

Exhibit A Executive Summary

Commonwealth of Kentucky

ExhibitAExecutiveSummary.pdf

Executive Summary

The U.S. Department of Housing and Urban Development (HUD) National Disaster Resilience Competition (NDRC) provides the Commonwealth of Kentucky with a tremendous opportunity to extend and enhance our efforts toward building resilient communities that proactively prepare for events, such as the tornados, severe storms, and flooding, which repetitively affect many communities throughout the Commonwealth. Through ‘Regrow Kentucky: A Path to Resilience,’ the Commonwealth proposes to harness existing planning mechanisms and develop decision-making frameworks to help inform and guide local resilience building for communities with unmet needs. Regrow Kentucky is a result of local triumphs over tragedy. A prime example is the town of West Liberty, Kentucky which suffered a massive tragedy when an EF3 tornado ripped through this community of 3,400 residents. The aftermath resulted in seven deaths, damage to nearly 400 homes, businesses and government structures, and destruction to much of the downtown area. To manage the recovery process, the town created two entities, the Morgan County Long-Term Recovery Committee and B.E.G.I.N Again (Building, Entrepreneurial, Green, Innovative and Networked) communities and enterprises. This effort guided the community to not only rebuild, but is allowing the region to move toward renewed economic prosperity. Examples such as this, where Kentucky communities have been able to spearhead cultural shifts and bounce forward with resilience based initiatives, illustrate the essence of the Regrow Kentucky program proposal.

The Regrow Kentucky program will be achieved through 4 Regrow Phases that will lead the Commonwealth toward creating ‘Paths to Resilience’ for multiple communities across the State. The following Regrow Phases were used when selecting the communities and projects for the

NDRC application. The Commonwealth will continue to expand these phases as the program matures.

Regrow Phase 1: Assess and identify pilot communities, develop framework and develop educational information.

Regrow Phase 2: Develop project selection criteria and financing program.

Regrow Phase 3: Select and manage project implementation; continue education.

Regrow Phase 4: Evaluate and measure program outcomes; develop best practices.

Through the Regrow Kentucky program we identified the five projects included in this application. In Louisville, we are presenting the Morris Forman Sewershed Project. The Morris Forman sewershed serves over 500,000 people. The project includes several activities that together improve the performance of the sewer system, restore key parts of the Beargrass Creek Paddys Run watersheds, and provide educational programs focused on watershed resiliency. In Middlesboro, we are presenting two projects: Flood Risk Reduction and Community Wellness. The Flood Risk Reduction Project includes a few activities focused on restoring Yellow Creek and reducing flood risk in Downtown Middlesboro. The Community Wellness project includes activities focused on healthcare, education, and economic revitalization. Finally, we are presenting the Community Hazard Assessment and Mitigation Planning System (CHAMPS) and Resilience Seed Program (RSP). These projects will initially serve our five target counties (Bell, Jefferson, Johnson, Magoffin, and Morgan), followed by implementation across the Commonwealth.

In the CHAMPS Project, the Team will utilize the five target areas and their recovery/resiliency projects, including NDRC funded projects, to enhance the “Projects” module with project milestones and reporting requirements. This will not only allow for this process to

be replicated in other jurisdictions and regions but will also allow the CCRR and the Team to capture the long-term benefits of each project. Housing the projects in CHAMPS allows the Team to track the regional economic, environmental and social benefits that these efforts stimulate in both the short term and long term, such as capturing losses avoided and observing economic development and housing trends.

The RSP will be developed to help communities better understand and develop potential solutions to their shocks and stresses. The RSP, which will be piloted in our five target counties, will support “first pass” resilience needs through planning, engineering, design and alternatives analyses in communities or watersheds across the Commonwealth. Based on these efforts, the ultimate goal for RSP projects is the attainment of additional dollars from federal, state, local or private sources for project implementation.

Our team, led by the Kentucky Department for Local Government (DLG), includes the Kentucky Division of Water (KDOW), and Kentucky Division of Emergency Management (KYEM) with support from Stantec Consulting Services, Inc. (Stantec) University of Louisville Center for Hazards Research and Policy Development (CHR), and the Commonwealth Council for Community Recovery and Resiliency (CCRR). Given the Commonwealth’s advanced track record toward resilience-based initiatives, the team is confident that this effort will leverage the Commonwealth’s capacity, sound approach, and commitment to stimulate a culture of resilience at the community and regional level while also providing a model for other states across the nation.

Exhibit B Threshold Requirements

Commonwealth of Kentucky

ExhibitBThresholdReq.pdf

Threshold Requirements

The Commonwealth of Kentucky (Eligible Applicant) identified five target areas in the Phase 1 application process: Louisville/Jefferson County, Bell County, Johnson County, Magoffin County, and Morgan County. All five are moving forward in the Phase 2 application. It is important to note that in the Phase 1 review, the MID-URN panel determined that Magoffin, Morgan, and Johnson counties did not pass threshold for Unmet Recovery Needs. From discussions with members of the HUD staff and subject matter experts at the academies along with correspondence with these same individuals via email and phone conversations, Kentucky believes this was a mistake and these counties have remained in this application for Phase 2.

In order to establish the threshold the Team examined unmet housing needs across the state and identified 63 residences that had been damaged during one of the qualified disasters that were not repaired resiliently due to a lack of funding. The unmet needs identified are located in the five target areas; 61 are designated as repetitive loss properties damaged by flooding and not built back in a resilient manner, while two of the properties were damaged by a tornado and not repaired to pre-disaster levels due to a lack of funding.

Funds awarded to the Regrow Kentucky program will be used solely for necessary expenses related to disaster relief, long-term recovery, restoration of infrastructure and housing, and economic revitalization in the most impacted and distressed areas for which the President declared a major disaster in the aftermath of an event occurring in 2011, 2012, or 2013, pursuant to the Stafford Act. Using the CHAMPS system, KYEM has documented \$70,073,854 of acquisition project needs in Kentucky that will be reviewed for this opportunity.

Magoffin County contains the third sub county area with an identified unmet recovery need. Census Tract 21153970200 makes up the sub county area and meets the impact threshold because 330 housing units were damaged in DR 4057 and 96 of those incurred serious damage according to Appendix C in the NOFA (Exhibit B Supporting Documentation: CDBGRDR Disaster-Appendix C2). According to the 2013 5 year ACS data the selected census tract has an unemployment rate of 14.1% (Exhibit B Supporting Documentation: Unemployment Rate Data) which is greater than 12.125% which is 125% of the national average of 9.7% (Exhibit B Supporting Documentation: Factfinder 5YR ACS Unemployment Data) for that same time period, qualifying this sub county area as distressed. Within this sub county area, one property was not rebuilt resiliently and has been identified as having unmet recovery needs (Exhibit B Supporting Documentation: Windshield Survey Results).

Johnson County contains the fourth sub county area with identified unmet recovery needs. This sub county area consists of three contiguous Census Tracts, 21115960400, 21115960300, and 21115960600. In Disaster 4057, the sub county area had 117 housing units damaged, with 33 housing units receiving serious damage (Exhibit B Supporting Documentation: CDBGRDR Disaster-Appendix C2). The sub county area meets the distressed threshold due to the documented environmental distress of an EPA identified brownfield. Johnson County has two brownfields in the selected sub county area (Exhibit B Supporting Documentation: EPA Brownfield KMZ File, Exhibit B Supporting Documentation: EPA Brownfield Data Spreadsheet). Johnson County has one property that has been identified as having an unmet need (Exhibit B Supporting Documentation: Windshield Survey Results). The RL property was not rebuilt to prevent future damages after DR 4057 in 2012; in fact a damage claim was recently filed in 2014.

Morgan County contains the fifth sub county area with an identified unmet recovery need. In Morgan County, Census Tracts 21175950100, 21175950300, and 21175950400 make up the sub county area. This sub county area meets the impact threshold because 351 housing units were damaged in DR 4057 and 165 of those incurred serious damage according to Appendix C in the NOFA (Exhibit B Supporting Documentation: CDBGRDR Disaster-Appendix C2). According to the 2013 5 year ACS data the selected census tracts had a combined unemployment rate of 12.9% (Exhibit B Supporting Documentation: Unemployment Rate Data) which is greater than 12.125% which is 125% of the national average of 9.7% (Exhibit B Supporting Documentation: Factfinder 5YR ACS Unemployment Data) for that same time period, qualifying this sub county area as distressed. Within the Morgan County sub county area, two properties have been identified as having unmet recovery needs (Exhibit B Supporting Documentation: Windshield Survey Results). Neither property was repaired to its pre-existing condition or repaired more resiliently. One of the homes is a mobile home that had its frame bent and has not had the frame repaired, another is a home that the owner stated was shifted on its foundation by the tornado and in both cases the insurance and FEMA funding was insufficient to properly repair the homes. As a result, these properties have windows that do not open properly and doors that do not properly fit into the frames. Additionally, no measures were taken to make the homes more resilient or provide the residents with shelter from future tornadoes.

Several partners agreed to assist with administering the activities, projects, and programs included in this application. The details of each partner's role and commitment will be outlined in subsequent Exhibits. All Partner Letters and Partner Agreements may be found in Attachment A.

Louisville

The Morris Forman Sewershed Project includes 19 different activities focused on stream/watershed restoration, resilience/sustainability education, property buyouts, green infrastructure installations, and resilient upgrades to the wastewater treatment system. All of the activities are designed to improve performance of the Morris Forman Sewershed in order to reduce and hopefully eliminate combined sewer overflows and accidental discharges of untreated sewage from the Morris Forman Water Quality Treatment Center during flood events.

1. Eligible Activity – The Morris Forman Sewershed Project includes only CDBG-NDR eligible activities. The Table below demonstrates how each type of activity complies.

Activity Type	CDBG Reference
Green Infrastructure Installation	Stafford Act Category D: Water Control Facilities
Stream and watershed restoration	Stafford Act Category C: Roads and Bridges Stafford Act Category D: Water Control Facilities Stafford Act Category G: Parks, Recreational Facilities, and Other Facilities
Education and job training	HCDA Section 105(a)(8) Public Services
Infrastructure Upgrades	HCDA Section 105(a)(2) Public Facilities and Improvements and Privately- Owned Utilities Stafford Act Category F: Utilities
Buyouts	HCDA Section 105(a)(1) Acquisition of Real Property

2. Resilience Incorporated - Green Infrastructure installations will reduce the amount of water entering the wastewater collection system, thus improving the system’s ability to handle flood events.

Buyouts will remove houses and structures from the floodplain, reducing damage from future storms.

The stream and watershed restoration activities will reduce pressure on the wastewater collection system, as the areas will absorb more stormwater naturally, rather than having it enter the sewer system.

The education programs will increase awareness of stormwater issues and how they impact resilience. Additionally, the apprenticeship program will offer job training and career development opportunities to low-income youth.

Upgrades to the wastewater system include adding generators, increasing capacity, and adding redundancy. These upgrades will improve the system's ability to perform and avoid combined sewer overflows during future flood events.

3. National Objective - All activities in this project directly or indirectly address flooding and flooding related damages from disaster number 1976. Because if this tie-back, this project is eligible for the urgent need waiver granted by this NOFA.
4. Overall Benefit - The benefit area for activities in the Morris Forman Project is the entire sewershed. Some census tracts in the sewershed have LMI percentages of 100%, while others are as low as 10%. The overall LMI percentage for the sewershed is XX%. The tracts adjacent to the section of Beargrass Creek where the majority of the activities will be located have a combined LMI percentage of 58. The green infrastructure installations are all occurring on properties managed by the Louisville Metro Housing Authority, except for one at Iroquois High School. The census tracts surrounding Iroquois High School have a combined LMI percentage of 53. The census tracts benefitting from the Starkey Pump

Station upgrades have a combined LMI percentage of 55. The Delaware Drive activity is located in census tract 113.10, which is 56% LMI.

5. Tie-Back - Disaster 1976 was a flood event causing damages across the city and especially in the Morris Forman Sewershed. All Activities in this project directly or indirectly address flooding, through infrastructure upgrades, green infrastructure installations, flood and stormwater education, and stream and watershed restoration.

Middlesboro

We are presenting two projects for Middlesboro in Bell County. The Flood Risk Reduction Project includes 4 activities focused on stream restoration/naturalization and floodproofing. The Community Wellness Project includes 4 activities that combine to promote economic revitalization, connectivity, education and healthcare.

1. Eligible Activity – All activities in the two Middlesboro projects are eligible activities per the eligibility categories listed below:

HCDA Section 105(a)(1) Acquisition of Real Property

HCDA Section 105(a)(2) Public Facilities and Improvements and Privately- Owned Utilities

HCDA Section 105(a)(8) Public Services

Stafford Act Category D, Water Control Facilities

Stafford Act Category E, Buildings and Equipment

Stafford Act Category G, Parks, Recreational Facilities and Other Facilities

2. Resilience incorporated – The 2011 floods cause much more than flood damage. Downtown Middlesboro and surrounding neighborhoods were devastated and economic recovery has not happened. The Flood Risk Reduction Project will improve the area’s ability to handle the

physical aspects of flood events, reducing the impact of future events. The Community Wellness Project will strengthen the economic and social fabric of the community, making the people and businesses less vulnerable and more likely to remain following future events.

3. National Objective – All activities in this project directly or indirectly address flooding and flooding related damages from disaster number 4008. Because of this tie-back, this project is eligible for the urgent need waiver granted by this NOFA.
4. Overall benefit – Middlesboro includes parts of four census tracts in Bell County. The these tract together are 57% LMI.
5. Tie-Back - All activities in this project directly or indirectly address flooding and flooding related damages from disaster number 4008.

CHAMPS

Kentucky will utilize the 5 target areas described above to develop and test new modules in the Community Hazard Assessment and Mitigation Planning System (CHAMPS). such as a Community Profile Dashboard function that will display community-specific resilience data elements (Hazards, Socio-Economic etc.) for each community in a mapped geo-spatial dashboard format. With this information, each community can track progress towards becoming a Smart Resilient Community employing best practices of situational awareness, risk identification and understanding, hazard mitigation, economic resilience and others). New functionality and governance will be developed to capture key resilience measures and opportunities based on data inventories that will help capture most impacted and distressed while also considering future opportunities beyond the purpose of the NDRC.

1. Eligible Activity – The CHAMPS project and the activities to be completed in the five target counties is an eligible activity under Section 105(a)(12), Planning and Capacity Building.
2. Resilience incorporated –CHAMPS will help the participating communities identify additional unmet needs through project identification from information gathered and from other existing programs on most impacted and distressed areas. This process will provide co-benefits across the board, from improving the communities understanding of their hazard and social vulnerabilities, environmental status, public health, and economic development factors. Developing and enhancing CHAMPS to capture most impacted and distressed characteristics and unmet needs will allow the Team to augment the system to specifically capture what is required of the NDRC. In addition, this effort will provide a long-term resilience solution that can be used within our identified threshold communities, and can also be replicated across the Commonwealth with the use of CHAMPS.
3. National Objective – CHAMPS piloting in the target areas will start with projects included in this application, as well as, other disaster related projects that could not be included. Because all of these tie-back to disasters 1976, 4008, and 4057, this project is eligible for the urgent need waiver granted by this NOFA.
4. Overall benefit – Only Bell County as a whole is over 50% LMI. The other target areas range between 39 and 45 percent LMI. The CHAMPS funding represents a small percentage of overall funding requested in this application. The overall funding request predominately serves LMI areas. Many of the projects that will be used to pilot CHAMPS are the projects included in this application, all of which benefit areas that are over 50% LMI. For this reason, we believe the CHAMPS project complies with the Overall Benefit criteria.

5. Tie-Back - CHAMPS piloting in the target areas will start with projects included in this application, as well as, other disaster related projects that could not be included.

Commonwealth Resilience Seed Program

The Resilience Seed Program (RSP) will help communities better understand and develop potential solutions to their shocks and stresses. The RSP will be used to support “first pass” resilience needs through planning, engineering, design and alternatives analyses in communities or watersheds across the Commonwealth. Based on these efforts, the ultimate goal for RSP projects is the attainment of additional dollars from federal, state, local or private sources for project implementation.

1. Eligible Activity – The RSP is an eligible activity under Section 105(a)(12), Planning and Capacity Building.
2. Resilience incorporated – Funding will support Resilience Based Plans (RBPs) for communities, watersheds, or other specific areas within communities where a need for identifying and enhancing the environmental, social and economic resilience is presented. RBPs may include planning, engineering, alternatives analyses and/or implementation strategies for communities to better understand their resilience needs. The ideal project must be developed through an iterative stakeholder development process. Successful proposals will include the following components:
 - Address current and future risks
 - Assess critical infrastructure shortfalls and needs
 - Comprehensively incorporate local value-based solutions

- Achieve a range of social, economic, environmental and quality of life benefits
 - Act as a model of resilience for other communities
3. National Objective – NDRC funding will be used to pilot the RSP in the five target areas because of their recent disaster history and unmet recovery needs. Because all of these tie-back to disasters 1976, 4008, and 4057, this project is eligible for the urgent need waiver granted by this NOFA.
 4. Overall benefit – Only Bell County as a whole is over 50% LMI. The other target areas range between 39 and 45 percent LMI. The RSP funding represents a small percentage of overall funding requested in this application. The overall funding request predominately serves LMI areas. For this reason, we believe the RSP program complies with the Overall Benefit criteria.
 5. Tie-Back - NDRC funding will be used to pilot the RSP in the five target areas because of their recent disaster history and unmet recovery needs, all of which tie-back to disasters 1976, 4008, and 4057,

Exhibit C Capacity

Commonwealth of Kentucky

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Capacity

Regrow Kentucky will be primarily managed by the Kentucky Department for Local Government (DLG), the applicant for NDRC; Kentucky Emergency Management (KYEM) and the Kentucky Division of Water (KDOW). The managing partners will rely on input from the Commonwealth of Kentucky Council for Community Recovery and Resiliency (CCRR), established by executive order on July 30, 2014. Data and disaster management will be performed with the use of the Community Hazard Assessment & Mitigation Planning System (CHAMPS) initiated in 2009.

As discussed in Phase 1, **DLG** has prior experience working on resilience based projects with the US Economic Development Administration (EDA) and HUD in developing the CCRR and the CHAMPS tool. DLG, under the Office of the Governor, provides financial assistance in the way of grants and loans, as well as advising local governments in matters of budget, personnel, and other issues relevant to those entities. Through 23 different grant and loan programs, DLG has general management and technical capacity within the following fields: data analysis, public works, affordable housing, environmental quality, community engagement, design and engineering, economic revitalization and human workforce development. The regular annual allocation for DLG's Community Development Block Grant programs (CDBG) is over \$23,000,000 annually. DLG provides assistance to all 120 counties in the state, 420 incorporated cities, and has 11 employees dedicated to project management, quality assurance, financial management, procurement, and internal control capacity for the State's CDBG program.

DLG will provide program oversight for the compliance of the CDBG-NDRC rules and regulations; including housing (\$42,408,788 in Neighborhood Stabilization funds) and economic

development concepts and has managed over 1,900 CDBG regular projects and \$915,227,164 through its office since 1984. DLG will enter into a grant assistance agreement with the sub-recipients that will outline their responsibilities. DLG will ensure that all information is set-up in the DRGR system for draws, monitorings and QPRs. DLG will review all environmental documents for CDBG compliance prior to the release of funds. DLG will request all funds from HUD through the DRGR system and will send the funds to the sub-recipient electronically from the State Treasurer's office. DLG will conduct on-site monitoring visits for each program area to ensure all CDBG rules and regulations are being followed and documented properly (i.e. Fair housing, environmental, labor, procurement....)

