



**Missouri
Department of
Natural Resources**

WATER QUALITY COORDINATING COMMITTEE

Missouri Department of Conservation
Conference Room
2901 Truman Blvd.
Jefferson City, Missouri

May 18, 2010

10:00 a.m.

MEETING AGENDA

Karst in the Ozarks, Denise Vaughn, Ozark Resource Center

Urban Stormwater Requirements: Municipal Programs, Technologies and Standards,
Ruth Wallace, DNR, Municipal Stormwater Program Coordinator

Other

Agency Activities

Meetings & Conferences



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MINUTES

Attendees:

Greg Anderson	DNR, Water Protection Program	Priscilla Stotts	DNR, Water Protection Program
John Schumacher	USGS	Anne Peery	DNR, Water Protection Program
Ruth Wallace	DNR, Water Protection Program	Bill Whipps	DNR, Water Protection Program
Cindy DiStefano	MO Dept. of Conservation	Mandy Sappington	DNR, Water Protection Program
Georganne Bowman	Boone County Public Works	Valerie Hentges	DNR, Water Protection Program
Jane Davis	DNR, Water Protection Program	Lorin Crandall	MO Coalition for the Environment
Stacia Bax	DNR, Water Protection Program	Denise Vaughn	Ozark Resources Center
Bob Broz	University of MO Extension	Darlene Schaben	DNR, Water Protection Program
Paul Andre	MO Dept. of Agriculture		

Introductions were made.

Karst in the Ozarks, Denise Vaughn, Ozark Resource Center

PowerPoint Presentation; Handouts: Video documentary and accompanying curriculum; Karst in the Ozarks Evaluation Form; Living on Karst – A Reference Guide for Ozark Landowners (booklet)

Denise works for the *West Plains Daily Quill* newspaper. She talked about how she got involved with karst research and mentioned that she received some technical feedback and suggestions for the video from Jim Vandike, Division of Geology and Land Survey in Rolla. Ozark Resource Center received a Section 319 minigrant from the Department of Natural Resources to create this video and educational curriculum. Denise showed the video. Mary Ann Mutrux wrote up an accompanying curriculum. The 18-minute video will target science students from grades 5 through 8. Pre- and post-tests were developed to test their knowledge. Mary Ann developed six lesson topics. The lesson topics were Missouri geological history (Eons & Eons of Ozarks Long Ago), karst rock identification (Karst Rock Detective), endangered and threatened species (Connecting Karst Critters), best management practices in karst areas (Karst King or Karst Klutz?), and identifying nonpoint pollution (Water Wonder Walk); and a home inventory to identify best and poor practices for protecting groundwater (Deep Feet Water Footprints). She talked about the content of each lesson. After the pilot program, Mary Ann decided the lesson should be targeted toward 7-12 grade students; it seemed these kids felt ownership. Denise thought they reached approx. 200-500 students each year.

The video premiered at Missouri State University – West Plains on March 25. They will show it at the Water Festival at Alley Spring on May 17 and again in West Plains on July 17. By July 1, the video should be finalized. The video should be available on the Web site (<http://www.watersheds.org/>) by August 31, which is the grant completion date. The video will be shown on Sept. 23 at a teacher workshop. They plan to apply for funding this fall or winter to work on a longer version. Denise showed pictures and talked about other karst features and dramas that she would have liked to include or add to the video. She handed out an evaluation form and welcomed any comments on the video.



Urban Stormwater Requirements: Municipal Programs, Technologies and Standards, Ruth Wallace, Municipal Stormwater Program Coordinator, MO Dept. of Natural Resources
PowerPoint presentation

Topics in this presentation included: urban myths, basic stormwater management requirements for new urban and redevelopment projects, including what municipalities are required to enforce and what is viewed as state-of-the-practice site design and technologies, and new and upcoming stormwater regulations.

