TECHNICAL PRESENTATIONS

Content Detail

This document is intended to be used by attendees of the 16th Annual EPA Region 6 Stormwater Conference, July 27-August 1, 2014 at the Worthington Renaissance Hotel in downtown Fort Worth, Texas.

This document provides details for all technical presentations for the conference including information such as Title of Presentation, Presenter/Biography, Date, Time and Track of Presentation, Objectives of Presentation, and Content of Presentation.

This document supports the Conference Agenda.

You will find that the order of the Technical Presentations follows the Agenda by Date, Time and Track

TECHNICAL PRESENTATIONS

Overview of the Institute for Sustainable Infrastructure's ENVISION Rating System

Michael F. Bloom, R.G. Miller Engineers

Tuesday, July 29, 2014 Track 1, 10:00-11:00 a.m.

Technical Level: Introductory

Objectives:

1. Understand the purpose and mission of the Institute for Sustainable Infrastructure (ISI) and its rating system for public infrastructure projects called ENVISION.
2. Learn how the ENVISION rating system awards project credits and project recognition and how public sector project sponsors can submit projects for third party verification.
3. Understand how ENVISION is being used across the county and in Texas.

Content:

The Institute for Sustainable Infrastructure (ISI) is a 501 (c) (3) not for profit organization that developed and maintains a sustainability rating system for civil infrastructure in the United States. That system, called Envision™, was created by ISI in Washington, DC and the Zofnass Program for Sustainable Infrastructure at the Graduate School of Design at Harvard University in Cambridge, Massachusetts. ISI was founded by the American Council of Engineering Companies (ACEC), the American Public Works Association (APWA), and the American Society of Civil Engineers (ASCE). The founding organizations of ISI have a combined membership of over 250,000 professionals and they represent public sector project owners, designers, planners, and engineers. The rating system can be briefly described as "LEED for horizontal projects."

Envision includes two main elements. First it includes a professional credentialing program which allows professional designers, planners, engineers to become Envision Sustainability Professionals through an educational program and test. Second it includes a project recognition program which may be used by project sponsors to seek and obtain one of four project award levels: Bronze, Silver, Gold, and Platinum, depending upon the number of credits the project secures from among the 60 credits available in quality of life, leadership, resource allocation, natural world, and climate and risk categories.

The presentation will provide background on the creation of ISI; an overview of the Envision rating system; highlights of the credits available; and a description of how project sponsors can seek ISI recognition; and how individuals, including attorneys, could become credentialed. The presentation will also highlight recent developments in Texas regarding the use of Envision to design projects, select consultants, award engineering contracts, and guide design competitions.

Biography:

Michael Bloom is the Stormwater Quality Practice Leader of R. G. Miller Engineers, Inc. in Houston, Texas. Michael received a BS in Mechanical Engineering from Syracuse University and a MS in Environmental Engineering from Drexel University. Michael moved to Houston in 1998. Michael is an Envision Sustainability Professional, Certified Floodplain Manager, a Board Certified Environmental Engineer, and a Registered Professional Engineer in Texas and seven other states. He has 22 years of environmental engineering experience.

He serves on the board of the Houston Land and Water Sustainability Forum. He is chair of the Watershed Management Committee of the Water Environment Association of Texas and he serves on the stormwater committee of the National Association of Flood & Stormwater Management Agencies (NAFSMA). Michael chairs the Greater Houston Partnership's Water Issues Subcommittee and he serves on GHP's Stormwater Management Subcommittee. He is former chair of the Stormwater Quality Committee of the Houston Council of Engineering Companies.

Michael obtained his Envision Sustainability Credential in January 2013. He is one of only 81 professional in the State of Texas with this credential.

Concurrent vs. Co-current Inclined Cell Sedimentation and How it Improves Surface Overflow Rates in a Hydrodynamic Separator

Hans de Bruijn, Fresh Creek Technologies, Inc.

Tuesday, July 29, 2014 Track 2, 10:00-11:00 a.m.

Technical Level:

Objectives:

Gravity sedimentation is a process where a particle must sink faster than the encapsulating water rises towards the exit invert for particle removal to occur. Increasing settling surface area on a relatively small footprint and reducing re-suspending turbulence forces are desired objectives to reduce the cost of particle removal per treated gallon. This presentation shows how redesign of inclined cells has eliminated a significant turbulence action inside the settling cell.

Content: Placing parallel plates or tubes in a settling tank to reduce the settling tank footprint and match conventional settling tank performance is a common practice because it reduces the required tank area up to 90%. All these designs inherently direct the purified water to the water surface and the sludge flow to the floor. Several patented methods have improved the flow patterns to avoid re-suspension of the sediment into the settling column. One of those designs has found its use in storm water run-off treatment. However, none avoid the shear plane of water flow and sediment bed flow due to counter-current flow of these designs. The turbulence this shear plane causes affects the needed depth of the cell to avoid the re-suspension of sediment in the rising water column. The con-current design we discuss in this presentation is affording less turbulence because the sediment- and water flow are substantially parallel and one directional. Other peripheral conditions must be met to make this Con-Current design practical for use in a hydrodynamic separator. For example the flow to each parallel operating settling cell must preserve the Surface Overflow Rate that determines the targeted removal of certain impurities. Conditions that exceed the water quality flow must be drained to avoid unsafe driving conditions and flooding, yet the washout of previously collected sediment must be avoided.

Biography:

Mr. de Bruijn is a Senior Environmental Manager at Fresh Creek Technologies, Inc. where he is responsible for identifying applications for various technologies to control stormwater and CSO outfalls.

Hans graduated in 1976 from Utrecht Institute of Technology, Netherlands with an Ing. in Structural and Civil Engineering degree (Master's Equivalent). During the course of his 36-year career, Mr. de Bruijn has received five U.S. patents for designs of various water treatment technologies.

He is a member of the ASCE/EWRI task committee on guidelines for certification of Manufactured Storm water BMPs, the ASTM C27.7 committee for precast treatment devices, the Technical advisory Work group for the Pennsylvania BMP Manual, and WEFTEC.

New Directions for integrated Stormwater Management (iSWM):
Using an Outcome-Based Strategy to Encourage Participation in North Texas

Jack Tidwell, Lesley Brooks

Tuesday, July 29, 2014 Track 3, 10:00-11:00 a.m.

Technical Level:

Content:

The North Central Texas Council of Governments (NCTCOG) leads the integrated Stormwater Management (iSWM) Program in North Texas. It is a cooperative initiative that assists cities and counties to achieve their goals of water quality protection, streambank protection, and flood mitigation, while also helping communities meet their construction and post-construction obligations under state stormwater permits.

Development and redevelopment by their nature increase the amount of imperviousness in our surrounding environment. This increased imperviousness translates into loss of natural areas, more sources for pollution in runoff, and heightened flooding risks. To help mitigate these impacts, more than 60 local governments are cooperating to proactively create sound stormwater management guidance for the region through the iSWM Program.

The iSWM Criteria Manual for Site Development and Construction contains criteria that cities and counties may use as a component of their stormwater management related development regulations. The Manual contains criteria to address and manage the water quality, streambank protection, storm water conveyance, and flood control issues associated with development and redevelopment. The criteria may be customized by local governments to meet specific local needs; however, communities must meet a minimum level of implementation and execute a License Agreement with NCTCOG to adopt and implement the iSWM Criteria Manual. To date, thirteen communities have adopted the iSWM Criteria Manual, but dozens have not.

NCTCOG is now establishing an outcome-focused iSWM Program, where entities can become iSWM members by meeting certain outcome-based criteria either through the adoption of the iSWM Criteria Manual or through the implementation of their own criteria and ordinances. The current process for an entity to become an iSWM community is to obtain a License Agreement from NCTCOG, which involves meeting several conditions, including the adoption of the iSWM Criteria Manual.

NCTCOG and Freese and Nichols, Inc., interviewed North Texas communities not participating in the program to determine the obstacles holding them back from adoption. These interviews have led to the revitalized outcome-based initiative.

The purpose of this presentation is to discuss the history of iSWM, the hurdles communities face in adopting iSWM, and its current outcome-based initiative. The presentation will outline the development of the new implementation method including the development of a list of outcomes, tiered measurement of implementation, and methods for determining a jurisdiction's iSWM implementation level. The new direction being taken to encourage and enable expanded use of iSWM approaches include an assessment of application for all types of project, such as new development, redevelopment, and transportation.

Region 6 Low Impact Development (LID) Panel

Moderator: Robert Adair

Presenters: Steven Albert, , Charles Penland, Margaret Robinson, Andy Johnston, Karan Bishop, Tiffany Price, Nick Russo, Alisa Max, Mikel Wilkens, Zach Roach, Becky Roark, Dana Brown, George Radnovich, David Batts

Tuesday, July 29, 2014, Track 4 (All Day)

Content:

This educational track will survey the progress of LID implementation across Region 6. During the course of this daylong session, speakers representing key Texas markets, including Houston, Dallas-Fort Worth, San Antonio and Austin will join speakers from Louisiana, Arkansas, Oklahoma and New Mexico, in giving the attendees an overview of the status of LID implementation and highlight key projects in their areas. These speakers are respected leaders in the LID adoption process in their respective communities and include civil engineers, an architect, landscape architects, a developer, MS4 personnel and an environmental non-profit representative.

In addition to these speakers, one portion of the program will explore the highly successful LID implementation program carried out by Harris County, where the adoption of LID is being implemented at a pace that is far more rapid than any major metropolitan area in Region 6 and arguably, perhaps faster than in any major metropolitan area in the country. This portion of the program will explore the process of development and the background behind the Harris County LID Design Guidance which was developed in 2011 hand has been the catalyst for the areas surge in LID-based development. Important topics addressed will include the reasons behind key decisions, internal concerns dealt with in the promulgation of the rules and the County's view (three years later) of how the rules and the collaborative permitting process that supports them are working out. Further discussion will cover how LID is being utilized on public infrastructure projects and how the County feels about these projects, and a host of other thoughts on the LID implementation process in Harris County.

Additional speakers will address key lessons learned with respect to the issues and processes that must be addressed in the implementation of LID with respect to the Operations and Maintenance of LID Integrated Management Practices.

Biographies:

From Houston

Margaret Robinson ASLA, Asakura Robinson; Steven Albert PE, Aguirre & Fields; Charlie Penland PE, Walter P Moore & Associates

From Austin

Andy Johnston PE, Halff & Associates

From San Antonio

Tiffany Price, Bender Wells & Clark

Karen Bishop, San Antonio River Authority

From Dallas-Fort Worth

Mikel Wilkens, Verdunity

From Oklahoma

Zach Roach, Ideal Homes

From Arkansas

Becky Roark, Illinois River Watershed Partnership

From Louisiana

Dana Brown ASLA, Dana Brown Associates

From Harris County

Nick Russo, Harris County PID

Alisa Max, Harris County PID

Operations & Maintenance: David Batts, Construction EcoServices

The Incorporation of LID on Affordable Housing Projects

Steven D. Trinkaus, Trinkaus Engineering

Tuesday, July 29, 2014, Track 1, 11:00- 12:00 noon

Technical Level:

Objectives:

- How LID concepts can be applied on variable soil conditions?
- How LID systems can be designed to address variable stormwater prescriptive requirements?
- How LID systems are designed as part of high density residential projects?

