AGENDA

1. Welcome/Introductions

2. Announcements

3. Update on Local Groundwater Management Efforts
   *Tim McLelland, Dick Renneker, Jim Stieritz*

4. OKI Staff Update

5. The Trenton Area Storm Water Study
   *Erman Caudill, FMSM Engineers*

6. Emerging Regulations for On-Site Residential Sewage Systems
   *Rebecca Fugitt, Ohio Department of Health*

7. Other Business

ADJOURNMENT
Twin Creek in Montgomery County
Great Miami River, Hamilton County
Great Miami, near New Baltimore
Great Miami, near New Baltimore
Great Miami, near New Baltimore
Great Miami, near New Baltimore
Mill Creek, Cincinnati, Northside area
Mill Creek, Cincinnati, Carthage area
Trenton Area Storm Water Management Project

Ohio, Kentucky, Indiana Regional Council of Governments (OKI)

November 30, 2005

Presented by:
Fuller, Mossbarger, Scott and May Engineers, Inc.
Erman Caudill, PE CFM
Presentation Outline

• Site Orientation
• Study Background, Motivation, and Goals
• Technical Approach
  – Numeric Modeling
• Status Report
• Watershed Master Plan
• Implementation
Great Miami River Basin

Source: “State of the Aquifer Report for the Lower Great Miami River Sub-basin”, Miami Conservancy District
Cross-Section A-A': Clay and Silt layers are interbedded with the sand and gravel aquifer but they may not create confined aquifer conditions. Recharge from induced infiltration is available.

Cross-Section B-B': shows an upper aquifer and lower aquifer separated by clay and silt. The clay and silt unit restricts GW movement between the two aquifer units. Production wells in the upper aquifer are able to induce infiltration from the Great Miami River.
Jackson Ditch – Unique Watershed

- Partially man-made channel
- Has no formal drainage outlet
- Situated on Lower Great Miami River Buried Valley Aquifer
- Significant source of water withdrawals
- Experiencing development pressure
- Existing nuisance flooding problems
Watershed Study

• Study Motivators
  – Assessment of existing issues
    • Flooding, water quality, development pressure
  – Aquifer source water protection
  – Evaluation of proposed development
  – Planning for future development
Project Team

- Project Management
- Hydraulics & Master Planning
- Water Quality Modeling
- Hydrogeology
- Surveys
Project Technical Approach

1. Data Gathering
   • Background Research
   • Watershed Characterization

2. Model Development
   • Hydrologic Modeling (HEC-HMS & HSPF)
   • Water Quality Modeling (HSPF)
   • Flood Modeling (HEC-RAS)

3. Master Plan Development
   • Stakeholder Involvement
   • Best Management Practice (BMP) Evaluation and Selection
   • Plan Development and Implementation
Data Gathering

- Field Reconnaissance
- Web-based Literature Search
- Meetings and Interviews

- Assemble Project GIS
  - Base mapping layers
  - Model support data
  - Decision support system

- Stakeholder Involvement
Watershed Characterization

Surface Conditions
- Land Use / Land Cover
- Overland Flow Conditions
- In-Stream Conditions
- Stream & Structure Capacity

Subsurface Conditions
- Soil Characteristics
- Aquifer Characteristics
- Groundwater Quality

Potential Issues
- Source Prevention and Protection
- In-Stream Concerns
- Groundwater Concerns
- Existing / Future Stressors
Surface Water Modeling

- Supports & validates watershed characterization
- Used to simulate watershed conditions
  - Short-Term event simulation
    - Isolated (peak) conditions
  - Long-Term continuous simulation
    - Typically expected or historic conditions
- Analyze Existing / Future Watershed Characteristics
- Evaluate Potential BMPs
- What-If Scenarios
  - Potential mitigation option evaluation
Modeling Approach

1. Hydrologic Modeling
   - HEC-HMS = Single Event Simulations
     - Peak Runoff Determination and Runoff Routing
   - HSPF = Continuous Simulations
     - Watershed Water Balance
     - Surface Water / Soil Moisture Interactions

2. Hydraulic Modeling (HEC-RAS)
   - Flood Stage Prediction

3. Surface Water Quality Modeling (HSPF)
   - Pollutant Loading
   - Discrete land use evaluation
   - BMP Evaluation
Hydrologic Modeling Process