KYEM has relevant project management, quality assurance, financial and procurement, and internal control capacity to quickly launch and implement major projects. Through its Recovery Branch, KYEM houses the management of the Public Assistance (PA) Program, the Individuals and Households Assistance (IA) Program, the Hazard Mitigation Grants Program (HMGP), and the Volunteer Coordination Program. The PA, IA, and HMGP programs of the KYEM Recovery Branch manage FEMA grants dedicated to response and recovery for public infrastructure projects and emergency protective services to reduce the risk from future disasters and enhance resilience.

In order to further enhance management and technical capacity, **KDOW** will serve as the other managing partner for this endeavor. KDOW functions as a cooperating technical partner (CTP) for the FEMA Risk Mapping Assessment and Planning (Risk MAP) program and manages major components of the Clean Water Act, water and wastewater infrastructure, floodplain management, and watershed management relating to water quantity and quality.

KDOW's capacity managing programs specific to water-related infrastructure and risk provide a competent technical and regulatory based partner to this effort.

The Resilience Seed Program (RSP) will be modeled off the existing Kentucky Division of Water (KDOW) 319(h) watershed planning process which has been established in coordination with USEPA since 1999. The framework for the 319h watershed planning process provides valuable insight into holistic solutions that will enhance community and individual resilience to shocks and stresses. The RSP will be administered and managed by KDOW; the Kentucky Department for Local Government (DLG) will manage the financial obligations with HUD. A Memorandum of Agreement (MOA) will be established between KDOW and DLG to effectively manage the overall Seed Grant Program.

The two Target Areas for Regrow Kentucky include sub areas within Jefferson and Bell Counties, Louisville Metro and the City of Middlesboro.

Louisville

The Louisville project, the Morris Forman Sewershed Project, will be administered by DLG and the following partners will manage the associated activities, Louisville and Jefferson County Metropolitan Sewer District (MSD), Louisville Metro Office of Sustainability, YouthBuild Louisville, Louisville Metro EMA/METROSAFE (EMA), Louisville Metro Housing Authority (LHA), Louisville Metro Parks, Partnership for a Green City, and Jefferson County Public Schools (JCPS). The following table displays the management breakdown of the various project activities.

Morris Forman Sewershed Project	
Activity	Management
Tree Planting	Office of Sustainability
Youth Build	Youth Build
Code Red	EMA
Parkway Place - Green Project	LHA
Liberty Green - Green Project	LHA
Starkey FPS Redundancy	MSD
Delaware Drive Buyout,pilot green in-lieu fee	MSD
Pinch Point Study on Middle/South Fork of Beargrass Creek	MSD
Beargrass Creek Trail, I-64 landscaping	Metro parks
Beargrass Falls Water & Sustainability Education	Partnership for a Green City
Beargrass Falls Formal Education Program in Urban	Partnership for a Green City
Beargrass FPS Education	MSD
GI CSO15- Wyanotte Park	MSD
GI CSO15- Iroquois Homes	MSD
MFWQTC - additional Final Effluent PS generators	MSD
MFWQTC - Biotower Improvements	MSD
MFWQTC - Drying System Upgrades	MSD
MFWQTC - Clarifier Upgrades	MSD
Iroquois HS, green roof 300 K and/or storage	JCPS

MSD is a non-profit regional utility service formed 70 years ago to operate and maintain Louisville's sanitary, storm, and waste water systems. MSD provides wastewater collection and treatment; stormwater and drainage management and flood protection to Louisville Metro and Jefferson County. This includes the operation and maintenance of over 3,200 miles of sanitary sewer; 11 wastewater treatment plants; 376 square miles of stormwater and drainage system; 29 miles miles of floodwall and levee and 16 flood pumping stations.

MSD has a long history of administering grants programs. Currently, almost 200 floodprone properties have been purchased as part of a grant buyout programs through FEMA and HUD. These properties are located throughout the Louisville-Jefferson County area. Since Louisville's 2009 flash flood event, Louisville has been approved for over \$25 million for voluntary buyouts of floodprone structures.

MSD continues to apply for new grant opportunities as they become available. In 2015, after significant local flooding, MSD applied for an additional \$22 million through FEMA's HMGP and PDM programs for voluntary buyouts of 125 floodprone homes, some of which have flooded as many as five times in the last 20 years.

The most recent example of a large grant project is the Maple Street buyout. The project was spurred by the 2009 flash flood. On August 4, 2009 record-breaking heavy rains fell on the Louisville Metropolitan area causing widespread flash flooding. Rainfall intensities as high as 8.5-inches per hour and rainfall totals up to 7.5 inches were recorded in 75 minutes, which overwhelmed many portions of the MSD drainage system. One of the most severe areas of flooding occurred in the flood-prone, low lying area along Maple Street between 21st and 26th Streets. This area has historically experienced localized flooding including another recent storm event on June 26, 2009, which caused flood damage to several homes and automobiles along

Maple Street and the surrounding area. Emergency boat rescues have been necessary during the most severe events to remove residents from harm.

Through FEMA's Hazard Mitigation Grant Program, nearly \$10 million was approved for the acquisition of 128 homes in a 15-acre, high risk flood area in western Louisville. MSD applied for the funding in early 2010 in an effort to remove homes repeatedly flooded by surface water. To date, 97 of the 128 homes have been purchased and demolished and seven additional homes are scheduled for closing.

The organizational chart for Louisville MSD identifies all key management and staff positions for the management of the NDRC funds. The MSD activities, Starkey FPS Redundancy, Delaware Drive buyout, Study on Middle/South Fork of Beargrass Creek, Beargrass FPS Education, Green Infrastructure Project at Wyandotte Park, Green Infrastructure Project at Iroquois Homes, Morris Forman Water Quality Treatment Center (MFWQTC) Effluent Generators, MFWQTC Biotower Improvements, MFWQTC Drying System Upgrades, and MFWQTC Clarifier Upgrades will be managed by the Engineering Division at MSD, which consists of 96 budgeted positions. Each project will have a project manager assigned within the Engineering Division, as shown on the organizational chart. The project manager will be responsible for contract administration, technical assistance, and project reporting. No new positions will be created, however a consultant will be used as needed to assist with grant management. MSD is a non-profit regional utility service formed 70 years ago to operate and maintain Louisville's sanitary, storm, and waste water systems. MSD provides wastewater collection and treatment; stormwater and drainage management and flood protection to Louisville Metro and Jefferson County. This includes the operation and maintenance of over

3,200 miles of sanitary sewer; 11 wastewater treatment plants; 376 square miles of stormwater and drainage system; 29 miles miles of floodwall and levee and 16 flood pumping stations.

Louisville Metro Office of Sustainability was formed to promote environmental conservation, health, wellness, and prosperity of citizens through education and awareness efforts. The Office of Sustainability is managed by a director and project coordinator and partners often with such organizations as the Air Pollution Control District, Kentuckiana Air Education, Louisville Energy Alliance, MSD, and Partnership for a Green City. With their partners, the Office of Sustainability is currently managing several sustainability initiatives. To help Louisville increase its canopy coverage, the Sustainability partnered on an urban tree canopy assessment to determine the current land cover for Jefferson County. This analysis makes it possible to identify the areas available to plant trees. Further analysis to identify the most suitable locations was also conducted. Each planting location was assigned a priority ranking for three issues; environmental need, urban heat island, and stormwater. A composite ranking was also derived based on the overall ranking of the three subcategories listed. Involvement in this study corresponds with the Tree Planting Activity to be managed by the Sustainability Office.

YouthBuild Louisville (YBL) is a non-profit organization which provides young adults with opportunities for success through job skills training, education and work experience with an emphasis on land conservation, watershed studies, horticultural stewardship, and service projects that benefit the surrounding community. YBL Environmental Education Conservation Corps Program is an environmental education work program that engages young adults in meaningful projects while building workforce skills that will prepare them for well-paying jobs in the green job sector. YBL has approximately 16 members on the Board of Directors and 12 management staff members who coordinate such services as project management, data management,

education, community engagement, and construction. YBL simultaneously manages such projects and programs as alternative school, job training, community service, leadership development, youth development, Long-term mini community, and community development. YBL will manage the proposed YBL Environmental Education Conservation Corps Program (EECC). This program will build upon the Roots of Success, a previously established program. Since 2010, 81.7% of program graduates have left the program career-ready and placed in jobs and/or college. One full-time staff member and one full-time AmeriCorps volunteer will manage the day to day operations of the EECC beginning in Spring 2016. They will be supported by the established infrastructure at YBL. The planned class size is 10 students. The curriculum is already established and previous experience with the Roots of Success Program can be leveraged. The Projects Manager will manage the grant and the program.

Louisville Metro Emergency Management Agency(EMA)/MetroSafe is an organization that serves Louisville/Jefferson County's public safety interest by providing a proactive approach to disaster management and providing efficient and effective centralized emergency communications. The primary role of this agency is to assist in coordination of multi-agency responses and serve as the point of contact when additional resources are requested from the state. In fulfilling this role, agency personnel help maintain the Emergency Operations Center (EOC) and regularly update the Emergency Operations Plan. In the event of an emergency, Emergency Support Functions have specific roles and responsibilities outlined in the Emergency Operations Plan. The Emergency Operations Center is the coordination hub during a disaster. Emergency Support Function personnel come to the Emergency Operations Center to coordinate the response, monitor the disaster and collect data about the emergency for State or Federal reporting purposes. The emergency management function of EMA/MetroSafe is mandated

through KRS chapter 39B.010 to serve the public safety interest of a local government within the territorial boundaries of a county. Louisville Jefferson County's Emergency Management Agency is directed to implement and maintain a local comprehensive emergency management program, including the development and maintenance of a local emergency operations plan. The EMA is managed by the Emergency Services Director, Debbie Fox. Within the last few years EMA has secured grant funding from FEMA, FEMA Port Security, KOHS, as well as Federal and State funding. In 2014, EMA Managed over \$2 million in grant funds to support strategic planning goals of the agency. Of these projects included installation and planning of outdoor warning sirens and an auto emergency alert system. Also EMA has managed MetroCall for the last 25 years, the oldest 311 call center in the country. These projects are very similar the Code Red activity which EMA will manage if awarded NDRC funding.

Louisville Metro Housing Authority (LMHA) is a non-profit agency responsible for the development and management of federally subsidized housing in the Louisville Metro area. The LMHA presently manages over 4,000 units with occupancy determined primarily by federal income guidelines. LMHA has four family housing communities and five housing communities for accessible and senior citizens, and a growing number of scattered site housing. Over 7,000 of the Louisville Metro's residents reside in public or subsidized housing. Funding for the agency's operation comes from residents' rents and annual operating subsidy from the U.S. Department of Housing and Urban Development (HUD). The agency also receives Capital Improvement funds on an annual basis from HUD. Periodically, the agency also applies for funds from HUD and the City's Community Development Block Grant (CDBG) program to finance various modernization improvements. The 2015 operating budget for LMHA is over \$36 million and there are

approximately 335 employees. LMHA will manage the Parkway Place – Louisville Housing Authority Green Activity and the Liberty Green – Louisville Housing Authority Green Activity.

Louisville Metro Parks is responsible for care of all park properties, creates new parks, provides safe and diverse recreational programs, and protects public lands and resources for future generations. The agency is administered by Director Seve Ghose, and divided into Operations, Park Resources, Community Centers & Athletics, Recreation Programs, Planning & Design, Historic Properties, Community Relations, Personnel divisions. The Beargrass Creek Trail and Landscaping Activity will be managed by Park Resources, Community Centers & Athletics, Planning & Design, and Personnel divisions. The Park Resources division manages natural resources, forestry and capital improvement projects. The Community Centers & Athletics division provides a wide variety of neighborhood-based recreation services, in support of the Mayor's Healthy Hometown Movement. The Planning & Design division develops plans to improve the parks and their facilities, with an emphasis on the Mayor's City of Parks initiative. The Personnel division ensures compliance with policies and procedures, and processes payroll.

The **Partnership for a Green City** represents a collaborative effort to improve sustainability internally and in the community by four of Louisville's largest public entities: Louisville Metro Government, University of Louisville, the Jefferson County Public Schools and Jefferson Community & Technical College. Through the coordination of efforts and cooperation, the Partnership has been able to realize real results that will have long-term impact on the health, education, and well-being of our citizens while improving and institutionalizing environmental practices within the organizations themselves. Over 150 employees participate on Partnership teams, which consult with external individuals or organizations to receive additional assistance.

The partnership for a Green City will manage the Beargrass Falls Water & Sustainability Education Activity

Jefferson County Public Schools (JCPS) seeks to create and sustain quality school districts for the Louisville community. To best serve the students and community, the Jefferson County Board of Education and the Superintendent work as a leadership team in complementary roles of policy governance and district management. JCPS has participated in numerous building renovations and new construction. JCPS will manage the Iroquois HS Green Roof activity.

Middlesboro

The Commonwealth and various State agencies have long established relationships with the City of Middlesboro and local partners. The City of Middlesboro will be one of the Kentucky communities that will directly benefit from the NRDC grant award. Together with the City of Middlesboro, partnering organizations will contribute to the successful project management and implementation of the Community Wellness Project and the Flood Risk Reduction Project. These managing and leverage partners will include The City of Middlesboro, the Southeast Kentucky Community and Technical College (SKCTC), Appalachian Regional Healthcare (ARH), and Discover Downtown Middlesboro (DDM), Inc. Local community partners which will be involved with the Middlesboro NDRC projects include community groups, the Artisan Incubator and Middlesboro Garden Club; business agencies, the Chamber of Commerce and Lincoln Memorial University (LMU); and Federal agencies, such as the US Army Corps of Engineers (USACE) and the National Park Service. Together, these partners provide a pathway for citizen involvement, an advisory role, and offer technical guidance for the implementation of Middlesboro's projects.

The **City of Middlesboro** is governed by the Mayor and the City Council who together operate and maintain the City's services to residents. The City staff is broken up into an Executive, Finance, Legal, Stormwater Management, Parks and Recreation, and Community Development/Planning Departments. The internal staffs within these departments manage the day to day activities and combined with consultant support are capable of managing the proposed NDRC projects. The City also has established relationships with various consultants both local and national that are an extension of the City's capacity to manage projects. The following table displays the management breakdown of the various project activities.

Project	Activity	Management
Flood Risk Reduction	Yellow Creek Canal Restoration	City via consultant & DDM
Flood Risk Reduction	Little Yellow Creek Stream Restoration	City via consultant
Flood Risk Reduction	Yellow and Little Yellow Creek Flood Study	City via consultant
Flood Risk Reduction	Downtown Floodproofing	City via consultant
Community Wellness	Hospital Site Development	ARH & City via consultant
Community Wellness	Medical Education Center	SKCTC
Community Wellness	Expanded City Trail/Greenways Network	City via consultant & DDM
Community Wellness	Farmers Market and Parking Lot Renovation	DDM

The City of Middlesboro frequently has contracted the services of Vaughn & Melton Consulting Engineers, Inc.(V&M), and is described in this application as an extension to the capacity of the City. V&M is located within Middlesboro and a full service consulting firm with experience in project management of infrastructure projects and grant projects, from planning through construction. V&M has various offices throughout the Appalachians and experience in

working with Middlesboro on projects. For example, V&M worked with the City and partner, DDM, on the Canal Walk Rehabilitation project in 2015, which was funded by a \$100,000 Recreational Trails Program grant from the Federal Highway Administration (FHA) and local funds. Also V&M worked with the City on the Middlesboro Channel Repair in 2014, funded by the USACE, to collect construction and as-built survey data for USACE maintenance. Within the region as well as Bell County V&M has completed bridge replacement, waterline extension, industrial park construction, sewer overflow reduction, walking trails, and wetland maintenance projects. A more detailed list of these projects, costs, and partners is provided in Attachment A. V&M understands the unique challenges and expectations of Kentucky regulators and the Middlesboro community. They have worked with the Middlesboro community for over 20 years. V&M is invested in the community and has local staff that can aid the City of Middlesboro with project management and administration. These staff include John Schneider, PLS, Jamie Noe, PE, Clint Goodin, PE, and Mitch Brunsmas, PE who have technical capabilities in grant administration, planning, site development, feasibility and value engineering, construction management, etc. and have worked with the City of Middlesboro for over 30 years. It is anticipated that the City of Middlesboro will administer grant funding from the State to implement the Flood Risk Reduction Project and these activities will be managed by V&M. The City of Middlesboro with the assistance of V&M, DDM, and KCTS will manage the activities within the Community Wellness Project.

Discover Downtown Middlesboro, Inc. (DDM) works closely with the City of Middlesboro to plan, manage, and implement projects. DDM will be one of the managing partners for activities within the Community Wellness Project, the Expanded City Trail/Greenways Network and Downtown Farmers Market and Parking Lot Renovation, and the Flood Risk Reduction

Project, the Yellow Creek Canal Restoration. DDM is a non-profit organization that encourages citizen participation in the revitalization of downtown Middlesboro, working to improve the physical appearance of downtown while preserving historic integrity, engaging and attracting downtown businesses, and increasing downtown interaction in hopes of making downtown Middlesboro the center of economic, civic, and social life of the region.

DDM is led by an executive director, executive committee, and board of directors with 3.5 full time staff that conducts day to day activities. DDM has direct experience in managing grant funds and projects. Executive director, Isaac Kremer, has secured and administered over \$2 million dollars in grant funding from public and private sectors within his 30 year tenure in non-profit organizations. In the previous 3 years, DDM has received \$337,750 in grant funds from various private and public agencies such as the National Trust for Historic Preservation, Kentucky Department of Local Government, Appalachian Regional Commission for Rural Development, Kentucky Heritage Council, and New York Community Trust. DDM is successfully managing the historic preservation and revitalization of the Benevolent and Protective Order of Elks Home (<http://downtownmiddlesboro.org/elks.com>) which is a downtown historic building and EPA Brownfield Site through securing funding and managing various consultants for the completion of environmental assessments and structural evaluations.

DDM and the City of Middlesboro work hand in hand to increase citizen involvement and awareness throughout the City. DDM is a grassroots organization with deep ties in the local community. DDM issues regular newsletters to over 3,000 community members. 56.7% of Middlesboro population is categorized as low to moderate income and in the Promise Zone. DDM organizes the Better Block Middlesboro program, The Palace, and Tri-State Messiah Sing Along, all events that focus on citizen support of local artisans, crafts, music, and local

attractions that create a sense of community belonging and establish community social resilience. DDM secured grant funding of \$135,000 to establish the “Selling to the World” program in conjunction with Southeast Kentucky Community and Technical College to provide business training to local citizens and business owners. DDM works collaboratively with the City of Middlesboro on downtown planning, downtown revitalization, and trail planning. DDM will continue to work with the City and consultants to efficiently plan, manage, and implement various activities in the Community Wellness Project and Flood Risk Reduction Project including the yellow Creek Canal Restoration, Expanded city Trail/Greenways Network. And The Farmers Market and Parking Lot Renovation.

ARH is a not-for-profit health system serving 350,000 residents across Eastern Kentucky and Southern West Virginia. Operating 10 hospitals, multi-specialty physician practices, home health agencies, HomeCare Stores and retail pharmacies, ARH is the largest provider of care and single largest employer in southeastern Kentucky and the third largest private employer in southern West Virginia.

