

Water:
Decision Making & Leadership
Teacher's Guide: Grades 11 & 12



Beaver **Water** District

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Overview

Beaver Water District

Building Blocks to Water Education Program

What are the project objectives?

Objectives: To develop age-appropriate educational materials to teach students about Beaver Lake watershed protection and water treatment at Beaver Water District.

Why was this project developed?

This project was developed to ensure that drinking water education and watershed education, based on Beaver Lake and the Beaver Lake Watershed, would be available in schools located in areas that receive drinking water from Beaver Water District.

Desired student outcomes:

1. Students will understand drinking water sources.
2. Students will understand that water is a valuable resource necessary for quality of life in Northwest Arkansas.
3. Students will relate watershed health to water quality in Beaver Lake.
4. Students will learn definitions related to drinking water and watershed.
5. Students will learn about activities and behaviors that will promote watershed health in Beaver Lake, and thus become stakeholders when it comes to their own water quality.
6. Students will relate this information and these behaviors to their family members and friends and others in the community.
7. Students in higher grade levels (such as high school) will understand lake zones, a natural lake vs. a manmade lake, and technical terms such as trophic, mesotrophic, oligotrophic, lacustrine zone, riverine etc.

What is the history of the Beaver Water District?

Mission: Our mission is to serve our customers in the Benton and Washington County area by providing high quality drinking water that meets or exceeds all federal and state regulatory requirements in such quantities as meets their demands and is economically priced consistent with our quality standards.

History: Fifty years ago, visionary community leaders got together to discuss the need for a long-term supply of clean, safe water for Northwest Arkansas. With an eye to the future and knowledge that a large lake was the best source of water, these citizens worked to establish Beaver Lake Reservoir. Beaver Water District was created to pay for the drinking water supply allocation of the lake. The dam that created Beaver Reservoir and the first water treatment plant were completed in the mid-1960s. Since that time, the District has expanded facilities and improved to keep up with increased water demand and stricter drinking water standards. In addition, three other water utilities have been created to provide drinking water from Beaver Lake.

Where did the name originate?

The Beaver Water District got its name from Beaver Lake. Beaver Lake got its name from the town of Beaver, which is actually located in the Table Rock Lake region, according to the Corps of Engineers' office in Rogers, Arkansas.

What areas of Arkansas are covered and which towns and cities benefit from Beaver Water District?

Beaver Water District supplies safe, clean water to about 250,000 people and industries on Northwest Arkansas. The district sells water wholesale to **Fayetteville, Springdale, Rogers, and Bentonville**.

Fayetteville buys water from Beaver Water District and owns and operates the system in Fayetteville, Farmington, Greenland, Goshen, Wheeler, parts of Johnson and some rural areas in Washington County. Fayetteville also provides wholesale service to Elkins, West Fork, Mount Olive Rural Water Association, and Washington Water Authority (as needed).

Springdale Water Utilities buys water from Beaver Water District and sells to consumers in Springdale, Bethel Heights, Elm Springs, the northern part of Johnson, the southern part of Lowell, and unincorporated areas of Washington and Benton counties that are within its designated water service boundary. Bulk sales are made to consecutive water systems operated by the cities of Cave Springs and Tontitown.

Rogers buys water from Beaver Water District and resells it to Rogers and a portion of Lowell and to Benton County Rural Development Authority (RDA) No. 4 Frisco Springs.

The city of *Bentonville* buys water from Beaver Water District and resells it in Bentonville and Bella Vista. You can access a diagram at the District's website at www.bwdh2o.org.

How does Beaver Water District impact the Northwest Arkansas region?

Beaver Lake provides drinking water to more than 350,000 people and industries in Northwest Arkansas, including the largest concentration of food industries in the United States. Another way to put it is this: **One out of eight people in the state of Arkansas gets his or her drinking water from Beaver Lake**, which provides raw water to the District, as well as three other drinking water utilities.

According to a recent population study, there could be as many as 1.2 million people residing in Northwest Arkansas by 2055. Through its master planning process, Beaver Water District (BWD) stays ahead of a growing population's demand for industrial and residential water supplies and reduces the strains of rapid growth on infrastructure including wastewater treatment, roadway expansions, traffic management, waste disposal and other services.

