

## Nationwide Floodplain Resources, LLC

TBPE Firm Number: 11064

January 14, 2014

Mr. Rick Bacon  
County Commissioner, Precinct 3  
Tom Green County  
113 W. Beauregard  
San Angelo, Texas  
(325) 234-4261

**Re: Proposal for Services**

Dear Sir:

Nationwide Floodplain Resources LLC (NFR), a subsidiary of Agillia LLC, is pleased to provide the following Statement of Qualifications and Proposal for engineering services pertaining to:

Project Name:	Tom Green County – Flood Study of Lake Creek Watershed
Project Location:	Tom Green County, Texas (see Exhibit 1 for study area)
Client:	Tom Green County

### Executive Summary

NFR has conducted a preliminary investigation to evaluate claims by Tom Green County staff and its citizens that serious errors exist in the current Flood Insurance Study and FEMA Flood Insurance Rate Maps (FIRM) pertaining to the subject area (see Exhibit 1). Based upon NFR's cursory level investigation, it appears that the stream centerlines are poorly defined at best based on recent aerial imagery and the best available topographic data. NFR concurs that serious errors exist within the current floodplain mapping and flood zone designation.

### Letter of Map Revision and Flood Study

NFR proposes to prepare a Flood Study pertaining to the study area indicated in Exhibit 1 (see below) pursuant to assisting the county with their submittal of an application to FEMA for a Letter of Map Revision (LOMR) for the subject study area.

The application for a LOMR would be based upon an independent Flood Study prepared by NFR, which would serve to properly delineate any floodplain zones found within the subject study area, and to petition FEMA to publish a Letter of Map Change reflecting these corrections to floodplain maps and the Flood Insurance Study (FIS) for Tom Green County.

### Sole Source Contract

The terms of this proposal are based upon the county awarding NFR a sole-source contract, of which would be awarded to NFR based upon our unique set of qualifications and understanding of the project. Should NFR be required to respond to a published Request for Statement of Qualifications and Proposal process, NFR would be happy to provide a second proposal especially custom tailored for that particular process.

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We appreciate the opportunity to provide this proposal for professional engineering services.

Please contact me once you have had a chance to review the attached proposal.

Sincerely,



Kenneth R. Dees, Engineer  
President

### Nationwide Floodplain Resources LLC

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[www.floodpermit.com](http://www.floodpermit.com)

[www.aqillia.com](http://www.aqillia.com)

(800) 610 4541 Ext 1

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**PROPOSAL**  
**FOR**  
**PROFESSIONAL ENGINEERING SERVICES**

**Flood Study of Lake Creek Watershed**  
**Tom Green County**



**January 13, 2014**

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## TABLE OF CONTENTS

1. **Attachment A – Statement of Qualifications** - NFR has included a Statement of Qualifications section within this proposal, which would illustrate that it is uniquely qualified to perform these services.
2. **Attachment B – Scope of Services** - NFR has included a Scope of Services section within this proposal, which accurately presents a plan to be utilized to request that the current FEMA Maps be revised by FEMA. The proposed services include state-of-the-art surveying and photogrammetry as well as a detailed hydrologic and hydraulic analysis of the study area in order to prepare a valid application for a Letter of Map Revision.
3. **Attachment C – Schedule of Delivery and Compensation** - NFR proposes a delivery of services and payment schedule which would provide the following benefits:
  - a. Enable the county to spread out payment over the course of two fiscal years. Fifty percent of the total fee would be paid during the first fiscal year (2014).
  - b. NFR would defer payment for one-half of the total fee until the second fiscal year of the contract (2015) at such time that FEMA provides a letter of acceptance of the county's application for a LOMR. In doing so, NFR would share the risk of acceptance with the county and limit the county's financial risk to one-half of the total fee.
4. **Attachment D – Assumptions and Limitations** – NFR's proposal including scope of services and fees are subject to these assumptions and limitations.
5. **Attachment E - General Conditions** – NFR has prepared and attached General Conditions which would apply to this proposal.
6. **Attachment F - Glossary** – NFR has prepared a glossary including terms utilized within this proposal.
7. **Attachment G – FEMA Map Revision Process** – NFR included a narrative describing FEMA's map revision process, as provided by FEMA.

## EXHIBITS

Exhibit 1 - Study Area, Ground Control and Photogrammetry Flight Paths

Exhibit 2 - USGS 7.5 Minute Quadrangle Map and Regulatory FEMA Floodplain

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## Exhibit 1

**Study Area,  
Ground Control  
And  
Photogrammetry Flight Paths**

**Nationwide Floodplain Resources, LLC**

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**Exhibit 2**

**USGS 7.5 Minute Quadrangle Map  
And  
Regulatory FEMA Floodplain**

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## AGREEMENT

### Acknowledgement / Acceptance / Authorization to Proceed

I acknowledge receipt of the above referenced Proposal for Services, including all referenced Attachments, attachments, and documents. I accept the terms and conditions of this proposal and hereby authorize NFR to proceed with the referenced scope of work.