The ARH system employs nearly 5,000 people and has a network of more than 600 active and courtesy medical staff members representing various specialties. Firmly committed to its mission of improving the health and promoting the well-being of all people in Eastern Kentucky and Southern West Virginia, in the past 12 months alone, ARH provided nearly \$138 million in uncompensated care for the uninsured and underinsured. ARH has successfully developed hospital constructions in the past and will be a managing partner in the Hospital Site Development to be located in Middlesboro.

SKCTC is committed to providing opportunities for success. Currently there is enrollment over 5,000. Southeast is accredited by the Southern Association of Colleges and Schools and

offers over 50 classrooms and online course options through each of five campuses in Cumberland, Harlan, Middlesboro, Pineville and Whitesburg. SKCTC offers academic transfer programs, Associate of Arts and Associate of Science Degrees that transfer easily to four-year institutions. SKCTC is managed by a president in conjunction with a Board of Directors and a President's Cabinet. The proposed Medical Education Center activity would be managed by the Academic Affairs Office.

DRAFT

Exhibit D Need

Commonwealth of Kentucky

ExhibitDNeed.pdf

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Need

Specific Unmet Recovery Needs (URN) and Target Geography were established in Exhibit B. Louisville projects and activities will take place throughout the Morris Forman sewershed. While the projects and activities have specific locations and local benefit, they also improve performance and resilience of the Morris Forman sewershed. Similarly, the projects and activities in Middlesboro will have an impact beyond their physical locations. The RSP program and CHAMPS project benefit entire counties and will eventually serve as models for the rest of the Commonwealth.

Middlesboro

The four census tracts that comprise Middlesboro make up the sub county target area for this application. They are Tracts 21013960500, 21013960600, 21013960700, and 21013960800. The area Most Impacted because it had 324 housing units damaged in DR 4008 and 154 housing units had serious damage. Additionally the area meets the Most Distressed characteristics Bell County is part of the Kentucky Highlands Promise Zone additionally 56.7% of the population in the sub county area are in low and moderate-income households as well as having two brownfields located in the floodplain in the impacted area. In the Bell County sub county area we identified 7 properties that have unmet recovery needs based on them being Severe Repetitive Loss (SRL) and Repetitive Loss (RL) properties located in the floodplain that were damaged during DR 4008 but were not built back in a resilient manner.

Located in the narrow passage between the Cumberland Mountains and the Appalachian Mountains, the city was established in 1890 in what geologists believe is a meteor crater, the Middlesboro Basin, along Yellow Creek, which flows north and east into the Cumberland River. Yellow Creek is historically known for flooding and in 1938, the Army Corps of Engineers began construction of the Middlesboro, KY Flood Control Project that diverted the headwaters of Yellow Creek around the city of Middlesboro. Three levee systems and a bypass channel were constructed to protect Middlesboro from the flash flooding that occurred frequently along Yellow Creek. The levee system was designed to control the 75-year flood event, which does not currently meet the Code of Federal Regulations standards. Although the construction of the levee system provided some relief to the city, flooding continues to occur and in 2011, a federal disaster declaration was issued for Bell County and Middlesboro.

During the 2011 event, significant flooding took place in areas outside of the protection of the levee system, impacting 390 businesses and homes. Residents were displaced due to flooding and damages were substantial to 478 homes. Since the 2011 event, a significant number of property owners have yet to re-open their businesses or rebuild their homes because of the high cost of flood insurance for their at-risk properties. This in turn has led to a decrease in economic business along the flood-prone areas of the historic downtown Middlesboro.

The majority of the residents and business owners within Middlesboro are within the 100 year floodplain. Not only are these established 1% chance flood plains a concern, but many other properties along the Yellow Creek Bypass suffer from flooding due to surcharged drainage systems and backwater because of hydraulic constrictions along the channel. Because of the repetitive nature of these flooding events, it is difficult for citizens to get back on their feet after an event. Flooding effects the economy of the city because citizens are unable to reopen

businesses in the floodplain, afford flood insurance, and repair unsightly property damage from flooding.

Not only have flood events affected Middlesboro economic status, but the decline of the coal industry has begun to take a toll on Middlesboro economy and its people. Historically, Middlesboro's economy has been dependent on coal mining which is declining and producing an insufficient number of high-quality and well-paying jobs. Over 500 jobs have been lost in the previous 20 years. People in Middlesboro don't want to stay in Middlesboro and don't feel like their kids have all the well-deserved opportunities that other kids do elsewhere. Because of this fact, Middlesboro is currently experiencing emigration, with a population loss of 4,200 in the previous 20 years. People need to work and they need to work quality jobs that provide them a decent income to provide for their families and establish a home in Middlesboro. Middlesboro has a hard time bringing in higher paying jobs, partially because only 5% of Bell County residents over the age of 25 have a college degree, compared to 13% of Kentuckians (2013 5yrs ACS).

Middlesboro ranks in the top 10% in the Country for low to moderate income families. 34% of the County's population lives in poverty compared to a statewide rate of 19% (2013 5yrs ACS). Poverty stricken families seek the help of the government when there is little other option, which has led to more than a quarter of residents living in (government subsidized housing) HUD housing. A declining tax base from the loss of coal industries and residents who simply cannot afford to pay taxes, negatively impacts the services that Middlesboro and Bell County are able to provide for their residents, which in turn effects their standard of living.

The continued increase in the unemployed and decline in available and well-paying jobs in Middlesboro creates frustration and depression among the citizens, negatively impacting all

aspects of their lives. Drug abuse is high with Middlesboro ranked in the top 10% in the nation for drug related deaths; a statistic that no community wants to be known for. Another issue showing need for community health related activities is that 27% of Bell County residents report a disability, compared to only 17% statewide.

Louisville

In Louisville Kentucky is proposing one project, the Morris Forman project. About 80% of all wastewater generated in Louisville Metro flows to the Morris Forman gravity sewers and the sewershed houses over 500,000 people. When any part of the system fails, flooding and contamination have the potential to impact hundreds of thousands of people. When the Morris Forman Water Quality Treatment Center (MFWQTC) fails, staggering amounts of raw, untreated sewage escapes into the Ohio River, one of our nation's most important waterways and the source of drinking water for millions of Americans.

Disaster 1976 was a flood event that caused significant damage to several different pieces of the wastewater collection system feeding the MFWQTC to fail, and damaged over 150 homes. The Starkey and Beargrass flood pumping stations serve the bottom of the Beargrass Creek watershed and one of the most densely populated areas of the city. During the disaster they could not handle to volume of stormwater. The back-up of stormwater allowed an excessive amount of water to enter the sewer system, caused combined sewer overflows into the Beargrass Creek and Ohio River. In the Delaware Drive area the Beargrass Creek floods homes in non-flood events. Homes are built in the floodway, and the creek bed no longer performs its natural functions.

The Louisville/Jefferson County sub county area is at a heightened environmental risk, as there are 31 brownfields in the Most Impacted and Most Distressed target area in Louisville/Jefferson County. Additionally Louisville is an economically and socially segregated city, so while parts of the city are very well off, 59 of the 159 tracts in the census place have an unemployment rate over 125% of the 2009-2011 ACS national average. 62 of the 159 tracts have over 50% of the population with low and moderate income, and 36 of the 159 have an affordable housing shortage.

Using 2010 Census Geography, Census Place 2148006, Louisville/Jefferson County metro government (balance) we identified 65 properties with an unmet need resulting from DR 1976 in the impacted and distressed target area many of them have suffered more than 5 losses since 2000 and a couple have even had 9 losses since 2000. Louisville/Jefferson County qualified as Most Impacted due to DR 1976 damaging 131 homes and severely damaging 22 homes pushing Louisville over the threshold for serious damage as well as minor damage to a substantial number of properties.

Magoffin County

Magoffin County, KY contains our third sub county area with an identified unmet recovery need. In Magoffin County Census Tract 21153970200 makes up the sub county area. This area is Most Impacted because it had 330 housing units damaged in DR 4057 and 96 of those units had serious damage. Additionally the area is Most Distressed because according to 2013 5 year ACS data the selected census tract has an unemployment rate of 14.1% which is greater than 125% of the national average of 9.7% for that same time period. In the Magoffin County sub county area 2 properties have been identified as having unmet recovery needs. These properties

are unmitigated FEMA repetitive loss properties that were not built back in a more resilient manor.

Johnson County

Johnson County contains the fourth sub county area with identified unmet recovery needs. The area in Johnson County consists of three contiguous Census Tracts, Tract 21115960400, 21115960300, and 21115960600. The area is Most Impacted because in disaster 4057, 117 housing units were damaged, with 33 housing units receiving serious damage. The area is Most Distressed due to the presence of two EPA identified brownfields. The area has one property that has been identified as having an unmet need. This property is a FEMA RL property that had damages because of DR 4057 that was repaired in a way that did not prevent future damages as proven by the most recent damage to this building occurring in 2014.

Morgan County

Morgan County contains the fifth sub county area with an identified unmet recovery need. In Morgan County, Census Tracts 21175950100, 21175950300, and 21175950400 make up the sub county area. This area is Most Impacted because 351 housing units were damaged in DR 4057 and 165 of those incurred serious damage. According to the 2013 5 year ACS data the selected census tracts had a combined unemployment rate of 12.9% which is greater than 12.125% which is 125% of the national average of 9.7% for that same time period, making the area Most Distressed. Within the Morgan County sub county area, two properties have been identified as having unmet recovery needs (Exhibit B Supporting Documentation: Windshield

Survey Results). Neither property was repaired to its pre-existing condition or repaired more resiliently.

Resilience Needs Within Recovery Needs

The disasters of 2011-2013 exposed several challenges facing Kentucky's communities, particularly in the five counties included in this application. In Louisville, the sewer system, specifically the Morris Forman sewershed, incurred damage and did not have sufficient capacity, resulting in un-quantified environmental damages, in addition to the damage to homes described above.

For Louisville, a resilient recovery means restoring the Beargrass Creek to a more natural state and adding infrastructure (green and gray) so the watershed is better able to absorb stormwater and take pressure off the sewer system. Combining these efforts with upgrades to the system itself and educating residents about stormwater and flooding will help the City avoid further damage to structures and reduce environmental degradation.

In Middlesboro, flooding inflicted further harm on the city's already struggling economy. Many businesses did not reopen, because the flood finally pushed them over the edge and families who cannot afford to pay to fix flood damages were flooded again. The story is similar in Magoffin, Morgan, and Johnson Counties, where struggling economies and impoverished families were hit with tornados and severe storms. In the case of Morgan County, nearly the entire central business district of West Liberty was destroyed. All four mountain counties were suffering from economic and population decline and the disasters exacerbated their problems.

For the mountain counties, a resilient recovery means mitigating against floods and severe storms while investing in economic and community development so when those hazards occur in the future, not only are the physically better prepared, the residents have the financial capacity and , more importantly the desire to remain in the community.

Appropriate Approaches

Addressing the vulnerability to flooding, severe storms, and tornadoes will help Kentucky protect its recovery. Recovery is in continual jeopardy of repeat damages especially due to flooding which tends to affect the same areas within a community repeatedly. Each flood threatens to push businesses out of business or the area and residents towards bankruptcy, unable to sell their flood prone homes and unable to afford the continued cost of recovery. These events also place continual stress on the people of Kentucky and the emergency management and public health infrastructure, which is tasked with responding each time an event occurs.

In Kentucky flooding impacts any population group that lives near a river, however, the effect of flooding has a disproportionate effect on the poor. While flood insurance is available in KY it can be very costly so obtaining flood insurance places a higher price burden on the poor if they are able to afford it. Additionally, when flooding does occur the poor are less able to absorb the costs associated with a flood event, the deductible bears a higher burden on the poor if they are properly insured, if not then their burden is even higher as their losses are not covered. Additionally they are less likely to be able to afford to mitigate their risks to flooding.

All disasters have a depressing effect on local economies, especially when floods and tornados destroy or severely damage central business districts, as was the case in Morgan and

Bell Counties. Economic development, education, and wellness related programs help to strengthen local economies and residents attachment to their community.

Kentucky's approach must also address the environmental concerns of flooding brownfields, combined-sewer overflows, and sewage treatment system failures. Upgrades to traditional sewer infrastructure cannot eliminate these concerns alone. Restoring natural systems and installing green infrastructure reduce the impact on the sewer system during storm and flood event. They also offer economic revitalization benefits like increasing property values, encouraging private investment, and adding tourism business.

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Exhibit E Soundness of Approach

Commonwealth of Kentucky

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Soundness of Approach

The NDRC application has engaged the Commonwealth and partners for over a long process. Building and enhancing partnerships are crucial in developing resilient based projects and programs and those partnerships need to be diversified in skill sets and approach. A resilience based project needs to be well rounded and address recovery and future needs, while achieving multiple benefits. It is important to understand the community's vulnerabilities and community development objectives, and to consider these holistically when developing resilience based projects. One of the major steps the Commonwealth has learned from this process is to make sure the projects being selected are increasing the overall resilience of the entire area/region and not just solving one problem, as sometimes mitigation projects have done in the past. Many of the topics discussed above have been taking place in the Commonwealth for years but through this process we have learned an enhanced way of reviewing ideas for soundness of approach and selecting projects that will truly increase the overall resilience of communities across the Commonwealth, currently as well as in the future.

As discussed in the Phase 1 and Phase 2 application the Team will build upon the successes that the Commonwealth has achieved over the years along with enhancing and expanding upon those efforts through what has been learned through this process and the available NDRC funding to build the Regrow Kentucky program. Kentucky has demonstrated capabilities to maximize this opportunity for the Commonwealth and HUD. The Commonwealth will sponsor and cultivate a statewide resilience program that helps communities identify their most impacted and distressed areas as well as categorize and implement projects that mitigate unmet needs that tie back to disasters. This will be created through understanding each

community's individual needs and vulnerabilities in creating a 'Path to Resilience' for each community in the Commonwealth.

The Team has laid out a 4 phased approach to allow the Commonwealth to test and replicate the program idea for building community paths to resilience. With an existing tool like CHAMPS, which can be used as a collaboration point for information and data created through this process, it was very important to the Commonwealth to build a program that can be sustainable beyond this grant and help stimulate a culture of resilience.

The Regrow Kentucky program will be achieved through 4 Regrow Phases that will lead the Commonwealth toward creating 'Paths to Resilience' for multiple communities across the State. The following Regrow Phases were used when selecting the communities and projects for the NDRC application. The Commonwealth will continue to expand these phases as the program matures as described.

Regrow Phase 1: Assess and identify pilot communities, develop framework and develop educational information.

Regrow Phase 2: Develop project selection criteria and financing program.

Regrow Phase 3: Select and manage project implementation; continue education.

Regrow Phase 4: Evaluate and measure program outcomes; develop best practices.

Regrow Phase 1: During the Phase 1 application process the Commonwealth was guided through identifying communities that had unmet recovery needs and were affected by a qualifying disaster. The locations that were identified as meeting threshold were areas located within the counties of Louisville/Jefferson, Magoffin, Morgan, Johnson, and Bell which provided a variety of shocks/stresses and diverse populations/economies to implement the program. After further discussion and review of the communities the Team decided to identify

two diverse locations in order to provide the Commonwealth with two distinct test beds; one being Urban and the other being Rural. The Team chose these two locations based on the different environments (both physical and political) along with a common hazard (flooding) in order to provide lessons learned to be used across the entire state in other urban and rural locations.

In order to tie the projects together in a cohesive system approach, these pilot communities will be used as a test ground for the development of new modules and templates within CHAMPS. The projects that have been selected within each community will be managed in the system and thus templates will be built for the community to use, but once those templates are built within CHAMPS for one community they can be used for the entire Commonwealth. This provides a link to expanding the lessons learned within our pilot communities to a broader network such as the entire Commonwealth.

Another step of Regrow Phase 1 is to develop resilience education programs that promote the concepts of resilience and provide low to moderate income individuals with opportunities to better themselves. The Commonwealth is thrilled to promote through this application multiple opportunities that have been identified for educational projects. The Commonwealth looked at education from two different perspectives, one in the form of educating the public of the effects of hazards and resilience measures which can be seen in the Code Red enhancement and Beargrass Falls education activities in Louisville Metro. The second sets of activities included for education activities are geared toward providing education opportunities that can be used as career development. This is being achieved through the partnership created with YouthBuild in Louisville metro and the nursing school opportunity created in Middlesboro with the Kentucky Community College & Technical System (KCTCS).

In order to enhance and educate the CHAMPS system key data elements that are needed to further understand resilience will be identified and built into the system. This will include the identification of data elements needed to capture the concept of **most impacted** which in turn captures hazard vulnerability and risk. In addition, data elements will be identified to capture **most distressed** which will identify social, environmental and economic vulnerabilities (triple bottom line). In order to fully understand one's resilience, the Team will identify strategic capacities that will be used to build a baseline resilience within governance, establish beneficial partnerships between public and private sectors to enhance education opportunities and provide avenues to share experiences regionally and across the nation.

In addition to identifying key data elements and developing new modules within CHAMPS to capture them, the Team will define what resilience is for the Commonwealth, including a suite of cross-disciplinary best practices on projects developed through the NDRC. This process will involve the review of potential co-benefits and collaborations the Regrow Kentucky program can promote such as hazard mitigation planning, NFIP, Community Rating System (CRS), economic and workforce development, environmental and public health, and other resilience based programs. To build the education program, the Team and CCRR will craft educational materials in the form of written technical documentation, webinars, and videos for CHAMPS and other formats to be dispersed by our partners and the CCRR. These materials will supplement and complement previously created materials for the other existing programs promoting resilience throughout the Commonwealth.

In order to further enhance the viability and sustainability of the Regrow Kentucky program the Team will develop resilience metrics that will be used to measure a community's

resilience level. This will be achieved through the assimilation of information gathered during this Phase of the project as well as utilizing our current resilience assessment methodologies.

Regrow Phase 2: In order to select and prioritize projects and activities for Phase 2 the Team developed a ten step selection criteria. This ten step criteria was developed to ensure that the projects being selected would meet the needs of the NDRC and provide activities that would thoroughly increase resilience throughout the Commonwealth. The criteria ranking metrics was developed with the Triple Bottom Line (TBL) framework in mind; or the impact on social, environmental, and economic sustainability. The following ten criteria were used and will be used in the future by the CCRR to score the eligibility of potential projects:

	Criteria	Description
1	Economic & Community Development	Increases resiliency, economic revitalization, and/or restores infrastructure
2	Housing	Promotes equitable, affordable housing
3	Sustainability	Provides a long term impact and success, improves the environment, education, economic prosperity, infrastructure, and/or quality of life, etc.
4	Replication & Scalability	Represents a model for other communities, is applicable to benefit a larger community, integrates a holistic vision
5	Leverage	Offers additional sources of funding in addition to NDRC funds
6	Hazard Risk Reduction	Reduces the risk of potential hazards or vulnerabilities such as flooding, tornado, severe

		storms
7	Social Equity	Addresses social vulnerability
8	Environmental Enhancement	Improves waste reduction, energy consumption, water quality, water availability, and/or air quality
9	Benefit Cost	Presents feasibility, justification, and cost effectiveness
10	Regional Implications	Illustrates regional application, addresses concerns that align with other jurisdictions in the region

Another step within the Regrow Phase 2 step was to develop a Regrow Kentucky financing program to award sustainable projects to qualified sub-applicants based upon resilience assessment data captured within Regrow Phase 1. The Commonwealth has promoted the idea of the Commonwealth of Kentucky Seed Program (RSP) to extend the benefits of the funding from a couple of singular projects to a project that funds multiple applications and activities.