Watershed Boundaries

Land Use

Soil Types

Topography

Precipitation Data

= "Skeletal" Rainfall / Runoff Simulation
Hydraulic Model Development (HEC-RAS)

- Model Planning and Layout
- Survey Structures and Channel
- Combine Topographic and Survey Data
- Build & Calibrate Model
- Analyze Results
Hydraulic Model Implementation

- Model Results
  - Profiles (Flood Elevation vs Distance)
    - Tabular Format
    - Graphical Format
  - Floodplain Delineations
    - Mapping
- Future Conditions
- BMP Evaluation
- Mitigation Options
Water Quality Model (HSPF)  
Hydrologic Simulation Program Fortran

- Simulates generation and movement of pollutants based on mixed land uses

- Typical constituents include:
  - Nutrients
  - Toxics
  - Sediment
  - Bacteria (Not studied here)

- Considers point source and non-point source loadings

- Can simulate in-stream or node based water quality
Typical HSPF Applications

- Watershed planning
- Storm drainage analysis
- Water quality planning & management
- Point, non-point source pollution analyses
- Soil erosion studies
- Evaluation of urban, agricultural BMPs
- Evaluation of impacts of land use changes
Status Report

- Preliminary Modeling Results
- Investigation of Mitigation Options
  - Focus on surface/groundwater interface
  - Regional approach is more efficient
  - Infiltration basins / swales / constructed wetlands look promising for water quality
  - Structural solutions anticipated for flood reduction
- Stakeholder Involvement
- Watershed Master Plan Development
Master Plan Development

Rainwater and Land Development
Ohio’s Standards for Stormwater Management Land Development and Urban Stream Protection

Second Edition 1996
Published by the Ohio Department of Natural Resources

- Select & Evaluate BMP’s
- Select & Evaluate Mitigation Alternatives
- Consider Low Impact Development, etc.
- Present Alternatives to Stakeholders
- Prepare Final Recommendations

Goal = protect / enhance the watershed
Master Plan Implementation

- Further investigation / modeling / plan refinement as needed
- Adoption by Butler County Storm Water District members
- Stakeholder buy-in and adoption
- Promotion of future development and land use practices according to plan
- Investigation and implementation of structural mitigation options
- Funding allocation and cost sharing mechanisms used as applicable
HSPF Model Structure

- PERLND
  - Snow
  - Water
  - Sediment
  - Quality
  - Pesticide
  - Nitrogen
  - Phosphorus
  - Tracer

- IMPLND
  - Snow
  - Water
  - Solids
  - Quality

- RCHRES
  - Hydraulics
  - Conservative
  - Temperature
  - Sediment
  - Nonconservative
  - BOD/DO
  - Nitrogen
  - Phosphorus
  - Carbon
  - Plankton
Ohio Department of Health
Bureau of Environmental Health

From Legislation to New STS Rules
Why Legislation? Why new Rules?

• The household sewage program was the only ODH environmental health program without a specific governing statute.

• The ODH household sewage system rules have not been updated since 1977 … and over a quarter century much has changed.
Why Legislation? Why new Rules?

MORE IMPORTANTLY there are problems with how Ohio has managed its onsite sewage infrastructure for our individual households and other small flow facilities.
STS

SEWAGE TREATMENT SYSTEMS:

HSTS & SFOSTS

NO longer HSDS – NO longer Disposal
History of HB 231

- Representative Tom Niehaus (now Senator Niehaus) introduced HB 231 on June 24, 2003.
- Governor Taft signed bill on February 1, 2005.
- Law in effect as of May 6, 2005 and requires that rules are adopted by May 2006.
HB 231 is the **foundation for change** giving us a “clean slate” for rule development

HB 231 is **very comprehensive** and requires STS standards for siting, design, installation, operation, monitoring, maintenance, and abandonment to be included in the new rules

**ORC Section 3718.02 (A)(1) to (A)(13)** mandates the rules to be adopted by the Public Health Council.
Public Health Council Rules:

2. Requires site evaluation for STS
3a. Soil absorption specifications
3b. Specifications for discharging systems in accordance with NPDES
3c. Requirements for maintenance (O&M)

Challenges we must address in rules …
Challenging Issues

• Technical – watertight tanks, pretreatment components, marginal site conditions, perched seasonal high water tables and gradient drains