Agreed and accepted this \_\_\_\_\_ day of \_\_\_\_\_, 2014.

Signature:	
Printed Name:	
Title:	

Our primary contact for this proposal / project would be:

Primary Contact Name:	
Telephone Number:	
Mobile Number:	
Facsimile Number:	
Email address:	
Billing Contact Name:	
Billing Address:	
Billing Telephone No:	

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## Attachment A Statement of Qualifications

Nationwide Floodplain Resources, LLC (NFR) is uniquely qualified to provide the services required for this project. Since 1987\*\*, NFR has provided professional services to hundreds of clients, including:

**Information Technology Services** – creation of proprietary software systems used for the aggregation and analysis of map data, as well as design of infrastructure such as water, wastewater, storm water and paving projects.

**Civil Engineering** – professional services including design of paving and infrastructure such as roadways, water and sewer systems as well as storm water improvements designed to address storm water quality and quantity

**Water Resources** - professional services including hydrologic and hydraulic analysis of open and closed conduit storm systems, including floodplain analysis, analysis and design of storm pipe networks, analysis and design of detention/sedimentation ponds used to address storm water quality and quantity.

**Regulatory Permitting and Compliance** – professional services which include preparation of applications for permit, liaison and negotiations with a host of local, state and federal agencies including TCEQ, LCRA, USACE and FEMA.

\*\* Nationwide Floodplain Resources LLC is a wholly owned subsidiary of Agillia LLC, which originally utilized the trade names Dees Technology and Geodesk.

### Additional Team Members

NFR would be assisted by a team of experts who specialize in their respective fields of expertise, including the following disciplines:

#### Land Surveying

NFR would incorporate the services of Carter Surveying and Mapping LLC, a Texas Corporation with offices in Aledo and Weatherford, Texas. Its principal officer, Mr. Patrick Carter, R.P.L.S., and his staff would oversee and prepare all land surveying services on behalf of NFR.

#### Aerial Photogrammetry

NFR would incorporate the services of United Geo Technologies, LLC, a Texas Corporation with offices in San Antonio, Texas. Its principal officer, Ms. Patsy Ingram and her staff would oversee and prepare all aerial photogrammetry including aerial photos and terrain maps.

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## Attachment B Scope of Services

Nationwide Floodplain Resources, LLC (NFR ) would provide engineering services in support of Tom Green County's, hereinafter referred to as Client, submittal of an application for a request for a Letter of Map Revision (LOMR) pursuant to correcting Base Flood Elevations (BFE's) and flood plain areas of the West and East Forks of Lake Creek, as noted on FEMA FIRM Panel Map Number 48451C0340E, dated June 19, 2012 (PROJECT). The East and West Forks of Lake Creek are currently designated as a FEMA regulated Zone AE with a floodway.

In order to resolve the errors found within the current floodplain maps, a independent, detailed flood study would need to be prepared, based upon newly developed ortho-rectified aerial photography and topographic information.

### Field Survey

NFR's land survey team would provide field survey services in order to establish ground control for aerial photogrammetry.

### Aerial Photogrammetry

Newly collected aerial data is necessary to more accurately define drainage divides and flow paths that contribute to the respective floodplains currently in question. This data would be collected by United Geo Technologies LLC, San Antonio, Texas 78250, a sub-contractor to NFR. The newly developed aerial data would be collected in the following format:

- Map Scale: 1"=100'
- Horizontal Accuracy: Class 1 – 1/40 of map scale
- Vertical Accuracy: 2 foot contours (one-half of contour interval)
- Coordinate systems: Texas Central State Plane Coordinates (4203) NAD 83 survey feet and vertically NAVD 88
- File formats:
  - Planimetrics & Topographic mapping in AutoCAD DWG
  - Ortho Photography in TIFF & SID format

United Geo Technologies, LLC would prepare data for an area of interest confined to 3,520 acres located along Highway 87 on north side of San Angelo Texas as indicated on our map labeled as Exhibit 1. The described areas would be flown at a scale to produce and provide mapping at a scale of 1"=100' with a two-foot contour interval and color ortho-photography. United Geo Technologies, LLC follows an entirely digital project workflow, beginning with scanning of aerial negatives using an in-house scanner, and fully digital analytic aerial triangulation. Data extraction, enhancement, QA/QC, and digital orthophotography work are performed in an image-based, stereoscopic 3D softcopy environment.

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The description of our technical approach is presented within the structure of our production work flow. The anticipated tasks for this effort are:

- Task 1 – Ground Control*
- Task 2 – Acquisition of Aerial Photography*
- Task 3 – Photo Lab Processing*
- Task 4 – Aerial Film Scanning*
- Task 5 – Digital Aerial Triangulation*
- Task 6 – Digital Terrain Modeling*
- Task 7 – Digital Photogrammetric Mapping*
- Task 8 – Digital Orthophotography*
- Task 9 – Deliverables*

### **Task 1 – Ground Control**

UGT would work together with Carter Surveying and Mapping to establish the ground control and provide the control on Texas Central State Plane Coordinates (4203) NAD 83 survey feet and vertically NAVD 88. UGT has estimated thirteen panels for control to support the topographic mapping as shown on Exhibit 1.