Regrow Phase 3: The Team and the CCRR will manage projects within the five (current) target communities and select additional projects through the RSP. The DLG and local partners will manage the implementation of the projects. The Team will develop a set of metrics that will monitor, track, and evaluate the performance of the resilience project/action through each step of the process. In order to create a sustainable project management process, the Team will enhance the CHAMPS “Projects” module with project milestones and reporting requirements. This will not only allow for this process to be replicated in other jurisdictions and regions but will also allow the CCRR and the Team to capture the long-term benefits of each project. Housing the projects in CHAMPS allows the Team to track the regional economic, environmental and social

benefits that these efforts stimulate in both the short term and long term, such as capturing losses avoided and observing economic development and housing trends.

Regrow Phase 4: The Team will evaluate the outcomes and effectiveness of the Regrow Kentucky program and measure, assess and adapt along that path. Evaluation criteria will be applied to each of the piloted communities in order to measure increased resilience on both a local and regional level.

It is the goal of the Team to create a sustainable culture of resilience through the tools and governance that are developed, establishing a program that can be replicated across other communities and be promoted as a best practice by HUD. Sustaining this effort is a key factor for the Commonwealth; three major components have been identified to achieve this goal. Using the NDRC funding opportunity, the Team will enhance an existing tool to be able to capture and measure resilience data through CHAMPS and its modules ([Exhibit E: CHAMPS Diagram](#)). Through this process, the Team intends to create a back log of unmet needs through Regrow Phases 1 and 2. This back log of resilience projects/actions will be maintained in CHAMPS and will be referenced for other resilience initiatives and programs across disciplines and regions. Finally, the creation and application of the RSP program provides a funding mechanism to promote and implement resilience across the target areas of the Commonwealth. These efforts along with our current resilience mechanisms will position our stakeholders and community members as empowered, strong, and resilient communities.

Project Name: CHAMPS Resilience Enhancements

Project Description: CHAMPS, was initiated in 2009 to meet the needs outlined by the Commonwealth and house community disaster management data in a single source available to the public. This tool has the capability to store points of contact for agencies providing aid,

inventory key infrastructure, record events and losses, house plans and assessments, and provide information to calculate benefit cost analysis to seek funding opportunities. Prior to a disaster, outreach with communities is performed to inventory needs, assets, support infrastructure, and resources; captured in the community profile module. Following a disaster, or smaller emergency incident, condition assessment of affected infrastructure is gathered from communities and compiled in the tool. Criteria can be applied to community needs to prioritize potential mitigation/resilience projects. This tool also tracks initiated projects and completed projects which has been used to examine mitigation successes and gather best practices to apply to other regions. To make the tool more accessible a large outreach and training program was conducted through in person trainings, posted videos, and tutorial documents available on the KYEM website. The Team plans to continue to perform outreach and enhance this tool and will utilize it to select mitigation/resilience projects for implementation when funding becomes available.

NDRC funds would be used to support this system and design new specific resilience based tools. This will include enhancing the Community Profile Dashboard function to display community-specific resilience data elements (Hazards, Socio-Economic etc.) for each community in a mapped geo-spatial dashboard format. With this information, each community can track progress towards becoming a Smart Resilient Community employing best practices of situational awareness, risk identification and understanding, hazard mitigation, economic resilience and others). New functionality and governance will be developed to capture key resilience measures and opportunities based on data inventories that will help capture most impacted and distressed while also considering future opportunities beyond the purpose of the NDRC.

1. Enhancing CHAMPS with new resilience based templates capturing specifics on risks and more importantly socio-economic variables, will allow other communities not just our target areas to track and measure credible evidence of social vulnerability. Being able to identify the vulnerable populations properly will allow the Commonwealth to decrease the risk to these populations.
2. Resiliency Value – This project will reduce the expected property damages based on the fact that new information will be captured on key pieces of infrastructure and therefore will be managed more efficiently. Also, identifying key data elements will allow communities to overlay this data onto hazard data to identify which key pieces of infrastructure are located in high hazard zones which could need mitigation.

Environmental Value – The CHAMPS system can be used to develop assessments that can track climate change indicators in order to help measure the effects on the environment, such more frequent rain events and the intensities of the events based on loss information.

Social Value – Through the identification of socially vulnerable populations social indicators can be captured on how well these areas are performing.

Economic Revitalization – Through identifying at-risk areas through the CHAMPS modules this will allow the communities to identify key areas of need for mitigation which would benefit these areas and make them more viable for future development.

3. The CHAMPS system addresses the unmet need by allowing the tracking of Repetitive Loss properties within the system and by providing data to enhance future flood risk assessments. The project meets a national objective because this activity will serve all of our target areas.

4. The enhancement of CHAMPS will allow communities to measure and track resilience levels with new data tools. This will provide communities an opportunity to create a base line for resilience and measure the increases.
5. Completing new templates and modules within CHAMPS for one community can then be replicated in all of the other communities using the system. The project can be scaled by how much money is provided for the project and which templates and modules can be built.
6. Benefit Cost Analysis – See Attachment F
7. Program Schedule – 24 Months
8. Budget - \$500,000 total cost, \$400,000 total request from HUD

Project Name: Resilience Seed Program (RSP)

Project Description: Through stakeholder engagement, the Commonwealth of Kentucky has identified significant needs within communities to better understand the dynamics of shocks and stresses and their impacts on the well-being of communities and individuals. In response to this need, the RSP will be developed to help communities better understand and develop potential solutions to their shocks and stresses. The RSP will be used to support “first pass” resilience needs through planning, engineering, design and alternatives analyses in communities or watersheds across the Commonwealth. Based on these efforts, the ultimate goal for RSP projects is the attainment of additional dollars from federal, state, local or private sources for project implementation. The RSP will be modeled off the existing Kentucky Division of Water (KDOW) 319(h) watershed planning process which has been established in coordination with USEPA since 1999. The framework for the 319h watershed planning process provides valuable insight into holistic solutions that will enhance community and individual resilience to shocks

and stresses. The RSP will be administered and managed by KDOW; the Kentucky Department for Local Government (DLG) will manage the financial obligations with HUD. A Memorandum of Agreement (MOA) will be established between KDOW and DLG to effectively manage the overall Seed Grant Program.

A subcommittee of the Commonwealth Council for Community Recovery and Resilience (CCRR) will be formed and consist of the project team managing the RSP. As such, the CCRR will have oversight of the RSP with recommendations for project selection provided by the project team. The project team will consist of eight (8) members: six (6) KDOW staff members with experience in the 319(h) watershed planning process, financial and grant management, natural hazards management, and the KDOW Director’s Office and a representative from DLG and Kentucky Division of Emergency Management (KYEM).

The RSP program will be administered for state fiscal years 2017-2019 with an annual budget of \$750,000. Individual RSP awards will range from \$50,000 - \$100,000 per applicant. The Commonwealth anticipates awarding 10-12 grants per year. Any funding remaining from previous fiscal years will be carried over to the following fiscal year until all funds (\$2,250,000) are awarded. Potential benefits have been quantified in the table below with some assumptions being made for future grant awards based off RSP applications.

Fiscal Year	Budget	Number of Community Grants Awarded	Anticipated Grants Awarded based on development of RSP applications (20% grant award rate; \$500,000 per grant)	Benefit/Cost Ratio
2017	\$750,000	10	\$1,000,000	1.3
2018	\$750,000	10	\$1,000,000	1.3
2019	\$750,000	10	\$1,000,000	1.3
Totals	\$2,250,000	30	\$3,000,000	1.3

Funding is available to develop Resilience Based Plans (RBPs) for communities, watersheds, or other specific areas within communities where a need for identifying and enhancing the environmental, social and economic resilience is presented. RBPs may include planning, engineering, alternatives analyses and/or implementation strategies for communities to better understand their resilience needs.

The ideal project must be developed through an iterative stakeholder development process.

Successful proposals will include the following components:

- 1) Address current and future risks
- 2) Assess critical infrastructure shortfalls and needs
- 3) Comprehensively incorporate local value-based solutions
- 4) Achieve a range of social, economic, environmental and quality of life benefits
- 5) Act as a model of resilience for other communities

The development of community RBPs should not contradict development of local or regional hazard mitigation plans but should serve as a mechanism to enhance local comprehensive, infrastructure, floodplain management, and planning efforts. For example, understanding the risks posed to water and wastewater treatment systems and infrastructure, bridges or culverts that act as pinch points that exacerbate flooding or other environmental harm, and the ability for critical services to provide assistance may be assessed. RBPs should be developed with specific goals in mind such that they may serve as leverage or justification for additional community mitigation and resilience needs. RBP applications are not required to include an implementation component; however, implementation is the goal of creating a plan and should be addressed in the planning document.

All potential applicants for RBP proposals will be required to submit a project proposal synopsis prior to full proposal submittal. This will allow the project team to assess the initial

proposals and provide valuable feedback to potential applicants. RBPs must be results-oriented with goals and objectives focused on enhancing the environmental, economic, and social resilience of a community or region. The following examples provide an overview of activities that may be included:

- 1) Identifying shocks and stresses
- 2) Risk assessments for natural and man-made hazards
- 3) Alternatives analyses to document methods proposed to reduce or eliminate documented shocks and stresses
- 4) Improving community capacity or ability to engage vulnerable populations
- 5) Education and outreach regarding resilience-based initiatives

The period of performance for RBPs will be three (3) years. Quarterly reports will be required from all sub grantees that outlines grant expenditures and accomplishments. KDOW staff will be available for interested parties to advise on project eligibility, scoring criteria and duplication of efforts. The RSP will use the ten step resilience criteria metrics described in Regrow Phase 2 to select proposals. Successful applicants must provide an overview of how each metric will be implemented and measured. Proposal scoring criteria will be based on meeting the metrics, sub grantee capacity, expected outcomes and leveraged efforts.

CHAMPS has been developed by KYEM to serve as a resource to Kentucky communities to enhance disaster management efforts based on the concept of understanding risk, then mitigating to reduce loss of life and property. As part of RSP development, a “Community Resilience Plan” template will be created in CHAMPS that incorporates the criteria for a successful RSP proposal. Potential applicants may utilize the template or create their own RSP based on specific community needs.

1. The RSP program will target at risk threshold areas to apply for mitigation/resilience based funding that will decrease vulnerability to those populations.

2. Resiliency Value – This project will reduce the expected property/infrastructure damages and casualties, based on the fact that grant opportunities will be provided for resilience opportunities.

Environmental Value – This project could fund grant opportunities that directly affect the environment within communities.

Social Value – This grant could be used to fund grant opportunities that directly affect social values within communities.

Economic Revitalization – This grant could be used to fund grant opportunities that directly affect economic revitalization within communities.

3. The Commonwealth considered multiple financing alternatives, such as revolving loan programs, before selecting the RSP program. The project meets a national objective because this activity will serve all of our target areas.
4. The RSP program will allow communities to identify and prioritize resilience grant opportunities, thus increasing the resilience of the selected communities
5. The RSP is scalable based on the funds allotted to the program. The scalability can be seen in the project description above.
6. Benefit Cost Analysis – See Attachment F
7. Program Schedule – 24 Months
8. Budget - \$2,700,000 total cost, \$2,250,000 total request from HUD

Project Name: Morris Forman Sewershed Project

A. Project Description: The Morris Forman Sewershed Project is an innovative approach to addressing flood reduction issues. The consultation process led to the identification of

several activities within the Beargrass Creek watershed and the Morris Forman sewershed. About 80% of all wastewater generated in Louisville Metro flows to the Morris Forman gravity sewers and the sewershed houses over 500,000 people. By identifying multiple activities within the sewershed, Louisville Metro will provide the nation with a holistic approach for managing sewershed issues, as well as providing validation of certain flood risk reduction models. The table below lists all of the project's activities.

Morris Forman Sewershed Project	
Activity	Management
Tree Planting	Office of Sustainability
Youth Build	Youth Build
Code Red	EMA
Parkway Place - Green Project	LHA
Liberty Green - Green Project	LHA
Starkey FPS Redundancy	MSD
Delaware Drive Buyout,pilot green in-lieu fee	MSD
Pinch Point Study on Middle/South Fork of Beargrass Creek	MSD
Beargrass Creek Trail, I-64 landscaping	Metro parks
Beargrass Falls Water & Sustainability Education	Partnership for a Green City
Beargrass Falls Formal Education Program in Urban	Partnership for a Green City
Beargrass FPS Education	MSD
GI CSO15- Wyanotte Park	MSD
GI CSO15- Iroquois Homes	MSD
MFWQTC - additional Final Effluent PS generators	MSD
MFWQTC - Biotower Improvements	MSD
MFWQTC - Drying System Upgrades	MSD
MFWQTC - Clarifier Upgrades	MSD
Iroquois HS, green roof 300 K and/or storage	JCPS

These activities represent a multi-faceted approach to resilience for the sewershed. Highlights of how the project will improve resilience include:

- Upgrades to Morris Forman Wastewater Treatment Plant,

- Green Infrastructure Retrofits for Low-Income Housing Communities,
- Upgrades and Redundancies added to the Starkey Pump Station,
- Buyouts, Stream Restoration, Trail Enhancements, and Culvert Projects in the Beargrass Creek Watershed will reduce at-risk properties and displaced residents
- Education Programs and Career Opportunities (Youthbuild, Beargrass Falls) resulting in better informed population and long-term resilience commitment through education and stewardship
- Community Wide Preparedness and Education through an Enhancement of Code Red
- Planting over 10K Trees
- Improvements in the environment through stream and ecosystem restoration
- Improved flood control and water quality through flood pump station rehab and installation of resilient measures
- Improved quality of life and healthier community /regional population supported by greenways trails, increased vegetation

1. The Morris Forman Sewershed includes over 500,000 people and Louisville's Central Business District. It serves the core of the City and the most economically depressed neighborhoods. Additionally, the sewershed includes most of Louisville's affordable housing units and 31 EPA identified brownfields. The sewershed has a total LMI percentage of 45, however 57 of the 121 census tracts have LMI percentages ranging from 51% to 99%. 18 tracts have LMI percentages over 75%. The activities in this project will reduce combined sewer overflows throughout the sewershed and will offer education and job training programs specifically designed for low-income youth.

2. Resiliency Value – The Morris Forman sewershed will have the capacity to effectively handle a 1% chance flood event.

Environmental Value – The Morris Forman sewershed will experience fewer combined sewer overflows and will not have failures that result in untreated sewage escaping into the Ohio River.

Social Value – The newly restored Beargrass Creek and trail will be an attraction for area residents where they learn about watershed resiliency.

Economic Revitalization – Property values along Beargrass Creek will increase and participants and Youthbuild participants will enter into resiliency focused careers.

3. All activities in this project directly or indirectly address flooding and flooding related damages from the qualifying disaster. Because of this tie-back, this project meets the urgent need national objective. Additionally, specific activities, such as the Iroquois High School green infrastructure installation and the Delaware Drive buyouts are located in census tracts that are over 51% LMI.
4. This project is a multi-faceted approach to addressing urban resilience, particularly as it related to flooding. Any combination of the activities in this project could be replicated in other urban areas to address similar needs.
5. Louisville Metro Government and the Louisville Metropolitan Sewer District (MSD) have a long and successful history of implementing activities such as the ones presented here. The green infrastructure installations and traditional infrastructure upgrades represent current best practices and many have already been implemented in Louisville.
6. This project and its activities resulted from extensive consultation with Louisville Metro departments, local nonprofits, and MSD. Many more activities were proposed, however the

final project represents the activities that best address flooding and community resiliency within the Morris Forman Sewershed, while fitting within the requirements in the NOFA.

7. Benefit Analysis – See Attachment F
8. Parts of this project can be scaled, while others cannot. Depending on the level of funding, entire activities may be eliminated or their scope may be reduced. For example, the resilient upgrades to infrastructure would be dropped entirely, if other funding could not be identified, while the number of buyouts on Delaware Drive could be reduced rather than the entire activity being removed.
9. Program Schedule – 24 Months
10. Budget - \$133,859,571 total cost, \$62,603,215 total request from HUD
11. This project includes activities included in the Louisville/Jefferson County Hazard Mitigation Plan, the Louisville Loop Master Plan, and the region.

Middlesboro, Kentucky celebrates its pristine surrounding landscape. Nestled in the heart of the Appalachian Mountains, a city that once prospered as a mining town, now struggles to overcome economic and environmental obstacles that have a direct impact on the resiliency of the community. The City must now revitalize and work to grow other industries, such as healthcare, education, and tourism for its population to maintain stability. The economic stability of the community directly affects the ability of the community to thrive, meet unexpected challenges, and overcome disasters. Due to challenging topography of the area, much of downtown was built within a floodplain. Repetitive flooding losses haunt downtown Middlesboro and continue to negatively impact growth of the City. These flooding issues culminated in the devastating storms and floods of 2011 that decimated many areas around Middlesboro, including downtown, and left families homeless, without adequate living supplies and businesses empty. Middlesboro faces many similar challenges to other communities impoverished by natural disaster, and therefore can serve as a laboratory for resiliency. By taking a holistic approach to urban resiliency planning, the city can tie the community and environment together to mitigate the impacts of future flooding while preserving its deep historic culture, providing valuable educational opportunities, welcoming visitors, and creating opportunities for healthy living.

To successfully address the most distressed areas of the community and provide relief to those most in need, a model was created that is both holistic and contextual. The theme of the model centers on transforming the existing water resources into assets that mitigate, enhance, and inspire. In doing so, Middlesboro expands access to education, healthcare, recreation and tourism, generating reinvestment in the community. Community stakeholders with support from the State of Kentucky collaborated on the implementation of this model. These stakeholders

include: the City of Middlesboro, Appalachian Regional Hospital (ARH), Discover Downtown Middlesboro, downtown business owners, and Southeastern Kentucky Community and Technical College. Key issues addressed with stakeholders included leverage capacity, existing partnerships between the stakeholders, and potential locations of future healthcare and educational facilities. The stakeholder group determined that there were significant needs for health care professionals that could be supported by the Community College and Lincoln-Memorial University. Current partnerships between the local universities, Union College, and the University of Pikeville further support opportunities to increase educational and training capacity with the implementation of programs in Middlesboro. Furthermore, entrepreneurship programs at Lincoln-Memorial could utilize expanded business opportunities in downtown Middlesboro. See Attachment D for an updated consultation summary. In summary, two key projects were defined: Flood Risk Reduction and Community Wellness Improvements. Within each Project, there are several activities. Each Project and the associated activities are further detailed below.

Project Name: Flood Risk Reduction

- B. Disaster 4008 caused extensive damage to the southeastern part of Kentucky and in particular Middlesboro. This application requests funds for flood risk reduction and mitigation strategies to address potential future risks for flooding. The entire city is at risk to repeat flooding including its historic downtown and surrounding residential areas. This equates to a monetary impact of over \$35 million dollars. The model outlined in the introduction is holistic in nature and considers comprehensive solutions that begin with better understanding the root cause of flooding and concludes with long-term activities to ensure a resilient future for Middlesboro.

To date no study has created a comprehensive analysis of how the Yellow River watershed and the environments contribute to flooding. Previous efforts have focused on individual projects without consideration for an overall approach. The project addresses this issue on two levels: create a flood risk analysis study to answer unsolved questions about the City’s stormwater conveyance system and its relationship with individual stream networks (resiliency), and improvements to the Little Yellow Creek Channel and Stream to enhance flood control capacity. In following this model the unmet need of flood control is addressed while concurrently addressing the City’s resiliency. The City and Discover Downtown Middlesboro will work directly with business owners and residents to provide the adequate training and education needed to successfully complete these projects.