• NPDES compliance – discharging systems

• Subdivisions – onsite versus sewers

• Professional competency and management capacity to support a sustainable onsite infrastructure
ORC Section 3718.02 (A)(11 to 13)

PHC rules must also include …

11. Criteria for 711 compliance (subdivisions)
12. Criteria and procedures for establishing optional HSTS management districts
13. Criteria for Small Flow Onsite STS

PHC may adopt other rules under (A) that are determined necessary to implement ORC
ODH Process for Development and Adoption of STS Rules

- Dr. Baird, our Director of Health, appointed an ODH Sewage Advisory Committee (SAC)
- First five bi-monthly meetings in April through June 2005 were used to gather SAC input on challenging “Decision Points” (see handout)
- Monthly meetings from July to October 2005 provided opportunities for SAC and interested parties to review working drafts of rules
Time Line for Rule Adoption

November 14, 2005
Draft Rules distributed for public comment
Late November – Early December 2005
ODH conducts information meetings around the state
Late December 2005
Final draft prepared based on public comments
January 2006
Final draft presented to Public Health Council
January to May 2006
Public Health Council and JCARR hearings
Draft STS Rules focused on Planning – Related issues

• More emphasis on soil and site evaluation
• Consideration of risk factors – limiting conditions, hydrogeology, source water
• Promote coordination with subdivision, county and area wide planning agencies
Draft Rules 1 to 3

1. Definitions – **check out HSTS & SFOSTS**
2. Purpose and scope – not just STS, but people and organizations are addressed in rules
3. Authority, applicability, …
   - Option to take on SFOSTS
   - “Henceforth” rules: an existing operating system is not subject to the new rules unless declared a public health nuisance by the board of health
   - Emphasizes **OWNER** responsibility
Draft Rules 4 to 4.3
Responsibilities of “People”

4. Owner, Site/Soil Evaluator, Designer
4.1 Installer registration
4.2 Septage Hauler registration
4.3 Service Provider registration

“Demonstration of Competency”
The law requires ODH oversight of local health department STS programs
Draft Rule 7

General Provisions and PROHIBITIONS

Encourages consideration of STS suitability and regulatory requirements prior to investing.

Overview of the conditions that impact STS use:

- general criteria for STS performance
- limits the use of discharging HSTS, and
- other regulations related to the use of a STS
Draft Rules 8 & 8.1

8. Site and soil evaluation – establishes the “common ground” for design decisions; use of a statewide form will help as well.

8.1 Subdivisions and new lots – prevents future problems by assuring STS suitability; must address new ORC 711 provisions.
Installation permits for new and replacement STS:
promotes application PRIOR to home construction to **site and protect the STS area**

**Operation permits** – complexity of the STS determines operation & maintenance (O&M) and any service contract requirements

9.1 **Layout plans, design plans, as-built records**
10 Sewage source, building sewer, …
   “need to know” what is going into the STS
11 Tanks, pumps, and controls
   WATERTIGHT TANKS are a major priority
12 Effluent quality standards and pretreatment …
   - NPDES discharge standards to be set by OEPA
   - ODH rules set standards for soil-based systems
   - EXAMPLE of fecal standard
Soil depth credit - Example #1:

Fecal Standards in Rule 12

Natural Grade

Trench Trench Trench

Fecal Standard
\( \leq 1000 \times 10^3 \)
Two Foot Credit

Fecal Standard
\( \leq 10,000 \times 10^4 \)
One Foot Credit

Septic Tank effluent - FULL vertical separation distance
When less depth to limitation, can use Soil Depth Credits

Example #2 - Elevation Credit
Soil absorption provisions allow for many types of STS, but set siting requirements …

3’ depth to restrictive soil layers, bedrock, ground water, and very porous materials connected to ground water

Except 2’ for perched seasonal high water table

… and siting limitations of at least 1’ of soil, UNLESS a variance for perched water
Draft Rules 13.1 to 13.3

13.1 Leaching trench requirements
13.2 Mound with pressure distribution
13.3 Drip distribution requirements

1 & 2 provide options for installer layout plans on suitable sites

These 3 do NOT prevent use of other options
Draft Rules 14 & 15

14 Site modification:
   fill material
   field tiles
   surface water diversion
   interceptor and gradient drains

15 Privies and holding tanks – very limited use and only by board of health variance
Draft Rules 16 to 16.2

16 Education, inspection, compliance, and enforcement – A proactive approach

The law requires a STS inspection by the local health department within first 18 months – this is the only required operation inspection (NOTE: required O&M service vs. inspection)

16.1 O&M management – rule allows flexibility

16.2 Residuals management – Federal 503 and the land application of domestic septage
17 STS Abandonment - “cradle to grave”

18 Variance rule - statewide consistency promotes equity for citizens and thus should discourage variances that would undermine the intent of the rules
Comments PLEASE!