Content:

This paper will describe how LID stormwater strategies were used on several high density residential affordable housing projects in Connecticut with variable site conditions. These projects are high density residential projects which provide a minimum of 30% of the total number of units meeting financial requirements set by the State of Connecticut to be deemed affordable. The projects have high impervious areas averaging 40% of the development area. In addition to variable site conditions, the regulatory requirements in the three communities also quite different.

One site with significant environmental constraints was not only required to address Groundwater Recharge and Water Quality, but also required no increase in runoff volume from the 2-yr up to and including 100-yr rainfall event. A second site required the reduction of the post-development peak rate for the 10-yr rainfall event to match the pre-development peak rate for the 2-yr rainfall event. This standard in addition to providing the Groundwater Recharge and Water Quality Volume.

The third site had to address peak rate attenuation for the 2-yr to the 100-yr rainfall event while preventing adverse impacts to delineated inland wetland areas as well as addressing water quality and recharge requirements.

While LID strategies are commonly used to match pre-development infiltration rates and address water quality of post-development runoff, these projects expanded the capability of LID treatment systems to address other stormwater management requirements in a community.

The paper will explain the field testing performed, the design process for the LID systems, including hydrologic modeling to achieve the required stormwater goals, in addition the site planning of the site. The paper will also describe the construction process for the installation of the LID treatment systems on two of the sites.

Biography:

Mr. Trinkaus is an internationally recognized expert in the field of Low Impact Development having presented at many ASCE/EWRI international conferences and many other regional conferences and workshops on LID and water quality issues. He was an invited to present on LID in Taichung, Taiwan by the Water Resources Agency in December of 2011. He was also invited to present a poster on LID and Sustainable Development at the 2012 OCS Convention in Science and Technology in Guangzhou, China. He was invited by Dr. Hyunsuk Shin of Pusan National University to present a workshop on LID in Pusan, South Korea in June of 2013 and has become a consultant to the National Smart Green Infra and Low Impact Development Research Group, directed by Dr. Shin. He also presented two papers at the 2012 ASABE Watershed Technology Conference in Bari, Italy in late May 2012 and water quality issues.

Mr. Trinkaus has written LID Design Manuals for the Towns of Tolland, Plainville, Harwinton and East Granby, Connecticut. He has designed many types of LID treatment systems for a variety of residential and commercial applications. He is chair and primary author of the EWRI LID Guidance Document Task Committee writing a National Guidance document on adopting LID standards and chair of the EWRI Filter Strip/Bioswales Task Committee.

Notes: Suitable for all levels

Predictive Performance Scaling Method for Hydrodynamic Separators

Mark B. Miller, Aquashield, Inc.

Tuesday, July 29, 2014, Track 2, 11:00- 12:00 noon

Technical Level: Intermediate

Objectives:

1. Presentation explores a predictive performance scaling (sizing) method for hydrodynamic separators using the unitless Peclet Number that accounts for horizontal and vertical flow dimensions in context with particle settling velocity.
2. This method allows a theoretical performance curve based on a given median (d50) particle size to be compared to test-derived performance curve based on a different particle size.
3. Performance curves for example d50 particle sizes including 45, 50, 67, 90, 110 and 125 microns are compared to a verified lab test. Sizing charts are then derived from these performance curve using the Peclet Number scaling method.

Content:

This presentation explores a predictive performance scaling (sizing) method for stormwater hydrodynamic separation (HDS) technology using the Peclet Number. HDSs utilize gravitational and inertial forces for suspended sediment removal, whereby HDS performance is a function of suspended solids removal efficiency, surface area loading rate and particle size distributions of the same specific gravity. This sizing approach provides a defensible means to scale the performance of an HDS between various influent particulate gradations. The unitless Peclet Number (Pe) is expressed as Pe = (D*h*Vs) / Q, such that the parameters of Flow Rate (Q in cfs), Horizontal Flow Dimension (D in ft), Vertical Flow Dimension (h in ft) and Particle Settling Velocity (Vs in ft/sec) are considered. The Pe scaling method includes a vertical depth component instead of a conventional single horizontal surface area component when scaling an HDS device. Particle settling velocities are based on Stoke's Law values. The Peclet Number method allows a theoretical performance curve based on a given median (d50) particle size to be compared to a test-derived performance curve based on a different particle size. Performance curves for d50 particle sizes including 45, 50, 67, 90, 110 and 125 microns are compared to an independently verified HDS laboratory test. This scaling method can be used for both net annual and 80% per storm event sediment removal efficiency. An HDS sizing chart can be derived for any given d50 particle size by using the Peclet Number scaling method.

Biography:

Research Scientist with Aquashield, Inc. in Chattanooga, TN since 2005. Responsible for product testing & development and worldwide regulatory affairs for stormwater treatment systems. Held senior level technical and management positions for local and regional environmental consulting companies (1993-2004) in Chattanooga, TN. Senior Geologist for Murphy Exploration and Production Company based in El Dorado, AR and New Orleans for Alaska and South America operations (1981-1993.
M.S., Geology, Centenary College, Shreveport, LA.

B.A., Geology, Univ. of Tennessee, Knoxville.

Registered Professional Geologist in Alabama, Arkansas, Georgia, Kentucky, Mississippi, Tennessee, Louisiana (pending).

Notes:

Author presented at EPA Region 6 conference in 2009 (Houston).

Impact of Fertilizer on Plant Physiological Function for Better Erosion Control

Brad Flack, Storm-Tex Services

Tuesday, July 29, 2014, Track 3, 11:00- 12:00 noon

Technical Level: Intermediate

Objectives:

1. How do macro-nutrients affect plant physiology
2. How does plant physiology affect erosion control
3. How to get the best macro-nutrients to the plant

Content:

Plants require food to eat along with water and air just like all other living things. Because most plants have the same basic structure and design, humans have been able to determine through thousands of years of trial and error what helps their crops grow stronger, faster, and yield more. The healthier the plant the better its parts, and in our case it's the roots of grasses we care most about in the storm water and erosion control industry. As we find alternatives to vegetation as a means to stabilize slopes and disturbed soils, there is something to be said about going back to the basics and doing it better than ever. The root system of grasses is what we primarily use to hold the soil in place on slopes and disturbed soil on construction jobs and we can save costs over the engineered solutions on some sites by doing a better job of growing the vegetation. The macro nutrients used in plant grow and production are Nitrogen, Phosphorus & Potassium (NPK) & Calcium, Magnesium & Sulfur. There are also many more nutrients which are present in the plant and perform important functions but because they are at such minute levels, these are classified as micro nutrients. These are found in the soil, the air, the decaying organic matter in and around the plants ecosystem. They are important, but for this presentation we will focus on the macro nutrients. The first nutrient we are discussing is Nitrogen. Nitrogen is a mixed bag when it comes to plant nutrition and the environment. We must discuss the use of this nutrient both with respect for its abilities to grow and its abilities to kill. Nitrogen is harvested in a few ways, but for primary use in commercially processed fertilizer, it is harvested from the Haber-Bosch process (invented about 1915) which uses natural gas ($CH4+$) for the hydrogen and nitrogen gas ($N2$) from the air at an elevated temperature and pressure in the presence of a catalyst to form ammonia ($NH3$) as the end product. This ammonia is used as a base to produce other forms of Nitrogen, such as anhydrous ammonium nitrate ($NH4NO3$) and urea ($CO(NH2)2$). These concentrated products may be diluted with water to form a concentrated liquid fertilizer (e.g. UAN). Deposits of sodium nitrate ($NaNO3$) are rare but can also be mined for fertilizer use... In the Nitrophosphate process or Odda Process (invented in 1927), phosphate rock containing phosphorus at 20% content is dissolved in a solution of nitric acid ($HNO3$) to produce a mixture of phosphoric acid ($H3PO4$) and calcium nitrate ($Ca(NO3)2$). This can be combined with a potassium fertilizer to produce a compound fertilizer with all three N:P:K: plant nutrients in easily dissolved form... The oldest most widely used method to harvest Potassium is to process Potash. Potash can be used to make the potassium element for fertilizers. Potash deposits are deeply buried marine deposits. The potassium in these deposits is found in the form of potassium chloride (Kcl). These deposits are mined and brought to the surface or they can be extracted in a method where hot water dissolves the deposit and then it is transferred to the surface, and concentrated by solar evaporation. Amine reagents are then added to either the mined or evaporated solutions. The amine coats the KCl but not NaCl (also mined out of the deposit of Potash). Air bubbles cling to the amine + KCl and float it to the surface while the NaCl and clay sink to the bottom. The surface is skimmed for the amine + KCl which is then dried and packaged for use as a K rich fertilizer—KCl dissolves readily in water and is available quickly for plant nutrition.

Biography:

Brad has earned his designation, among select thousands in the world, as a Certified Professional in Erosion and Sediment Controls (CPESC) as well as his designation as a Certified Erosion, Sediment and Storm Water Inspector (CESSWI), lending his experience and training to his customers to consult them in all of their storm water needs.

Additionally is the Administrative Vice President of the South Central Chapter of the International Erosion Control Association and the Region 7 Representative for the CPESC, Inc group, and he serves on the Education Committee: Stormwater Management Track for the IECA. Brad has been involved with Stormwater Quality Management since 2004 where he learned about permitting, turf establishment, erosion control and detention pond maintenance. He has since then continued to learn and develop his storm water knowledge and skills and is now a speaker at many conferences sharing his expertise. His attention to detail and depth of knowledge about structural control devices, vegetative stabilization and best management practices are a valuable asset to both Storm-Tex Services and his clients. His wife is his high school sweetheart, and they have been married for 10 years with a 5 year old son and 1 year old baby boy. Brad is also in active leadership at his church and frequently goes on mission trips to drill for water in rural villages in Honduras.

Controlling Pesticide Runoff from Nurseries Using LID and On-site Management Techniques

Jason R. Vogel, Oklahoma State University

Tuesday, July 29, 2014, Track 1, 1:45-2:45 p.m.

Technical Level:

Objectives:

1. Learn how LID structures such as bioretention and submerged flow wetlands can reduce pesticides in stormwater and irrigation runoff.
2. Learn how on-site management and operational variables can reduce pesticide transport offsite.
3. Learn about recent research being conducted by OSU on pesticide management in nursery runoff.