Specific activities within this project include:

Activity	Owner/Leverage Partner
Yellow Creek Canal Restoration	City via consultant & DDM
Little Yellow Creek Stream Restoration	City via consultant
Yellow and Little Yellow Creek Flood Study	City via consultant
Downtown Floodproofing	City via consultant

1. Implementation of these activities will lead to the protection of 609 residential structures in the floodplain, 46 commercial structures in the floodplain, and a protection of 24 repetitive

loss properties. This project will immediately affect 10,000 people. This project will be evaluated by the following metrics:

2. Resiliency Value – The resiliency value was analyzed to be \$2,122,186. These values include decreases in flood risk for repetitive loss structures, decreases in flood risk for structures along the channel and stream restoration, and a flood risk reduction plan with relevant solutions for solving Middlesboro flooding.
3. Environmental Value – The environmental benefit was calculated at \$15,399,077. There will be an increase in the intrinsic value of the channel and stream restoration.
4. Social Value – There will be an increase in family recreation location with channel and stream restoration projects.
5. Economic Revitalization – There will be temporary economic boosts from the construction of the projects, an increase in property value for properties along activities and for flood proofing properties, and cost savings to the state and federal government by eliminating flooding issues.
6. All activities in this project directly or indirectly address flooding and flooding related damages from the qualifying disaster. Because of this tie-back, this project meets the urgent need national objective. Additionally, all activities are located in census tracts that are over 56.7% LMI.
7. This project is a multi-faceted approach to addressing rural resilience, particularly as it related to flooding. Any combination of the activities in this project could be replicated in other rural areas to address similar needs.

8. Middlesboro, DDM, and V&M have a long and successful history of implementing activities such as the ones presented here. The flood reduction initiatives represent current best practices and many have already been implemented in neighboring communities.
9. This project and its activities resulted from extensive consultation with the City of Middlesboro departments, local nonprofits, and regional agencies. Many more activities were proposed, however the final project represents the activities that best address flooding and community resiliency within the City of Middlesboro, while fitting within the requirements in the NOFA.
10. Benefit Analysis – See Attachment F
11. Parts of this project can be scaled, while others cannot. Depending on the level of funding, entire activities may be eliminated or their scope may be reduced. For example, the number of floodproofed structures could be reduced rather than the entire activity being removed.
12. Program Schedule – 24 Months
13. Budget - See Attachment F
14. The project is based on existing studies including the following:
 - Downtown Middlesboro: Our Vision & Plan
 - Retail market analysis for Downtown Middlesboro
 - Historic Preservation Plan for Middlesboro, Kentucky
 - Cumberland Valley Regional Mitigation Plan

Project Name: Community Wellness Improvements

A byproduct of flooding coupled with the shift away from coal mining is increased poverty and high levels of obesity and cancer. Disasters similar to 4008, created exacerbate already unmet healthcare needs. With restricted access to healthcare, Middlesboro will continue to suffer without hope for new industries and opportunities. The increased healthcare needs have also resulted in a need for quality healthcare professionals. Two-year and four-year degree programs at Southeastern Community Technical College and nearby Lincoln-Memorial University report an unmet need for nurses which support Appalachian Regional Hospital (ARH) facilities (including the one located in Middlesboro). Improved access to healthcare facilities, expanded educational programs, and opportunities for recreation, healthy food options, and cultural amenities are part of the Community Wellness project for Middlesboro.

Specific activities within this project include:

Activity	Owner/Leverage Partner
Hospital Site Development	ARH & City via consultant
Medical Education Center	SKCTC
Expanded City Trail/Greenways Network	City via consultant & DDM
Farmers Market and Parking Lot Renovation	DDM

15. This project will directly affect 50,000 people annually who use local health care services, another 53,000 annual users of the trail network and will provide employment for approximately 1,000 people regionally.

This project will be evaluated by the following metrics:

16. Resiliency Value – The project improves access of needed healthcare and education services through more appropriate physical locations. The greenway network and farmers market are designed to support mitigation and flood control measures.
17. Environmental Value – Increase the percentage of the local population with improved access to nature and outdoors.
18. Social Value – Increase in the number of people with access to the downtown clinic and hospital; increase in the number of visitors to the downtown farmers market; increase in the number of users of greenway.

The current wellness of the Middlesboro population is stark:

- 20% of residents in Bell County (Middlesboro) are medically uninsured,
- 25% do not see a doctor due to cost, 25% of residents have not had a diabetes screening,
- Over 50% of women have not had preventative breast cancer screenings,
- Over 12% of the population is below the poverty light
- Only 7% of the population lives near a park

These factors support the rising statistics of adults who are obese (25% vs. 25% nationally) and 33% of who are physically inactive (compared to 21% nationally). When natural disasters occur such as Disaster 4008, these numbers have the potential to increase dramatically and further limit access to health care and healthy living. This project proposes to directly respond to Middlesboro's community wellness in tandem with addressing flood mitigation. In doing so, the community cannot only survive but thrive.

19. Economic Revitalization – The number of new businesses opening in downtown upon completion of trail network and regional hospital development; the number of new artists who participate in local art program; the percentage increase in property values upon completion of hospital and creation of new jobs; the number of annual visitors to Middlesboro.
20. All activities in this project directly or indirectly address social impacts from the qualifying disaster. Because of this tie-back, this project meets the urgent need national objective. Additionally, all activities are located in census tracts that are over 56.7% LMI.
21. This project is a multi-faceted approach to addressing rural resilience, particularly as it related to social stresses. Any combination of the activities in this project could be replicated in other rural areas to address similar needs.
22. Middlesboro, ARH, DDM, and V&M have a long and successful history of implementing activities such as the ones presented here. The wellness initiatives represent current best practices and many have already been implemented in neighboring communities.
23. This project and its activities resulted from extensive consultation with the City of Middlesboro departments, local nonprofits, and regional agencies. Many more activities were proposed, however the final project represents the activities that best address flooding and community resiliency within the City of Middlesboro, while fitting within the requirements in the NOFA.
24. Benefit Analysis – See Attachment F
25. Parts of this project can be scaled, while others cannot. Depending on the level of funding, entire activities may be eliminated or their scope may be reduced.
26. Program Schedule – 24 Months

27. Budget - See Attachment F

28. The project is based on existing studies including the following:

- Community Health Needs Assessment for Middlesboro ARH Hospital
- Downtown Middlesboro: Our Vision & Plan
- Retail market analysis for Downtown Middlesboro
- Historic Preservation Plan for Middlesboro, Kentucky
- Cumberland Valley Regional Mitigation Plan

DRAFT

Exhibit F Leverage

Commonwealth of Kentucky

ExhibitFLeverage.pdf

Leverage

In order to sustain Regrow Kentucky, long term solutions for funding are necessary. The NDRC grant provides a mechanism to jump start the program and perform projects that improve resilience and awareness throughout the Commonwealth. However, it is crucial for long term success to leverage planned, existing, and future funding mechanisms for sustaining the program. The exploration of co-benefits is also a large consideration and the potential for adjusting how public and private investment can occur as influenced by the Regrow Kentucky program. As described in great detail CHAMPS, a program that has received over \$1.5 million in federal and State investment will be leveraged during this project. In addition, the following programs managed by State and non-profit partners have the potential to lend expertise and resources to the implementation and maintenance aspects of our response to the states vulnerabilities. The following programs will be leveraged for the Seed Program to ensure longevity and sustainability of the program.

The Cabinet for Economic Development was established to network small businesses and has a new KY Innovation Network office in eastern Kentucky where information and resources are easily disseminated to the small business community. This entity also manages the Kentucky Small Business Credit Initiative which is a program designed to mitigate the risk associated with small business lending. When a disaster occurs they have the ability to make direct loans and are familiar with dealing directly with businesses during an emergency. They have policies in place to require businesses to rebuild more resilient and energy efficient. In addition, the Kentucky Angel Investment Act Program allows security exchange commission (SEC) accredited investors to make capital investments in Kentucky small businesses. Tax credit maximums are 40% for non-enhanced and 50% for enhanced communities (enhanced dealing with an unemployment threshold). There is a total

of \$300M in tax credits available each calendar year.

Through DLG, funds that are administered for affordable housing and CDBG can include preferences and possibly criteria to mitigate federal disasters. The Affordable Housing Program is a trust fund independent of state government funding and may serve only low/moderate income populations, and funds are also given to local nonprofits; a relationship of which have an opportunity for leveraging. DLG also manages a flood control program with state money of \$6M in unreleased state bonds that displays a direct financial commitment for leverage for the NDRC. Money can be used with federal partners, generally post disaster to build back resiliently.

Another initiative through HUD sets aside Section 1-8 vouchers to use in the event of a disaster to fund the Kentucky Home Performance Energy Program to improve housing energy. This initiative replaces manufactured housing pre 1976 with Energy Star manufactured homes. This program not only has committed to supporting and providing data for Phase 1 implementation, but also could be used as a partner program through Regrow Kentucky to ensure that homes cannot be placed in the floodplain and on a permanent foundation, which lessens future risk.

The Kentucky Housing Corporation (KHC) is in the process of chartering the Commonwealth of Kentucky Disaster Housing Resource Council, also known as the Disaster Housing Task Force, whose mission is to work collaboratively to develop partnerships and joint strategies among various state agencies, federal agencies, local governments, and for-profit and non-profit partners in the local communities necessary to carry out the Kentucky Disaster Housing Plan. The goal is to quickly provide assistance and resources to residents needing immediate shelter, to retain residents in interim housing, and to expedite the restoration of permanent housing following a disaster. By aligning efforts between the CCRR and the Disaster Housing Task Force, co-benefits will be achieved through the Regrow Kentucky effort and ensure that it is targeting both pre- and post-disaster efforts so if structures are not built to withstand an event before, structures can be rebuilt better or relocated in the future.

Basic infrastructure is a necessity for economic growth and through Regrow Kentucky, critical infrastructure will be further identified for the sake of identifying risk reduction projects that harness the ability for co-benefit of economic growth. The Kentucky Infrastructure Authority (KIA), another state-level entity was created in 1988 to provide the mechanism for funding construction of local public works projects. KIA manages local financing needs through revolving loan fund programs (similar to the intended Regrow Kentucky Revolving Loan Fund) that offer communities the opportunity to apply for improvement funds. These include the Federally Assisted Waste Water Revolving Fund, Infrastructure Revolving Loan, Governmental Agencies Program, Federally Assisted Drinking Water Revolving Fund, and the Clean Water State Revolving Fund.

The Kentucky Division of Water (KDOW) also has funding and resources to lend to the Regrow Kentucky program, as the department directly addresses the management, protection, and enhancement of the quality of water resources throughout the Commonwealth. This is completed through voluntary, regulatory, and educational programs. Currently, KDOW is in the process of implementing LiDAR for risk assessments; consisting of approximately \$3 million in leverage. Additionally, Risk MAP products contribute approximately \$6 million in risk identification and communication leverage. The State Owned Dam Repair (SODR) is a legislative appropriation to assess and mitigate risks associated with state owned dams. Over \$10 million in project planning, mapping, construction and mitigation has been identified through SODR.

With several initiatives through the Kentucky Association of Counties (KACO), and the Kentucky League of Cities (KLC), there has been extensive conversation about how issues and vulnerabilities might affect risk considerations or attract incentives from insurers. KACO and KLC are large providers of local public facility insurance, provides local communities with Disaster and Loss control Teams, which in turn are used for loss control and risk management. The organizations also provide multiple short-term lending, bonds, and leasing ranging from

hundreds to millions of dollars. Discussions with these two particular agencies have included conversation on finding opportunities for incentives to qualify for lower insurance rates based on understanding risks and vulnerabilities. The potential leverage point through the Regrow Kentucky program will be to create an incentive program with KACO and KLC to consider lowering rates based on the resilience a community is completing.

With Eastern Kentucky and the central Appalachia representing some of the most economically distressed and vulnerable populations of the Commonwealth and the nation, there are organizations working toward the revitalization of this region. SOAR and ARC are focused on economic development that could potentially support and address aspects of the implementation and maintenance in response to identified vulnerabilities of the Regrow Kentucky program. SOAR seeks to improve education, health, and economic outcomes. With workgroups focused on increasing access to broadband, business incubation, and agriculture, regional foods, and natural resources, this organization has prioritized actions to diversify the economy for the next several years. ARC is another regional entity whose strategic goals and programs are in alignment with the outcomes sought through the Regrow Kentucky program. Another worth mentioning is the Appalachian Development Alliance (ADA) that joins nontraditional, multi-county business lenders that are focused on the collective success of eastern Kentucky and its business interests. Member organizations operate revolving loan fund programs with capital obtained from public and/or private sources and couples that with technical assistance to help regional businesses thrive. These are just a few of the many programs and organizations that are potential local and regional partners that can lend funding and financial resources for resilience building in the Commonwealth and contribute to the expansion of the Regrow Kentucky program upon implementation.

The Commonwealth will work with University partners to complete research on resilience planning, produce policy guidance, offer technical assistance, and deliver trainings on related topics. These universities are key partners to producing innovative methodologies that assist the Commonwealth with resilience building initiatives at the regional and local levels. The first example is the University of Louisville CHR which has been described in great detail. The University of Kentucky Hazard Mitigation Grants Program (UK-HMGP) provides staffing and support to assist communities with FEMA grant application and benefit cost ratio calculations. Western Kentucky University provides guidance and resources on karst related resilience planning, and just announced the first 4-year degree program in floodplain management in the United States. Recently, the Kentucky Geological Survey housed at the University of Kentucky met with the CHR to discuss a potential role within the Regrow Kentucky program through providing risk and hazard geologic maps, geologic suitability identification, and assessing the redundancy of water systems through ground water mapping as an alternative water source. The above educational institutions operate existing and planned programs that have leveraging potential to implementing the objectives of Regrow Kentucky.

Outcome: This proposal outlines the first steps of a long-term vision of building more resilient communities in the Commonwealth of Kentucky. It is understood that this cannot be achieved through one stand-alone program, but through a combination of efforts that, when combined, will cause long-lasting sustainable projects and effects. Regrow Kentucky will serve as the catalyst for resiliency efforts within the Commonwealth. Where our residents and business owners are educated about natural shocks and stresses, where homeowners have options to protect their assets or chose to participate in a buyout, where floodplain restoration and management takes place and isn't considered a trend, where our communities are provided safe shelter from

tornadoes, where economic growth in impoverished areas is enhanced and where resiliency isn't just a term but a way of life.

CHAMPS will serve as a tool to help measure success of the program. This component to our program will capture the initial inventory, assess, measure, and evaluate the short and long-term results of the Regrow Kentucky program. Such measurements might include an increase in the number of affordable housing units produced outside of areas that are vulnerable to hazards, or the number of structures and parcels acquired and converted to recreational land thereby resulting increased quality of life and other measurable benefits. It could be through the areas where mitigation measures have been implemented, that are resulting from the Regrow Revolving Loan Fund program and other financing programs available to these areas. Based on resilience assessments and re-assessments throughout the Commonwealth as completed in CHAMPS and with the leadership of the Team and the CCRR, marked progress could be shown through the completion of resilience-building initiatives, especially targeting at-risk and economically depressed communities.

Morris Forman Sewershed Project

The Morris Forman Sewershed Project has over \$133 million in direct leverage. The project has various state and local leverage partners. Each activity and its individual leverage amounts are broken down in the following bulleted list.

- The Tree Planting activity has \$769,604 leveraged from both public and private funding including Louisville Metro Government, MSD, Garden Club, Cities of Service Grant, Brown Forman, UPS, and Doe Anderson.
- The Youth Build activity has \$1.423 million leveraged from Chase Bank, AmeriCorps, a

million dollars from Hillerich Land Donation, Department of Labor Youth Build Grant, and Louisville Metro Government.

- The Parkway Place and Liberty Green Louisville Housing Authority Green and the Pinch Point Study on Middle/South Fork of Beargrass Creek activities leverage a total of \$8 million from MSD.
- The Starkey FPS Redundancy activity has a total of \$48.017 million in leverage from MSD.
- The Delaware Drive Buyout activity leveraged \$300,000 from MSD and Metro Louisville Government.
- Leverage for the Beargrass Creek Trail is \$150,000 from a 50/50 match with USACE and private citizens who have committed interest in seeing the trail activity come to fruition.
- The Beargrass Falls Water & Sustainability Education and Beargrass Falls Formal Education Program in Urban activities leverage totals of \$306,300 come from various funding partners including MSD, University of Louisville, and Metro Louisville Government.
- \$5.6 million is being leveraged for the Beargrass FPS Education activity to perform Beargrass pump station electrical improvements.
- The GI CSO15 Wyandotte Park and Iroquois Homes have a combined leverage of \$46.6 million from MSD.
- The Morris Forman Water Quality Treatment Center additional final effluent Pump station generators activity is leveraging \$2.6 million in funding from MSD.
- The Morris Forman Water Quality Treatment Center Biotower Improvements activity leverage from MSD totals \$12.85 million.
- MSD has provided \$5.207 million for the Morris Forman Water Quality Treatment Center Drying System Upgrades activity.

- \$985,465 direct leverage is available for the Morris Forman Water Quality Treatment Center Clarifier Upgrades activity from MSD
- The Iroquois Green Roof activity has leverage of \$1 million from JCPS and \$50,000 from Lowes as well as some of the \$8 million from MSD for green infrastructure projects.

Community Wellness Improvements

The Community Wellness Improvement Project for Middlesboro has over \$96 million in direct leverage. The project has various regional and local leverage partners. Each activity and its individual leverage amounts are broken down in the following bulleted list.

- The Hospital Site Development activity has leverage of \$18 million from ARH and potentially additional leverage dollars from the City of Middlesboro.
- The Medical Education Center activity has leverage of \$7.5 million from SKCTC and local funds raised from the community of \$1.3 million, totaling \$8.8 million.
- The leverage amount for the Expanded City Trail/Greenways Network activity is \$100,000 provided by the City of Middlesboro to DDM for trail management and development.
- The Farmers Market and Parking Lot Renovation does not have committed leverage at this time.

Flood Risk Reduction

- Provided from the City of Middlesboro, the Yellow Creek Canal Restoration activity does not have committed leverage at this time.
- The Little Yellow Creek Stream Restoration activity does not have committed leverage at this time.

- The Yellow and Little Yellow Creek Flood Study activity does not have committed leverage at this time.
- The Downtown Floodproofing activity does not have committed leverage at this time.

DRAFT

Exhibit G Long-Term Commitment

Commonwealth of Kentucky

ExhibitGCommittment.pdf

Regional Coordination and Long-Term Commitment

The Regrow Kentucky: a path to resilience initiative has influenced several major changes being made in the Commonwealth of Kentucky to improve resilience including increased overall awareness, the implementation of tools to manage resilience-based activities, establishment of a working group within the resilience governing body in the Commonwealth (Committee on Community Recovery and Resilience – CCRR), holistic community-based approaches to promote the sustainability of infrastructure, community development decisions with long term sustainability in mind and stakeholder engagement via various means.

The Team’s primary target for resiliency will be areas with the greatest number of unmet needs; the eastern Appalachian areas include Bell, Magoffin, Morgan and Johnson counties and Jefferson County within central Kentucky. In order to measure the long-term commitment of the Regrow Kentucky program the Team will track and measure the effectiveness of the program through the Community Hazard Assessment and Mitigation Planning System (CHAMPS) system. Dependent on the projects selected, these metrics could include the increase in jobs and economic stimulus created by the chosen projects, the increased green space and natural floodplain functions from acquisitions, and measured improvements found through the completion of Risk and Resilience assessments developed at the beginning and end of the projects.