### **Task 2 – Aerial Photography**

The color aerial photography would be acquired at a 1"=660' negative scale for the whole selected project area marked on your provided map, with a 60% forward lap, and 30 % side lap.

- Aerial photography would be acquired using a RC-30 precision aerial mapping camera equipped with image-motion compensation, and distortion-free lens system. Aerial photography would be conducted only during times of optimal atmospheric conditions and sun angle.
- If any photography is deemed defective and unusable, it would be reflown using the same aircraft, camera, flight specifications, film, etc. as the original mission. Atmospheric conditions and time of day would match the original mission as closely as possible. Reflights would be completed as soon as possible to the date of discovery of the defect.

### **Task 3 – Photo Lab Processing**

The aerial negatives would be processed, labeled, and checked for compliance with the approved flight plan.

### **Task 4 – Aerial Film Scanning**

Negatives of the aerial photography at the various photo scales would be placed in our LH Systems DSW-500 scanner and scanned at a resolution of 12.5µm to produce a 0.32-foot pixel resolution for the raster image. The DSW-500 is a precision, pass-through type

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photogrammetric scanner capable of scanning at resolutions between 4 and 20  $\mu\text{m}$  with  $\frac{1}{2}$   $\mu\text{m}$  accuracy. The system is roll fed with automatic film advance, and utilizes a high-speed Kodak digital camera. Imagery would be stored on our 5-Terrabyte RAID Level 5 data storage system for processing.

All film is passed through a HAS Images Film Cleaner prior to performing the scanning. The automatic dodging software that we have installed on our scanning system would optimize each image, smoothing localized bright and dark patches to ensure even, consistent imagery of the highest possible quality for imaging tasks.

### Task 5 – Digital Aerial Triangulation (DAT)

UGT uses digital analytical aerial triangulation (DAT) because it is faster, more cost effective, and less error-prone than conventional methodologies.

- Point marking and reading would be performed digitally on LH Systems Digital Photogrammetric Workstations, calibrated to a precision of 1  $\mu\text{m}$ . The control data, passpoints, checkpoints and drop points would be located digitally on the raster images.
- DAT computations would be run using Leica's Orima software, which is capable of performing block/bundle adjustments using a rigorous least squares analysis, and possesses error detection and removal facilities. Corrections for lens distortion, earth curvature, atmospheric refraction, and film shrinkage would be applied.

### Task 6 – Digital Terrain Modeling (CONTOURS)

UGT would develop a Digital Terrain Model (DTM) for the designated project for the described boundary plus 100'. Adequate mass points and breaklines would be collected within the mapping project area suitable to develop two foot contours for your project.

During the soft copy compilation process we would simultaneously tie and compile the breaklines and mass point's data necessary to develop the contours placing spot elevations at all top & lows, intersections and where ever contours or more than two and half inches apart at map scale. Digital Photogrammetric Workstations running SOCET SET and PRO600 software would be used to perform DTM data extraction and QC in an image based, full 3D stereoscopic environment.

### Task 7 – Digital Photogrammetric Mapping

Mapping shall meet National Map Accuracy Standards. UGT technicians would utilize softcopy photogrammetric workstations to direct stereo-compile the data required for the planimetric mapping component which would consist of roads (paved and unpaved), buildings, railroads, drainage channels and hydrology and hydrology features (bridges, culverts, headwalls), public sidewalks, railroads, drive ways, parking lots. The softcopy compilation process enables simultaneous compilation of breaklines and vector data layers.

### Task 8 – Digital Orthophotography Mapping

Digital ortho-photography production would be performed using Ortho Master/Ortho Vista software which automate and streamline the ortho-photo production and QC processes.

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The unrectified raster images would be geo-referenced to the DTM, using the digital aero-triangulation control solution and aerial camera data. Digital ortho-photography would be created by draping the unrectified raster images over their corresponding digital terrain models. Relief displacement would be removed from the raw image at ground level on a pixel by pixel basis, yielding a set of ortho-rectified digital photo images.

UGT would then provide color digital ortho-photography tiles of the project area with 1/2' pixels in TIFF format with world file of each tile. UGT would also provide an overall mosaic of project in Mr. SID format for planning purposes.

### Deliverables

- Planimetric & Topographic mapping in AutoCAD DWG
- Orthophotography in TIFF & SID format
- All data would be delivered on DVD's

### Rejection Criteria

National Standard for Spatial Data Accuracy (NSSDA), Geospatial Positioning Accuracy Standards, Part 3, (FGDC, 1998) shall be used by UGT to guide the statistical and testing methodology for mapping.

1. Estimating the spatial accuracy of point coordinate values produced from maps with respect to geo-referenced ground positions of higher accuracy.
2. Visual verification shall be used by the UGT to ensure there are no gaps, overlaps, smears, edge-matching errors or discoloration.