The District's new Administration Center accommodates space needs for staff and increases **accessibility to the public for educational and other purposes**. The project is built in accordance with the Leadership in Energy and Environmental Design (LEED) program, a green building rating system. Educational components of the building include a drinking water plant model and a topographical wall sized map of the Beaver Lake Watershed.

Beaver Water District wants you to know that **your tap water is "food grade and table ready,"** and it has been since the plant began operations in the 1960s. The District operates around the clock to make sure that your water is safe to drink. So, the next time you turn on the tap or read an article comparing the merits of tap water versus bottled water, think about all the people beyond the pipe who make it possible for you to have potable water in Northwest Arkansas.

For more information & education resources send an email to:

education@bwdh2o.org
www.bwdh2o.org

Frameworks

Arkansas Framework Correlations have been aligned within each of the unit lessons. These frameworks can be found through the *Arkansas Department of Education's web site for Curriculum Frameworks* (<http://www.arkansased.org/divisions/learning-services/curriculum-and-instruction/frameworks>).

7Es Teaching and Learning Model

The 7Es Teaching and Learning Model (Elicit, Engage, Explore, Explain, Elaborate, Evaluate, and Extensions) is specifically detailed within each lesson and implied throughout the unit. We referenced this model from *Primary Connections* (<http://primaryconnections.org.au/teaching-and-learning/>).

See “7Es New Development Policy and Approval Process” (page 6).

Lesson 1: Mock Public Hearing: Streamside Development Project Proposal

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Purpose/Summary

Students stage a mock hearing in order to make a decision on a proposed development project near a stream. This lesson can be implemented as a 2-3 day activity, a 2-3 week investigation, or as a semester research project.

Objectives

Students will be able to:

- Describe the public hearing process.
- Analyze different roles and opinions of area stakeholders.
- Recommend options pertaining to specific aspects of the proposed development based on needs of various stakeholders.

Arkansas Framework Correlation

Science

Strand: Physical Dynamics

Standard 1: Students shall understand the physical dynamics of Earth.

PD.1.ES.1 Describe the structure, origin, and evolution of the Earth's components:

- Atmosphere
- Biosphere
- Hydrosphere
- Lithosphere.

PD.1.ES.6 Describe the processes of degradation by weathering and erosion.

PD.1.ES.8 Describe the relationships of degradation (a general lowering of the earth's surface by erosion or weathering) and tectonic forces.

PD.1.ES.9 Construct and interpret information on topographic maps.

PD.1.ES.11 Describe the physical and chemical properties of water.

PD.1.ES.19 Describe the cycling of materials and energy:

- Nitrogen
- Oxygen
- Carbon
- Phosphorous
- Hydrological
- Sulfur.

Strand: Biological Dynamics

Standard 2: Students shall understand the biological dynamics of Earth.

BD.2.ES.4 Construct a trophic-level pyramid (energy levels).

BD.2.ES.5 Construct a food chain.

BD.2.ES.6 Diagram a food web.

BD.2.ES.8 Describe biodiversity.

BD.2.ES.9 Explain how limiting factors affect populations and ecosystems.

Strand: Social Perspectives

Standard 3: Students shall understand the impact of human activities on the environment.

SP.3.ES.1 Explain the reciprocal relationships between Earth's processes (natural disasters) and human activities.

SP.3.ES.2 Investigate the relationships between human consumption of natural resources and the stewardship responsibility for reclamations including disposal of hazardous and non-hazardous waste.

SP.3.ES.3 Explain common problems related to water quality:

- Conservation
- Usage
- Supply
- Treatment
- Pollutants (Point and Non-point Sources).

SP.3.ES.4 Explain problems related to air quality:

- Automobiles
- Industry
- Natural Emissions.

SP.3.ES.5 Evaluate the impact of different points of view on health, population, resource, and environmental issues:

- Governmental
- Economic
- Societal.

SP.3.ES.6 Research how political systems influence environmental decisions.