Content:

Nurseries often apply pesticides for either operational or even regulatory purposes. These pesticides may ultimately be transported offsite in storm or irrigation runoff. For instance, nurseries within the USDA red imported fire ant quarantine zone are required to apply insecticides to their nursery pots to prevent migration of fire ants. Many herbicides may also be applied to nurseries to inhibit the unintentional transport of potentially invasive plants across the country in potted plants. In Oklahoma, nurseries adjacent to streams and lakes have recently been detecting potentially toxic concentrations of pesticides in nearby receiving waters. Commercial nurseries also occur in the region that have their irrigation return flow discharge directly into the storm system. Solutions are needed for these issues. LID and other management techniques are able to limit the amount of pesticide that ultimately is transported to receiving water bodies in runoff from both storms and daily irrigation. This workshop will discuss the processes and concepts associated with applying LID and other management techniques to reduce the amount of pesticides in runoff, including results of recent and ongoing studies by Oklahoma State University that were funded by US EPA Region 6 IPM and the USDA IPM programs.

Biography:

Dr. Jason Vogel is an Assistant Professor and Stormwater Specialist in the Department of Biosystems and Agricultural Engineering at Oklahoma State University and is a registered Professional Engineer in the state of Oklahoma. He currently leads the Low Impact Development research and extension team at OSU. Additionally, he is currently serving as the Executive Director of the Green Country Sustainability which is organizing the Green Country LID Design Competition and the Great Plains LID Research and Innovation Symposium in April 2014. Before joining OSU in December 2009, he worked for the U.S. Geological Survey in Lincoln, Nebraska for seven years, conducting water quality research. He got his Ph.D. from OSU in 2001 in Biosystems and Agricultural Engineering, and also has degrees from Texas A&M and the University of Nebraska.

Texas Stream Team: Citizen Science Water Quality Monitoring and TMDLs

Travis Tidwell, Texas State University

Tuesday, July 29, 2014, Track 2, 1:45-2:45 p.m.

Technical Level:

Objectives: The objectives of the course are to:

1) Provide background content on Texas Stream Team

2) Describe how Texas Stream Team and Citizen Science projects can be useful to TMDL's and Implementation Plans

3) Provide case studies where Texas Stream Team Citizen Science Groups are collecting data for TMDL's and Implementation Plans

This course will provide a BASIC level of technical content

Content:

Texas Stream Team is a statewide network of partner organizations and citizen scientists who are committed to watershed stewardship. Texas Stream Team Citizen Scientists are trained to collect water quality data and are encouraged to participate in local water quality projects by contributing their data and knowledge of local water bodies. This course will inform the audience of the value of citizen science programs like Texas Stream Team to accomplish the goals of a TMDL and or Implementation Plan. The course will also provide case studies of how Texas Stream Team Groups are collecting water quality data for these projects.

Biography:

Travis joined the Texas Stream Team in June of 2012. Before taking the position as the Monitoring Program Coordinator, Travis worked with the National Oceanic and Atmospheric Administration on the Natural Resource Damage Assessment of the Deepwater Horizon oil spill. Prior to that, Travis worked for the Texas Parks and Wildlife Department at the AE Wood Fish Hatchery in San Marcos, Texas, and he also worked for the National Marine Fisheries Service as a Fishery Observer in the Gulf of Alaska and Bering Sea. Travis received a B.S. degree in Biology from the University of Texas at Austin and a M.S. degree in Marine Science from the University of Texas Marine Science Institute in Port Aransas where he studied the early life history of billfish. Travis lives in New Braunfels where he spends as much of his free time as he can fly fishing and kayaking on the Guadalupe River.

TPDES Construction General Permit Compliance Training

Misti Shafer, Compliance Resources, Inc.

Tuesday, July 29, 2014, Track 3, 1:45-2:45 p.m.

Technical Level:

Objectives:

- History of CGP
- SWP3 requirements
- BMP pictures (good and bad)

Content:

- Regulation Background / History
- Introduction to the TPDES regulations
- 8 – Step Process
- EPA – Effluent Limit Guidelines (ELG)
- TCEQ / EPA inspections
- EPA – Expedited Settlement Offer (ESO)
- EPA – Consent Decree
- Spill Response
- Self-Audit
- Best Management Practices (BMP's)
- EPA Triggers

Biography:

Misti Shafer, CPESC, CESSWI (with CRI since September 2002)

- Bachelor of Science (BS) in Environmental Design from Texas A&M University, College Station, Texas

- Bachelor of Science (BS) in Construction Science from Texas A&M University, College Station, Texas

- Coursework in project management, soil science, construction materials and methods, AutoCAD, drafting, surveying, concrete and steel structural engineering, and environmental design

- Internship with DPR Construction in their OSHA/Safety department

- Two years of experience in the homebuilding construction industry including permitting and project coordinating for David Weekley Homes in Austin, Texas and Houston, Texas

- Attended various trainings / conferences through Environmental Protection Agency (EPA), Texas Commission on Environmental Quality (TCEQ), Edwards Aquifer Protection Program (EAPP), International Erosion Control Association (IECA), South Central International Erosion Control Association (SCIECA), Capital Area Erosion Control Network (CAECN), Homebuilders Association (HBA), and the Austin Contractors and Engineers Association (ACEA)

- CESSWI Council Regional Representative - Region 7 Southwest (September 2012 – March 2016); covers Colorado, Kansas, New Mexico, Oklahoma, Texas, Utah, and Mexico

- CESSWI Council Administrative Vice Chair, Ethics Committee Chair, and Application Review Committee Chair (April 2013 – March 2016)

Integrated Stormwater Design & Analysis of LID Connected to a Traditional Drainage System

Michael Crenshaw, XP Solutions

Tuesday, July 29, 2014, Track 1, 2:45-3:45 p.m.

Technical Level: Introductory

Objectives:

- Stormwater Controls
- LID Analysis
- Impact of site runoff on water quality

Content:

We know how to design traditional pipe drainage as the core of stormwater management to protect our urban areas from flooding. Increasingly the LID (Low Impact Design) movement provides us guidance and technology on how to manage site stormwater in a sustainable way to protect water quality. In recent years, these two approaches have been brought together through legislation and industry practice. Yet they remain strangely incompatible in practice. It could even be said that together they can result in poor stormwater management, or at the very least, that opportunities for good stormwater management are lost by not designing and analyzing the integrated system.

This presentation highlights the apparent areas of incompatibility between traditional drainage design and LID. It goes on to show that, drawing on experience from around the world and with some innovation in the way we design drainage and with the support of emerging technology, we can design and analyzing the integrated system. Software tools allow the integrated design and analysis of LID and traditional drainage. Although many new tools exist for LID design they do not integrate LID with traditional drainage in a way to get the best of both worlds, maintaining the focus on good stormwater management while putting into practice the sustainable approach of LID. As a result of new techniques, we should be able to mitigate urban flooding and reduce degradation of water quality in a way that is affordable now and in the future.

Biography:

Michael Crenshaw is a Professional Engineer (TX), Certified Floodplain Manager, Certified Professional in Erosion and Sediment Control, and Certified Professional in Storm Water Quality. Michael has over 15 years of experience and is currently serving XP Solutions as Stormwater and Flood Products Manager. Prior experience includes Product Manager with Wallingford Software USA, city stormwater manager and consulting engineer. Roles included product management, program management, and project manager specializing in floodplain management, drainage systems analysis and design, watershed master planning, storm water management program development and planning, hydrologic-hydraulic studies and designs, flood and all hazards mitigation planning, complex drainage systems analysis and design, and watershed master planning studies and analysis. Mr. Crenshaw has assisted various cities in developing stormwater utilities, NPDES Phase II storm water management plans as well as managed FEMA Map Modernization flood insurance studies.

Monitoring to Answer Questions, Not Just Collecting Data

Roger Glick, City of Austin, Texas

Tuesday, July 29, 2014, Track 2, 2:45-3:45 p.m.

Technical Level: Introductory to Intermediate

Objectives:

1. How to design a monitoring program to meet specific objectives.
2. Issues to consider for a successful long-term monitoring program including staffing, operations and data management.
3. Data analyses tools to meet specific objectives such as compliance or control performance.

Content:

The course will start with a discussion about stage and flow measurements. There are many methods that may be employed to measure stage and flow; however, some methods may perform better in different situations. This section will also include a discussion on the pros and cons of weirs, flumes and open channel techniques to measure flow.

The second section of the course will focus on the different type's water quality sampling. Manual grab samples may be appropriate if the program is of limited scope and duration, and required for some parameters, while automatic sampling will allow fewer personnel to sample multiple locations at the same time. The next question to be addressed with respect to sample collection is to whether analyze the samples as discrete or composite samples, and if the analyses will be performed on composite samples are the aliquots collected on a flow or time basis. Each of these decisions will have cost consequences for labor, equipment and laboratory analyses and will impact the types of analyses that may be done with the data.

The third section will deal with data management. Stormwater monitoring will rapidly generate large quantities of water quality data and time-series data. The volume of data produced may overwhelm staff if there is not an adequate plan to deal with it. This also includes methods to QC the data prior to analyses and long-term storage of the data. These data will represent a significant investment over time, as much as a major capital project, but many groups give data security little thought.

The fourth section will touch on data analyses techniques. The options here will be limited by decisions made earlier in the project. When designing a program, the needs of the data users should be considered prior to selecting a sampling scheme. For example, a large number of grab samples may be used to estimate the mean concentration of the runoff in a watershed, but it will not provide any information on event to event variability. Composite sampling will allow for analyses of event mean concentrations but will not be suitable for intra-event analyses such as first flush.

The course will conclude with practical considerations that need to be addressed. Most rainfall events happen outside of normal work hours. How will staff be deployed and activated? Will the program use dedicated staff? Under what conditions will staff be activated?

Biography:

Dr. Glick has managed the Stormwater Monitoring Program for the City of Austin Watershed Protection Department since 1996. In that time he has developed monitoring studies designed to characterize urban runoff, evaluate stormwater control measures, and for permit compliance. Prior to his joining the City of Austin, he work at the Waterways Experiment Station for the US Army Corps of Engineers.

Notes:

The technical content of this course will be basic to intermediate.

What do Inspectors Need to Know about BMPs

Terrill Lemke and Tim Zimmerly, Los Alamos National Laboratory

Tuesday, July 29, 2014, Track 3, 2:45-3:45 p.m.

Technical Level: Introductory

What Do Inspectors Need To Know About BMPs? A successful construction site inspection program is the key to proper implementation of Storm Water Pollution Prevention Plans (SWPPP) and maintaining regulatory compliance. Best Management Practices (BMPs), in turn, are the cornerstone of SWPPP implementation, effective storm water management, and successful sediment and erosion control. To ensure an effective and successful inspection program, inspectors need to have an appropriate and adequate knowledge of BMPs, and the ability to work with contractors and designers as a team.