### Delivery Time

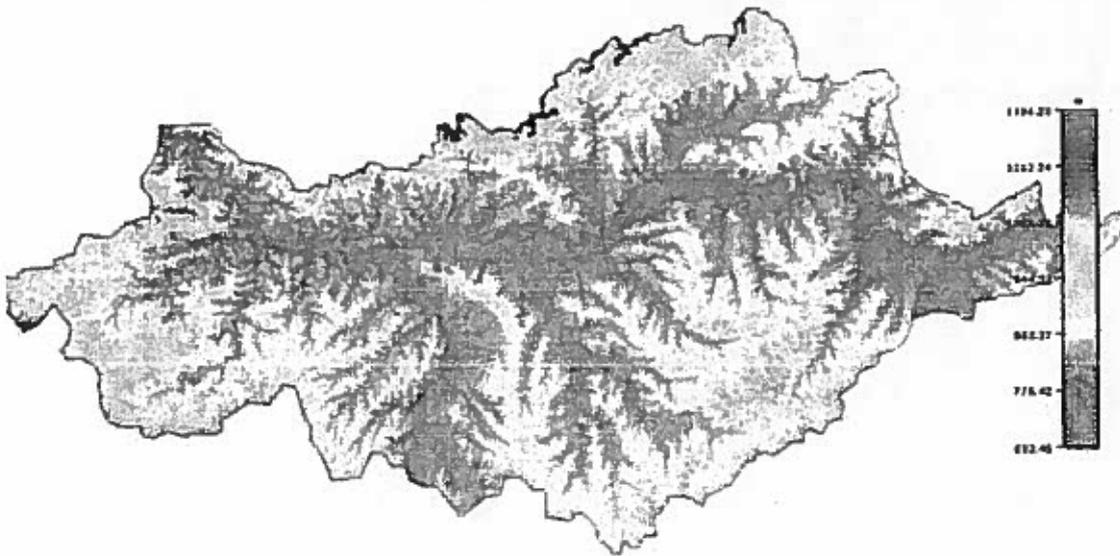
Aerial photography would commence the first day weather permits, following notice to proceed. UGT estimates the digital mapping be delivered in approximately three weeks from date of flying or receipt of ground control.

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### Task 9 – Effective Hydrologic and Hydraulic Model Data

In addition to the collection of newly developed data, NFR would obtain available copies of the current effective models in an effort to compare the subsequent water surface profiles from this study with the current effective BFEs.



### Task 10 – Hydrologic and Hydraulic Analysis

Floodplain development presents many challenges to the floodplain manager and hydraulic engineer. Historic floodplain maps that were created when little or no development existed are no longer valid representations of the existing floodplain condition. Conveyance of floodwaters in wash corridors and arroyo floodplains that were once predominantly overland sheet flow or flow in rills and gullies, are now redirected by houses, fences, small buildings, streets, and other obstructions to flow. In many of these cases, flood containment within the historic mapped flood plain is questionable due to loss of storage and flow path obstruction, and there is a need to quantify the discharge that has been diverted from the floodplain.

Traditional one-dimensional backwater models (HEC2 or HECRAS) are inadequate to predict the unconfined flow behavior in such urban environments and if used, require too many assumptions regarding flow diversions and potential confinement. Advances in the computational speed of computers has facilitated the reality of using two-dimensional flood routing programs to efficiently simulate these complex urban flood environments with accuracy and detail.

Due to the existence of non-riverine or stream-like features within the watershed, it will be necessary to perform a two-dimensional (2-D) hydrologic and hydraulic analysis to gain a better understanding of drainage patterns and flooding potential within the study area. A 2-D modeling

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approach is a significant deviation from traditional mapping methods (HEC2 or HECRAS) in that storage is more accurately accounted for, which can possibly result in lower overall water surface elevations. 2-D modeling is better suited for modeling flat terrain with low relief and poorly defined drainage patterns.

NFR will utilize FLO-2D for two-dimensional hydrologic and hydraulic analysis and delineation of floodplain areas. FLO-2D is a flood routing model that simulates channel flow, unconfined overland flow and street flow over complex topography. The routing model accounts for the diversity and complexity of flood simulations by incorporating rainfall, infiltration, location of structures such as commercial, industrial and residential buildings, as well as any other structures which might significantly affect analysis.

A detailed hydrologic study would be prepared which would calculate the amount of storm water runoff during the one percent chance annual flood (100-year storm event) for the Lake Creek Watershed, which is approximately eight square miles in size. The hydrologic study would be based upon newly developed aerial photogrammetry and two-foot topographic maps developed as part of the scope of this project.

The hydraulic study of the floodplain areas within the Lake Creek watershed would identify any riverine and/or shallow concentrated flow areas that exist within the watershed.

