March 10, 2019

TO: Kevin Sneed
      WV NFIP Coordinator
      WV National Flood Insurance Program Office
      WV Division of Homeland Security and Emergency Management
      1900 Kanawha Blvd. East, Bldg. 1, Room EB-80
      Charleston, WV 25305-0360

Project: Statewide Multi-Hazard Risk Assessments (TEIF/TEAL)
         Project Number: FEMA-4273-DR-WV-0031
         Performance Period: 6/20/2018 – 6/4/2021

SUBJECT: Unique Work Tasks for HMGP and CTP projects awarded to WV GIS Technical Center, West Virginia University

Dear Kevin,

Please refer to Table 2 that lists the deliverables for the HMGP Statewide Multi-Hazard Risk Assessments Project awarded to the sub-recipient WV GIS Technical Center that complement the Cooperating Technical Partners (CTP) Program agreements in support of the WV Flood Tool. It is important to keep the HMGP and CTP work tasks and deliverables separate to avoid double dipping from federal funds for the same tasks.

The work tasks are organized the same as the corresponding goals and deliverables. A total of 15 deliverables align with the work tasks or goals: 6 flood risk assessment, 5 landslide risk assessment, and 4 data development.

Table 1. Deliverables organized by three major work tasks: flood risk assessment, landslide risk assessment, and data development. There are a total of 15 principal work tasks or deliverables for the entire project. System administrative tasks are not included.

Major Work Tasks	Designation Letter	Work Tasks Goals Deliverables
Flood Risk Assessments	F	6
Landslide Risk Assessments	L	5
Data Development	D	4

WORK TASKS / GOALS / DELIVERABLES (2018-2021)
HMGP Grant: Multi-Hazard Risk Assessments

Table 2. Work Tasks and Deliverables in support of WV Statewide Multi-Hazard Risk Assessments project funded by Hazard Mitigation Grant Program (HMGP)

FLOOD RISK ASSESSMENT		
MAJOR ACTIVITY	IN SUPPORT OF	TASK #
Site-specific flood risk assessments for 287 Incorporated / Unincorporated Communities	Local/State Hazard Mitigation Plans. Support for other plans (environmental assessments, comprehensive), flood reduction, and community resiliency efforts. Produce an automated ArcGIS Python Script Alternative methodology to Hazus-MH software for flood loss estimates of site-specific structures	F1
Statewide geodatabase of site-specific flood risk structures	Local/State Hazard Mitigation Plans Floodplain Manager and Community Rating System (CRS) activities Flood Risk Assessment GIS (FRAGIS) for more than 100,000 structures in regulatory and non-regulatory 100-year floodplains	F2
3D flood risk visualizations	3D community flood risk visualizations movie that can be published on the WV Flood Tool.	F3
Assemble statewide composite flood risk products	Statewide composite flood risk products that support hazard risk assessments and floodplain management activities. Examples include: • Composite Water Depth Grids (Model-Backed, Hazus, High-Water Marks, etc.) • Composite Water Surface Elevation Grid (Advisory Flood Heights, AE BFE Grid) • Composite Floodplains (Regulatory and Non-Regulatory Floodplains (Advisory A, Updated AE) • Building counts (bSF) and areas (aSFHA) in the 100-year floodplains	F4
Update State Hazard Mitigation Plan	Riverine Flood Hazards Chapter of 2023 State Hazard Mitigation Plan update Relevant Hazard Mitigation Actions listed in the 2018 State Hazard Mitigation Plan	F5
Publish flood risk data and products	Flood risk data and products published on state geo-platform that includes WV Flood Tool (www.mapwv.gov/flood) • Statewide riverine flood risk assessments for 1% Annual Event • More accurate FEMA Community Boundary layer for 287 communities (55 counties and 232 municipalities) • Various story maps for flood disaster events, flood risk assessments, mitigation strategies	F6

LANDSLIDE RISK ASSESSMENT		
MAJOR ACTIVITY	IN SUPPORT OF	TASK #
Landslide Inventory	Statewide landslide incident inventory from multiple data sources and landslide studies.	L1
Landslide Method Development]	Landslide prediction methodology developed by knowledge experts from West Virginia University who include Dr. Steve Kite (Geomorphologist), Dr. James Thompson (Soil Scientist), Dr. Aaron Maxwell (Geologist/Modeler), and Dr. Maneesh Sharma (Geologist/GIS).	L2
County-Level Landslide Map and Report Generation	Susceptibility maps and reports for all 55 counties developed from statistical models that evaluate various spatial inputs that have a high correlation to mapped landslide incidents: geology, soils, topography (slope, aspect, etc.), proximity to roads and streams.	L3
Landslide web application	Landslide Inventory Tool (www.mapwv.gov/landslide) that includes: • Landslide Incidents (published reports, agency databases, mapped landslides, etc.) • Landslide Model Inputs (geology, soils, topography, etc.) • Landslide Predictive Model Susceptibility Maps • Landslide Hazard Outreach Information (story maps, fact sheets, etc.)	L4
Update State Hazard Mitigation Plan	Landslide Hazard Chapter of 2023 State Hazard Mitigation Plan update Relevant Hazard Mitigation Actions listed in the 2018 State Hazard Mitigation Plan	L5