SP.3.ES.7 Investigate which federal and state agencies have responsibility for environmental monitoring and action.

SP.3.ES.8 Compare and contrast man-made environments and natural environments.

SP.3.ES.9 Evaluate personal and societal benefits when examining health, population, resource, and environmental issues.

SP.3.ES.10 Predict the long-term societal impact of specific health, population, resource, and environmental issues.

SP.3.ES.11 Investigate the effect of public policy decisions on health, population, resource, and environmental issues.

Strand: Nature of Science

Standard 4: Students shall use mathematics, science equipment, and technology as tools to communicate and solve environmental science problems.

NS.4.ES.1 Collect and analyze scientific data using appropriate mathematical calculations, figures and tables.

NS.4ES.2 Use appropriate equipment and technology as tools for solving problems (e.g., microscopes, centrifuges, flexible arm cameras, computer software and hardware).

NS.4.ES.3 Utilize technology to communicate research findings.

Strand: Nature of Science

Standard 5: Students shall describe the connections between pure and applied science.

NS.5.ES.1 Compare and contrast environmental concepts in pure science and applied science.

NS.5.ES.2 Explain why scientists should work within ethical parameters.

NS.5.ES.3 Evaluate long-range plans concerning resource use and by-product disposal for environmental, economical and political impact.

NS.5ES.4 Explain how the cyclical relationship between science and technology results in reciprocal advancements in science and technology.

Strand: Nature of Science

Standard 6: Students shall describe various environmental science careers and the training required for the selected career.

NS.6.ES.1 Research and evaluate science careers using the following criteria:

- Educational requirements
- Salary
- Availability of jobs
- Working conditions.

7Es New Development Policy and Approval Process

Elicit

View videos of public hearings on development proposals from the Internet. Show images of conventionally developed sites and sites on which Low Impact Development methods have been implemented. Research articles about issues related to project reviews by City Counsels and Planning Commissions, site preparation for development, stormwater management considerations in project planning, during construction, and post-construction, etc . . .

Engage

Demonstrate the activity. Have students do the research on local government development policies and public hearing process. What are the short-term and long-term pros and cons related to the project in terms of:

- Economics (include consideration of the monetary value of services provided by soft engineering utilizing natural site features/drainages/vegetation as compared to hard engineering installations of pavement, concrete and pipe conduit)
- Environmental impacts
- Affect on community quality of life

What were some LID alternatives to conventional development methods?

Explore

Have the students form teams for investigation. Move the students to the computer lab and initiate productive Internet research for information on local government development policies, LID resources, community stakeholder perspectives. Have the students compile and organize information, record their observations on public process, stakeholder positions on issues, short- and long-term economics and impacts/costs-benefits of development methods, etc . . .

Explain

Have the students interpret aspects of their research with regard to development policies, the approval process, public hearings, and their views based on their own, as well as their assigned stakeholder role. Have the teams present their findings to the class.

Elaborate

Have questions for the teams during their presentation. Identify other developments' pros and cons. What development methods present the best overall scenario for all stakeholders and the community as a whole?

Evaluate

Assess the student's investigative and computer research skills, teamwork, presentation, and also with a unit test.

Extensions

Combine this lesson with attendance of, participation in, and/or reporting on local government public hearings on new development projects.

Problem Question

To Be Added

Keywords

- See the UACDC LID Design Manual Glossary (pages 214-221).
- See the education links on <http://www.bwdh2o.org/>.

Timeline/Procedure

This instructional unit may be scheduled as a 2-3 day activity, a 2-3 week investigation, or as a semester research project. Procedural details for the 2-3 day lesson scenario are provided below. To expand the lesson to a 2-3 week lesson, instruct students to research additional options for or alternative approaches to aspects of the proposed development (e.g. investigate local LID projects, online research, etc.). The lesson becomes more active with the semester project scenario in which local planning commission members, city planning and/or stormwater staff, environmental special interest groups, and/or landowners are invited to the classroom to speak about their roles in public hearings. Students also attend a public hearing or a planning commission meeting. A semester-long lesson scenario could include student involvement in their community's development project approval process and investigation of a real, local development. The students would conduct their own stakeholder research, and then present their views or recommendations at an actual planning commission meeting or public hearing. Prior to participating in the actual meeting or hearing, students could rehearse their presentations by staging a mock meeting/hearing in the classroom. The students will feel ownership of their recommendations for the proposed project and feel they are contributing to their community. They may even provide input that leads to the incorporation of low-impact features to a development in their own neighborhood!