**Task 11 – Preparation of Flood Study Report** – A flood study report would be prepared which provides all of the necessary information (supporting calculations and exhibits, model output, and mapping, shape files, depth/inundation grids for each return event) required by FEMA to process a request for a LOMR application. The flood study would present findings for both the hydrologic and hydraulic analyses, as well as a comparison of the subsequent results with prior studies, BFEs and mapping efforts. To the extent practical, the study would discuss the nature of errors which have been found, as well as justification for the corrections which have been proposed. Finally, the flood study would provide information required for submittal of an application for Request of a Letter of Map Revision (LOMR), which would be necessary to correct the errors found in existing maps, including establishment of corrected Base Flood Elevations (BFEs) as well as a corrected Special Flood Hazard Areas (SFHA) delineations.

**Task 12 – Preparation of Request for LOMR Applications** – An application for a Request for a LOMR, complete with all necessary supporting information, would be prepared on behalf of the County and submitted to FEMA.

**Task 13** – We would provide opportunity for the County to review our work during preparation of the flood study. Once the flood study has been prepared, we would provide the County the opportunity to review same, and would address comments and concerns of the County prior to submittal of the flood study to FEMA.

**Task 14 – Liaison with FEMA, Processing and Revisions** – Time and other fees associated with this phase of the contract is not included within the fixed fee for preparation and submittal of LOMR documents. NFR would invoice the county for time and other expenses incurred during review of the LOMR application by FEMA.

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**Attachment C**  
**Schedule of Delivery and Compensation**

**DELIVERY SCHEDULE**

Task	Month and Year																	
	2/1	3/1	4/1	5/1	6/1	7/1	8/1	9/1	10/1	11/1	12/1	1/1	2/1	3/1	4/1	5/1	6/1	
	2014												2015					
Surveying																		
Aerial Mapping																		
Preparation of Hydrologic Model																		
Preparation of Hydraulic Model																		
Preparation of Flood Study Document																		
Preparation of Exhibits																		
Preparation of FEMA Forms																		
Submit LOMR Flood Study to County																		
Address County Comments																		
Submit LOMR Flood Study to FEMA																		
FEMA Review Period																		

**COMPENSATION SCHEDULE**

For your budgetary consideration, NFR proposes a fixed fee amount of \$150,000 as compensation of all tasks required for preparation of the Letter of Map Revision and submittal to FEMA.

1. **Retainer** - A retainer in the amount of \$10,000 would be due upon award of contract.
2. **Payments during Preparation of LOMR** - NFR would provide monthly invoices for time and expenses, not to exceed fifty percent of the total fee during the first year of the contract.
3. **Payments during FEMA Review period** - NFR would provide monthly invoices for time and expenses incurred during review of the submittal to FEMA. The total balance, in the amount of fifty percent of the total fee, would be paid during the second year of the contract, upon approval of the LOMR by FEMA.

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### Attachment D

#### Assumptions and Limitations

The proposed scope of services and fee are subject to the following assumptions and limitations:

1. Verification of individual/commercial property structure or finished floor elevations is beyond the scope of this study.
2. NFR's cost does not include the payment of any application or processing fees to any entity on behalf of the Client. NFR would not be responsible for any future increases in application, processing or review fees associated with the regulatory support services.
3. NFR's services under this scope do not include any other engineering, environmental or land surveying services other than those noted in Attachment B, Scope of Services, nor of any study of areas other than those denoted in Exhibit 1.

**Reimbursable Expenses** - Travel Expenses, Travel Time, Meals during Travel, Printing, Plots, long-distance telephone calls, delivery, submittal and review fees are paid by client and are not included as part of the fixed fee for services.

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## Attachment E General Conditions

- 1. PARTIES AND SCOPE OF WORK:** Nationwide Floodplain Resources LLC, (hereinafter referred to as "NFR") shall include said company or its particular division, subsidiary or affiliate performing the work. "Work" means the analysis of complex technical tasks, design and preparation of plans, specifications and studies or other service to be performed by NFR as set forth in NFR's Proposal for Services (hereinafter referred to as proposal), Client's acceptance thereof and these General Conditions. Additional work ordered by Client shall also be subject to these General Conditions. "Client" refers to the person or business entity ordering the work to be done by NFR. If Client is ordering the work on behalf of another, Client represents and warrants that it is the duly authorized agent of said party for the purpose of ordering and directing said work. Unless otherwise stated in writing, Client assumes sole responsibility for determining whether the quantity and the nature of the work ordered by the client is adequate and sufficient for Client's intended purpose. Client shall communicate these General Conditions to each and every third party to whom Client transmits any part of NFR's work. NFR shall have no duty or obligation to any third party greater than that set forth in NFR's proposal, Client's acceptance thereof and these General Conditions. The ordering of work from NFR, and/or the reliance on any of NFR's work, shall constitute acceptance of the terms of NFR's proposal and these General Conditions, regardless of the terms of any subsequently issued document.
- 2. SCHEDULING OF WORK:** The services set forth in NFR's proposal and Client's acceptance would be accomplished in a timely, workmanlike and professional manner. NFR is not responsible for any delays, including a delay of commencement of the work, or if NFR is required to stop or interrupt the progress of its work as a result of changes in the scope of work requested by the Client, or to fulfill the requirements of third parties including governing agencies, or other causes beyond the direct reasonable control of NFR.
- 3. ACCESS TO SITE:** Client would provide liaison with citizens in order to arrange access to private property by NFR to perform reconnaissance and surveying services.
- 4. AGENCY DECISIONS:** NFR cannot, and does not, guarantee or otherwise warrant that the regulatory approval/permit sought under this scope of services can or would be received. NFR would work diligently in support of such approval, based on the physical and regulatory parameters associated with this project. It is understood that NFR does not have control over agency decisions.
- 5. PAYMENT:** Client shall pay any retainer amount as specified upon acceptance of this proposal and contract, prior to start of work. Client shall pay all invoices upon demand and per the terms as specified in Attachment B. Client further agrees to pay interest on all amounts invoiced and not paid or objected to for valid cause in writing within said thirty (30) day period at the maximum interest rate permitted under applicable law until paid. Client agrees to pay NFR's cost of collection of all amounts due and unpaid after sixty (60) days, including, but not limited to court costs and reasonable attorney's fees. NFR shall not be bound by any provision or agreement requiring or providing for