Comments due Friday – December 16, 2005

Handout provides the e-mail address of BEH@odh.ohio.gov

… and fax and mail addresses

PLEASE be specific!
OKI GROUNDWATER COMMITTEE MEETING SUMMARY
Wednesday, November 30, 2005
OKI Board Room – 10 a.m.

Attendees:

Jim Fox, Chair  Village of Indian Hill
Scott Belcher  City of Middletown
Erman Caudill  FMSM Engineers
J. Dwight Culbertson  City of Fairfield
Frank Divo  SOWC
Mike Ekberg  Miami Conservancy District
Kevin Fall  Butler SWCD
Bob Fischer  Paramount’s Kings Island
Rebecca Fugitt  Ohio Department of Health
Doug Furnas  Village of Waynesville
William Gollnitz  Greater Cincinnati Water Works
Lon Green  City of Trenton
Stan Harris  FMSM Engineers
Todd Kehr  City of Trenton
Art Keith  Village of Waynesville
James Koch  Clermont County Water
Bob Lentz  Butler Stormwater District
Mike Lippert  City of Wyoming Water Works
Mary Lynne Lodor  Butler Co. Dept. of Environmental Services
Robert Marsh  Southwest Regional Water District
Tim McLelland  Hamilton – New Baltimore Groundwater Consortium
Paul Michalski  Chevron
Dean Niemayer  Hamilton County Regional Planning Commission
Norma Pennock  SWRWD
Bruce Pletsch  Miami Conservancy District
Dick Renneker  Warren County Water
D. Scott Riegert  Leggette, Brashears & Graham, Inc.
Ken Shearwood  Village of New Richmond
Tom Schumann  USGS
Cliff Shrive  RD Zande
Jim Stieritz  Cinergy Corp.
Dave Weihrauch  City of Oxford
Scott Wilson  Butler County Health Department
Bruce Whitteberry  Greater Cincinnati Water Works
Tom Yeager  Clermont County Water

OKI STAFF
Bruce Koehler, Fran Malone, Larisa Sims, Jane Wittke
Welcome and Introductions
Jim Fox called the meeting to order at 10:00 a.m. He then introduced Mr. Dave Weinrauch, City of Oxford, Vice Chair of the Groundwater Committee.

Mr. Fox noted that the next meeting of the Groundwater Committee will be either February 22, 2006 or March 1, 2006 at 10:00 a.m., dependent on confirming presentations, and with the final date to be provided later in a mailing. Everyone introduced themselves and their affiliations.

Announcements
Jane Wittke announced a new publication available for downloading at the National Association of Clean Water Agencies website: www.nacwa.org/pubs/index.cfm. The report, Planning for Decontamination Wastewater: A Guide for Utilities, explores the potential impacts of wastewater generated during the response to and clean up of a chemical, biological or radiological (CBR) terrorist attack. It can be downloaded free of charge.

Updates on Local Groundwater Management Efforts
Tim McLelland, Hamilton to New Baltimore Groundwater Consortium, reported that the annual Children’s Waterfest was held on October 14. It was a huge success with over 1000 children attending, and the Consortium received 300 letters of support from teachers thanking them for the event.

The Hamilton to New Baltimore Groundwater Consortium received the Groundwater Guardian Award for the 9th consecutive year. The Members include the cities of Hamilton, Fairfield, Cincinnati, Southwest Regional Water District, Southwestern Ohio Water Company. In addition, Tim noted that the Brown County Rural Water Association received the Groundwater Guardian Award for the first time this year. Many communities are eligible and are encouraged to apply for this award.

