OKI GROUNDWATER COMMITTEE  
September 2, 2015 - 10:00 AM  
OKI Board Room  
720 East Pete Rose Way (at the corner of Eggleston Avenue)  
Cincinnati, Ohio 45202

TIMED AGENDA

1. Welcome/Introductions (10:00-10:03 a.m.)

2. Announcements (10:03-10:05 a.m.)

3. Update on Local Groundwater Management Efforts (10:05-10:35 a.m.)  
   Chris Brausch, Tim McLelland, Jane Wittke

4. Rumpke Operations and Source Water Protection (10:35-11:20 a.m.)  
   John Butler, Rumpke

5. OKI Staff Update (11:20-11:25 a.m.)  
   Bruce Koehler

6. The Healthy Water Ohio Initiative and  
   Federal Farm Bill Implications for Source Water  
   (11:25 a.m.-12:10 p.m.)  
   Larry Antosch, Ohio Farm Bureau Federation

7. Other Business (12:10-12:15 p.m.)

ADJOURNMENT
Work Plan for OKI’s Stream Buffer Study

A. Main Purpose
The stream buffer study’s main purpose is to carry out recommended policies of the Strategic Regional Policy Plan by analyzing a national issue from a regional perspective and providing local governments with an interactive, web-based tool to make informed choices about encouraging, installing and protecting stream buffers in the OKI Region.

K. Deliverables
1. stream buffer benefits (primarily text, with some diagrams and perhaps photos)
2. stream buffers (primarily GIS maps, with some text and perhaps diagrams)
3. stream buffer mapping methodology (primarily text, with some GIS graphics)
   a. Where do buffers and floodplains coincide?
   b. What maximum extent should we set for buffers?
4. stream buffer setback regulations and guidelines
   a. what stream buffer setback regulations and guidelines exist in the OKI region?
   b. what stream buffer setbacks regulations and guidelines are prevalent outside the region?
   c. How can stream buffers and Manning’s Roughage Co-Efficient co-exist?
5. stream buffer BMPs (primarily text and diagrams, with some photos)
   a. regulatory BMPs (proposing buffers)
   b. vegetative BMPs (installing buffers)
   c. maintenance BMPs (retaining buffers)
6. stream buffer slide show presentation

L. Milestones
1. Friday, August 14, 2015: finalize proposed work plan for this study with Travis
2. Tuesday, September 8, 2015: reach an understanding with Brittany and GIS staff on the best approach to start analyzing aerial orthophotographs for mapping stream buffers (Task J.2)
3. Friday, October 16, 2015: have Task J.3. (stream buffer mapping methodology) outlined in detail and mostly written
4. Friday, November 20, 2015: have information gathered, outlined and partly written for Tasks J.1. (stream buffer benefits) and J.4. (stream buffer setbacks)
5. Friday, December 18, 2015: have enough information on Task J.5. (stream buffer BMPs) to create an outline and sample writing
6. Friday, January 8, 2016: evaluate project progress to date, adjust work plan accordingly, and review stream buffer mapping work to date with Travis
7. Friday, January 26: introduce the stream buffer study to the Regional Conservation Council’s Annual Meeting Planning Committee with hopes of getting a place on the Annual Meeting Program (Task J.6. – stream buffer slide show)
8. Friday, February 26: have a preliminary slide show on the stream buffer study to enhance promotion of the Regional Conservation Council’s Annual Meeting
9. Friday, March 18, 2016: finish preparing a stream buffer study slide show
10. Tuesday, Wednesday or Thursday, March 29, 30 or 31, 2016: present the stream buffer study at the RCC Annual Meeting (Task J.6. – stream buffer slide show)
11. Friday, April 8, 2016: finish writing and illustrating Task J.3. (stream buffer mapping methodology)
12. Friday, April 15, 2016: finish writing and illustrating Tasks J.1. (stream buffer benefits) and J.4. (stream buffer setbacks)
13. Friday, April 29, 2016: finish writing and illustrating Task J.5. (stream buffer BMPs)
14. Friday, May 6, 2016: evaluate project progress with Travis and identify final priorities for remaining work, especially Task J.2. (mapping stream buffers)
15. Friday, May 20, 2016: finish and review Task J.2. (mapping stream buffers)
16. Friday, May 27, 2016: initiate work with OKI’s Communications Division to have the stream buffer study posted on OKI’s website
17. Friday, June 10, 2016: ensure that stream buffer study is posted on OKI’s website
18. Friday, June 24, 2016: address public responses to stream buffer study
IDENTIFYING FORESTED AREAS IN CINCINNATI, OHIO

