

<http://www.epa.gov/ednnrmrl/swmm> to download this software free of charge. I served on its development advisory committee and see it as becoming the national math engine for much of urban stormwater modeling in the future. While this software can be obtained free of charge, we expect private industry to incorporate enhancements and features that will make it even easier to use and will expand its capabilities. Watch for new products that will emerge over the next year that are anchored around this new *SWMM* 5.0 math engine.

Our goal is to have the *CUHP* model be able to work with the new EPA software just like the current version works with the *UDSWM* program. One challenge is to write software that will convert the existing *CUHP* and *UDSWM* inputs to run under the new software package. Once done, the model will permit us to continue to use our hydrology methods and to expand our modeling capabilities to water quality, continuous simulations and many other features inherent in the EPA's model. We hope to have these tasks completed in 2005.

District's April 2004 Seminar

On April 28, 2004, the District held its annual seminar on urban stormwater and floodplain management topics. It was attended by over 200 participants from municipalities, federal and state governments, consultants and other organizations. The proceedings are available for download from: <http://udfcd.org/conferences/conferences.htm>

Douglas and Arapahoe Counties Criteria Manual Update Project

The District continues to work with the preparation of updated stormwater criteria manuals for Douglas and Arapahoe Counties. The consultant for this project is Muller Engineering Company. Since the project began in 2003, the Cities of Centennial, Lone Tree and Castle Rock have joined this effort. It is expected that the manuals for all the counties and cities now participating in this effort will be released in 2005.

Denver is preparing a BMP Implementation Manual

Denver's Wastewater Management Division is continuing with its effort to

develop a BMP implementation guidance document. The consultant for this project is Wright Water Engineers, Inc. This effort will result in a document that will suggest options of how to make BMPs work in an ultra-urban infill and redevelopment areas. Look for this document to also be released in 2005.

Denver is updating its Stormwater Design and Technical Criteria

Denver's Wastewater Management Division has launched an effort to update its Stormwater Design and Technical Criteria. The District has been asked to manage this project and is working with Denver and Wright Water Engineers, Inc., the project's consultant, to come up with an updated criteria document. Much of the focus is on streamlining the old document, utilizing the technical criteria of the District through cross-references and integrating the BMP implementation issues and guidance developed under the effort described above. Look for this effort to be completed late in 2005.

New Spillway Gates at Maple Grove Reservoir

By Mark R. Hunter, P.E., Manager, Maintenance Program

By mid-December, 2004 the two new steel crest gates located in the spillway of Maple Grove Dam were ready to hold back the water that was re-filling the reservoir. The new gates replaced two inflatable dams (fabridams) that were installed in 1977 and were near the end of their service life. The fabridams were installed to improve the operational control of the reservoir and to reduce spillway outflow to be in line with the flood-carrying capacity of the downstream channel.

Maple Grove Reservoir is situated on Lena Gulch at 27th Avenue near Youngfield Street in Lakewood, Colorado. Consolidated Mutual Water Company owns the reservoir and uses it to store raw water. The water is eventually treated and distributed to Consolidated's customers.

When Maple Grove Reservoir was constructed in 1955 it inadvertently provided substantial downstream flood protection. This benefit to the communities downstream of the reservoir was recognized in the 1975 Lena Gulch Drainage Study.

In 1974, Consolidated was directed by the Colorado State Engineer's office to enlarge the Maple Grove Dam spillway to pass the calculated Standard Project Flood. This is the flood that would result from a storm

with a recurrence interval of 250 years in the Lena Gulch drainage basin upstream of the reservoir.

Portions of Wheat Ridge, Jefferson County, and Lakewood benefited from



Looking upstream at the old fabridams

the flood protection provided by the reservoir. Along with the District, these communities cooperated with Consolidated in 1976 to design a unique spillway enlargement that met the needs of both Consolidated and the flood-prone communities downstream of the reservoir.

The coordinated plan called for Consolidated to own the 30-foot long by 6-foot tall dam and the District to own the 40-foot long by 10-foot tall dam, both of which were located in the newly-enlarged spillway. The dams in the spillway allowed discharges through the spillway to be controlled by the mechanically operated gates. The result was that the District and downstream local governments could anticipate acceptable spillway outflows during 100-year storm events while Consolidated could be confident in being able to withstand the Standard Project Flood without overtopping the reservoir.

The fabridams were inflated by a combination of air and water and were difficult to operate and maintain. They showed their vulnerability in March of 1979 when vandals using knives sliced

open the 30-foot long dam allowing a relatively small but certainly unexpected flood to occur. The peak flow immediately below the reservoir was about 750 cubic feet per second and caused some residential basement flooding and first floor damage to some commercial buildings.

The replacement system uses hydraulic cylinders to raise and lower the two

independent crest gates. They will operate under the same discharge parameters as did the fabridams. The new steel crest gates are more resistant to vandalism and are far simpler to operate and maintain than the fabridams. The new system affords renewed confidence in the integrity of Maple Grove Dam to the District, Consolidated, and the communities downstream of the reservoir.



Looking upstream at one of the new gates

Maintenance Eligibility Program

By David Mallory, P.E., Senior Project Engineer, Floodplain Management Program

Construction Plan Reviews

The Wednesday, November 24th headline in the *Rocky Mountain News* proclaimed "Home Boom, \$13.1 billion in 2004 home sales". This year's continued robust housing market was fueled by low interest rates, a belief the Colorado economy is strengthening and a post election bounce. Total home sales for 2004 will likely outpace last year's record by 10%. The result was a continued boom in land development activities. The eastern E-470 and northern I-25 corridors have attracted the largest development interest. District staff reviewed over 300 construction plan referrals. Providing timely reviews is always challenging and this year was no exception. Terri Fead, PE has supplemented District staff

throughout the year. Terri's involvement has been a tremendous benefit to the maintenance eligibility program and I'm happy to announce she will be part of the program next year.

The District's maintenance eligibility database, updated bi-monthly, and the *Guidelines for Maintenance Eligibility Of Flood Control Facilities Constructed By Others* (Maintenance Eligibility Guidelines) have been available online throughout the year. This has proved helpful to local governments and consulting engineers alike. Another effective tool has been the practice of holding project meetings involving District staff, design consultants and local government representatives as a way to reach consensus and move

construction plans quickly through the final review process. We are also available by e-mail, fax or telephone to answer questions on design criteria and the maintenance eligibility program.

In April, the District hosted a workshop addressing current issues and guidelines in stormwater planning and design (see Ben Urbonas's article). One presentation subject was "Maintenance Eligibility and Master Plan Implementation". Bill DeGroot touched on this issue in his article. Bill continues to provide excellent leadership in this important effort. Private land development projects are responsible for constructing perhaps one-half to two-thirds of the Denver metropolitan area's major drainageway