NOTE: This scenario and lesson is simplified and does not take into account wetlands and floodplain regulations that occur at the federal level. It may be appropriate to have some students research these issues.

Materials

- Copy of the script for each student
- Costumes (if desired)
- Proposed project print-out for each student
- Low Impact Development: A Design Manual for Urban Areas (UACDC LID Manual)

Source Options:

1. Beaver Water District/Resources/Brochures & Booklets Webpage Link:

http://www.bwdh2o.org/wp-content/uploads/2012/03/Low_Impact_Development_Manual-2010.pdf

2. Borrow copies for classroom use from Beaver Water District. Just email a request to education@bwdh2o.org.

3. Purchase from the University of Arkansas Community Design Center at uacdc.uark.edu.)

- (Optional) Classroom discussion with Stakeholder Representatives (e.g. Local Developer, Planning Commissioner, City Planning Department or Stormwater Management Staff, Environmental Special Interest Group member, etc. . .) come to your class to speak about development and alternative options for development

Teacher Preparation

Basic Lesson:

- Give the students some background on public hearings
- Provide the students with the visual display of the proposed project site
- Point out a few of the issues that might be involved with this project (Review the issue/fact sheet in this document)
- Distribute the UACDC LID Design Manuals to each group of students or have students access the UACDC LID Design Manual PDF online, explain how the manual is set up, and point out the glossary (pages 214-221) at the end of the manual
- Have the students create a visual display of how the project could be constructed differently
- Assign roles from the script to individual students or groups of students, with one student per group appointed to represent and speak for their group during the hearing

Roles:

Downstream Land Owner
Business Owners
Neighborhood Residents
Planning Commission Chair
Planning Commission Members
City Planning Department Staff
Environmental Special Interest Group Representatives
City Stormwater Staff
Developer

- Read through the script
- After reading the script, have the groups display/present new concept(s), or recommended changes to the proposed development plan (other than those noted in the hearing) and use this fresh input to aid in discussion

BACKGROUND INFORMATION

Students will analyze a proposed development near a creek, investigate alternatives, and present their proposal option(s) to the group.

Development alternatives research sources for this topic:

- UACDC LID Design Manual
(http://www.bwdh2o.org/files/45/Low_Impact_Development_Manual-2010.pdf)
- Low Impact Development Websites: www.epa.gov
- Local development site visits (list provided) to view/compare/contrast hard engineering vs. soft engineering features
- City Council or Planning Commission Public Hearing to witness the entire process in action

New Development Project Approval Process

A proposal for a new development project must go through multiple agencies for review before being approved. Representatives from state and federal agencies will visit the project site and make their determinations about various factors involved with the site. The project proposal is then posted for public notice. The public is allowed to request a hearing to comment on or provide input for the project. At the public hearing, all agencies, businesses, organizations, and citizens are given the opportunity to speak. All information gathered at the hearing contributes to the decision-making process pertaining to recommendations for project modification(s) or final approval. This lesson will guide students through a city public hearing in which project approval is decided and project designers are instructed to obtain proper, required permits from state and federal agencies.