A WORKFLOW FOR FOREST CLASSIFICATION ACROSS OHIO

STEP 1
Forested areas were identified by subtracting LIDAR derived Digital Elevation Model (DEM) from LIDAR derived Digital Surface Model (DSM) to yield height above ground for each pixel. Pixels lower than 20 ft or greater than 210 ft were removed.

STEP 2
A maximum likelihood classification of CR imagery based on forest and non-forest training data identified forested areas. CR imagery was used because it offers a higher resolution compared with equally accurate satellite imagery.

STEP 3
Results from LIDAR analysis and CR classification were overlaid. Forested areas identified in both analyses appear in green.

STEP 4
Final results show areas identified as forested in both analyses.
Field Tree Height Measurements Versus LiDAR Estimates
Mill Creek, Butler County

Note: The difference between field measured tree height and LiDAR estimate is shown. Negative values indicate LiDAR underestimation in feet.

Legend
- Field Verified Tree Locations
- Streams
LiDAR Canopy Height (ft.)
High: 130
Low: 20

ID 21
Height: 50
Difference: -11.1
% Error: 22.2

ID 22
Height: 51
Difference: -11.6
% Error: 23.0

ID 23
Height: 58
Difference: -0.6
% Error: 0.6

ID 24
Height: 61
Difference: -3.1
% Error: 6.1
State Route 32
Olive Branch-Stonelick Road
Old State Route 74
Site where development may encroach upon the stream buffer
RUMPKE
Operations and Source Water Protection
Presented by John R. Butler P.E.
Agenda

• Better understanding of the Rumpke landfill
• Learn about the monitoring systems for the landfills
• Learn about how landfill operations protects sources of water
Rumpke Family Tradition

- Family owned and operated since 1932
- Founded in Cincinnati
- Locations in Ohio, Kentucky and Indiana
- Residential, commercial and industrial waste and recycling services
- More than 2,300 employees
Source of Water around the Landfill

- Ground Water
- Surface Water
- Waste water
Regulations to Protect Sources of Water

• Setback requirements for all landfills.
• Design Requirements for Landfills
• Management Requirements for Landfills
Landfill Setbacks in Ohio

State Minimum- 15 feet to upper most aquifer

Rumpke Landfill- 150+ feet in depth to closest water - brine
Ground Water

- Geologic Formation at Landfill
- Groundwater Network
- How to verify if groundwater is affected by Landfill
- Remediation efforts for pre Subtitle D regulations.
Groundwater Well Map
Appendix II

| TYPE OF IMPACT | SW (Agri.) Protection | GW-Agri. Protection | GW-Softhcks | General Solution
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<td>well (ft)</td>
<td>ARI (ft)</td>
<td>Heads (ft)</td>
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- **Area:** includes all areas where proposed activity will occur
- **ARI:** area of influence
- **Heads:** area of influence
- **3300:** area of influence

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- **Area:** includes all areas where proposed activity will occur
- **ARI:** area of influence
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- **3300:** area of influence

**Notes:**
- "Area" means authorized final use area
- "ARI" means authorized maximum daily waste receipt
- "Heads" means vertical expansion
- "3300" means vertical expansion

**Failure to comply with 3745-27-20 is a compliance issue. Substantial compliance is a permit renewal criterion. See 3745-27-20(A)(5).**
Surface Water