Background

The Commonwealth of Kentucky is eligible for the NDRC through meeting unmet needs thresholds in two main target areas, Louisville Metro and the City of Middlesboro and

surrounding areas in the heart of Appalachia. These two areas vary geographically and demographically but share similar unmet needs resulting from flood related disasters in 2011. According to the Commonwealth's Enhanced Mitigation Plan, flooding is the greatest natural hazard in the Commonwealth, resulting from the 89,000 miles of rivers and streams that provide various benefits and risks to communities throughout the state. Through executive action in July of 2014, the CCRR was formed, co-chaired by two members of the project partners for this application, Kentucky Department for Local Government (DLG) and Kentucky Emergency Management (KyEM). The Commonwealth has also implemented a valuable tool; the CHAMPS to manage mitigation actions that help enhance resilience.

The Commonwealth is committed to long-term resilience through the CCRR, continued use of CHAMPS, implementation of projects and programs that reduce risks and enhance the resilience of communities, and stakeholder engagement through a multitude of avenues including professional organizations, state and local targeted outreach for vulnerable areas, and social media.

Partners in Long-term Commitment

KDOW's mission is to of manage, protect, and enhance the water resources of the Commonwealth. This mission is largely carried out by implementing four strategic objectives: 1. Protect, manage and restore water resources; 2. Conduct effective water resources planning; 3. Meet federal and state program requirements; and 4. Promote better management and communication of data.

Over the past year, KDOW pursued water quality preservation and restoration through several initiatives. A partnership with the United States Army Corps of Engineers enables more

comprehensive monitoring and examination of Harmful Algal Blooms (HABs) with the most recent satellite imaging technology. KDOW also convened meetings of the HAB Advisory Workgroup which facilitates communication and consistency among several agencies regarding any threats to water recreation or consumption should a HAB be detected.

Kentucky's Nutrient Reduction Strategy is a science and technology-based approach to reducing the effects that nitrogen, phosphorus, and other harmful nutrients have on waters of the Commonwealth and, ultimately, the Gulf of Mexico. The Kentucky Nutrient Reduction Strategy consolidates and builds upon existing efforts regarding nutrient management in Kentucky, as well as providing a broad review of ongoing and future activities. The strategy describes voluntary practices and regulatory initiatives, and identifies areas needing further development. The primary goal of this strategy is to reduce the nutrients (primarily nitrogen and phosphorus) being lost from point and non-point sources which are having harmful effects on Kentucky's waters.

Ongoing biological inventories and habitat management initiatives in select watersheds and Wild Rivers corridors contribute to preserving and restoring natural habitats, and provide ecological and economic benefit to the Commonwealth. Water quality monitoring of Kentucky's various river basins provides benchmarks to evaluate water impairment and restoration activities, KDOW expanded its online Water Maps Portal with the addition of the Water Health Portal and several mapping tools, such as Risk MAP and the Watershed Viewer, designed to make information about the waters, watersheds, and floodplains of the Commonwealth more easily accessible and understandable to the user. Imaging technology and data that are more robust makes it possible to better predict risks from such emergencies as dam failures or floods.

DLG will provide program oversight for the compliance of the CDBG-NDRC rules and regulations. DLG will enter into a grant assistance agreement with the sub-recipients that will outline their responsibilities. DLG will ensure that all information is set-up in the DRGR system for draws, monitoring's and QPRs. DLG will review all environmental documents for CDBG compliance prior to the release of funds. DLG will request all funds from HUD through the DRGR system and will send the funds to the sub-recipient electronically from the State Treasurer's office. DLG will conduct on-site monitoring visits for each program area to ensure all CDBG rules and regulations are being followed and documented properly (i.e. Fair housing, environmental, labor, procurement....). DLG provides an understanding of local government; including housing (\$42,408,788 in Neighborhood Stabilization funds) and economic development concepts and has managed over 1,900 CDBG regular projects and \$915,227,164 through its office since 1984. They provide assistance to all 120 counties and 420 incorporated cities, and have 10 employees that complete project management, quality assurance, financial management, procurement and complete internal control capacity for the State's CDBG program.

KYEM has relevant project management, quality assurance, financial and procurement, and internal control capacity to quickly launch and implement major projects. Through its Recovery Branch, KYEM houses the management of the Public Assistance (PA) Program, the Individuals and Households Assistance (IA) Program, the Hazard Mitigation Grants Program (HMGP), and the Volunteer Coordination Program. The PA, IA, and HMGP programs of the KYEM Recovery Branch manage FEMA grants dedicated to response and recovery for public infrastructure projects and emergency protective services to reduce the risk from future disasters and enhance resilience.

Tools for Resilience Development

CHAMPS development was initiated in 2009 to meet the needs outlined by the Commonwealth and house community data in a single source available to the public. This tool has the capability to store points of contact for agencies providing aid, inventory key infrastructure, record events and losses, and provide information to calculate benefit cost analysis to seek funding opportunities. Prior to a disaster, outreach with communities is performed to inventory needs, assets, support infrastructure, and resources; captured in the community profile module. Following a disaster, or smaller emergency incident, condition assessment of affected infrastructure is gathered from communities and compiled in the tool. Criteria can be applied to community needs to prioritize potential mitigation/resilience projects. This tool also tracks initiated projects and completed projects that have been used to examine mitigation successes and gather best practices to apply to other regions. To make the tool more accessible a large outreach and training program was conducted through in person trainings, posted videos, and tutorial documents available on the KYEM website. The Team plans to continue to perform outreach and enhance this tool and will utilize it to select mitigation/resilience projects for implementation when funding becomes available. NDRC funds would be used to support this system.

Actions since September 2014

On April 3, 2015, Louisville Metro experienced a significant rainstorm resulting in significant flooding in areas near rivers, creeks and streams. Many homes were affected with damages to personal and real property. On May 6, 2015, Mayor Greg Fischer announced the formation of a Flood Mitigation Workgroup. The Flood Mitigation Workgroup was charged

with developing recommendations to address the immediate needs in response to the Spring 2015 flooding in Louisville Metro and recommendations for a long-term plan to mitigate the impact of flooding.

In August 2015, KAMM held its annual conference at which numerous technical sessions focused on resiliency and rebuilding. Session titles included; *After the Storm, Building an Economic Resilient Magoffin County*, *Climate and Weather Records – Why Should You Care?*, *Weather Ready: Establishing a Robust Hazardous Weather Response Plan and Getting Recognized for It*, *Regrow Kentucky and the Commonwealth Council for Community Recovery and Resilience*.

Each of these examples provides proof of Kentucky's long-term commitment to mitigation, resilience and recovery from natural disasters. The Commonwealth has taken significant steps, particularly within the last decade, towards creating resilience across a broad spectrum of environmental, economic and social issues. Due to the number of frequent disasters and a real need for additional mitigation opportunities, the Commonwealth has proactively sought improvement to existing response, recovery and mitigation efforts from disasters. In order to accomplish these goals, improved coordination, inventory and asset management, streamlined communication and long-term recovery and resilience planning is needed. Actions to address these needs have been implemented at the local, regional and state level to provide long-term sustainable solutions and commitments.

To improve coordination, streamline communication, and ensure long-term community resilience management the Commonwealth of Kentucky formed the CCRR in July 2014. The CCRR is comprised of members with expertise in such areas as finance, emergency management, housing, and health and family services. Before, during, and after the event of a

disaster this resource supports communities to employ the best methods to prepare, respond, and recover resiliently. CCRR reviews community recovery and resilience plans, improves insurance programs and building codes, reviews determinations made by FEMA and KYEM following a disaster, provides technical assistance, and identifies funding opportunities available to communities. Additionally, the CCRR will form a subcommittee of Project Team partners and others with a long-term investment and interest in resilience. This subcommittee of the CCRR will recommend project selection from the Resilience Seed Program (RSP) for funding the development of community-based resilience implementation plans. Baseline and Goal Outcome Measure for the Resilience Seed Program (RSP):

Metric	Baseline (September 2014)	Goal (September 2019)
Number of Community Resilience Plans	0	20
Number of 319(h) watershed-based plans with Resilience component	0	5
Number of Mitigation Actions resulting from RSP	0	30

Lessons Learned

The City of Middlesboro has secured long-term partners to implement the projects within the most impacted areas. These stakeholders include the City of Middlesboro, Appalachian Regional Hospital (ARH), Discover Downtown Middlesboro, downtown business owners, and Southeastern Kentucky Community and Technical College. Key issues addressed with stakeholders included leverage capacity, existing partnerships between the stakeholders, and

potential locations of future healthcare and educational facilities. Through these meetings, each stakeholder has improved their resiliency awareness and whether funded or not will move these concepts forward in planning and implementation.

Kentucky, during the 2013 hazard mitigation planning cycle was the first state to implement an Applicant Agent certification course. The need for the Applicant Agent certification course stemmed from the following: Kentucky currently ranks seventh (7th) nationwide for frequency of disaster declarations. This course, launched in May of 2011, is offered quarterly to all applicants and potential applicants of the Public Assistance (PA) and the multiple hazard mitigation programs.

Legislative Updates

Kentucky is one of a handful of states that requires floodplain development permits through Kentucky Revised Statute (KRS) 151.250. The associated regulations in 401 KAR 4:060 are more restrictive than the federal minimum through one-year substantial improvement requirement and the requirement to establish floodway boundaries for all development along or across a stream. KDOW has a model floodplain management ordinance for local community NFIP administration that incorporates the higher regulatory standards. It is always recommended that communities adopt one foot of freeboard. Louisville Metro requires one foot of freeboard, has open space requirements, requirements in floodplain compensation and deed restrictions requirements. These efforts have resulted in Louisville Metro increasing their FEMA Community Rating System (CRS) status on October 1, 2015.

Kentucky leads the nation in the number of permit users submitting Discharge Monitoring Reports (DMRs) through the online NetDMR system. This facilitates exceptional transparency

because the public can access all DMR data through the United States Environmental Protection Agency (USEPA) website. KDOW was able to reduce its permit application backlog by 9.6%, and approve 95% of new applications within the required timeframe, even though applications nearly doubled in FY2015. KDOW also issued seven General Permits in FY2015, which included separate coal mining discharge permits for the eastern and western portions of the state.

Louisville MSD has developed a Green Infrastructure Design Manual (<http://www.msdlouky.org/insidemsd/standard-drawings.htm>) that incorporates 18 practices for green infrastructure including green roofs, permeable surfaces, bioswales, etc. Long term maintenance and enforcement information can be found at the following link: http://www.msdlouky.org/insidemsd/pdfs/Maintenance_Agreement_Document_2014.pdf

Additionally, MSD modified the Wastewater/ Stormwater Discharge Regulations (WDRs) for compliance with the EPA's Municipal Separate Storm Sewer System (MS4) permit with changes effective August 1, 2013. The amendments require the use of green infrastructure to manage stormwater from new development construction. Communicating expectations, procedures and standards via the Design Manual was central to the regulatory updates.

Raising Standards

As a River City, Louisville has its fair share of floodplain and drainage issues. Flooding can occur from Ohio River flooding, flash flooding from interior streams, and flooding from overloaded storm systems. Louisville Metro is a participant in the [National Flood Insurance Program](#) (NFIP), and MSD is responsible for [enforcing the local Floodplain Management Ordinance](#) and for administrating both the National Flood Insurance Program and Floodplain Management Program. To encourage communities to establish sound floodplain management

programs that go beyond the NFIP minimum requirements, in 1990 the Community Rating System (CRS) was created by FEMA. Louisville Metro participates in the CRS program and as of October 1, 2015, has achieved a Class 3 Rating, which awards residents in the community with up to a 35% discount on flood insurance premiums.

Louisville Metro has several higher standards in place that support their long-term commitment to sustaining a robust resiliency program.

- The [Louisville Metro Floodplain Management Ordinance](#) requires a 25-foot stream buffer be maintained along all blue line streams as defined by the USGS Topographic Maps.
- Louisville MSD manages and regulates development to the Local Regulatory Flood Encroachment Zone that is modeled based on fully developed conditions.
- Developed a Green incentive program focuses on commercial, industrial and institutional properties. MSD is assisting commercial, industrial and institutional property owners on a priority basis with green infrastructure incentives to reduce stormwater runoff to sewers and creeks. By reducing impervious area and infiltrating stormwater with green infrastructure practices, property owners will receive a reduction on monthly stormwater user charges.

Louisville Metro is currently updating their Multi-Hazard Mitigation Plan as part of their regular cycle of plan maintenance. The existing plan minimally addresses resiliency. For this update, it is anticipated that a heavy emphasis will be placed on resilience, recovery and rebuilding. The plan will implement a collaborative planning process, innovative outreach strategy, and robust risk assessment to develop a meaningful mitigation strategy for Louisville Metro.

The KDOW, through administration of the National Flood Insurance Program (NFIP) and Risk MAP (Mapping, Assessment, Planning) has provided significant new tools for risk identification and assessment across the regions impacted by qualifying disasters. Flood risk information that communicates the depth of flooding, the chance of flooding during a 30-year period have been created in and around Middlesboro and are under development in Louisville Metro. Watershed based reports are created with community risk profiles and potential mitigation actions.

KDOW personnel conducted over 5,000 inspections and responded to more than 1,500 complaints in FY2015, and facilitated communication and responses to emergencies during the unusually harsh winter conditions of February and March 2015. Their efforts helped make certain that water resources remained safe and accessible for consumers.

Aligned planning processes

Planning processes have been aligned with several entities including the following: YouthBuild, Sustain Louisville, Beargrass Creek Alliance, Discover Downtown Middlesboro, Appalachian Regional Hospital, KDOW, KyEM and DLG. Resilience is expected through planning synergies directly resulting from developing this application. The relationships established are expected to continue. Louisville Metro EM has inventoried all public buildings in the geographic area including the areas identified within the unmet needs threshold areas.

Additional goals and metrics for this initiative align with those outlined in the Kentucky Enhanced Hazard Mitigation Plan (<http://kyem.ky.gov/recovery/Pages/State-Hazard-Mitigation-Plan.aspx>). Enhanced State Hazard Mitigation Plan is from 2013; climate change implementations will be adopted in 2018 in the next hazard mitigation plan update.

Other planning alignments include: Enhanced state hazard mitigation plan, Seed Program based off the KDOW 319(h) watershed planning process, Kentucky Drought Mitigation Plan; Dam Safety Mitigation Plan, Kentucky Nutrient Management Strategy, Louisville Metro Consolidated Housing Plan and the Discover Downtown Middlesboro Strategic Plan.

Urban and Rural Projects

Middlesboro

Due to the unique geography and economic decline, the Appalachian region, which is comprised of a significant portion of eastern Kentucky, includes one of the most impacted and distressed target areas. The terrain intensifies the impacts of shocks such as severe storms, flooding, and tornados and makes disaster response much more challenging. The Appalachian region has a greater presence of poverty, unemployment, and aging infrastructure compared to other areas of the state, making eastern Kentucky vulnerable and at risk for greater losses from disasters.

The City of Middlesboro partnering organizations include The City of Middlesboro, the Southeast Kentucky Community and Technical College, Appalachian Regional Healthcare, and Discover Downtown Middlesboro, Inc. Local community partners include community groups, the Artisan Incubator and Middlesboro Garden Club; business agencies, the Chamber of Commerce and Lincoln Memorial University; and Federal agencies, such as the US Army Corps of Engineers and the National Park Service.

Nestled in a valley created by a meteor impact millions of years ago, the City of Middlesboro was the original gateway to the west through the Cumberland Gap. Situated in the heart of

central Appalachia, the historic and culture-laden city has recently endured considerable downturn due to natural hazard, health, and drug abuse stresses. Flooding in the city is quite common; the US Army Corps of Engineers – Nashville District partnered with the city to develop a systemic approach to better manage flood hazards. The flood protection system in the City of Middlesboro consists of earthen floodwall in conjunction with stream improvements and closure systems to abate the impacts of major floods. This federal/local partnership has endured for greater than 50 years. Just recently, the US Army Corps of Engineers – Nashville District prepared a draft environmental assessment for maintaining the flood protection system. Due to the decline of the coal industry and the debilitating impacts from health and drug-related issues, the city has taken proactive steps to institute a renaissance. In 2004, Discover Downtown Middlesboro (DDM) was formed as a non-profit organization that encourages citizen participation in the revitalization of the city. The organization seeks to improve the physical appearance of the downtown while maintaining its historic integrity; to retain existing businesses and to attract new ones; and to make downtown Middlesboro the center of the economic, civic, and social life of the tristate (Kentucky, Tennessee, Virginia) area.

Louisville Metro

The Louisville project, the Morris Forman Water Quality Treatment Center Sewershed Project, and include the following partners, Louisville and Jefferson County Metropolitan Sewer District (MSD), Louisville Metro Office of Sustainability, YouthBuild Louisville, Louisville Metro EMA/METROSAFE (EMA), Louisville Metro Housing Authority (LHA), Louisville Metro Parks, Partnership for a Green City, and Jefferson County Public Schools (JCPS). Louisville Metro represents the Commonwealth's largest metropolitan area and is the economic

center of a multi-state region. Construction of Louisville's Flood Protection System commenced in 1947; US Army Corps of Engineers – Louisville District, developed original plans. Since the flood protection system truly works as a “system”, continual assessment, communication, maintenance, and upgrades are needed. For example, failure at one end of the system can have a flooding impact of greater than seven feet upstream. Given this, Louisville MSD was specifically created to manage the region's sewer and flood protection systems. Since design and implementation of the original flood protection system, Louisville has undertaken many steps to improve drainage, pumping operations and watershed and floodplain management.

On June 17, 2013, Louisville Mayor Greg Fischer was one of the inaugural Signatories of the Resilient Communities for America Agreement. In keeping with that agreement, Louisville/Jefferson County is committed to resilience building and is placing an emphasis on maintaining quality of life for our citizens following disasters or other impactful events. Louisville/Jefferson County is coordinating our traditional hazard mitigation program, which focuses on preparedness, response and physical mitigation initiatives such as sirens and levees, with programs that provide education and promote environmental stewardship, access to healthy food and active living. Sustain Louisville, the city's first comprehensive sustainability plan, was adopted by Mayor Fischer and published in March 2013. Sustain Louisville includes a focus on city adaptation and resilience. Sustain Louisville establishes the connection between sustainability and resilience and affirms that achieving our “triple bottom line” sustainability goals - focusing on people, prosperity and planet - equally supports the city's resilience-building efforts.

Vulnerable Populations

Resilience Seed Program (RSP) will be used for community resilience assessments including social resilience. RSP is anticipated to begin in state fiscal year 2017 and last for 3 years through FY 2019. Anticipated yearly funding is \$750,000 each year (\$2,250,000 total). The primary benefits will be the holistic understanding of resilience needs in communities.

Better Insurance Coverage

Through the NFIP and KDOW's involvement with the Kentucky Department of Insurance. Insurance coverage over extended durations will be communicated throughout the projects undertaken. The proposed project in the City of Middlesboro will potentially affect five non-residential structures on FEMA's Special Direct Facility (SDF), which are repetitive loss structures. Numerous other structures will also be positively affected, resulting in a revitalization of the downtown Middlesboro area.

October 1, 2015, the City of Henderson and Henderson County in western Kentucky and five communities in Campbell County (northern Kentucky) joined the FEMA Community Rating System (CRS). Louisville Metro participates in the CRS program and as of October 1, 2015, has achieved a Class 3 Rating, which awards residents in the community with up to a 35% discount on flood insurance premiums.