DATA DEVELOPMENT & EXCHANGE

MAJOR ACTIVITY	IN SUPPORT OF	TASK #
Statewide Building Inventory	A structure-level inventory of all building and facilities *exposed* to multi-hazards. Data resources for site-specific building information and identification include the site address, parcels, assessment records, leaf-off imagery, building footprints, insurance and business databases, critical facilities, etc. This task provides the building exposure information for multi-hazard assessments. Semi-automated tool or processes for creating building inventory	D1

Fill in GIS Data Gaps of Key Reference Layers	Corrected reference GIS data layer deficiencies that are preventing West Virginia from achieving detailed hazard identification and quality risk assessments. GIS data improvement activities include:
	
	• Parcels and assessment attributes
	• E-911 addresses and road centerlines
	• Leaf-off aerial imagery
	• Building-specific databases (e.g., WV Board of Risk)
	• *Elevation: High-resolution QL2 lidar elevation data sets required for ground elevation, flood water depths and water surface elevations are being acquired by FEMA*
	
	Note: E-911 site address and leaf-off aerial imagery are necessary to pinpoint flood-risk structures, while parcels and assessment attributes provide building values.
	
	Two major state contracts executed through WVU Procurement for the filling in data gaps for parcels/addresses and leaf-off imagery. HMGP funding to select communities is tracked through MOUs/Statements of Work that lists responsibilities, specification, and deliverables.
	
	Enhancements to the State and National Spatial Data Infrastructures in support of hazard risk assessments. Examples include that reside in the public domain:
	• State aerial imagery contract that allows local, state, and federal agencies to collaborate in purchasing imagery at reduced costs
	• Continually maintained parcels and E-911 addresses by local steward that are accessible to state and national level integration
	   o Technical and financial assistance for select E-911 Offices for addressing deficiencies located in hazard areas
	   o Technical and financial support to select county assessors for converting their remaining paper tax maps to digital map systems.
		D2

Identify and Report Data Gaps of Reference Layers	Identify and report data gaps at the county level for key geodatabase reference layers (parcels, addresses/geocoding, imagery, elevation, building footprints, critical infrastructure, etc.) that are hindering quality risk assessments.	D3

	Coordinate solutions to data gaps with state-level integrators. Prepare MOUs for communities that lists responsibilities, specification, and deliverables. • E-911 Addresses: WV Division of Homeland Security and Emergency Management, Statewide Addressing and Mapping System (SAMS) Program • Parcels/Assessment Records: WV Property Tax Division	5
Exchange Risk Assessment Information	Exchange the best available risk assessment information among local, state, and federal partners and geo-platforms.	D4

Project Overview: The Statewide Hazard Mitigation Project funded by the FEMA Hazard Mitigation Grant Program (HMGP) involves three major components. The grant recipient and sub-recipient are the State Hazard Mitigation Office (Brian Penix) and the WV GIS Technical Center at West Virginia University (Kurt Donaldson), respectively.

- **Flood Risk Assessments**: Create site-specific flood risk assessments for 287 communities (232 municipalities and 55 unincorporated areas. Referred to as the Total Exposure in Floodplains (TEIF) project. Results will be published on the WV Flood Tool (www.mapwv.gov/flood) and to the Flood Risk Assessment Geographic Information System (FRAGIS).

- **Landslide Risk Assessments:** Generate landslide incident and susceptibility maps for 55 counties. Referred to as the Total Exposure in Areas of Landslides (TEAL) project. Results will be published on the WV Landslide Tool (www.mapwv.gov/landslide).

- **GIS Data Development:** The development of complete and current community boundaries, parcels, site addresses, and leaf-off imagery is necessary to fulfill the requirements of county and state hazard risk assessments and products. These GIS data layers are essential for pinpointing and estimating building loss for at-risk structures and facilities.

Timeline: The performance period for the Statewide Multi-Hazard Risk Assessments (Project Number: FEMA-4273-DR-WV-0031) is 6/20/2018 to 6/4/2021. Outputs of this project include the flood and landslide risk assessments for upcoming local and state hazard mitigation plan updates.

Please contact me if you have any questions.

Sincerely,

Kurt Donaldson

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