• Design of Stormwater ponds and conveyance systems for landfill.
• Operations of Sedimentation Ponds around landfills
Design of Sedimentation Ponds

Pond 1 Stage-Storage Curve

- Principal Spillway Elevation 711.5
- Max. Allowable Sediment Elevation 700.6 ft
- 31.5 ac-ft Storage Per Ohio EPA Rule
- 14.5 ac-ft of Sediment Storage
- Total Storage Below Principal Spillway 46.0 ac-ft
Floating Weir
Rock Checks
Alternatives to Rock Checks
Leachate/Waste Water

• "Leachate" means liquid that has come in contact with or been released from solid waste
Leachate Treatment and Disposal

- Leachate is typically high in Nitrogen and BOD which are easily treated in wastewater treatment plants.
- Leachate from the Landfill in Colerain discharges the leachate to the GCMSD Gest St Facility
John Butler
Senior Site Engineer
Rumpke Consolidated Companies, Inc.
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John.Butler@rumpke.com
www.rumpke.com
www.rumpkerecycling.com
An unprecedented coalition of Ohio water stakeholders from conservation, business and industry, universities, water suppliers, agriculture and others to lead the development of a 20- to 30-year Ohio water resource management strategy.

To develop a set of recommendations that will sustainably meet current and future water needs while enhancing the state’s economy and quality of life for all Ohioans.
Steering Committee

- Business and industry
- Conservation and environmental advocacy
- Finance
- Food and farming
- Lawn, horticultural, turf
- Municipal water systems
- Public health
- Recreation and tourism
- Research, education and outreach
How did the input process work?

A wide spectrum of experts collaborated in work groups to identify water quality/quantity problems and solutions. The 5 topics addressed were:

- Vision for Ohio’s water resources
- Challenges
- Solutions
- Education/outreach
- Funding
HwO Opinion Survey

Northwest 14%
Northeast 37%
Central 18%
Southwest 25%
Southeast 6%

xx% = Percent of all respondents (weighted)

healthywaterohio.org
Statewide Issues

- Health care
- The state’s economy, including jobs
- K-12 education
- Crime and violence
- The state’s roads and bridges
- **Adequate water for drinking, recreation, industry, and other uses**
- Public transportation
Environmental Issues

- Water quality
- Air quality
- Waste disposal
- The amount or quantity of water
- Land use
- Extreme weather
Water Related Issues

- Keeping drinking water safe
- Protecting fish and wildlife habitat
- Repairing or replacing aging water-related infra-structure
- Having enough water for commerce, industry, and power generation
- Policies to deal with flooding, drought, and other water-related natural disasters
- Preserving waterways for recreation and tourism
Water Pollution Sources

• Factories and industrial plants
• Failing or inadequate sanitary sewer pipes
• Trash and litter
• Hydraulic fracturing, or fracking
• Failing or inadequate septic tanks and leach fields
• Runoff from farms
• Soil erosion from construction sites
• Runoff from developed residential areas
• Wildlife

healthywaterohio.org
Work Group Discussions

- Vision
- Challenges
- Solutions
- Education and Outreach
- Funding
SWOT ANALYSIS

Please tell us what you think are Ohio’s strengths, weaknesses, opportunities, and threats related to its water resources.

healthywaterohio.org
Recommendations

- **Research**
  - Identification of knowledge gaps, formal research group, coordination

- **Policy and Jurisdiction**
  - Watershed districts, voluntary management practices, incentives, collaboration and coordination

- **Infrastructure**
  - Needs assessment

- **Funding**
  - Water Trust

- **Education and Awareness**
  - Government leaders, students, public
Implementation

Phase 1 (2015 – 2016)
- Create the Ohio Water Trust
- Pursue capitalization funds

Phase 2 (2017 - 2020)
- Implement priority initiatives

Phase 3 (2021 and beyond)
- Continue established processes
- Measure progress and ROI

healthywaterohio.org
Ohio Water Trust

Potential Funding Sources

- Water Quality Trades
- Agriculture & Business Funding
- Government Bond Sales
- Water User Fees
- Portion of Boating or Fishing License Fees
- Philanthropy

How much is enough?