Attachment D: Consultation Summary

Kentucky Department for Local Government:

Representing

The Commonwealth of Kentucky

AttachmentD.pdf

Attachment D: Consultation Summary

Citizen Participation and Consultation Summary Chart – Kentucky

Note: Public Hearing Information is highlighted in green

1	2	3	4
Agency Name or Stakeholder Group (if applicable)	Agency Type - Target Population (If applicable)	Type of Outreach	- Method of Notification (if applicable) - Materials Provided
DLG	Local and State Government – public, low income and vulnerable populations	Public Hearing Notice	Online link to draft application posted on DLG, KYEM, and KDOW websites (Attachment D: DLG Website)
DLG	Local and State Government – public, low income and vulnerable populations	Public Hearing offered via a webinar 3-19-15	Email invites and online posting of the webinar for public consumption (Attachment D: DLG Website) – PowerPoint presentation presented and comments could be made via chat or phone line (Attachment D: Webinar Public Comments)
DLG	Local and State Government – public, low income and vulnerable populations	Public Hearing 3-25-15	Email invites and online posting for public consumption (Attachment D: DLG Website)– PowerPoint presentation presented and opened the floor for comments (Attachment D: Public Hearing Comments)
KYEM	State and local government	Meeting	Emergency Management invitees – PowerPoint presentation on the NDRC and discussion with the partners.

1	2	3	4
Agency Name or Stakeholder Group (if applicable)	Agency Type - Target Population (If applicable)	Type of Outreach	- Method of Notification (if applicable) - Materials Provided
Commonwealth Council of Kentucky Council for Community Recovery and Resilience (CCRR)	State agencies	Meeting	Personal invites from DLG – Materials provided included handouts and PowerPoints. Small breakout meetings occurred to capture information to be used for the Phase 1 Application
Kentucky Association of Mitigation Managers (KAMM)	Non-profit – State and local stakeholders attending KAMM regional trainings (6 were held with the NDRC discussed) (Several members of our threshold communities were represented. http://www.kymitigation.org/kamm-regional-meeting/	In person training	Email and website notification – PowerPoint presentation on the NDRC and open discussion on the subject matter used to influence the Phase 1 Application
KDOW, Louisville MSD, CHR, Stantec	KDOW, Louisville MSD, CHR, Stantec	Meeting	Phone call and email invitations – Discussed the NDRC with members of the Louisville/Jefferson county which is a threshold community. Identified unmet needs and discussed conducting a windshield survey.
KDOW, Louisville MSD, CHR, Stantec	KDOW, Louisville MSD, CHR, Stantec	Meeting	Phone call and email invitations – Discussed the results of the windshield survey and the identified Louisville/Jefferson county’s unmet needs.
KAMM	Non-profit – State and local stakeholders	Survey	Emails with link to survey sent to over 1200 KAMM members or contacts. Survey to capture needs, development issues and vulnerabilities. http://www.kymitigation.org/kentucky-resilience-questionnaire/

1	2	3	4
Agency Name or Stakeholder Group (if applicable)	Agency Type - Target Population (if applicable)	Type of Outreach	- Method of Notification (if applicable) - Materials Provided
KYEM and CHR	State and local government	Conference presentation	Conference invitation which was open to the public – PowerPoint discussing resilience and the NDRC.
KY Cities Mayors	Local Government – low income households	Email blast on Public Notice	Announcement of the public notice and the availability to view and comment on the Phase I Application with attachments (Attachment D: Email Notification)
KY County Judges	Local Government – low income households	Email blast on Public Notice	Announcement of the public notice and the availability to view and comment on the Phase I Application with attachments (Attachment D: Email Notification)
KY Certified CDBG Administrators	Quasi-governments, private consultants and non-profits	Email blast on Public Notice	Announcement of the public notice and the availability to view and comment on the Phase I Application with attachments (Attachment D: Email Notification)
KY Area Development District Directors	Quasi-government	Monthly meetings	Announcement of the public notice and the availability to view and comment on the Phase I Application with attachments (Attachment D: Email Notification)
KY Assoc. of County Judges and Magistrates Local planning authorities/KDOW	Local Government – low income households Local Government	Elected Officials training Meeting	Summary of Federal funds available and their eligible uses Resilience-based coordination with engineering stakeholders to discuss wastewater treatment capacity and construction

1	2	3	4
Agency Name or Stakeholder Group (if applicable)	Agency Type - Target Population (if applicable)	Type of Outreach	- Method of Notification (if applicable) - Materials Provided
FEMA/USACE/KDOW	Federal, state governments	Webinar	Flood control structure integrated project team discussing levee-related long-term resilience objectives
Kentucky River Authority	Regional	Public meeting	Open to Public. Navigation, lock operation and potential future economic uses of KY River
Silver Jackets	Federal, state, regional, local	Meetings	Discussion of ongoing mitigation and resilience objectives and activities for federal, state, regional and local stakeholders including specific projects with resilience components
KY League of Cities	Local Government – low income households	Elected Officials training	Summary of Federal funds available and their eligible uses
KY Assoc. of Counties	Local Government – low income households	Elected Officials training	Summary of Federal funds available and their eligible uses
Local governments/KDOW	Public officials	Meetings	Discussion of flood-related hazards and long-term resilience planning
Kentucky League of Cities	City organization	Meeting/webinars	Disaster recovery and long term resilience opportunities

1	2	3	4
Agency Name or Stakeholder Group (if applicable)	Agency Type - Target Population (if applicable)	Type of Outreach	- Method of Notification (if applicable) - Materials Provided
Local Governments/KDOW	Local Governments	Teleconference	Open to public. Discussion of mitigation opportunities relating to applicable disaster recovery
Eastern Kentucky University	University	Meeting	Brainstorm to include resilience components into theories regarding disaster recovery
Local governments/USGS/NWS / USACE/KDOW	Federal/Local Governments	Meeting	Flood inundation mapping protocols for flood risk identification, disaster preparation and long-term resilience
Insurance agents	Private – insurance agents	Training	Open to public. Training related to implementation of new NFIP (BW12/HFIAA) bills
KDOW/EPA	Federal/state/local	Webinar	Flood resilience for water and wastewater utilities
Kentucky Association of Mitigation Managers (KAMM)	Non-profit	Training	Multiple events open to public. Training provided on natural risks, mitigation opportunities and resilience objectives
CCRR	State and Local Governments	Meeting, 7-14-2015	Phase II Project Solicitation
Louisville Stakeholder Meeting	Local Governments	Meeting, 8-03-2015	Phase II Project Development
Middlesboro Stakeholder Meeting	Local Governments	Meeting, 8-12-2015	Phase II Project Development

1	2	3	4
Agency Name or Stakeholder Group (if applicable)	Agency Type - Target Population (if applicable)	Type of Outreach	- Method of Notification (if applicable) - Materials Provided
Louisville Stakeholder Meeting	Local Governments	Meeting, 8-21-2015	Phase II Project Development
Kentucky Association of Mitigation Managers (KAMM)	State and Local Governments	Presentation, 8-27-15	Multiple events open to public. Training provided on natural risks, mitigation opportunities and resilience objectives
Middlesboro Stakeholder Meeting	Local Governments	Meeting, 8-31-2015	Phase II Project Development
Louisville Stakeholder Meeting	Local Governments and Project Partner Agencies	Meeting, 9-03-2015	Phase II Project Development
Louisville Stakeholder Meeting	Local Governments	Meeting, 9-08-2015	Phase II Project Development
Louisville Public Meeting	Local Government – public of Louisville, low income and vulnerable populations	Public Hearing Notice - 9-08-2015	Open to public posted on MSD website. Discussion of NDRC opportunity
Louisville Stakeholder Meeting	Local Governments	Meeting, 9-15-2015	Phase II Project Development
Louisville Stakeholder Meeting	Local Governments	Meeting, 9-16-2015	Phase II Project Development
Middlesboro Stakeholder Meeting	Local Governments and Project Partner Agencies	Meeting, 9-22-2015	Phase II Project Development

1	2	3	4
Agency Name or Stakeholder Group (if applicable)	Agency Type - Target Population (if applicable)	Type of Outreach	- Method of Notification (if applicable) - Materials Provided
Middlesboro Public Meeting	Local Government – public of Middlesboro, low income and vulnerable populations	Public Hearing Notice - 9-22-2015	Open to public posted in newspaper and websites. Discussion of NDRC opportunity
Louisville Stakeholder Meeting	Local Governments	Meeting, 10-05-2015	Phase II Project Solicitation
Louisville Public Meeting	Local Government – public of Louisville, low income and vulnerable populations	Public Hearing Notice - 9-15-2015	Open to public posted on MSD website. Discussion of NDRC opportunity

Attachment F Benefit-Cost Analysis

Commonwealth of Kentucky

AttachmentFBCA.pdf

Project - West Virginia								
ID	1	2	3	4	5	6	7	8
	Costs and Benefits by category	Page # in BCA Narrative - Attachment F	Qualitative Description of Effect and Rationale for Including in BCA	Quantitative assessment		Uncertainty (1-5)	Post Project Benefits Tracking	
				(Explain basis and/or methodology for calculating Monetized Effect, including data sources, if applicable)	Monetized effect (if applicable)		Output (metric)	Outcome (qualitative)
Life cycle costs								
1.a	Tree Planting	#	Louisville would use \$2,400,000 of CDBG-NDR funds to plant 10,000 large trees to reduce runoff, increase canopy coverage and reduce urban heat island impacts	Documentation provided by Louisville	\$3,169,604 in upfront costs			
1.b	Youth Build	#	Louisville would use \$1,350,000 of CDBG-NDR funds to provide young adults with opportunities for success through job skills training, education and work experience with an emphasis on land conservation, watershed studies, horticultural stewardship, and service projects that benefit the surrounding community.	Documentation provided by Louisville	\$2,773,116 in upfront costs			
1.c	Code Red	#	Louisville would use \$225,000 of CDBG-NDR funds to help alert resident via email or text in the event of emergency situations or critical community alerts like evacuation notices, bio-terrorism alerts, boil water notices, and missing child reports.	Documentation provided by Louisville	\$225,000 in upfront costs			
1.d	Parkway Place - Louisville Housing Authority Green Project	#	Louisville would use \$1,833,692 of CDBG-NDR funds to construct green infrastructure such as bioswales and pervious pavers draining to existing underground retention basins	Documentation provided by Louisville	\$9,833,692 in upfront costs			
1.e	Liberty Green - Louisville Housing Authority Green Project	#	Louisville would use \$600,000 of CDBG-NDR funds to construct green infrastructure bioswales to improve drainage, reduce the risk of sinkholes, and remove more water from the combined sewer system.	Documentation provided by Louisville	\$600,000 in upfront costs			
1.f	Starkey FPS Redundancy	#	Louisville would use \$11,623,418 of CDBG-NDR funds to add a redundant pump station at Starkey Flood Pump Station.	Documentation provided by Louisville	\$59,640,891 in upfront costs			
1.g	Delaware Drive Buyout (Buechel Branch)	#	Louisville would use \$7,000,000 of CDBG-NDR funds to buy out 47 property in flood prone areas and reduce water surface elevations	Documentation provided by Louisville	\$7,300,000 in upfront costs			
1.h	Pinch Point Study on South Fork of Beargrass Creek	#	Louisville would use a portion of \$457,000 of CDBG-NDR funds to produce accurate data to determine mitigation opportunities to reduce flooding.	Documentation provided by Louisville	\$457,000 in upfront costs			
1.i	Beargrass Creek Trail, I-64 landscaping	#	Louisville would use \$8,943,000 of CDBG-NDR funds to create a trail that connects Waterfront Park and the Big Four Bridge to an existing trail that leads to Cherokee Park. The project also involves bank stabilization, wetland restoration, and brownfield reclamation.	Documentation provided by Louisville	\$9,093,000 in upfront costs			
1.j	Beargrass Falls Water & Sustainability Education	#	Louisville would use \$600,000 of CDBG-NDR funds to create an education center that conducts ecological and disaster reliance community-based research while being a demonstration site for to help educate the community on ways that individuals can become more sustainable.	Documentation provided by Louisville	\$1,068,300 in upfront costs			
1.k	Beargrass Falls Formal Education Program in Urban Sustainability and Disaster Resilience	#	Louisville would use \$510,000 of CDBG-NDR funds to partner with The Partnership for a Green City to create a program for students interested in urban sustainability beginning in elementary school through graduate studies.	Documentation provided by Louisville	\$510,000 in upfront costs			
1.l	Beargrass FPS Education	#	Louisville would use \$200,000 of CDBG-NDR funds to fund Formal Education Programs in Urban Sustainability and Disaster Resilience.	Documentation provided by Louisville	\$200,000 in upfront costs			
1.m	Pilot green in-lieu fee	#	Louisville would use a portion of the \$7M from of CDBG-NDR funds to encourage green initiatives to reduce stormwater impacts.					
1.n	GI CSO15- Wyandotte Park and Iroquois Homes	#	Louisville would use \$11,980,000 of CDBG-NDR funds to construct green infrastructure at Wyandotte Park and Iroquois Homes.	Documentation provided by Louisville	\$52,220,221 in upfront costs			
1.o	Morris Forman (MFWQTC) - additional Final Effluent PS generators	#	Louisville would use \$5,200,000 of CDBG-NDR funds to install two generators to allow MFWQTC to pump effluent over the flood wall in the event of a total power failure.	Documentation provided by Louisville	\$7,800,000 in upfront costs			
1.p	MFWQTC - Biotower Improvements	#	Louisville would use \$2,600,000 of CDBG-NDR funds to return the existing biotowers to full operating efficiency by installing new variable frequency drives (VFDs).	Documentation provided by Louisville	\$15,450,020 in upfront costs			
1.q	MFWQTC - Drying System Upgrades	#	Louisville would use \$1,600,000 of CDBG-NDR funds to refurbish three current operational trains and to return a fourth train to operability.	Documentation provided by Louisville	\$6,807,000 in upfront costs			
1.r	MFWQTC - Clarifier Upgrades	#	Louisville would use \$500,000 of CDBG-NDR funds to modify the 20 existing clarifiers of the perimeter feed to increase secondary treatment capacity and decrease the potential for short circuiting.	Documentation provided by Louisville	\$1,485,465 in upfront costs			
1.s	Iroquois HS, green roof 300 K and/or storage	#	Louisville would use \$2,000,000 of CDBG-NDR funds to install a green roof at Iroquois High School.	Documentation provided by Louisville	\$2,050,000 in upfront costs			
Resiliency Value								
	Communication during disasters		Alerts residents via email or text in the event of emergency situations or critical community alerts like evacuation notices, bio-terrorism alerts, boil water notices, and missing child reports.	Qualitative				
1.c	Code Red	#	See Above	See Above	++			
	Resiliency Research and Education		Creates an education center that conducts ecological and disaster reliance community-based research	Qualitative				
1.j	Beargrass Falls Water & Sustainability Education	#	Provides a sustained educational/behavior change outreach program for residents of Beargrass Creek Watershed to ensure they understand what they can do to minimize the impact of flooding disasters, regulatory review of floodplain regulations, and bank stabilization research	See Above	++			
	Removal of flood prone properties from at risk area		Removal of flood prone properties reduces recurring damages to structures and contents.	FEMA BCA Methodology. FEMA FIS Flood Elevations. USACE Depth Damage Curves.				
1.g	Delaware Drive Buyout (Buechel Branch)	#	See Above	See Above	Accounted for in Reduced flood water levels			
	Reduce flood water levels		Reducing flood hazards by removing flow constrictions or reducing peak flows in such a way that flood hazard areas will be modified	FEMA BCA Methodology. FEMA FIS Flood Elevations. USACE Depth Damage Curves.	Net Present Value			
1.g	Delaware Drive Buyout (Buechel Branch)	#	See Above	See Above	\$81,171			
1.n	GI CSO15- Wyandotte Park and Iroquois Homes	#	See Above	See Above	\$16,851,078			
	Operational Redundancy		Project creates redundancy in operation to prevent a failure of operations in the event of a natural or manmade disaster such as flooding, power outage, equipment breakdown, etc.	Qualitative				
1.o	Morris Forman (MFWQTC) - additional Final Effluent PS generators	#	See Above	See Above	++			
Environmental Value								
	Tree planting		Trees reduce rainfall runoff, urban heat island impacts, and carbon emissions	USDA Forest Service	Annualized Benefit			
1.a	Tree Planting	#	10,000 trees planted	USDA Forest Service	\$370,000			
	Green infrastructure		Provides runoff reduction which reduces peak flows during a rain event as well as allows biological processes to filter water before discharging	Center for Neighborhood Technology. U.S. Environmental Protection Agency. The Economic Benefits of Green Infrastructure. A Case Study of Lancaster, PA. February 2014. Wastewater treatment rates provided by Louisville	Annualized Benefit			
1.d	Parkway Place - Louisville Housing Authority Green Project	#	Bioswales and pervious pavers	See Above	\$3,540,673			
1.e	Liberty Green - Louisville Housing Authority Green Project	#	Bioswales	See Above	\$155,013			
1.n	GI CSO15- Wyandotte Park and Iroquois Homes	#	CSO Reduction	See Above	\$559,300			
1.s	Iroquois HS, green roof 300 K and/or storage	#	Green Roof	See Above	\$350,384			
	Bank stabilization		River bank restoration reduces sediment erosion and helps restore the natural conveyance and functions of streams	Method based on KY Fish and Game, rate per AMU	Net Present Value			
1.i	Beargrass Creek Trail, I-64 landscaping	#	See Above	See Above	\$2,835,000			
	Wetland creation		Wetland areas have a variety of ecosystem function benefits including water filtration and production services	FEMA Standard Values for Environmental Benefits of Wetlands	Annualized Benefit			
1.i	Beargrass Creek Trail, I-64 landscaping	#	See Above	See Above	\$8,858			