This October some members of the Consortium attended the first public hearing for the former ARMCO facility that is within one mile of New Miami Village and Hamilton North wellfields. The federal government is classifying this site as a Superfund alternate site because at this time they do not have enough information to consider it a Superfund site. Over the next year, they will continue to study the site in conjunction with Weston and ENSR. Weston is contracted by USEPA and ENSR is contracted with ARMCO. They expect to be finished with their first phase of data collection in 2006.

Dick Renneker, Warren County, described the expansion that is taking place at the County’s North Wellfield in the Franklin-Carlisle area along the Great Miami River from 3 MGD (millions of gallons a day) to 9 MGD. The plans for the expansion have been submitted to Ohio EPA. Once the county receives the approval, construction will begin.
The wellfield and treatment plant on Union Road in the Otterbein - Trader’s World area will be abandoned when the expansion of the North Wellfield is completed and placed into operation.

In the south end of the county, across from King’s Island, the County’s Deerfield-Hamilton water treatment plant is being expanded from 6 MGD to 12 MGD. The plans are 60% complete and they hope to begin construction next year.

On the wastewater side, the Commissioners have approved increasing the capacity of the treatment plant on the south end of the county, which serves Deerfield and Hamilton Townships. The plant capacity will be increased from 7.25 MGD to 12 MGD. A consultant has been selected and the contract is in the final stages. Design and approvals will take 15 months and construction should begin in 2007.

In response to a question from Jim Fox, Dick explained that the Commissioners are now changing the zoning code to make the minimum lot size somewhere between 2 – 20 acres. Changes to the zoning code are scheduled for public hearing in early 2006. The final text is being written at this time.

They are continuing to pursue legislation with the State Representatives and Senators to get some kind of impact fee to make every house that is built pay a $5000 -7,000 fee that would go to the school systems. There are some people interested in such legislation in Columbus, but it has not gone out of committee.

**Jim Stieritz, Cinergy Corporation**, reported that Cinergy’s miniature train display is up and running well in Downtown Cincinnati this winter season. The other big event in Cinergy is the merger with Duke. They are three times as large as Cinergy with the completion of the merger officially scheduled for June 1, 2006.

Cinergy has been installing air pollution control devices because of Clean Air Act requirements. This involves trying to reduce mercury, SO2 and NOX concentrations. Selected Catalytic Reduction or SCR devices have been installed at the Miami Fort plant. Time has also been spent getting the permits for new scrubbers. Groundwater impacts should be minimal from the new system because all the waste materials that are generated are in the form of gypsum which is sent to the LaFarge wall board plant in Silver Grove, Kentucky. The Zimmer Station is doing the same thing. The waste is in the range of 500,000 tons per year sent from these plants for processing.

At the Boone County, Kentucky power plant, East Bend Station, across from Rising Sun Indiana, a few additional monitoring wells are being installed. This is part of a groundwater investigation related to the landfill because of an increased concentration of chlorides in one of the monitoring wells.
There is continued work at the Beckjord Power Plant on the groundwater remediation system that has been ongoing since the mid 1990’s to protect Clermont County’s wells. It has been pumping almost continuously since 1995 at 160 GPM (gallons per minute). Monitoring wells indicate decreased concentrations of salts in the water from the power plant ash pond.

Other monitoring wells at other facilities in the CG & E service territory include: the Zimmer landfill, Miami Fort plant, Woodsdale near Miller Brewing, and East Bend Station. All those facilities report safe results with no statistically significant detections.

**OKI Staff Updates**

*Bruce Koehler* gave an update on three grants that are related to groundwater:

The Great Miami Runoff Reduction Project is a $98,000 project that includes $65,000 of federal pass-through money from the Miami Conservancy District for installation of a rain garden and pervious parking area in Heritage Park, Colerain Township. The Friends of the Great Miami is giving presentations on this project and seeks audiences.

The Section 319 Implementation Grant is a $970,000 project including $472,600 local match to restore the Mill Creek and the East Fork Mill Creek in West Chester Township, Butler County. This grant is nearly contracted and ready for an initial disbursement of funds.

The Section 319 Planning Grant is a $119,000 project to develop a Drinking Water Protection Plan for the Village of New Miami and to expand potential contaminant source inventories from New Miami to Colerain Township. This grant is paying for a tablet personal computer (PC), a pocket PC and geographic information system software to record geographical data on potential sources of water pollution along the Great Miami River and major tributaries. Field inventory work will recognize that surface water pollution can become groundwater pollution through induced infiltration.