These concepts have been identified and developed through the successful implementation of a NPDES Construction General Permit inspection program at Los Alamos National Laboratory, a 40 sq. mi. Department of Energy research facility in northern New Mexico. This presentation will address required BMP knowledge, common issues with BMP implementation, and the challenges of interacting with others regarding BMPs:

- What level of knowledge and understanding of BMP effectiveness, limitation, and local applicability does an inspector need to have?
- Common construction site problems
- The contractor ignorance on BMP implementation and specification is frequently regarded as the responsibility of the designer or contractor, and not within the purview of the inspector. Should this be the case?
- What kind of BMP function and performance?
- How should BMPs be called out in the design/SWPPP and modification?
- As an inspector what BMPs are appropriate?
- If you are an inspector, how can you recommend, design, or redesign BMPs?
- If the contractor proposes recommendations to change a design without being liable?
- If the contractor or designer what BMPs should be used, what type of information should an inspector provide?

Ensuring that inspectors have appropriate BMP knowledge gives them the tools to be effective. It is also important that inspectors understand how to discuss this information with contractors, designers and regulators. This fosters consistency, quality, and regulatory compliance.

A Case Study: Southbury Medical Facility and LID

Steven D. Trinkaus, Trinkaus Engineering

Tuesday, July 29, 2014, Track 1, 4:00-5:00 p.m.

Technical Level: Introductory

Objectives:

- What site investigations need to be done for the design of LID infiltration systems?
- How do you apply LID concepts to a commercial site plan?
- Designing LID systems to handle more than the 90% rainfall event (water quality storm)

Content:

This paper will describe the site investigation, design and approval process which implemented Low Impact Development strategies to address both volumetric increases and water quality issues for a commercial medical building and associated parking in Southbury, Connecticut. The site has several environmental constraints, the primary one being an extensive wetland/watercourse system which traverses the site. In addition to large wetland system, the watercourses on this site have severely impacted by increased stormwater runoff volume from up gradient development which have minimal, if any stormwater detention systems. The result is that the streams are experiencing severe bank erosion and the resultant deposition of the eroded material in the downstream channel.

A primary concern in the design process was to prevent more adverse impacts to the wetlands and the watercourses as a result of this development. The proposed development consists of an office building for medical professionals containing approximately 40,000 square feet on three floors and approximately 155 parking spaces. It was clear that only with the implementation of LID strategies could this site be developed in an environmentally sound fashion and address the potential stormwater impacts.

The site design uses linear bioswales and Bioretention systems without an underdrain to treat the runoff from all of the impervious areas of the development. The grading of the impervious areas was critical in delivering the runoff to the bioswales as overland flow to prevent concentrated flow conditions from occurring. It was also important to make the LID treatment systems easy to maintain.

The site investigation is the most important step in the design of LID treatment systems. It is very important to have a thorough understanding of the soil and groundwater conditions on the site. This was accomplished by the excavation of numerous soil test pits as well as conducting "Double Ring" Infiltration tests. After the initial sizing of the Bioretention systems to address water quality, they were enlarged slightly to attenuate the runoff from the twenty five year storm as the town of Southbury requires no increase in the peak rate of runoff for this storm event. The modeling was done with Hydrocad to demonstrate that the Bioretention systems would be able to fully infiltrate rainfall events up to and including the twenty five year storm event.

The project has been approved by local land use agencies and construction is expected to start in the June of 2013.

Biography:

Mr. Trinkaus is an internationally recognized expert in the field of Low Impact Development having presented at many ASCE/EWRI international conferences and many other regional conferences and workshops on LID and water quality issues. He was an invited to present on LID in Taichung, Taiwan by the Water Resources Agency in December of 2011. He was also invited to present a poster on LID and Sustainable Development at the 2012 OCS Convention in Science and Technology in Guangzhou, China. He was invited by Dr. Hyunsuk Shin of Pusan National University to present a workshop on LID in Pusan, South Korea in June of 2013 and has become a consultant to the National Smart Green Infra and Low Impact Development Research Group, directed by Dr. Shin. He also presented two papers at the 2012 ASABE Watershed Technology Conference in Bari, Italy in late May 2012 and water quality issues.

Mr. Trinkaus has written LID Design Manuals for the Towns of Tolland, Plainville, Harwinton and East Granby, Connecticut. He has designed many types of LID treatment systems for a variety of residential and commercial applications. He is chair and primary author of the EWRI LID Guidance Document Task Committee writing a National Guidance document on adopting LID standards and chair of the EWRI Filter Strip/Bioswales Task Committee.

Notes:

Suitable for all levels

Integrated Catchment Modeling: Stepping Back for a Wider View and Better Understanding

Nicholas J. Anderson, MWH Global, Inc.

Tuesday, July 29, 2014, Track 2, 4:00-5:00 p.m.

Technical Level: Intermediate

Objectives:

1. Integrated approach to stormwater management.
2. Modeling of grey and green infrastructure.
3. Application of the Source-Pathway-Receptor approach to developing solutions

Content:

As the importance of stormwater management is increasingly coming to the fore and with the ever escalating cost, it is now time for paradigm shift in our thinking. Integrated Catchment Modeling (ICM) offers an approach that can meet the regulatory, financial, social, economic and environmental needs in areas where stormwater is a key driver for a utility.

This presentation will focus on the use of watershed wide hydraulic models and the benefits they can bring to the management of stormwater across all drainage systems including rivers and streams, sewers and drains, and above ground in urban and suburban areas.

The presentation will further extend to the application of the source-pathway-receptor (S-P-R) approach to stormwater management and how applying the theory in conjunction with the results from hydraulic models can encourage a wider choice of solution, optimizing the best use of existing systems and applying green and grey upgrades for both quantity and water quality improvements.

Time has shown engineers and planners that greater understanding of a problem will statistically lead to a more appropriate and effective solution. With the application of the S-P-R approach and with quantification of flow and loads from an ICM, the presentation will conclude by looking at the effectiveness of using ICMs through looking at a number of case studies from around the world. It will detail the background, summarize the needs of the catchment and how solutions were developed, how grey and grey solutions were incorporated into the ICM and the resultant benefits. Concluding with a 'lessons learned' offering insight into how the approach can be developed into an effective MS4 strategy and planning tool.

Biography:

Mr. Anderson is a Principal Engineer and Modeling Technical Leader at MWH with more than 18 years of hydraulic and hydrological modeling experience. His expertise includes a wide range of waste and storm water management projects involving water quality, flooding risk, strategic planning and the detailed design modeling of grey, green and blue infrastructure. A Chartered Environmentalist and Water & Environmental Manager in the UK, his recent experience has been in leading MWHs Integrated Catchment Modeling to define, quantify and develop risk based solutions for catchment wide multiple system flooding and water quality problems.

The Value of Audit Preparation to Avoid Enforcement

John Whitescarver and Diana McDonald

Tuesday, July 29, 2014, Track 3, 4:00-5:00 p.m.

Technical Level: Introductory

Objectives:

1. The value of the self-audit
2. Preparation for an audit
3. How enforcement penalties are decided

Content:

Whitescarver will discuss the EPA Region 6 stormwater audit outline.

McDonald will discuss EPA's enforcement process and significant stormwater issues. She will provide examples of recent enforcement of the NPDES municipal stormwater program.

Whitescarver will then discuss the relationship between the audit and enforcement.

We offer the option to extend the session into the next hour with a panel discussion. We will invite representatives of two municipalities that have been subjected to an audit and/or enforcement action. Their presentation will be followed by comments by Diana McDonald.

We will reserve the end of the presentation for audience comments.

Biography:

John Whitescarver served on the EPA Headquarters team that developed NPDES and developed industrial effluent guidelines. Later he was invited to serve on three EPA advisory panels: Grants, Stormwater Phase 2 and Compliance Assurance. He has published 135 issues of The Stormwater Quarterly and is the founder of the National Stormwater Center® that has trained and certified 3,000 inspectors in government and industry.

Diane McDonald served at EPA Region 6 with the NPDES wastewater enforcement program 28 years, the last fifteen in storm water enforcement. She is field certified, conducting inspections and issuing enforcement actions along with resulting penalties. She has served on several national stormwater workgroups including those that helped define storm water significant non-compliance, the stormwater Enforcement Response Guide, How to Conduct an MS4 Audit, How to Conduct an MS4 Inspection and Audit, the penalty policy for construction, and the penalty policy for other industries.

Notes:

Audit Outline will be distributed on a CD

Overview of the SITES Rating System for Sustainable Landscapes

Lisa Storer, Lady Bird Johnson Wildflower Center at University of Texas in Austin

Wednesday, July 30, 2014, Track 1, 9:00-10:00 a.m.

Technical Level: Introductory

Learning Objectives:

- Introduce the research evidence that supports the need to consider and integrate landscapes as a critical component of enhancing the overall resilience of any development site
- Identify strategies and tools for supporting and measuring the performance of sustainable land design and development for a range of project typologies
- Learn about completed projects using low-impact development and green infrastructure techniques and which resulted in healthier environments with functioning, high-performance landscapes

Course Abstract:

With predictions estimating that 80% of the world's population will be living in cities by 2050, what we build on the land profoundly impacts ecological systems as well as the health, safety, and welfare of our communities. Yet, in industry practice today, landscapes and infrastructure are rapidly designed and developed without due consideration for the resulting harmful impacts on the already scarce, natural resources we depend on or to the meaningful quality of life in a community.

On any land development project, the supply, management, and treatment of water is critically important, as global concern over the quality and availability of fresh water continues to rise. So, it stands to reason that natural systems are of critical value for their ability to efficiently store, clean, and distribute available water. This presentation will focus on the steps that those involved in the development of the built environment are taking to harness the potential of landscapes and enhance the long-term sustainability of projects.

The Sustainable Sites InitiativeTM (SITESTM) has developed a comprehensive, voluntary rating system for sustainable land design and development that rewards projects for maximizing the use of available precipitation, conserving water for landscape use, protecting water quality, and restoring aquatic ecosystems, in addition to other sustainable site practices. By providing performance measures rather than prescriptive practices, SITES acknowledges the unique conditions of each site and encourages project teams to be flexible and creative as they design, plan, and develop beautiful, functional, and regenerative landscapes.

SITES-certified projects will be used to showcase best approaches to land development that work with nature to manage stormwater. These include a Washington, D.C. Department of the Environment demonstration project that includes 7,500 square feet of LID elements implemented into a multi-functional urban park design, a 2.8-acre university campus open space that uses a rainwater system to capture over 90 percent of site stormwater that is then filtered and reused for irrigation, and a governmental research laboratory in the arid west that uses soil and vegetation based systems to convey stormwater and replicate the previous hydrologic conditions of the site. Also, a commercial site in southern California that accommodates urban stormwater run-on and provides water quality improvements will highlight bioremediation and phytoremediation stormwater management techniques, and a commercial research facility's campus that was completely revitalized to include a natural, stormwater management system will show how stormwater management features can serve as amenities and aid in the improved health and well-being of facility employees. Each of these projects incorporated stakeholders and site users in the design and planning process, provide on-going opportunities for sustainability awareness and education for the public, and implemented a site-specific long-term maintenance plan to ensure the effectiveness of the sustainable design features.