	Green space creation		Green space has a variety of environmental benefits including air quality, runoff reduction, and recreational.	FEMA Mitigation Policy - FP 108-024-01	Annualized Benefit			
1.g	Delaware Drive Buyout (Buechel Branch)	#	15.5 acres of green space	See Above	\$1,713,344			
1.i	Beargrass Creek Trail, I-64 landscaping	#	8.17 acres of brownfield acquired and converted into green space	See Above	\$903,098			
	Riparian area created		Riparian areas have various environmental benefits including water filtration, erosion control, and habitat revitalization.	FEMA Mitigation Policy - FP 108-024-01	Annualized Benefit			
1.g	Delaware Drive Buyout (Buechel Branch)	#	2.7 acres of riparian area	See Above	\$1,449,631			
	Superfund sites reclamation		Superfund sites acquired and reclaimed involve the removal of toxic chemicals and restoration of natural functions of the land	Qualitative	Annualized Benefit			
1.i	Beargrass Creek Trail, I-64 landscaping	#	5 superfund sites	See Above	Qualitative			
	Emission Reduction		Bike trails displace automobile traffic which reduces carbon dioxide emissions from driving. Biker commuters have a reduced environmental footprint.	Source: TIGER BCA Resource Guide, updated 3.27.2015; USEPA, "Average Annual Emissions and Fuel Consumption for Gasoline-Fueled Passenger Cars and Light Trucks," October 2008, pp.4-5; Source: U.S. Census Bureau, 2009-2013 5-Year American Community Survey - Louisville/Jefferson County metro government (balance), Kentucky	Net Present Value			
1.i	Beargrass Creek Trail, I-64 landscaping	#	See Above	See Above	\$43,990			
Social Value								
	Education		Community education through funded programs	Qualitative				
1.b	Youth Build	#	Provides young adults with opportunities for success through job skills training, education and work experience with an emphasis on	See Above	++			
1.c	Code Red		Provides alerts and instruction for residents via email or text in the event of emergency situations or critical community alerts like evacuation notices, bio-terrorism alerts, boil water notices, and missing child reports.	See Above	++			
1.j	Beargrass Falls Water & Sustainability Education	#	Create an education center that conducts ecological and disaster reliance community-based research while being a demonstration site for to help educate the community on ways that individuals can become more sustainable.	See Above	++			
1.k	Beargrass Falls Formal Education Program in Urban Sustainability and Disaster Resilience	#	Partners with The Partnership for a Green City to create a program for students interested in urban sustainability beginning in elementary school through graduate studies. Includes annual Youth Summit with the following foci: Green Infrastructure, Tree Planting, and School Based Disaster Resilience Programs	See Above	++			
1.l	Beargrass FPS Education	#	The Partnership for a Green City is working to create a seamless progression for students interested in urban sustainability beginning in elementary school through graduate studies. The Partnership will host an annual Youth Summit with the following foci: Green Infrastructure, Tree Planting and School Based Disaster Resilience Programs.	See Above	++			
1.s	Iroquois HS, green roof 300 K and/or storage		The Iroquois HS project will teach students about the construction process, create great mentoring opportunities since they are a construction magnet school, teach the students about sustainability and water reuse, provide the students with leadership training, and as well will reduce the volume of combined sewer overflows.	See Above	++			
	Community Cohesion and Connectivity		Improved living environment, social cohesion	Qualitative				
1.a	Tree Planting	#	See Above	See Above	++			
1.i	Beargrass Creek Trail, I-64 landscaping	#	Trails connect to existing pathways and creates new routes throughout the community. Waterfront Park is currently fundraising for a westward expansion. The \$35 million, 22-acre expansion will connect West Louisville and East Louisville, making it safer for cyclists and pedestrians to cross busy 9th Street. The project will include plazas, pathways, footbridges, sculptures, historic elements and fountains.	See Above	++			
1.n	GI CSO15- Wyandotte Park and Iroquois Homes	#	Construction of green infrastructure adds to aesthetic benefit and improved living environment	See Above	++			
	Recreation/Improved environment and health		Increased physical activity and overall health, leading to savings in lifetime health costs	Qualitative				
1.a	Delaware Drive Buyout (Buechel Branch)	#	15.5 acres of designated greenspace to be constructed	See Above	++			
1.i	Beargrass Creek Trail, I-64 landscaping		See Above	See Above	++			
	Human impacts during flooding		Removal of flood prone properties reduces recurring displacement costs during cleanup associated with rental and disruption.	FEMA BCA Methodology	Net Present Value			
1.a	Delaware Drive Buyout (Buechel Branch)	#	Buy out 47 property in flood prone areas and reduce water surface elevations	See Above	\$46,280			
	Benefit to low/moderate income persons		Projects directly benefit low/moderate income persons/households	Qualitative				
1.b	Youth Build	#	Provides young adults with opportunities for success through job skills training, education and work experience with an emphasis on land conservation, watershed studies, horticultural stewardship, and service projects that benefit the surrounding community.	See Above	++			
1.i	Beargrass Creek Trail, I-64 landscaping		Increased access to parks, city centers, markets, and hospital	See Above	++			
1.s	Iroquois HS, green roof 300 K and/or storage		Completing the rest of the project will allow students from a depressed area the opportunity to participate first hand through mentorship and training in a project/program that will help increase their success in life. They will also be working on a project in a depressed area that will ultimately increase the value of the surrounding properties in the community. This project improves the environment, economy, infrastructure, education of students and quality of life of people living in this watershed/sewershed.	See Above	++			
	Improved Utility Service		The proposed improvements would help ensure sewer service to homes during a flood event. Improvements would increase the overall conditions of the community with positive public health and perception implications.	Qualitative				
1.o	Morris Forman (MFWQTC) - additional Final Effluent PS generators	#	See Above	See Above	++			
1.p	MFWQTC - Biotower Improvements	#	See Above	See Above	++			
1.q	MFWQTC - Drying System Upgrades	#	See Above	See Above	++			
1.r	MFWQTC - Clarifier Upgrades	#	See Above	See Above	++			
Economic Revitalization								
	Direct / Secondary Economic Impact		Pilot Green Fees					
1.m	Pilot green in-lieu fee		See Above	See Above				
	Improved Property Value		Added 5% home value increase for properties located within 0.5 miles of proposed parks and green space.	Source: Asabere, P. and F. Huffman. 2009. "The relative impacts of trails and greenbelts on home price." The Journal of Real Estate Finance and Economics 38(4): 408-419.	Net Present Value			
1.i	Beargrass Creek Trail, I-64 landscaping		See Above	See Above	\$10,068,154			
	Job Creation/Training		All construction projects	Qualitative				
1.f	Starkey FPS Redundancy		Job creation and/or training as a direct results of projects	See Above	++			
1.j	Beargrass Falls Water & Sustainability Education		Addition of a redundant pump station at Starkey Flood Pump Station.	See Above	++			
	Retail Development		Creation of an education center that conducts ecological and disaster reliance community-based research while being a demonstration site for to help educate the community on ways that individuals can become more sustainable.	See Above	++			
			Economic benefits as a result of new retail	Qualitative				
1.i	Beargrass Creek Trail, I-64 landscaping		Local developer Steve Poe is expanding RiverPark Place, an apartment, condominium, park and marina development along the Ohio River and the portion of the Louisville Loop that connects Waterfront Park to the Beargrass Creek connector trail. The \$24 million project will add six buildings, with 600 apartments and condominium units, restaurants, retail space, a parking garage and the reconstruction of the marina with 150 boat slips. \$200 million investment from the Jefferson Development Group to redesign the triangular plot at the intersection of Lexington Road and Grinstead Drive – adjacent to the existing portion of the trail, and less than a mile from the proposed route. No official plans have been released, but the developers are considering condos, apartments, shops and restaurants, a bike shop and a deli.	See Above	++			
	Economic Revitalization Program		Economic revitalization as part of the program					

1.i	Beargrass Creek Trail, I-64 landscaping	<p>Louisville's \$35 million Waterfront Botanical Gardens (Botanica) will be located directly across the street from where the existing trail runs.</p> <p>Local developer Steve Poe partnered with REI, a real-estate investment trust, to construct a 72-unit apartment complex on Lexington Road, within a close proximity to the proposed trail and restoration project. The \$8 million project, called the Woods at Lexington Road, will be built on a 4.2-acre tract.</p>	See Above	++			
1.i	Beargrass Creek Trail, I-64 landscaping	<p>Cityscape Residential is planning a \$40 million, 250- to 300-unit residential development called Axis Apartments on a 30-acre parcel adjacent to Lexington Rd. This development abuts the proposed route of the Beargrass Creek connector trail. Once both developments (trail and apartments) are complete, the residents will be able to hike and bike from their apartments into downtown completely off-road, next to a restored stream. This development is on the abandoned Progress Rail property.</p>	See Above	++			
1.i	Beargrass Creek Trail, I-64 landscaping	<p>A \$50 million Main and Clay development, a seven-story project in the heart of Butchertown (the same neighborhood the majority of the trail will run through). The Bristol Development Group has proposed a mixed-use development containing ground-floor retail with 260 residential units.</p>	See Above	++			

--	-	0	+	++	?
Strong negative	Negative	Neutral	Positive	Strong positive	unknown

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YFN - years from now
 NPV - net present value
 Discount Rate

7%

IE - Initial Expenditure
 A - Annual Expense
 Ns - Start Construction
 Nc - Complete Construction
 Nd - Design Life
 i - Discount Rate

$$Lifecyle Cost = IE(1+i)^{-Ns} + A \frac{(1+i)^{Nd}-1}{i(1+i)^{Nd}} - A \frac{(1+i)^{Nc}-1}{i(1+i)^{Nc}}$$

Designation			Lifecyle Cost Calculation					Selection Metrics					
ID	Component/Phase	Activity	Initial Expenditure	Start Construction (YFN)	Complete Construction (YFN)	Annual Expense	Design Life (YFN)	Lifecyle Cost (NPV)	Benefits (NPV)	Benefit-Cost-Ratio (BCR)	Net Benefit Value (NPV)	Leverage	Grant Need
1	City of Louisville												
1a		Tree Planting	\$ 3,169,604					\$ 3,169,604	\$ 5,284,140.12	1.667	\$ 2,114,536.12	\$ 769,604	\$ 2,400,000
1b		Youth Build	\$ 2,773,116					\$ 2,773,116		0.000	\$ (2,773,116.00)	\$ 1,423,116	\$ 1,350,000
1c		Code Red	\$ 225,000					\$ 225,000		0.000	\$ (225,000.00)	\$ -	\$ 225,000
1d		Parkway Place - Louisville Housing Authority Green Project	\$ 9,833,692					\$ 9,833,692	\$ 48,863,928.96	4.969	\$ 39,030,236.96	\$ 8,000,000	\$ 1,833,692
1e		Liberty Green - Louisville Housing Authority Green Project	\$ 600,000					\$ 600,000	\$ 2,139,297.76	3.565	\$ 1,539,297.76	See Project 1.d	\$ 600,000
1f		Starkey FPS Redundancy	\$ 59,640,891					\$ 59,640,891		0.000	\$ (59,640,891.00)	\$ 48,017,473	\$ 11,623,418
1g		Delaware Drive Buyout (Buechel Branch)	\$ 7,300,000					\$ 7,300,000	\$ 3,290,426.07	0.451	\$ (4,009,573.93)	\$ 300,000	\$ 7,000,000
1h		Pinch Point Study on South Fork of Beargrass Creek	\$ 457,000					\$ 457,000		0.000	\$ (457,000.00)	See Project 1.d	\$ 457,000
1i		Beargrass Creek Trail, I-64 landscaping	\$ 9,093,000					\$ 9,093,000	\$ 13,972,493	1.537	\$ 4,879,493.46	\$ 150,000	\$ 8,943,000
1j		Beargrass Falls Water & Sustainability Education	\$ 1,068,300					\$ 1,068,300		0.000	\$ (1,068,300.00)	\$ 468,300	\$ 600,000
1k		Beargrass Falls Formal Education Program in Urban Sustainability and Disaster Resilience	\$ 510,000					\$ 510,000		0.000	\$ (510,000.00)	See Project 1.j	\$ 510,000
1l		Beargrass FPS Education	\$ 200,000					\$ 200,000		0.000	\$ (200,000.00)	See Project 1.d	\$ 200,000
1m		Pilot green in-lieu fee											
1n		GI CSO15- Wyandotte Park and Iroquois Homes	\$ 58,580,211					\$ 58,580,211	\$ 24,569,835.41	0.419	\$ (34,010,375.59)	\$ 46,600,211	\$ 11,980,000
1o		Morris Forman (MFWQTC) - additional Final Effluent PS generators	\$ 7,800,000					\$ 7,800,000		0.000	\$ (7,800,000.00)	\$ 2,600,000	\$ 5,200,000
1p		MFWQTC - Biotower Improvements	\$ 15,450,020					\$ 15,450,020		0.000	\$ (15,450,020.00)	\$ 12,850,020	\$ 2,600,000
1q		MFWQTC - Drying System Upgrades	\$ 6,807,382					\$ 6,807,382		0.000	\$ (6,807,382.00)	\$ 5,207,382	\$ 1,600,000
1r		MFWQTC - Clarifier Upgrades	\$ 1,485,465					\$ 1,485,465		0.000	\$ (1,485,465.00)	\$ 985,465	\$ 500,000
1s		Iroquois HS, green roof 300 K and/or storage	\$ 2,050,000					\$ 2,050,000	\$ 4,835,563.83	2.359	\$ 2,785,563.83	\$ 50,000	\$ 2,000,000
Application Total			\$ 187,043,681.00					\$ 187,043,681.00	\$ 102,955,685.60	0.550	\$ (84,087,995.40)	\$ 127,421,571.00	\$ 59,622,110.00



BCA Overview Table

Project - Middlesboro, KY							
1	2	3	4	5	6	7	8
Costs and Benefits by category	Page # in BCA Narrative - Attachment F	Qualitative Description of Effect and Rationale for Including in BCA	Quantitative assessment		Uncertainty (1-5)	Post Project Benefits Tracking	
			(Explain basis and/or methodology for calculating Monetized Effect, including data sources, if applicable)	Monetized effect (if applicable)		Output (metric)	Outcome (qualitative)
Life cycle costs							
Expanded City Trail/Greenway Networks		Funds will be used to build a network of trails that establish riparian area which will enhance tourism, recreation, and environmental values.	City of Middlesboro P&R budget	\$ 8,848,679.16	1		
Southeast Education Alliance Building- New Medical Center		Funds will enhance and support the additional educational programming proposed by the Community College	SEKTC project planning and budget	\$ 10,000,000.00	1		
Downtown Farmers Market and Parking Lot Renovation		Funds will be used to support the redevelopment of a downtown parking area into a local farmer's market with the addition of green infrastructure	City of Middlesboro and DDM Planning and Budgeting	\$ 2,232,701.89	2		
Little Yellow Creek Stream Restoration		Funds will be used to restore a heavily sedimented stream, enhancing stream quality and providing flood mitigation.		\$ 1,161,780.28	1		
Downtown Revitalization & Flood Retrofits		Funds will support downtown property retrofits to decrease damages from future floods.		\$ 750,000.00	3		
Little Yellow Creek Channel Improvements		Applicant will use funds to restore and naturalize the original Little Yellow Creek Channel to enhance tourism and flood control.		\$ 1,077,180.00	1		
New Cancer and Breast Center		Applicant will use funds to build a new cancer center at within the Middlesboro municipal boundary.	ARH Hospital Planning	\$ 35,800,746.29	1		
Resiliency Value							
Flood Risk Analysis Study		Applicant will use \$100,000 CDBG-NDR funds to conduct a holistic preliminary engineering analysis of the existing stormwater conveyance system and stream network to determine flood origins and make recommendations for alleviating flooding.	FEMA BCA Methodology. FEMA FIS Flood Elevations. USACE Depth Damage Curves.	\$ 100,000.00	1		
Downtown Revitalization and Flood Retrofits			FEMA and State DEM Repetitive Loss Database	\$ 2,122,186.44	1	Decrease in flood damages to RL structures	Cost Savings for damage reduction
Environmental Value							
Expanded City Trail/Greenway Networks - Riparian Land Restored		Increased open and riparian space	FEMA BCA Methodology	\$ 12,799,129.32	1	Increase in trail visitors and tourism	Tourism Dollars Increase
Little Yellow Creek Stream Restoration		Increased intrinsic value and biological quality	Kentucky Mitigation Values FEMA BCA Methodology	\$ 7,483,201.07	1	Stream flow and biological monitoring: Increase in fish and biodiversity	Cleaner water and better attraction for citizens
Little Yellow Creek Channel Restoration		Increased intrinsic value and biological quality	Kentucky Mitigation Values FEMA BCA Methodology	\$ 7,915,875.92	1	Stream flow and biological monitoring: Increase in fish and biodiversity	Cleaner water and better attraction for citizens
Social Value							
Expanded City Trail/Greenway Networks - Aesthetics and Recreation		Improved stream front recreation and aesthetic value to community - social cohesion	N.A.	N.A.	3	Number of people per month who spend time in the park area	Imprvoed community's attitude towards outdoor recreation
New Cancer and Breast Center		Overall better life expectancy across region due to better and more accessible cancer treatment	7% in increased survival rate for early detection and treatment American Cancer Society Statistics	\$ 25,410,000.00	1	Number of patients treated annually	Overall preventative health approach of community members
Southeast Education Alliance Building- New Medical Center		Additional programming which will provide additioning teaching resources	SEKTC Planning Numbers for additional staff and students projected		2		
Economic Revitalization							
New Cancer and Breast Center		Temporary construction jobs needed to build facilities. Permanent medical and staff jobs to run and operate facilities	ARH Planning Data	\$XXX,XXX a year for X years and \$X,XXX,XXX a year over XX years (design life)	1	Annual income of construction workers and professionals working in completed facility	Where the workers/professionals come from. Local community or commuters?
Expanded City Trail/Greenway Networks - Aesthetics and Recreation		Increased tourism	National Park Service Statistical Database for Park Users	\$ 84,010,681.13	1	Economic impact of tourism	Increased number of tourism and \$ spent
Downtown Farmers Market and Parking Lot Renovation		Increase in agriculture economy	FEMA BCA Methodology				

Social
Economic
Environmental
Resiliency

YFN - years from now
NPV - net present value

Discount Rate **7%**

IE - Initial Expenditure
A - Annual Expense
Ns - Start Construction
Nc - Complete Construction
Nd - Design Life
i - Discount Rate

Application Designation				Lifecycle Cost Calculation						Selection Metrics				
Component/Phase	Value	Project	Activity	Initial Expenditure	Start (YFN)	Complete (YFN)	Annual Expense	Design Life (YFN)	Lifecycle Cost (NPV)	Design Life Benefits (NPV)	Benefit-Cost-Ratio (BCR)	Net Benefit Value (NPV)	Leverage	Grant Need
	X X	Community Wellness Improvements	New Cancer and Breast Center	\$ 22,000,000.00			1,000,000	50	\$ 35,800,746.29	\$ 25,410,000.00	0.710	\$ (10,390,746.29)	\$ 18,000,000.00	\$ 17,800,746.29
	X X X	Community Wellness Improvements	Expanded City Trail/Greenways Network	\$ 8,266,000.00			50,000.00	25	\$ 8,848,679.16	\$ 96,809,810.45	10.941	\$ 87,961,131.29	\$ 100,000.00	\$ 8,748,679.16
	X X	Community Wellness Improvements	Southeast Education Alliance Building- New Medical Center	\$ 10,000,000.00					\$ 10,000,000.00	\$ -	0.000	\$ (10,000,000.00)	\$ 76,300,000.00	\$ (66,300,000.00)
	X X	Community Wellness Improvements	Downtown Farmers Market and Parking Lot Renovation	\$1,956,687			20,000	50	\$ 2,232,701.89	\$ -	0.000	\$ (2,232,701.89)		\$ 2,232,701.89
		Total Project							\$ 56,882,127.34	\$ 122,219,810.45	2.149			\$ (37,517,872.66)
	X X X X	Flood Risk Reduction	Flood Risk Analysis Study	\$110,000					\$ 110,000.00	\$ -	0.000	\$ (110,000.00)		\$ 110,000.00
	X X	Flood Risk Reduction	Downtown Rivalization & Flood Retrofits	\$ 750,000.00					\$ 750,000.00	\$ 2,122,186.44	2.830	\$ 1,372,186.44		\$ 750,000.00
	X X X X	Flood Risk Reduction	Yellow Creek Channel Improvements	\$ 1,077,180.00					\$ 1,077,180.00	\$ 7,915,875.92	7.349	\$ 6,838,695.92		\$ 1,077,180.00
Louisville	X X	Flood Risk Reduction	Little Yellow Creek Stream Restoration	\$ 1,161,780.28					\$ 1,161,780.28	\$ 7,483,201.07	6.441	\$ 6,321,420.79		\$ 1,161,780.28
		Total Project							\$ 3,098,960.28	\$ 17,521,263.43	5.654			\$ 3,098,960.28

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