Issue/Fact Sheet

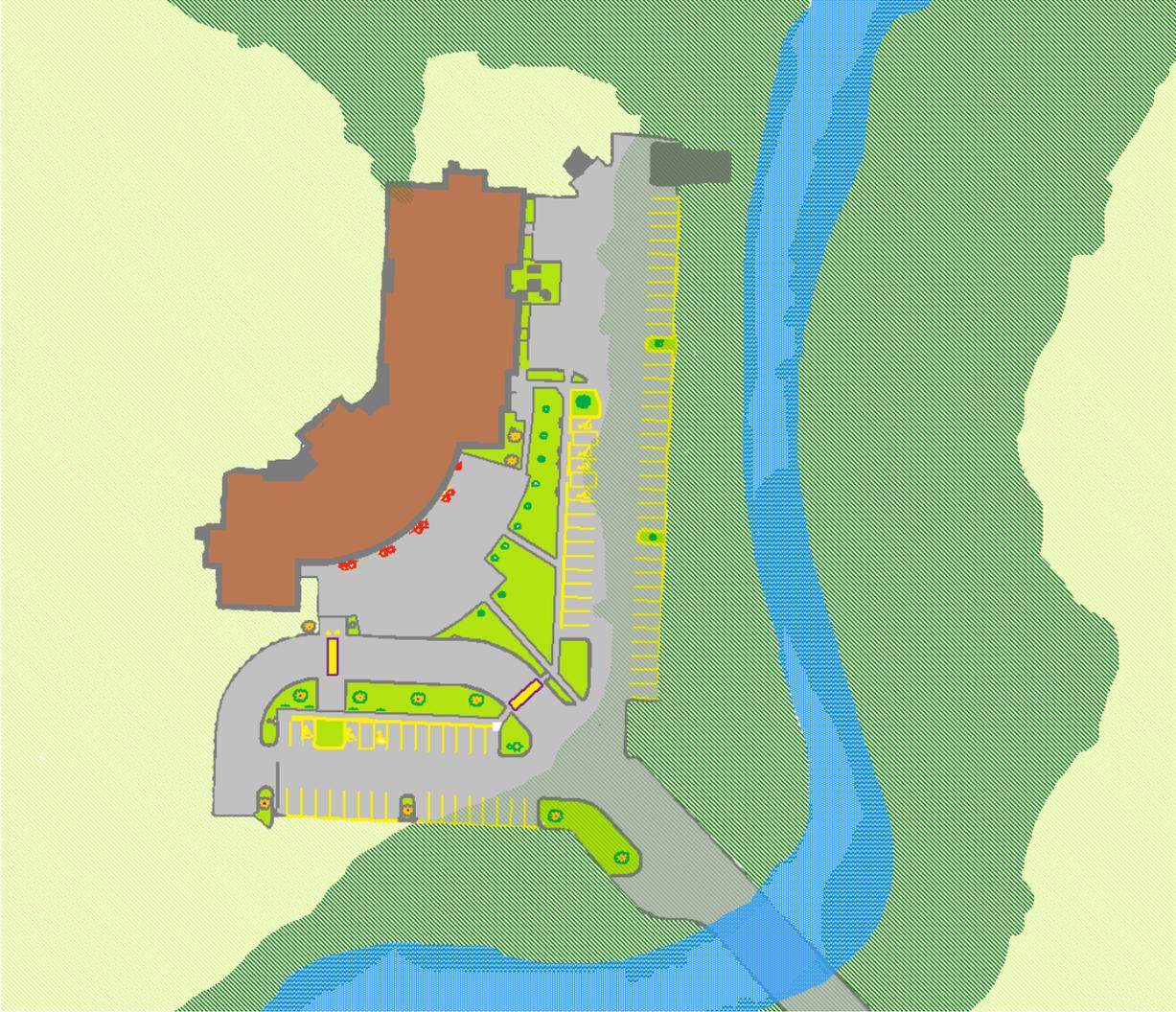
This development will:

- Provide an economic boost to the area by providing jobs and sales tax income
- Enable residents to drive less and bike/walk more due to the proximity of the new development
- Increase:
 - City Infrastructure Installation and Maintenance Expense (Sewer, Sidewalks, Streets, Utilities)
 - City Services Expense (Ambulance, Fire, Police, etc . . .)
 - Tax Rates (Potentially) to Pay for Added Expense for City Services, Infrastructure Maintenance, Stormwater Management
 - Traffic
 - Air Pollution from Building and Combustion Engine Emissions (CO₂, Petroleum Compounds, Particulates, etc . . .)
 - Impervious Cover (Compacted Soils, Pavement, Roof Surface Area, etc . . .)
 - Urban Heat Island Effect
 - Water Pollution - Point Source and Non-Point Source
 - Habitat and Riparian Buffer Removal/Loss for the Area
 - Stream and Ground Temperature Due to Removal of Canopy
 - Stormwater Runoff & Flash Flooding
 - Erosion
- Decrease:
 - Air, Land, and Water Quality
 - Species Diversity – Animal, Bird, Insect, Plant, Reptile
 - Groundwater Recharge
 - River/Stream/Spring Base Level (Minimum Flow)