Instructor Biography:

Lisa Storer is the Senior Program Coordinator for the Sustainable Sites InitiativeTM (SITESTM). SITES is an interdisciplinary collaboration led by the Lady Bird Johnson Wildflower Center at the University of Texas at Austin, the United States Botanic Garden, and the American Society of Landscape Architects to transform land development and management practices toward regenerative design through the nation's first voluntary guidelines and rating system for sustainable landscapes.

Trained as an architect, but discovering a passion for sustainable design, she has worked on multiple LEED projects, ranging in scale from a small office renovation, to a 2.2 million square foot skyscraper, to a 300-acre university campus. Prior to joining SITES, Lisa was the Director of Communications for Cook+Fox Architects in New York City, and while there helped to start Terrapin Bright Green, a sustainable consulting practice.

Lisa is a LEED Accredited Professional and has a master's degree in architecture from the University of Texas at Austin with a focus in sustainable design. She also has a bachelor's degree in fine arts from New York University.

Satiating a Yard-Hungry Channel: The Rehabilitation of the Bitter Creek Tributary

Heather Harris, CH2M Hill and Janna Renfro, City of Austin, Texas

Wednesday, July 30, 2014, Track 2, 9:00-10:00 a.m.

Technical Level: Intermediate

Objectives:

How to address stabilization needs in limited drainage easement How to address erosion challenges in highly residential areas How to address these challenges while mimicking natural conditions to the extent possible

Content:

Increased impervious cover in an ephemeral stream in southeast Austin (called the Bitter Creek tributary) has resulted in increased volume and frequency of storm runoff and stream flow; the contributing watershed is nearly built-out with single family residences. Additionally, the upstream section of the reach was "engineered" to directly receive runoff from several storm drain discharges and street right of way. Downstream of the engineered portion is a more natural stream environment and an existing amenity pond.

The upstream section has become wider and deeper over time, impacting many residential properties and degrading riparian habitat (Figure 1). This section is highly incised with vertical, eroding banks. Local storm drain outfalls have failed due to erosion. The City of Austin requested a conceptual level design for rehabilitation of the Bitter Creek Tributary; stream rehabilitation for this project is defined as improvements related to stream stabilization, flood risk management, and water quality benefits.

The project team conducted data collection and hydraulic and hydrologic modeling efforts to estimate existing conditions and possible impacts of proposed solutions to the upstream section of the Bitter Creek Tributary. As of abstract submission, the project team has selected an alternative that combines the use of natural channel design with vegetated mechanically stabilized earthen (MSE) wall technology. By combining the methods, the intent is to foster riparian habitat to the extent possible while working within a confined footprint between single family houses.

Stormwater outfall rehabilitation, mid-section streambank improvements, and conversion of the existing amenity pond into a water quality treatment facility were also recommended as part of this project, as was large debris removal. The project team is currently in the process of acquiring cross-City department consensus for the conceptual design, and the design phase will follow soon thereafter.

Biography:

Heather Harris, P.E. is a Water Resources Engineer in CH2M HILL's Austin office with 15 years of experience. She currently serves as the Water Environment Federation's Stormwater Committee Second Vice-Chair and the Water Environment Association of Texas's Stormwater Committee Chair.

The Path to Post Construction Stormwater Implementation- City of Arlington, TX

Ben Pylant and Stephen Crawford, Halff Associates, Inc.

Wednesday, July 30, 2014, Track 3, 9:00-10:00 a.m.

Technical Level: Intermediate

Objectives:

1. Public Feedback on Post-Construction Ordinance
2. Review of Post Construction Benchmark communities across the nation.
3. Discussion of lessons learned from post-construction implementation process.

Content:

The City of Arlington has chosen a pro-active path to address post-construction stormwater requirements in the City. With EPA stormwater regulations considered imminent, the City has chosen to pursue a progressive post-construction stormwater ordinance that incorporates Green Infrastructure and water quality requirements. Through public outreach meetings, the City stakeholders made known their desire for a higher quality of life and a more sustainable future for their City. This presentation will share the effort that went into the development of an updated Design Criteria Manual and Unified Stormwater Ordinance that will propel the City in that direction. Information will be shared on the research of post-construction ordinances from benchmark communities throughout the nation. We will also discuss the knowledge gained from this effort, the feedback from citizens and stakeholders through the public outreach process, as well as the lessons learned along the path to implementation.

Biography:

Mr. Pylant is a licensed professional engineer, certified floodplain manager, and certified professional in erosion and sediment control. He graduated from Louisiana Tech in 2004 with a bachelor's degree in Civil Engineering and in 2009 he completed his Masters in Business Administration from the University of Texas at Arlington. He is now working on a variety of water resources, low impact development, and stream stabilization projects for private, municipal, and federal clients out of the Halff Associates Fort Worth Office. In 2013, he was named the Young Engineer of the Year by the Fort Worth Chapter of the Texas Society of Professional Engineers (TSPE). In 2012, he headed up the civil design task for the team selected as the winners of the North Central Texas Low Impact Development Design Competition for the multi-use redevelopment category.

Mr. Crawford is a licensed professional engineer and certified floodplain manager. He has worked on numerous drainage studies and drainage design projects in his 17 year career. Additionally, his project experience includes a vast resume of site development projects, including industrial warehouse sites and multi-use public facility sites. Mr. Crawford also has experience with stream bank restoration, flood warning, utility rehabilitation/relocation, construction management, and expert witness work. In April 2009, he became the Branch office manager for Halff's office in Grand Prairie, Texas.

BMP Performance Evaluation in Texas

Michael Barrett, University of Texas at Austin **(Guest Technical Expert)**

Wednesday, July 30, 2014, Track 4, 9:00-10:00 a.m.

Technical Level: Introductory

Content:

This talk will briefly describe some of the monitoring efforts in the State of Texas that were conducted to assess the pollutant removal of a variety of stormwater Best Management Practices (BMPs). The presentation will also cover the primary mechanisms for pollutant removal in BMPs, how monitoring data is analyzed, and some of the common pitfalls encountered when evaluating BMP performance.

Biography:

Dr. Barrett is a Professor of Civil Engineering at the University of Texas at Austin. His research interests are focused on the management of urban and highway Stormwater runoff. His projects primarily involve the evaluation of structural and nonstructural best management practices, and the preparation of guidance documents for land development activities. Dr. Barrett is a member of the ASCE Urban Water Resources Research Council and the Hydrology, Hydraulics, and Water Quality Committee of the Transportation Research Board.

The Green Country LID Design Competition

Jason R. Vogel, Oklahoma State University

Wednesday, July 30, 2014, Track 1, 10:30-11:30 a.m.

Technical Level: Introductory

Objectives:

1. Learn about the winning designs from three sites in the Green Country LID Competition.
2. Learn about the planning and execution of our competition.
3. Learn about lessons learned from our competition.

Content:

A public-private consortium known at the Green Country Sustainability Forum was formed in July 2013 to organize the Green Country LID Design Competition. This workshop will share the results of the Competition, plus explain the logistical challenges and successes associated with putting on this type of event in a relatively small metro area such as Tulsa, which has less than 1,000,000 people. This workshop will be co-taught with Scott Grant from Tulsa County Conservation District.

Biography:

Dr. Jason Vogel is an Assistant Professor and Stormwater Specialist in the Department of Biosystems and Agricultural Engineering at Oklahoma State University and is a registered Professional Engineer in the state of Oklahoma. He currently leads the Low Impact Development research and extension team at OSU. Additionally, he is currently serving as the Executive Director of the Green Country Sustainability which is organizing the Green Country LID Design Competition and the Great Plains LID Research and Innovation Symposium in April 2014. Before joining OSU in December 2009, he worked for the U.S. Geological Survey in Lincoln, Nebraska for seven years, conducting water quality research. He got his Ph.D. from OSU in 2001 in Biosystems and Agricultural Engineering, and also has degrees from Texas A&M and the University of Nebraska.

Tree Planting for Riparian Corridor Restoration and Stormwater Management

Jonathan W. Holley and Catherine A. Elliott, Harris County Flood Control District

Wednesday, July 30, 2014, Track 2, 10:30-11:30 a.m.

Technical Level: Intermediate

Objectives:

- Tree Planting as a BMP,
- channel maintenance, and
- riparian function restoration

Content:

The Harris County Flood Control District (District) maintains over 2500 miles of channel infrastructure and over 100 detention basins in a predominantly urbanized county on the southeast Texas coastal plain, which includes the City of Houston, Texas. Historically, severe flooding problems necessitated the creation of the District whose mission is to provide flood damage reduction projects that work, with appropriate regard for community and natural values. The majority of the District's system of detention basins and urban drainage network has been traditionally maintained as grass-lined right-of-way that requires regular cyclical maintenance in the form of mowing. A tree planting program was initiated in 2001 with the primary goal being to establish a closed canopy of trees that would reduce or eliminate the need for cyclical maintenance by shading out the undesirable species and slow the growth of turf grass. Secondary benefits included improving slope stability, controlling erosion, supporting permit compliance, and functioning as a stormwater Best Management Practice (BMP). Several case study examples in Harris County are now able to illustrate the establishment of canopy closure, maintenance cost savings, and slope stability while minimizing impacts to conveyance and detention storage capacity. Calculations indicate that trees planted within detention basins take <1.5% of the available storage volume. Furthermore, when canopy closure is achieved on all 960 acres currently planted, it will reduce almost 45 acre-feet of runoff annually. Additional benefits of the tree planting program include riparian buffer restoration for habitat and water quality improvement. While tree planting is not applicable on all flood control channels due to potential impacts on conveyance, it has proven to be effective at reducing cyclical maintenance costs while enhancing stormwater management, bank stability, and riparian habitat.

Biography:

Jonathan W. Holley, CPESC, received a B.S. in biology from Wake Forest University and a M.S. in biology from the College of William & Mary. His master's research studied the effectiveness of stormwater retention ponds at achieving their regulatory design requirements for stormwater detention and the subsequent impacts to water quality and the downstream aquatic community. He worked for a MS4 Phase II in Gaston County, North Carolina where he assisted with permit compliance, designed and coordinated permitting of water quality enhancement features, and conducted erosion and sediment control inspections. He also worked for a consulting firm in Virginia assessing, designing, and monitoring stream restoration projects. He has worked at the Harris County Flood Control District for four years where his experience includes designing stormwater quality enhancement features into flood control projects, assisting with MS4 Phase I permit compliance, and coordinating a natural channel design team.

Catherine Elliott, Catherine is the Manager of the Stormwater Quality Department for Harris County Flood Control District. She has been employed by the District for over 25 years. She has extensive experience in municipal stormwater quality management, MS4 permit compliance activities, storm water management program development and implementation, TMDL's and I-Plans, stream restoration activities and other related water quality issues and research.