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arbitration of disputes or controversies arising out of this agreement, any provision wherein NFR waives any rights to a mechanics lien, or any provision conditioning NFR's right to receive payment for its work upon payment to Client by any third party. These General Conditions are notice, where required, that NFR shall file a lien whenever necessary to collect past due amounts. Failure to make payment within 90 days of invoices shall constitute a release of NFR from any and all claims which Client may have, whether in tort, contract or otherwise, and whether known or unknown at the time.

6. **PROVISIONS SEVERABLE:** The parties understand and agree that these General Conditions shall be enforced as written. In the event any provision of these General Conditions should be found to be unenforceable, such provision shall be stricken and the remaining provisions shall be enforceable, to the extent possible.

## Attachment F Glossary

### A

**Act** - The National Flood Insurance Act of 1968 and any amendments to it.

**Actual Cash Value (ACV)** - The cost to replace an insured item of property at the time of loss, less the value of physical depreciation.

### B

**Base Flood** - The flood having a 1% chance of being equaled or exceeded in any given year.

**Base Flood Elevation (BFE)** - The elevation shown on the Flood Insurance Rate Map (FIRM) for Zones AE, AH, A1-A30, AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO, V1-V30, and VE that indicates the water surface elevation resulting from a flood that has a 1% chance of equaling or exceeding that level in any given year.

**Basement** - Any area of the building, including any sunken room or sunken portion of a room, having its floor below ground level (subgrade) on all sides.

**Breakaway wall** - A wall that is not part of the structural support of the building and is intended through its design and construction to collapse under specific lateral loading forces, without causing damage to the elevated portion of the building or supporting foundation system.

### C

**Community** - A political entity that has the authority to adopt and enforce floodplain ordinances for the area under its jurisdiction. In most cases, a community is an incorporated city, town, township, borough, village, or an unincorporated area of a county or parish. However, some states have statutory authorities that vary from this description.

**Community Rating System (CRS)** - A program developed by the FEMA Mitigation Division to provide incentives for those communities in the National Flood Insurance Program that have gone beyond the minimum floodplain management requirements to develop extra measures to provide protection from flooding.

**Condominium** - That form of ownership of real property in which each unit owner has an undivided interest in common elements.

### E

**Elevated Building** - A building that has no basement and has its lowest elevated floor raised above the ground level by foundation walls, shear walls, posts, piers, pilings, or columns. Solid

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foundation perimeter walls are not an acceptable means of elevating buildings in V and VE zones.

**Elevation Certificate** - A certificate that verifies the elevation data of a structure on a given property relative to the ground level. The Elevation Certificate is used by local communities and builders to ensure compliance with local floodplain management ordinances and is also used by insurance agents and companies in the rating of flood insurance policies.

**Emergency Program** - The initial phase of a community's participation in the National Flood Insurance Program. During this phase, only limited amounts of insurance are available under the Act.

**Enclosure** - That portion of an elevated building below the lowest elevated floor that is either partially or fully shut-in by rigid walls.

### F

**Federal Emergency Management Agency (FEMA)** - The federal agency within the Department of Homeland Security that is tasked with responding to, planning for, recovering from, and mitigating against man-made and natural disasters.

**Federal Policy Fee** - A flat charge that the policyholder must pay on each new or renewal policy to defray certain administrative expenses incurred in carrying out the National Flood Insurance Program.

**Flood** - A general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties (at least one of which is the policyholder's property) from one of the following:

- Overflow of inland or tidal waters
- Unusual and rapid accumulation or runoff of surface waters from any source
- Mudflow
- Collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood as defined above

**Flood Disaster Protection Act (FDPA) of 1973** - Made the purchase of flood insurance mandatory for the protection of property located in Special Flood Hazard Areas.

**Flood Hazard Boundary Map (FHBM)** - Official map of a community issued by the Federal Insurance Administrator, where the boundaries of the flood, mudflow, and related erosion areas having special hazards have been designated.

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**Flood Insurance Rate Map (FIRM)** - Official map of a community on which the Mitigation Division Administrator has delineated both the special hazard areas and the risk premium zones applicable to the community.