SITE: Before Development Map



SITE: Proposed Development Plan



Mock Public Hearing Script

(Planning Commission Chair)

A development is being proposed that will include commercial businesses, roads, and parking lots. We're meeting to discuss and hear opinions on the development. We'll be hearing from downstream landowners, neighborhood residents, business owners, the developer, the planning commission chair, planning commission members, city planning department staff, environmental special interest group representatives, and city stormwater staff.

(Developer)

We're proposing a large development of roads, parking lots, and several businesses. Please look at the visual display of our proposed development. You will see that our plans include the clearing of land next to a stream and the addition of red dirt fill to the project area to elevate the construction surface above the floodplain. We're very excited at the prospect that this project will be beneficial for everyone in many ways. Residents will be able to stay closer to home when doing their business, which will save them time and energy. This is a good thing for the environment because area residents will not have to drive as much. You'll see more citizens walking or riding bicycles, which is good for the environment and their health. This project will also help the city by creating new jobs and increasing the sales tax revenue. We're open to suggestions on fine-tuning our proposed development plan. Thank you for your input.

(Environmental Special Interest Group Representative)

We have concerns regarding floodplain alteration and the amount of impervious cover being built. The impervious cover will increase the amount of stormwater runoff into the stream. Stormwater runoff also picks up and transports surface pollutants. Filling the floodplain will constrict larger flow volumes to the stream channel instead of allowing the flow to slow down, spread out, and soak in to the floodplain. Pollutant concentrations and amplified erosion potential associated with greater hydrologic load will have a dramatic negative impact on the stream and its water quality. Also, the removal of the riparian zone (trees, bushes, and grasses) will lead to:

- Further exacerbation of problems and costs associated with erosion
- Decreased pre-stream sediment and pollutant filtering (pollutants from the runoff will directly enter the stream)
- Increased stream water temperature or thermal pollution without adequate tree canopy to shade the stream

The trees provide shade, which also regulates ground temperature. Removal of the existing tree canopy will lead to increased ground temperature.

(City Stormwater Staff)

We believe that this development will cause major damage to the stream not only at this location but will also affect properties downstream for miles. The increase in the impervious cover will produce a greater amount of stormwater runoff and we will see more flooding. If the developer wants to pursue this option, s/he must provide evidence, from computer models of the changes to downstream water levels, that downstream properties will not be adversely impacted as a result of

this development. We believe that other options* for aspects of this development should be explored.

Alternative wording:

(City Stormwater Engineer)

Staff has reviewed the proposed development and conducted hydrologic analysis of the impact on the surrounding community. Our analysis indicates that this development will cause increased flooding and erosion for several miles downstream. Several acres of forest are being replaced by impervious cover, such as parking lots and rooftops. It is apparent from our analysis that the proposed stormwater facilities do not protect downstream property owners from damage. We recommend the proposal be tabled until alternatives that provide the needed protection are investigated.

(Planning Commission Staff)

This development as proposed meets the technical requirements of our planning regulations. However, staff does not believe that it meets the intent of protecting natural streams within the City. There has to be some way in which all involved can benefit from this opportunity. Please feel free to offer your opinion on what options* are available.

Alternative wording:

(Planning Commission Staff)

Staff has reviewed the proposed development and finds it to meet the technical requirements of the zoning ordinance and development regulations. However, according to the Mayor's proclamation dated April 22, 1970, it is the priority of this city to fully protect its natural environment. Subsequent mayors have respected this proclamation. In our analysis, we find that this development falls short of our city's priority in several areas including:

- Removal of several acres (or dozens) of mature trees without proper mitigation,
- Degradation of several hundred linear feet of riparian buffer without proper mitigation,
- Likely degradation of water quality and aquatic diversity due to removal of riparian trees and channelizing of the stream.