Notes:

Intermediate technical content

Picking the Right Stormwater Utility Fee Algorithm to Meet Your Community's Needs

Stephen R. Lienhart, Dewberry

Wednesday, July 30, 2014, Track 3, 10:30-11:30 a.m.

Technical Level:

Objectives:

1. Basic considerations in selecting and implementing a rate structure algorithm
2. Current and pending new regulatory drivers that will impact the operations and funding needs of stormwater utilities
3. Evolving/more comprehensive algorithms that can be used to address specific NDPES/MS4 and NNC needs

Content:

This presentation will:

- Provide a basic review of the central issues, choices and decisions involved in the selection, development and implementation of an initial stormwater utility rate structure
- Discuss recent and anticipated future changes in stormwater management programs that will likely require new services, enhanced program activities, and increased staff/new equipment and additional funding
- Present basic fee billing algorithms in current use for customer billing and their data needs/sources; and
- Offer new billing algorithm structures and elements that a community might add to address water quality treatment issues, transparency concerns and costs related to TMDLs and NNCs.

Biography:

Mr. Lienhart has been involved in water resources issues as a consulting engineer since 1973. He has been responsible for field studies, systems modeling, facilities design and operations, and management programs for municipal stormwater systems, surface waters, and groundwater. He has diverse experience in stormwater management, water supply, water quality management, as well as the institutional, regulatory and funding issues relating to these practice areas. Mr. Lienhart has served on advisory panels for water quality issues for the Florida Department of Environmental Protection and most recently served as the representative for Florida Municipalities on FDEP¡¦s TMDL Allocation Technical Advisory Committee and subsequently on the Department¡¦s Pollutant Trading Policy Advisory Committee, representing the interests of regulated cities and counties.

Municipal LID Regulations

Steven D. Trinkaus, Trinkaus Engineering

Wednesday, July 30, 2014, Track 4, 10:30-11:30 a.m.

Technical Level:

Objectives:

What are common barriers in land use regulations to LID?
How to overcome these barriers to facilitate the inclusion of LID in land use regulations?
What information is necessary to include in LID Design Manual to be successful?

Content:

As more communities look to adopt environmentally sustainable regulations, particularly with regard to stormwater management, LID strategies have been the primary methodology under consideration. Many communities have created regulatory approaches which either encourage or mandate the use of LID strategies, however the implementation of these LID strategies have not always been successful.

In some cases design engineers do not incorporate LID in their designs even though the regulations encourage LID. In other cases, there have been a high number of Bioretention systems which have not functioned properly and even failed prematurely. Why are these issues occurring? A second and potentially larger issue is that many of these non-functioning systems are located in very public locations, so the public is given a distorted view of a Bioretention system and LID in general which makes implementation even more difficult.

As LID treatment systems are relatively simple concepts, it is concerning that something is not working right on both the regulatory and the design side. Are the regulations missing something or design professionals missing something which result in these problems.

This paper will investigate by a review of LID regulations in communities where problems have occurred and those where there are no issues and determine the differences which result in success or failure. Is it simply language within the regulations? Are the approaches to apply LID strategies clearly defined in the regulations? Are design details provided for various types of LID systems which are adequate for the design community to use? Are the design details based upon the best available information at the time the regulations were written?

In addition to addressing these questions, potential solutions will be discussed to make the existing LID regulations stronger and result in LID treatment systems functioning as intended.

Biography:

Mr. Trinkaus is an internationally recognized expert in the field of Low Impact Development having presented at many ASCE/EWRI international conferences and many other regional conferences and workshops on LID and water quality issues. He was an invited to present on LID in Taichung, Taiwan by the Water Resources Agency in December of 2011. He was also invited to present a poster on LID and Sustainable Development at the 2012 OCS Convention in Science and Technology in Guangzhou, China. He was invited by Dr. Hyunsuk Shin of Pusan National University to present a workshop on LID in Pusan, South Korea in June of 2013 and has become a consultant to the National Smart Green Infra and Low Impact Development Research Group, directed by Dr. Shin. He also presented two papers at the 2012 ASABE Watershed Technology Conference in Bari, Italy in late May 2012 and water quality issues.

Mr. Trinkaus has written LID Design Manuals for the Towns of Tolland, Plainville, Harwinton and East Granby, Connecticut. He has designed many types of LID treatment systems for a variety of residential and commercial applications. He is chair and primary author of the EWRI LID Guidance Document Task Committee writing a National Guidance document on adopting LID standards and chair of the EWRI Filter Strip/Bioswales Task Committee.

Monitoring as a Means to Keep Your Green Infrastructure on Track

Rudraksha Jhaveri, Mahan Rykiel Associates

Wednesday, July 30, 2014, Track 1, 1:15-2:15 p.m.

Technical Level: Intermediate

Objectives:

1) Green roof technology can be adapted for ground applications in transportation projects
2) Monitoring and pilot projects can be used to develop best management practices for green infrastructure
3) Designers, managers, and government agencies collaborate on public transportation projects

Content:

Overview

The Green Track pilot project developed by the local Transit Authority and Mahan Rykiel Associates was designed to investigate and determine the feasibility of installing and maintaining a vegetated track system on a commuter light rail in Maryland. Modeled after similar projects in Europe that use green roof technology in rail applications, the initiative selected four (4) test sites to monitor and evaluate the environmental benefit of different soil media and planting methods of 'green tracks' over a three year period.

Context

Within the building sector green roofs are a proven technology. They are incorporated into new construction and adaptive reuse projects. Each generation of product development brings enhanced environmental and economic benefits to designers, regulators, and stormwater managers. In addition to these benefits, green roofs provide the public with a visible and often tangible amenity.

As early as 1908, this technology was applied in Europe to deliver the same benefits to transportation projects under the name 'green tracks'. Projects that use this technology replace traditional ballasted tracks with soil and vegetative systems developed for green roofs. These 'green tracks' are proven to reduce runoff, assist in phytoremediation, provide habitat, and help reduce the urban heat island effect. However, in the United States, only a limited number of trolley projects have incorporated 'green tracks'.

As stormwater regulations have and continue to tighten, transportation agencies are looking to adopt proven green technologies in existing and future projects. This increased interest in 'green tracks' has yet to translate in to widespread acceptance because qualified professionals and regulators have limited first-hand experience monitoring and applying the technology. As a result, the industry is hesitant to capitalize on the environmental, economic, and social benefits of 'green tracks'.

Conclusions

The data collected from the Green Track monitoring and pilot project offers designers, engineers, government regulators, and allied professional's actionable information that can be used to adapt green roof technology for use in transportation projects. In addition, the study provides a concrete example of how infrastructure can be transformed from grey to green through retrofitting, as well as, the importance of monitoring and pilot projects in developing best management practices for stormwater management and green infrastructure. The results of the study show the potential of 'green tracks' in the United States as a viable measure to enhance stormwater management, reduce the urban heat island effect, improve air quality, and increase green space in urban areas.

Biography:

Rudraksha Jhaveri is a landscape designer who focuses on the role of infrastructure as a vehicle to create a more productive and vibrant urban landscape. She is passionate about transforming grey infrastructure to green amenity and seeks to infuse her design projects with a functional aesthetic that reflects its environment. Rudraksha worked on the Green Tracks pilot project in Baltimore, developing experimental protocols, monitoring site performance and crafting the final recommendations for the Maryland Transit Administration. She holds a Master of Landscape Architecture from The Ohio State University and Bachelor in Architecture from Raheja School of Architecture in Mumbai, India.

JoAnn Trach Tongson is an Associate Principal with 22 years of experience. The scope of her work ranges from urban infrastructure, to campus planning, and park design. JoAnn is enthusiastic about drawing out the embedded history and ecology of a site, while balancing the programmatic and budgetary needs of clients and partners. On the Green Tracks pilot project, she ensured efficient and open communication between the diverse group of partners and collaborators. JoAnn is currently working on Baltimore's Watershed 263 BMP program – retrofitting small sites within the City's 39-acre Patapsco River watershed to test stormwater technology and design techniques.

Case Study: Linking Watershed and Receiving WQ Models to Protect & Enhance WQ in the Trinity River-Ft. Worth, Texas

Tina Peterson, CDM Smith, et al.

Wednesday, July 30, 2014, Track 2, 1:15-2:15 p.m.

Technical Level:

Objectives:

1) Process of watershed and receiving model development concurrently
2) Process of linking watershed and receiving water quality models real time
3) Application of the toolset

Content:

The Fort Worth Central City project began in 2002 as a major urban revitalization project for downtown Fort Worth, Texas, and is part of a master plan encompassing 88 miles of the Trinity River and its major tributaries. It is a joint effort of the Tarrant Regional Water District (TRWD), the City of Fort Worth (COFW), and the US Army Corps of Engineers (USACE). Besides the opportunity for the urban revitalization, a critical focus of this project is to bring citizens back to the Trinity River a desired public amenity to enjoy and recreate. To do this, the Central City project is developing a flood bypass channel will be constructed and four flood control gates will allow the current levees to the removed which then allows for river front/waterway development.

Water quality in this segment of the Trinity River is already high and allows for contact recreation and high quality aquatic life uses. The project partners recognize the criticality of maintaining the current water quality level and also recognized the need for a water quality management toolset to help guide water quality approaches in the future. A CEQUALW2 hydrodynamic and water quality receiving water model has been developed for the Central City area to evaluate river water quality considering the proposed river and canal network, and considering operation of the gates. USEPA- SWMM models have been developed for the Fort Worth urban and developing watersheds flowing into the Central City portions of the Trinity River. The SWMM models generate stormwater flows and water quality concentrations that are linked to the CEQUALW2 receiving water model. Combined, this linked model approach allows for rapid identification of strategic watersheds for water quality management and for rapid comparison of water quality management practices. Besides being used to demonstrate the appropriate level of water quality management that will maintain the public's ability to enjoy a high quality urban water resource – the Trinity River – this toolset further facilitates partnership between project partners (TRWD, COFW, USACE) to protect and enhance water quality.

This paper will present the development of the toolset as well as discuss the next steps of the project.

Biography:

Dr. Petersen is an experienced water resources project manager and team leader with over 15 years of experience completing a wide range of water quality, water supply and stormwater management studies for state, municipal and private sectors. She has technical expertise on water quality modeling, monitoring and local/state permitting. Dr. Petersen has published over 30 papers in conference proceedings and peer review literature.

Collaborative Partnerships for Public Education and Outreach

Becki Begley, City of Fort Worth, Texas

Wednesday, July 30, 2014, Track 3, 1:15-2:15 p.m.

