecasting Loss of Training/Testing

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Potential Loss of Training Land Use, 2030



# Questions?

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