**Flood Zone (Zone)** - A geographical area shown on a Flood Hazard Boundary Map or a Flood Insurance Rate Map that reflects the severity or type of flooding in the area.

**Floodplain** - Any land area susceptible to being inundated by floodwaters from any source.

**Floodplain Management** - The operation of an overall program of corrective and preventive measures for reducing flood damage, including but not limited to, emergency preparedness plans, flood control works, and floodplain management regulations.

### G

**Grandfathering** - An exemption based on circumstances previously existing. Under the NFIP, buildings located in Emergency Program communities and Pre-Flood Insurance Rate Map buildings in the Regular Program are eligible for subsidized flood insurance rates. Post-Flood Insurance Rate Map buildings in the Regular Program built in compliance with the floodplain management regulations in effect at the start of construction would continue to have favorable rate treatment even though higher base flood elevations or more restrictive, greater risk zone designations result from Flood Insurance Rate Map revisions.

**Group Flood Insurance Policy (GFIP)** - Issued by the NFIP Direct Program in response to a presidential disaster declaration. Disaster assistance applicants, in exchange for a modest premium, receive a minimum amount of building and/or contents coverage for a 3-year policy period. An applicant may cancel the group policy at any time and secure a regular Standard Flood Insurance Policy through the NFIP.

### I

**Increased Cost of Compliance (ICC)** - Coverage for expenses a property owner must incur, above and beyond the cost to repair the physical damage the structure actually sustained from a flooding event, to comply with mitigation requirements of state or local floodplain management ordinances or laws. Acceptable mitigation measures are elevation, flood-proofing, relocation, demolition, or any combination thereof.

### L

**Lowest Floor** - The lowest floor of the lowest enclosed area (including a basement). An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access, or storage in an area other than a basement area, is not considered a building's lowest floor provided that such enclosure is not built so as to render the structure in violation of requirements.

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### M

**Mandatory Purchase** - Under the provisions of the Flood Disaster Protection Act of 1973, individuals, businesses, and others buying, building, or improving property located in identified areas of special flood hazards within participating communities are required to purchase flood insurance as a prerequisite for receiving any type of direct or indirect federal financial assistance (e.g., any loan, grant, guaranty, insurance, payment, subsidy, or disaster assistance) when the building or personal property is the subject of or security for such assistance.

**Manufactured (Mobile) Home** - A structure built on a permanent chassis, transported to its site in one or more sections, and affixed to a permanent foundation. "Manufactured (mobile) home" does not include recreational vehicles.

**Mitigation Division** - A division under FEMA that manages the NFIP and oversees FEMA's mitigation programs.

**Mobile Home** - see entry for Manufactured Home

### N

**National Flood Insurance Program (NFIP)** - A federal program enabling property owners in participating communities to purchase insurance protection against losses from flooding. This insurance is designed to provide an insurance alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods.

**National Flood Insurance Reform Act (NFIRA)** - The purpose of the National Flood Insurance Reform Act of 1994 is to improve the financial condition of the NFIP and reduce federal expenditures for disaster assistance to flood-damaged properties. The act affects every part of NFIP, insurance, mapping and floodplain management. NFIRA also gives lenders tools with which to enforce requirements for flood insurance coverage mandated under the Flood Disaster Protection Act of 1973.

**Non-Residential** - Includes, but is not limited to: small business concerns, churches, schools, farm buildings (including grain bins and silos), pool houses, clubhouses, recreational buildings, mercantile structures, agricultural and industrial structures, warehouses, hotels and motels with normal room rentals for less than 6 months' duration, and nursing homes.

**Non-Special Flood Hazard Area (NSFHA)** - An area in a low to moderate risk flood zone (Zones B, C, X) that is not in any immediate danger from flooding caused by overflowing rivers or hard rains. However, it's important to note that structures within a NSFHA are still at risk.

### O

**Other Residential** - Hotels and motels where the normal occupancy of a guest is 6 months or more; a tourist home or rooming house which has more than four roomers. A residential building

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(excluding hotels and motels with normal room rentals for less than 6 months' duration) containing more than four dwelling units. Incidental occupancies such as office, professional private school, or studio occupancy, are permitted if the total area of such incidental occupancies is limited to less than 25 percent of the total floor area within the building.

### P

**Participating Community** - A community for which the Mitigation Division Administrator has authorized the sale of flood insurance under the NFIP.

**Policy** - The entire written contract between the insured and the insurer. It includes: the printed policy form, the application and Declarations Page, any endorsement(s) that may be issued, and any renewal certificate indicating that coverage has been instituted for a new policy and new policy term.

**Post-FIRM Building** - A building for which construction or substantial improvement occurred after December 31, 1974, or on or after the effective date of an initial Flood Insurance Rate Map (FIRM), whichever is later.

**Pre-FIRM Building** - A building for which construction or substantial improvement occurred on or before December 31, 1974, or before the effective date of an initial Flood Insurance Rate Map (FIRM).