Technical Level:

Objectives:

1. Covering all aspects of education/outreach permit sector requirements
2. Benefits of collaborative partnerships
3. Leveraging budget dollars to reach broad audiences

Content:

Since the City of Fort Worth is part of a much larger watershed, local and regional collaboration is an integral part of the stormwater public education and outreach program. The Texas Pollutant Discharge Elimination System Multi-Sector General Permit (TPDES) requires that the city promote, publicize, and facilitate public education and outreach to residents, visitors, public service employees, businesses, commercial and industrial facilities, and construction site personnel. The TPDES permit components include reporting of illicit discharges and improper disposal of materials (including floatables), proper management and disposal of used oil and household hazardous wastes, and the proper use, application and disposal of pesticides, herbicides and fertilizers. Involvement in a number of collaborative partnerships with both private and public entities has been fruitful to fulfill the broad topical and outreach audience requirements of the TPDES permit. Involvement with other city departments and other organizations allows for a broader appeal to stormwater messaging and for a deeper understanding of the importance of regional cooperation in protecting the watershed. Collaboration has resulted in shared costs during budgetary constraints. GIS mapping has offered insight for targeting future education and outreach opportunities. Several partners have agreed to participate in the creation of this presentation.

Biography:

Becki Begley
Public Education Program Coordinator
30 years of education experience
2.5 years in environmental education/outreach Bachelor of Science in Education, Wright State University Master of Education, Wright State University

A Watershed Approach to Protecting Stream WQ Using Compost BMPs

Britt Faucette, Filtrexx International

Wednesday, July 30, 2014, Track 1, 2:45-3:45 p.m.

Technical Level:

Objectives/Content:

Building on concepts of bio mimicry, natural capital restoration, and ecosystem service enhancement, attendees will learn how compost-based storm water best management practices (BMPs) use natural processes to achieve high performance results in storm water volume reduction, pollution prevention, and bio filtration. Based on recent scientific research over 20 different BMPs are currently being utilized in green infrastructure and sustainable site development across the US. Attendees will learn how compost is being used in a variety of storm water management applications – including green infrastructure, how it performs relative to conventional practices, and why design and watershed professionals are choosing compost to meet their goals.

Content: Urban storm water runoff poses a substantial threat to receiving surface waters across North America. Green infrastructure, low impact development, green building ordinances, National Pollutant Discharge Elimination System (NPDES) storm water permit compliance, and Total Maximum Daily Load (TMDL) implementation strategies have become national priorities; however watershed professionals need more sustainable, low cost solutions to meet these goals and guidelines.

(See learning objectives)

Biography:

Dr. Britt Faucette is an Ecosystem Scientist, Certified Professional of Erosion & Sediment Control (CPESC), and Leadership in Energy and Environmental Design Accredited Professional (LEED AP), and serves as the Director of Research and Design Services for Filtrexx International. He earned his Ph.D. from the Odom School of Ecology at the University of Georgia where he researched soil-water-plant performances of various BMPs used in soil erosion and storm water management applications. Britt coordinates international research programs and engineering services for Filtrexx International and serves on technical committees with the American Society of Test Methods (ASTM), the Board of Trustees for the US Composting Council (USCC) Research & Education Foundation, and Chairperson of the Georgia Soil and Water Conservation Commission (GA SWCC) Advisory Committee to revise the state Erosion & Sediment Control Manual. In 2008 he was the recipient of the Clean Water Award presented by the US Composting Council. He has contributed to 12 peer-reviewed and over 100 popular press articles, developed national and state specifications on organic materials used in erosion and sediment control and storm water management, worked with foreign governments, taught graduate students, consulted on compost and storm water related projects in 15 countries, and has published two books on research and design elements of organic materials used in storm water management.

Adjust your Lens to Bring your Regional Drainage Picture to Focus

Thomas Caffarel, Freese & Nichols, Inc. and Kenneth L. Schaub, Jr., DPW-Fort Hood

Wednesday, July 30, 2014, Track 2, 2:45-3:45 p.m.

Technical Level:

Objectives:

1. Define what regional drainage planning is & the steps involved in creating a comprehensive plan
2. Communicate the benefits of regional drainage studies
3. Begin planning for a regional study

Content:

Fort Hood has numerous drainage and erosion issues throughout the Army base. For years they have reacted to drainage concerns, resulting in on-site solutions attempting to address a specific problem by treating the symptoms. After spending money on projects that don't fully address the problems, they decided to proactively look at areas holistically. The North Fort Hood Regional Drainage Plan took a broader look at the drainage issues to discover the cause of common drainage problems, various alternatives to resolve those problems, and formulated a CIP list.

A regional drainage plan begins with good data. Fort Hood began their plan with a base-wide inventory of their utilities and storm drain system. With this detailed inventory, the entire networks of drainage systems within North and West Fort Hood were modeled using XP-SWMM 2D. The 2D model allowed Fort Hood to see where runoff would spill between basins and how downstream issues affect upstream systems, and vice versa. Alternatives were analyzed for the entire study area and a phasing plan for the improvements was developed for budgeting and drainage purposes.

The final deliverable included the XP-SWMM model that Fort Hood can update as future development is planned and occurs. This will be extremely beneficial in understanding how a future development may create a drainage problem upstream or downstream and allow the design engineer to resolve those potential problems through the design.

This presentation will detail the effort included in reaching this deliverable and the benefit it has had for Fort Hood.

Biography:

Thomas Caffarel graduated from Texas Tech University in 2004 with a Bachelor of Science Degree in Civil Engineering and has been a private consultant for over nine years. His current position is with Freese and Nichols, Inc., out of their Dallas office where he is a Project Manager for many of their North Texas municipal clients. Additionally, he serves as Project Manager for stormwater related USACE contracts and TxDOT contracts.

Lynn Schaub graduated from Baylor University in 1995. His experience spans almost twenty years in the environmental/consulting industry. His employers have ranged from Municipal governments to private consultants to the Federal Government. His current position is with the Federal Government at Fort Hood, Texas where he is the lead Environmental Protection Specialist for the Water Program. Mr. Schaub also serves as the Storm Water Champion for the entire military installation.

Charting your Course and Tracking Success

Kristina Twigg, Water Environment Federation

Wednesday, July 30, 2014, Track 3, 2:45-3:45 p.m.

Technical Level:

Objectives:

- Building an online publication from scratch
- Creating a web presence and generating site content and traffic
- Web and social media data collection

Content:

This presentation will discuss the advantages of integrating content and messaging across different platforms through a case study of the Water Environment Federation's Stormwater Report, which is WEF's primary vehicle for generating and distributing stormwater content. Specific topics to be addressed will include considerations for creating an online publication, building a distribution list, using social media to generate and promote content, building a web presence, tracking success, and tools for creating and managing content and gathering analytics data. The presentation will also cover aspects of the project and other communication efforts that have proven to be most successful.

This is a basic level presentation to be submitted under the category of Public Education and Outreach. The Stormwater Report is geared toward stormwater professionals, rather than the public, and is global in scope. However, the case study is applicable to municipalities looking for new ways to share information with the public and measure their success.

In April 2011, WEF launched the Stormwater Report, a free monthly e-newsletter that began with 5,000 subscribers and is now distributed to nearly 30,000 stormwater professionals. Since its debut, the newsletter has included a feature story as well as short news updates on stormwater policy, technical topics, public outreach, and more.

There are many advantages to starting an online publication, from driving traffic to your website to providing regular communications to gathering information about your audience. However, launching a new publication requires careful consideration of organizational processes, audience, content generation, delivery mechanism and design, frequency, timing, and online hosting.

WEF quickly expanded its Stormwater Report readership as well as its content and began creating a web presence, first on the primary WEF website and later on a separate website powered by WordPress. The newsletter has also become a revenue-generating product and has led to the creation of a new, quarterly print publication, World Water: Stormwater Management.

WEF utilizes social media to both promote its content and generate new content. Social media efforts include a stormwater Twitter account, a LinkedIn discussion group, and a YouTube stormwater video competition called the StormTV project, for which 113 videos have been submitted over two submission periods. WEF rigorously tracks the success of its articles and social media efforts through various analytics tools, many of which are free.

Biography:

Kristina Twigg is editor of the Stormwater Report, a monthly e-newsletter distributed to 30,000 stormwater professionals, and associate editor of World Water: Stormwater Management, a quarterly magazine by WEF Publishing UK Ltd. Ms. Twigg has also served as an assistant manager in the Water Environment Federation's Water Science & Engineering Center since 2010, where she works closely with WEF's network of water professionals, particularly in the stormwater, watershed, and laboratory practices areas. Kristina manages the Stormwater Report website as well as stormwater-related social media efforts as part of her efforts to support the print and online publications.

Ms. Twigg has a B.S. in Bioenvironmental Sciences and an M.S. in Science and Technology Journalism, both from Texas A&M University. She worked with the university's Texas AgriLife Research & Extension Urban Solutions Center on communication, outreach and implementation of green infrastructure projects. She also spent time as a technical editor of papers and proceedings related to nonpoint source pollution.

Concrete Channel vs. Natural Arroyo – Regulatory Stormwater Management Strategies and Impacts on Water Quality in Greater Albuquerque, New Mexico

Charles Thomas and Gerhard Schoener, SSCAFCA

Wednesday, July 30, 2014, Track 4, 2:45-3:45 p.m.

Technical Level: Intermediate

Objectives: Infiltration as a Potential Tool to Improve Stormwater Quality

Content:

Stormwater management strategies that focus on preservation of natural arroyo systems and potential implications on infiltration and runoff volumes are discussed in the context of increasing urbanization; the increase of impervious coverage in a watershed not only leads to higher runoff volumes for a given storm event, but also increases the frequency of runoff events.

In their original state, watersheds in the Middle Rio Grande area drain stormwater runoff through a network of natural stream channels or arroyos. Historically, flood control strategies focused on the most efficient ways to convey stormwater runoff through populated areas, resulting in the conversion of many arroyos to hard-lined channels. Due to the increasing cost of traditional construction and concerns for the environment, local agencies started to consider stormwater management approaches that preserve arroyos in as natural a state as desirable, taking advantage of naturally high infiltration rates in arroyos and their potentially beneficial effect on water quality.

The purpose of this study was to explore the potential impact of transmission losses, i.e. infiltration into the arroyo bed as a flood wave moves downstream, on flood hydrographs. Flow data from two local watersheds was analyzed; results show that runoff hydrographs resulting from small storm events decrease in size as they move downstream, an apparent discrepancy that can partially be explained by transmission losses.

Hydrologic models for natural arroyo systems in watersheds in the Albuquerque/Rio Rancho area show that a large portion or all of the runoff from a small storm event can be infiltrated before it reaches the Rio Grande. Since pollutants in urban stormwater runoff are a major concern for the receiving water body, transmission losses could be a valuable tool for protecting water quality in the Southwest.

Biographies: Charles Thomas: Charles (Chuck) Thomas was hired as Executive Engineer for the Southern Sandoval County Arroyo Flood Control Authority (SSCAFCA) in July of 2011. During his tenure, he has been focused on building successful funding partnerships for future flood control improvements and has seen SSCAFCA take on a lead role with the watershed based MS4 permitting efforts. His previous professional experience includes serving as Director for the New Mexico Mining and Minerals Division (MMD) as well as the Division's Mine Reclamation Bureau Chief for the State of New Mexico.