Ohio Water Trust
Governed by a diverse stakeholder board with funds managed by a trusted entity

Water Investment & Revolving Funds

What are the right practices, the right time and the right places?

Science and Performance-Based Targeting of Funds to Meet Explicit Goals

- Farm Water Projects
- Nature Water Projects
- Community Water Projects

Benefits: Improved water quality, reduced storm water and flooding, some enhanced agricultural productivity, lower drainage maintenance and dredging costs, voluntary Clean Water Act compliance, increased habitat, fishable and swimmable waters and other societal values.

Is it working?
OKI GROUNDWATER COMMITTEE MEETING SUMMARY
Wednesday, September 2, 2015
OKI Board Room – 10:00 a.m.

Attendees:
Bruce Whitteberry, Greater Cincinnati Water Works, Chairman
Jack Thornsberry, Butler County Water and Sewer Department, Vice Chairman
Larry Antosch, Ohio Farm Bureau Federation
John Butler, Senior Site Engineer, Rumpke
Scott Belcher, City of Middletown
Tom Benge, Southwest Regional Water District
Chris Brausch, Warren County Water and Sewer Department
Barry Conway, City of Franklin
Rob Darner, USGS
Frank Divo, Southwestern Ohio Water Company
Elmer Dudas, City of Springboro
Mike Ekberg, Miami Conservancy District
Andreas Eddy, City of Fairfield
Mike Flavin, Southwestern Ohio Water Company
Rick Fueston, Clermont County Water Resources Department
Tammy Jett, Duke Energy Environmental Department
Omar Kahn, Duke Energy
Krystal Lacy, Miami Conservancy District
Mike Lippert, City of Wyoming
Tim McLelland, Hamilton to New Baltimore Groundwater Consortium
Terry Morris, City of Springboro
Dave Morrison, Southwest Regional Water District
John Nurre, Duke Energy
Bill Paullin, Southwest Regional Water District
Norma Pennock, Southwest Regional Water District
Greg Petredis, Committee Member
Allison Reed, Ohio EPA
Richard Renneker, Committee Member
Phil Sackenheim, Southwest Regional Water District
Robert Settles, Southwest Regional Water District
Clifford A. Shrive, Stantec
Zach Smith, Miami Conservancy District
Richard Stuck, Greater Cincinnati Water Works

OKI Staff:
Regina Brock, Bruce Koehler, David Shuey, Brittany White, Jane Wittke
**Welcome/Introductions/Announcements:**
Bruce Whittenberry opened the meeting at 10:00 a.m. and announced that the next meeting will be December 9, 2015. The 2016 meeting dates will be March 2, May 25, September 7 and November 30. He also announced that certificates for contact hour credit from the previous meeting were available on the table in the back of the room for pick-up.

**Update on Local Groundwater Management Efforts**

**Chris Brausch, Warren County,** covered three topics. Completion for the Water Master Plan is scheduled for November/December. The plan includes an updated hydraulic model of the distribution system and evaluation of softening technologies, including ultrafiltration and lime softening. This plan will identify brick and mortar improvements for the next 20 years.

The County is currently updating their Source Water Protection Area Delineation (1-year and 5-year time-of-travel zones). The maps are being developed by county staff, using GFLOW hydrogeologic software. Work will continue over the next several months with assistance and guidance from staff of the Ohio EPA Groundwater Division, including Allison Reed, Linda Slatterly, and Megan Marhelski. Modeling is expected to be completed within the next three to four months.

With public schools back in session, the County is again providing educational programs to children in the Little Miami and Mason school districts. The County contracts with Suzanne Geisler of Environmental Education Services, Inc. for the programs. The service is provided free to the schools systems with water quality, environmental, and natural resource lessons aligned with the Ohio Department of Education’s revised academic content standard. Lessons are offered from pre-kindergarten through 8th grade and last between 25 to 50 minutes.