Staff's recommendation is that modifications be made to the proposed development to address these needs of the city.

(Downstream Landowner)

I'm worried about this development causing land and water problems in the long run. The increase in the amount of water will cause a loss of some of my pastureland due to erosion from flooding. How can I be sure that I won't lose pastureland from erosion?

*See "Stakeholder Roles For Options Presentations (page 23).

(Neighborhood Residents)

We're concerned also because we have a walking path beside this stream and our children play in the stream. This is a great recreational area for everyone in these neighborhoods. We're afraid the erosion will damage our walking path and the new stormwater runoff will pollute our stream and our children might be harmed when playing there. There has to be some way to compromise on this development.

(Business Owners)

We're in favor of this development because there will be new opportunities for business and we feel that our business would be successful out here where there is very little competition. This area is going to develop eventually, so why not go ahead and get started?

(Planning Commission Member)

We understand the concerns that have been expressed. We feel like this is a good opportunity to develop this area. There are many neighborhoods in this area and to have new businesses come here would help the people in this part of town. The residents in this area would travel less to shop or do their business. This will save in energy used in transportation and also reduce air pollution. This development will also increase the sales tax revenue for the city and those extra funds could go to fund new projects in the city. Some projects might include road improvements, parks and recreation department, and other beneficial programs. However, as staff has pointed out, there are serious issues with this development. We have to look at options* that will work with the environment *and* allow this development.

(Developer)

We're certainly willing to listen to any options* that are financially possible for our development. We'd like to develop the best project that would benefit all stakeholders involved in this area. Thank you in advance for your input.

Alternate wording

(Developer)

We are willing to listen to options* that are financially possible for our development. We consider ourselves to be good neighbors. However, regarding the issues raised we have the following responses:

Regarding destruction of the walking path and recreation area; all of the proposed development is on private property. Informal walking paths and recreation can potentially cause personal injury. In addition, we believe these informal and unsupervised areas will become havens for criminals and become detrimental to our development. We are not willing to take on the liability of inviting the public, especially unsupervised children onto our property for horseplay.

Regarding protection of the natural streams within the city; as you have stated, we have met the technical requirements of the planning regulations. Our engineer has taken extensive and expensive measures to assure us that those regulations were met. It is our opinion that those requirements are sufficient to protect both the natural and the built environment.

(Mayor and Commissioners)

You have heard the respective comments for the stakeholders in the room. Have I got a motion from the commission?

After a motion is made and seconded, then the commission discusses among itself the merits of the development. Then the mayor calls for a vote.

*See “Stakeholder Roles For Options Presentations (page 23).

STAKEHOLDER ROLES FOR OPTIONS PRESENTATIONS

Downstream Land Owner

Neighborhood Residents

Business Owners

Environmental Special Interest Group

City Stormwater Staff

Additional Resources

Internet Resources	
Beaver Water District	http://www.bwdh2o.org/
Arkansas Department of Environmental Quality	http://www.adeq.state.ar.us/
Environmental Protection Agency (EPA)	http://www.epa.gov
Smart Growth Network (a partnership of governmental and nonprofit organizations formed by the EPA)	http://www.smartgrowth.org
EPA's smart growth page	http://www.epa.gov/livability/index.htm
Sierra Club's page on sprawl	http://www.sierraclub.org/sprawl
U.S. Geological Survey (USGS) Water Quality Information	http://www.water.usgs.gov
Water Quality site	http://water.epa.gov/

Local Low Impact Development Sites

Low-Impact Development (LID) is an innovative, effective and ecologically-based approach to the management of storm water runoff associated with land development. LID infrastructure uses techniques to mimic the pre-construction natural hydrology of the area. These design features allow for the capture, storage, infiltration, evaporation and percolation of would-be runoff that would otherwise contribute to the overload and deterioration of local water bodies in the watershed.

To fully appreciate the stark differences in functionality of LID vs. non-LID sites, one must visit these sites and analyze the outflows associated with LID vs. non-LID sites.