Prior to working for MMD, he spent over eight years as the Chief Engineer for the Drinking Water Bureau for the New Mexico Environment Department where he implemented the Arsenic Rule and developed the Statewide Engineering Program for the Ground Water Quality Bureau in 2008. As a project manager for the City of Albuquerque, Chuck oversaw storm water projects that incorporated both multi-use and zero drainage discharge concepts.

Chuck has a Bachelor's of Science degree in Mining Engineering from the New Mexico Institute of Mining and Technology and is recipient of the Old Timers Award, presented annually to the top Mining Engineering graduate. He is a professional engineer registered in New Mexico since 1997.

Originally from Washington State, Chuck grew up throughout the southwest, spending the majority of the last 25 years in New Mexico. He lives in Albuquerque with his wife Rebecca and their two sons. He spends his free time with his family and competing in the Highland Games as a Masters Class Scottish Heavy Athlete.

Gerhard Schoener: Gerhard stared as an intern with the Southern Sandoval County Arroyo Flood Control Authority (SSCAFCA) in May of 2007, and was hired as a permanent employee the following year. In his position as Watershed Scientist, he develops comprehensive management plans for regional watersheds. His research interests include hydrologic processes, and the development and calibration of rainfall-runoff models.

Gerhard has a Bachelor of Science degree in Forestry from the Georg August University in Goetting/Germany, and a Master of Water Resources degree from the University of New Mexico.

Originally from Munich/Germany, Gerhard spent two years working with children in a community center in Tijuana/Mexico. He moved to New Mexico in 2005 and now lives in Albuquerque with his wife and three children. In his free time, he enjoys growing a market garden and raising chickens and sheep.

Street Dust: Implications for Stormwater and Air Quality, and Management through Street Sweeping

Steven Calvillo, TYMCO, Inc.

Wednesday, July 30, 2014, Track 1, 3:45-4:45 p.m.

Technical Level: Introductory

Objectives: The audience will gain an understanding of:

- Contaminants found in street dust, their sources, and how they affect stormwater and air quality.
- The history and differences of various street cleaning technologies, and their effectiveness of improving stormwater and air quality.
- Methods and findings of various street cleaning studies.

Content:

Street dust represents a source of dual potential risk to stormwater and air quality. It has been well-documented that washing of this material to local watersheds can degrade water quality. Studies have also demonstrated that as much as 85% of ambient particulate matter (PM10), exposure to which is associated with several health effects, can arise from resuspension of accumulated street dust. The objectives of this study were to: (1) Critically review the available literature regarding street dust and potential impacts on stormwater and air quality, (2) Develop an understanding of available street sweeping technologies and their relative efficacy, (3) Extrapolate the relative efficacy of multiple street sweeping technologies to the context of environmental/ecological and human health risk, and (4) Provide recommendations for future research studies.

Biography:

Steven Calvillo is a graduate of the University of North Texas, with a Bachelor of Business Administration degree in Marketing and an Undergraduate Academic Certificate in New Product Development. He is also a graduate Baylor University, where he earned a Master's degree in Environmental Studies.

His master's thesis, entitled Street Dust: Implications for Stormwater and Air Quality, and Management through Street Sweeping, critically reviews the available literature regarding street dust and its potential impacts on stormwater and air quality, as well as street cleaning technologies and their relative effectiveness.

He currently works for TYMCO, Inc.

Modeling the Impacts of Regulations on Creek Health

Roger Glick, City of Austin, Texas

Wednesday, July 30, 2014, Track 2, 3:45-4:45 p.m.

Technical Level: Intermediate

Objectives:

1. Data requirements important to capture different management plan goals.
2. Selection of simulation periods, length of simulation and weather conditions.
3. Data analyses to assess the output and tie to management plans.

Content:

Modeling is may be used to evaluate the potential benefits of stormwater control measures (SCM) or regulations incorporated in a stormwater management plans. An important output that has been assessed with the ArcSWAT model is the change in the hydrologic regime. Using appropriate indicators of hydrologic alteration (IHA) from continually-simulated flow allows an assessment of relative impacts on the biological community and on in-stream erosion.

The course will start with a discussion of the ArcSWAT model and its current capabilities. Specific capabilities related to input data requirements will be covered along with some discussion of the limitations and accessibility of some nationally available data sources. Recent ArcSWAT enhancements include a small time-step and its importance will be exemplified. The incorporation of physically based modeling of SCMs will also be discussed, along with the discussion of data needs and whether these can be incorporated as single units or multiple facilities. At each step, the discussion will tie back to the usefulness of the model in assessing the relative merits of various management actions.

The second section of the course will focus on the outputs from case studies conducted by the City of Austin where various regulations and SCMs were modeled. Graphical demonstration of the output will be provided as examples of the type of data which is easily derived directly from the model output.

The environmental impact assessment will be covered last and primarily focus on those associated with IHAs as these require the use or development of relationships and sometimes additional data to implement. For example, the streambank and streambed characteristics are obviously critical to the ability of flow to cause erosion and the excess shear on the banks needs to be calculated. A discussion of the regional differences in IHAs and ensuring that applicable relationships are used will also be covered. The course will conclude with questions and answers on specific applications?

Biography:

Dr. Glick has managed the Stormwater Monitoring Program for the City of Austin Watershed Protection Department since 1996. During that time he implemented the use of modeling to augment monitoring data to evaluate changes in regulations and management strategies Prior to his joining the City of Austin, he work at the Waterways Experiment Station for the US Army Corps of Engineers.

Notes:

The technical level of this course will be intermediate

Implementation and Management of an End of System Outfall Identification Project in a Phase I MS4

Betsi Chatham and Michael Kazda, City of Fort Worth

Wednesday, July 30, 2014, Track 3, 3:45-4:45 p.m.

Technical Level:

Objectives:

1. Review Texas Pollutant Discharge Elimination System Permit MS4 mapping requirements
2. Introduce Three-Step Process of End of System (EOS) Outfall Identification Project
3. Explore challenges in accomplishing EOS identification using existing staff and resources.

Content: Abstract

This presentation provides supporting information for the implementation of the End of System (EOS) Outfall Identification Project. An in-depth review of permit language and responsibilities pertaining to outfall mapping and monitoring will afford further discussion of the EOS Outfall Identification Project standards and procedures. These procedures are outlined in a 3-Step process with the comprehensive review of associated project support documents.

Additionally, Fort Worth has an ongoing Dry Weather Field Screening (DWFS) program that tests all known major outfalls in the city a minimum of once per five (5) years. Investigators perform trace-back and other follow-up investigation in response to any suspected illicit discharge. A major component of the MS4 Mapping requirements is attribute verification and location of all MS4 outfalls within 3 years of the permit issuance. Since the Dry Weather Field Screening Program requires monitoring all major outfalls, each outfall is identified, attributes reviewed, and DWFS completed so these two permit requirements are met. Due to permit time constraints, all outfalls will be reviewed for location and major outfall status by July 2014 (current TPDES permit issuance July 2011).

Three-Step Process of End of System (EOS) Outfall Identification Project

1. Identification Data Review and Map Generation – on screen review of all outfalls which are tagged with EOS status, outfall size and ENV-ID (GIS)

2. Field Visit Verification – field investigation to verify EOS status, outfall size, and identify and name all outfalls to be included in the DWFS program (Monitoring Staff)

3. Data Upload – enter new outfalls into Dry Weather Field Screening Database and tag identified outfalls within the GIS (DWFS Team Lead and GIS)

Biography:

Betsi Chatham- Senior GIS Analyst

20 years of Environmental GIS experience Bachelor of Arts, Arizona State University Master of Applied Geography, Southwest Texas State University

Michael Kazda-Environmental Supervisor

5 years of Environmental Management experience Bachelor of Arts, Colorado College Master of Arts, University of Wyoming

MS4 E-Assessment (NEW! EPA Program)

Thea Lomax and Everett Spencer, US EPA Region 6
Wednesday, July 30, 2014, Track 4, 3:45-4:45 p.m.
Technical Level: Intermediate

Content: Storm Water E-Assessment is an information tool developed by the EPA to collect detailed information on how municipalities permitted under an MS4 permit have implemented their Storm Water Management Plan. The tool assesses how the permit has been implemented in order to achieve permit compliance and reduce pollutants from storm water discharges into the MS4.

Biographies: Thea Lomax has 36 years of experience in environmental management and has done enforcement in many program including: Storm Water, WasteWater, RCRA, Underground Injection Control, Surface Impoundments, Groundwater and many others. Ms. Lomax is the Team Leader of the Group that developed EPA's first MS4 Checklist that gained use and notoriety from EPA Headquarters and Regional Offices; and also leads the development of the Storm Water E-Assessment. In her leisure Ms. Lomax plays keyboard and writes and plays piano. Ms. Lomax studied at Sul Ross State University in Alpine, TX and University of Texas A& M in Commerce, TX and has a BS in Geology and MS in Education.

Everett Spencer has been in EPA Water Enforcement for 30 years and has worked in every area in the Water Branch. He is also a volunteer Firefighter/ECA with the Ovilla Fire Department. Prior to EPA Mr. Spencer was a Drilling Fluids Engineer with Dresser Magcobar on offshore oil drilling rigs. He also spent a year sampling stacks at the refineries in Louisiana. Mr. Spencer has a BS in Geology from LSU and is a US Army veteran.

Importance and Role of Maintenance for Stormwater Control Measures

William (Bill) F. Hunt, North Carolina State University **(Guest Technical Expert)**

Friday, August 1, 2014, Track 4, 8:00 -9:00 a.m. (General Session)

Technical Level: Introductory

Content:

Stormwater Control Measures (SCMs) can have a great design, be well sited, and appropriately constructed. However, without proper maintenance these same SCMs are apt to underperform, and in the worst cases fail completely. This presentation will focus on what happens when SCMs suffer from neglect and provide a few basic tips for inspection and maintenance of several SCMs. North Carolina's Inspection and Maintenance Certification.

Biography:

Dr. William F. Hunt ("Bill") is actively involved with Best Management Practices (BMP) research in the Biological and Agricultural Engineering Department and is the leader of the Stormwater Engineering Research Group. He is a Professor, Extension Specialist, & University Faculty Scholar. He is an active member of the American Society of Civil Engineers (ASCE) and the American Society of Agricultural and Biological Engineers (ASABE), where he has many committee leadership roles. Hunt conducts 20-25 workshops and other training events per year across NC and the USA. In 2010-11, he was an Honorary Research Fellow at the University of Auckland in New Zealand and in 2012, a CUGE Research Fellow for Singapore National Parks.

He has two B.S. (Civil Engineering and Economics) and one M.S. (Biological and Agricultural Engineering) degrees from NC State. Bill received his Ph.D. from Penn State in 2003.