**Tim McLelland, Hamilton to New Baltimore Ground Water Consortium,** reported on the effects of a lightning strike that apparently caused the explosion of a 15,000 gallon underground diesel storage tank in Fairfield in the first week of August. Evidence suggests that lightning hitting a pole transformer was the most likely cause but that is still under investigation by the insurance company. Although only one of three underground storage tanks in the area exploded, the other two tanks in the ground were crushed from the weight of the concrete that smashed on them from the explosion.

While this hazard was unprecedented, impacts of the explosion were confined above a clay layer as part of the tank pit, just outside the 5-year time-of-travel for Hamilton’s wells. As a precautionary measure, Hamilton shut down two wells that were the most influential to the part of the aquifer near the explosion. Tim stressed, however, that any risk of contamination to the aquifer was very minimal. With the involvement of Fairfield Public Utilities, the Fairfield Fire Department, Ohio EPA and the Bureau of Underground Storage Tanks, more than 27,000 gallons of gas/diesel fuel and water were removed from the blast site, and the Consortium will follow up with the City of Fairfield and the gas station owner to consider additional monitoring in the area.

**Jane Wittke, OKI,** reported on a new OKI project underway to create interactive water resource profiles for the 131 political jurisdictions in Butler, Clermont, Hamilton, and Warren Counties.
The intent of the project is to support informed decision-making by local officials that could affect water resources. She noted that decisions affecting water resources are most often made at the local level, even though water does not recognize local political boundaries and water resource planning and management is most effective at the level of watersheds and aquifers.

The purpose of the profiles is to explain the interaction between the population of a jurisdiction and the water resources within it and how they can affect each other, as well as the effects of the jurisdiction on the watershed(s) and aquifer(s) of which the jurisdiction is a part, whether upstream/up gradient or downstream/down gradient from other jurisdictions. The profiles will include maps with different layers to provide information about the streams, surface water bodies, watersheds and aquifers, relative water quality and attainment status of water resources the extent and implications of impervious surface and tree canopy; identification of population and households by jurisdiction and by watershed; terrain; flooding frequency; hydrologic soil groups; and aquifer extent.

To help the committee visualize the layers of information and description that will be provided, Jane displayed a series of examples specific to the City of Monroe, albeit in a non-interactive format; OKI’s GIS department is very involved in creating the profiles as well as OKI water quality staff.

Rumpke Operations and Source Water Protection
John Butler, Senior Staff Engineer at Rumpke, described how Rumpke’s operations are protective of source water, with a focus on its major sanitary landfill in Colerain Township in northern Hamilton County, the sixth largest in the U.S. Rumpke has locations in Ohio, Kentucky and Indiana and offers residential, commercial and industrial waste and recycling services. There are strict regulations for waste management facilities to protect water resources and Rumpke’s operations are in some cases even more protective than the regulations. For example, the state minimum requirement for siting a landfill above an aquifer is a depth to water of 15 feet. Rumpke’s landfill in Colerain Township is a minimum of 150 feet above any underlying aquifer and pump tests have indicated very little groundwater would be available in that location. The geologic formation at the landfill includes three feet of clay which contributes to a bathtub-like structure that helps to contain the processes at the facility.

Rumpke uses both shallow and deep wells for monitoring groundwater to detect any potential contamination, located every thousand feet around the landfill. Some trace amounts of chloride, acetone, methyl-ethyl-ketone and ammonia have been detected, but John noted that sampling of the surrounding area has indicated that these chemicals can be found naturally occurring. He also noted that trace amounts of tritium, a radioactive isotope, had been detected in leachate but not in the groundwater. (Leachate is the liquid that has come in contact with or has been released from solid waste.) Rumpke utilizes this trace material which is not in groundwater to evaluate groundwater for potential affects from the landfill. In addition to the design characteristics of the facility itself, John also mentioned that landfills cannot be located near parks, wetlands, or streams.
To protect surface water, stormwater ponds and conveyance systems are operated around the landfill. Total Suspended Solids (TSS) are sampled from the sedimentation ponds weekly, and when sedimentation levels rise above a certain point it is required that the ponds are emptied and cleaned. To avoid this costly and time consuming process Rumpke has a number of preventative measures. There are floating weirs to control water discharge from the ponds so that the discharge is independent of rain events. Rock checks and alternatives such as large logs from the area slow the velocity of running water and cause sediment to drop out. Concrete forebays also stop sediment from reaching the sedimentation pond. In addition to TSS, samples for drinking water standards are tested once per month.