In Northwest Arkansas, LID sites can be found ranging from small residential projects to large commercial ones. Upon visiting one of these LID sites, one will appreciate the interconnectivity of the techniques employed to keep our natural water bodies from being inundated with excess storm water runoff.

Benton County:

- Habitat Trails in Rogers is a green affordable neighborhood consisting of 17 Habitat for Humanity homes situated just off Old Wire Road within walking distance to Wire Elementary school
<http://uacdc.uark.edu/project.php?project=18>
http://places.designobserver.com/media/pdf/Habitat_Trails_445.pdf
http://uacdc.uark.edu/books/excerpts/5Habitat_Trails_Book.pdf
- LEED Gold-Certified Beaver Water District Administration Center at 301 N. Primrose Road, Lowell, AR has an abundance of green and LID features such as pervious pavement in the parking areas and retention areas to allow runoff to percolate into the ground
http://www.bwdh2o.org/files/45/Beaver_Water_District_Admin_Center_Brochure.pdf
- The IRWP Rain Garden Horsebarn Rd and 52nd Street Bridge, Rogers, AR
<http://www.irwp.org/assets/conservation/rain-garden/MainSign.pdf>
- The Bentonville Rain Garden at Crystal Bridges trailhead at “A” Street
<http://www.facebook.com/media/set/?set=a.10150202993264121.312335.128813264120>

Washington County:

- LEED Gold-Certified Arvest Bank - 1164 East Joyce Boulevard, Fayetteville AR 72703 has features such as pervious pavement, bioswales to catch surface water and underground cisterns to capture rainwater coming off of the roof.
<http://www.ozarksunbound.com/arvest-bank-on-joyce-in-fayetteville-named-a-leed-gold-building-announcement/14978>
<http://www.fayettevilleflyer.com/2011/03/30/arvest-bank-officially-receives-gold-leed-certification/>
- Eco Modern Flats - 130 South Hill Avenue, Fayetteville, AR 72701 is a completely green renovation of an existing apartment complex that employs rainwater collection and cistern systems to irrigate the landscaping and community garden. Non-native plant species have been removed and replaced with native and drought-tolerant species
<http://www.fayettevilleflyer.com/2011/03/30/arvest-bank-officially-receives-gold-leed-certification/>

- The Gatehouse green roofs are atop two roofs in “The Gardens,” the tailgating area on the south side of the University of Arkansas campus, to reduce the amount of storm water that washes off of the roof
<http://architecture.uark.edu/525.php>
<http://architecture.uark.edu/500.php>

Other Notables:

- Fayetteville Public Library - 401 W. Mountain St., *Fayetteville, AR 72701*
<http://www.faylib.org/information/pdf/GreenBldgFlyer2008.pdf>
http://www.faylib.org/new_library/leed_info.asp
- Sam’s Club - 3081 N. Highway 112, *Fayetteville, AR 72704*
<http://www.walmartrealty.com/EconomicDevelopment/FeaturedProjects.aspx>
<http://www3.samsclub.com/NewsRoom/Press/488>
http://www.braewater.com/about/news/sams_club_is_rainwater_harvesting
- The Botanical Gardens of the Ozarks - 4703 N. Crossover Road, Fayetteville, Arkansas 72764
<http://www.bgozarks.org/>
- Block Street between Dickson and the Fayetteville Square
http://www.sustainablecitiesinstitute.org/view/page.basic/blog/feature.blog/fayetteville_ar
http://www.accessfayetteville.org/government/strategic_planning/projects/Downtown_Master_Plan.cfm
- Hill Place Apartments at 6th and Hill in Fayetteville
 754 South Royal Oak Parkway, Fayetteville, AR 72701-6302
<http://www.hillplaceapts.com/impact.aspx>

Resources for materials not included:
UA Center for Math & Science Education
<http://www.uark.edu/~k12info/>
 479.575.3875
Northwest Arkansas Education Co-Op
<http://starfish.k12.ar.us/web/>
 479.267.7450
Beaver Water District
www.bwdh2o.org
 479.717.3807
 Know of other resources? Please let us know!
education@bwdh2o.org or 479.756.3651