Project partners of the Section 319 Planning Grant had a productive kickoff meeting on October 26, 2005. The group agreed to meet quarterly through July 2007 as a Drinking Water Protection Team. The next meeting is scheduled for 9:00 a.m. Wednesday, January 25, 2006, at the Fairfield Waterworks.

*Jane Wittke* introduced *Larisa Sims*, a new senior planner at OKI who is working on the first phase of implementing the Strategic Regional Policy Plan (SRPP) adopted by the board in April. The goal of the plan is to bring about more consistency between local land use planning and regional transportation planning. The SRPP was developed over the past three years by OKI’s board of elected officials with input from peer reviewers and technical experts such as some members of the Groundwater Committee.
The plan is ambitious and includes 101 policies in six categories (Transportation, Public Facilities and Services, Natural Systems, Economic Development, Housing, and Land Use), so that three phases of implementation have been identified. The first phase started in October 2005 and will run through June 2008.

Jane held up a matrix of implementation activities that will be undertaken in the first phase and described several tasks that would probably be of most relevance and interest to the Groundwater Committee. For example, growth areas are being tracked to identify public facility needs, and Bruce Koehler has contacted most water and wastewater suppliers about their existing service areas and their projected service areas. Staff will continue to pursue funds for water quality management to meet federal mandates and local needs, such as OKI’s work with the Groundwater Committee. Staff will also continue to track information on watershed conditions for local governments, and assist local governments and watershed groups with source water protection.

Other planned activities in the first phase of implementation include researching incentives and programs for conserving natural systems, as an aid to local governments; investigating economic/environmental value models for local government use; researching environmentally sensitive building practices; and identifying green space stakeholders and strategies for regional cooperation.

The Trenton Stormwater Study
Erman Caudill, Fuller, Mossbarger, Scott and May Engineers described a stormwater study underway west of Trenton and in the vicinity of the wellfields of Southwest Regional Water Company, Miller Brewing Company, Cinergy, and the City of Trenton. It is being undertaken under the auspices of the Butler County Engineer’s Office because it lies within the Butler County Stormwater District.

The impetus for the study includes flooding and development pressure in the area and the need to protect water quality. The study area has some unique hydrogeological conditions, as a very shallow watershed in which surface water from the Jackson Ditch ends up directly in the aquifer because it has no other drainage outlet.

Erman summarized the project’s technical approach, which includes data gathering, model development, and master plan development. A status report will summarize preliminary modeling results, investigation of mitigation options, stakeholder involvement, and watershed master plan development. A copy of Mr. Caudill’s PowerPoint is included to provide more detail.

Emerging Regulations for On-Site Residential Sewage Systems
Rebecca Fugitt, Ohio Department of Health, gave an overview of the regulations proposed to implement House Bill 231. This bill became law in early 2005 and governs household sewage treatment systems. The proposed regulations are available at
www.odh.ohio.gov/rules/drafts/3701-29.aspx, and public comments will be taken on them until December 16.

Rebecca described key provisions of the proposed rules, among them that limits are placed on the use of discharging household sewage treatment systems (HSTS), and new ones will require a permit under the National Pollutant Discharge Elimination System (NPDES). In addition, standards are required for siting, design, installation, operation, monitoring, maintenance, and abandonment of HSTS.

Given the potential of HSTS to impact groundwater and public health, the proposed rules call for more emphasis on soil and site evaluation; consideration of risk factors such as hydrogeology and source water; and promoting coordination with local and regional planning agencies. A copy of Ms. Fugitt’s PowerPoint is included to provide more detail.

In response to questions from the committee, Rebecca clarified that training for installation and maintenance of new HSTS may be offered through the Ohio Onsite Wastewater Association and the Operator Training Committee of Ohio. When asked about grandfathering as it could apply to property transfers, she said that would happen only if there were problems with the system or through the required notice from the realtor. She also acknowledged that there was concern about having adequate numbers of certified soil scientists to carry out the proposed rules.

**Other Business**

Bruce Whitteberry announced that Tim McLelland had received a “Friend of Water Resources” award from the Butler County Soil and Water Conservation District.

**Adjournment**

Jim Fox reminded the group that the next meeting will be February 22 or March 1 at 10 a.m. at OKI. The meeting was adjourned at 12:15 p.m.