John also noted that recycling has been increasing over the years, which is changing the composition of the waste and management practices for the landfill. For example, less paper and food are being deposited, which means that the landfill yields less methane and carbon dioxide. Nonetheless, the methane and carbon dioxide that are produced by the decomposition of the garbage are used to run the trucks that pick it up. A third party company partners with Rumpke to harvest this gas byproduct to heat 25,000 homes in the area, and 4-5% of Duke’s natural gas is provided by this process. John also explained that leachate from the Colerain landfill is discharged to the Metropolitan Sewer District facility by way of a sewer pipe buried under I-275.

**OKI Staff Update**

Bruce Koehler, OKI, briefed the Committee on OKI’s stream buffer study that will provide local governments with an interactive, web-based tool that can be used to make informed choices about encouraging, installing and protecting stream buffers. Bruce used an example of a previous initiative at OKI to map forested areas in Cincinnati, explaining that the process will be similar but with the end product identifying stream buffers.

**The Healthy Water Ohio Initiative and Federal Farm Bill Implications for Source Water**

Larry Antosch, Ohio Farm Bureau Federation, reported on the Federation’s Healthy Water Ohio Initiative, a just-completed strategy for water resources management in Ohio. Over the course of 21 months, the Initiative involved a statewide opinion survey and a thousand telephone interviews to identify water issues, attitudes and potential solutions; listening sessions and several work groups involving more than 200 people; and a steering committee comprised of a wide spectrum of experts on water quality and quantity issues. Larry explained that the steering committee for the Initiative included representatives of business and industry, conservation and environmental advocacy, finance, food and farming, lawn, horticultural and turf, municipal water systems, public health, recreation and tourism, research, education and tourism.

The input process was initiated with a survey of residents from all over Ohio that ensured a representative sample. When compared with other issues of concern statewide (such as health care, the state’s economy, education, crime, infrastructure and public transportation), adequate water for drinking, recreation, industry and other uses did not rank highly among the respondents. When asked about environmental issues specifically, however, respondents put water quality at the top of the list. Keeping drinking water safe was the major water quality
concern, followed by protecting fish and wildlife habitat, and repairing or replacing aging water-related infrastructure.

The steering committee then used the findings of the survey and work groups to arrive at recommendations, which include: identifying knowledge gaps and educating government leaders, students, and the public; providing incentives and encouraging voluntary management practices, collaboration and coordination among jurisdictions, especially on a watershed basis; conducting a needs assessment of infrastructure; and pursuing funding for a Water Trust, using a model similar to the Clean Ohio Fund. Implementation of the recommendations is anticipated in three phases: Phase I (2015-2016) involves creating the Ohio Water Trust and pursuing capitalization funds; Phase II (2017-2020) involves implementing priority initiatives; and Phase III (2021 and beyond) involves continuing established processes and measuring progress. Potential funding sources include water quality trades, agriculture and business funding, government bonds, a portion of boating or fishing license fees, and philanthropy.

For more information about the Healthy Water Ohio initiative and to review a copy of the final report Larry suggested visiting www.healthywaterohio.org. He also provided a fact sheet on the source water protection program of the U.S. Department of Agriculture’s Farm Service Agency and the nonprofit National Rural Water Association and invited questions about the federal farm bill.

Other Business and Adjournment
Jack Thornsberry reminded the committee that the next meeting will be held on December 9 at 10 a.m. in the OKI Board Room and adjourned the meeting at 12:05 p.m.