The Department will be releasing a new publication this fall called *Missouri Guide to Green Infrastructure: Integrating Water Quality into Municipal Stormwater Programs*. This will be a useful tool in helping communities to meet municipal separate storm sewer system (MS4) permit requirements. It will also be useful to developers and their consultants. A lot of information related to the MS4 program, industrial stormwater and land disturbance permits can be found at <http://dnr.mo.gov/env/wpp/stormwater>.

Urban myths in the MS4 program tend to include: All environmentalists are anti-development, Phase III is coming, Low Impact Development won't work in Missouri, terms always mean one thing (e.g. post-construction means closing off a construction site practice, but today it is much broader than that and includes environmental site design and on-site controls), federal/state/city owned projects are not subject to stormwater requirements (if a contractor gets a permit from the city they don't have to get one from DNR), environmentally sound development always costs more, infiltration is really bad in karst areas, pre-development hydrology means Lewis & Clark landscapes.

The MS4 program is a federal program. Springfield, Independence and Kansas City came in under Phase I (populations greater than 100,000) in the early 2000s. Most of the remaining regulated MS4s (147) were issued their first permit in 2003, based on populations of 1,000 within urbanized areas, or 10,000 outside of the urbanized areas. Regulated MS4s must have a written stormwater management program plan to address public education and involvement, illicit discharge detection and elimination, construction site runoff pollution, post-construction (permanent) runoff and municipal operations runoff. Phase I MS4s have to also perform routine water quality monitoring and regulate industrial stormwater. Urban pollutants of concern typically include: bacteria, nutrients, pesticides, oils, greases, polycyclic aromatic hydrocarbons, metals, chlorides, sediment, temperature, endocrine disruptors and others. MS4s typically regulate some of these items through ordinance as they are required to have meaningful enforcement capacity.

A lot has changed with post-construction runoff management. Regulated MS4s are now required to mimic pre-construction runoff conditions in all new development of an acre or more in size. As a way to meet this requirement, one can expect to see local standards that will address the small storm events (those that happen 90 to 95% of the time). Several states are implementing such standards. EPA will be updating stormwater regulations by November 2012, and it is expected the update will include similar standards. These small storms carry "first-flushes" resulting in about 75% of urban runoff pollution. The goal is to hold stormwater on site as long as possible, providing dispersed infiltration where necessary through rain gardens and similar practices. This is the opposite of conventional stormwater management where the goal has been to move stormwater off site as fast as possible. Environmental site design (ESD) (previously referred to commonly as "better site design") is the first line of defense, because it is the greatest opportunity to incorporate large scale green infrastructure items such as stream buffers, connected greenways, pocket parks, narrow/thru street designs, smart parking lots, etc. ESD also provides the best opportunity to mark places for on-site low impact development practices such as rain gardens, bioswales, street edge alternatives, infiltration trenches, stormwater wetlands, cisterns, planter boxes, roundabout rain gardens, etc. When this approach is used in new development, it is possible to save up to 25% costs in some projects according to various cost-benefit studies.



Performance of these practices can be viewed at www.bmpdatabase.org. Sites can be modeled for ESD and LID practices through EPA's newly published SUSTAIN model <http://www.epa.gov/ednrmrl/models/sustain/index.html>.

Since karst areas were discussed, here are some stormwater practice tips for karst areas. Avoid karst where possible in the site plan. Do not discharge stormwater to sink holes. Minimize site disturbances and major cut/fill. Minimize drainage alterations and protect existing karst swales (flows). Minimize impervious cover to reduce runoff. Think dispersed small, shallow infiltration practices. Avoid big contributing drainage areas (keep less than ½ acre each). Take soil borings close to structures, roads, etc. Wet swales don't work. All BMPs require adjustments for karst. Ponding is the enemy of karst.

Meetings and Conferences

June 8-10 Heartland Nutrient Management Workshop, Lied Conference Center, Nebraska City, Nebraska
July 18-21 65th International Annual Soil & Water Conservation Society Conference, Ecosystem Services: Applications for Conservation Science, Policy and Practice, Hilton at the Ballpark, St. Louis, Missouri

Meeting adjourned.