**Preferred Risk Policy (PRP)** - A policy that offers fixed combinations of building/contents coverage or contents-only coverage at modest, fixed premiums. The PRP is available for property located in B, C, and X zones in Regular Program communities that meet eligibility requirements based on the property's flood loss history.

**Probation Surcharge (Premium)** - A flat charge that the policyholder must pay on each new or renewal policy issued covering property in a community that the NFIP has placed on probation under the provisions of 44 CFR 59.24.

### R

**Regular Program** - The final phase of a community's participation in the National Flood Insurance Program. In this phase, a Flood Insurance Rate Map is in effect and full limits of coverage are available under the Act.

**Replacement Cost Value (RCV)** - The cost to replace property with the same kind of material and construction without deduction for depreciation.

**Residential Condominium Building Association Policy (RCBAP)** - Policy issued to insure a residential condominium building and all units within the building, provided that the building is located in a Regular Program Community and at least 75 percent of the total floor area is residential.

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### S

**Single-Family Residence** - A residential single family dwelling. Incidental office, professional, private school, or studio occupancies, including a small service operation, are permitted if such incidental occupancies are limited to less than 50 percent of the building's total floor area.

**Special Flood Hazard Area (SFHA)** - A FEMA-identified high-risk flood area where flood insurance is mandatory for properties. An area having special flood, mudflow, or flood-related erosion hazards, and shown on a Flood Hazard Boundary Map or a Flood Insurance Rate Map as Zone A, AO, A1-A30, AE, A99, AH, AR, AR/A, AR/AE, AR/AH, AR/AO, AR/A1-A30, V1-V30, VE, or V.

**Standard Flood Insurance Policy (SFIP)** - Policy issued to insure a building and/or its contents.

**Submit-for-Rate** - An application for flood insurance on a building for which no risk rate is published in the Flood Insurance Manual. Insurance coverage can be obtained only after the NFIP has approved the application and has established the risk premium rate.

### T

**2 to 4 Family Residence** - A residential building (excluding hotels and motels with normal room rentals for less than 6 months' duration) containing no more than four dwelling units. Incidental occupancies such as office, professional, private school, or studio space are permitted if the total area of such occupancies is limited to less than 25 percent of the total floor area within the building.

### W

**Waiting Period** - The time between the date of application and the policy effective date.

**Wave Height Adjustment** - A measurement that is added to the base flood elevation for V Zones shown on the Flood Insurance Rate Map published prior to 1981. For coastal communities, the base flood elevation shown on Flood Insurance Rate Maps published prior to 1981 are still-water elevations, which include only the effects of tide and storm surge, and not the height of wind-generated waves.

**Write Your Own (WYO) Program** - A cooperative undertaking of the insurance industry and FEMA begun in October 1983. The WYO Program operates within the context of the NFIP and involves private insurance carriers who issue and service NFIP policies.

### Z

**Zone** - A geographical area shown on a Flood Hazard Boundary Map or a Flood Insurance Rate Map that reflects the severity or type of flooding in the area.

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## Attachment G FEMA Map Revision Process

A complete and detailed description of the process can be found in FEMA publication *"Guidelines and Specifications for Flood Hazard Mapping Partners, Volume 2, Map Revisions and Amendments"*.

The summary provided below is an edited version of the above referenced document.

### 2.1.1 Receipt and Acknowledgment

Map revision requests must be made in writing by the designated community official.

Once the request is received, FEMA's Mapping Partner has 5 working days to send an acknowledgment letter to the community.

### 2.1.3 Case Initiation

Upon receipt of the request, the processing Mapping Partner shall:

- Assign a case number (if appropriate);
- Create a revision case file, in accordance with Section 66.3 of the NFIP regulations (see Appendix F of these Guidelines)

### 2.1.4 Initial Reconnaissance

After the case has been properly recorded, the processing Mapping Partner shall begin a search of all available records to determine the status of the community in the NFIP and to identify all past actions by FEMA in the community that may affect the request. The processing Mapping Partner shall determine whether all data required to address the request have been submitted, advise the FEMA PO or his/her designee of the results of this review, and make a recommendation concerning action to be taken.

### 2.1.5 Required Data

Based on the reason for and extent of the request, the processing Mapping Partner shall determine whether sufficient data have been submitted by the community or other revision requester for additional data in accordance with the applicable portions of Sections 65.5, 65.6, 65.7, 65.10, 65.11, 65.12, and 65.13 of the NFIP regulations. In addition, the processing Mapping Partner shall ensure that the requester has completed and submitted the appropriate application/certification forms from the latest version of the MT-2 application/certification forms package.

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All data submitted must be certified by a Registered Professional Engineer or Licensed Land Surveyor in accordance with Part 65 of the NFIP regulations. Examples of standard data requirements for various modifications include, but are not limited to, the following:

### All Revisions

1. Topographic work map that includes the entire area of the revision and delineates floodplain and/or floodway boundaries, BFEs, and cross-section locations, and all applicable items required in the MT-2 package
2. Floodplain and/or floodway boundary delineations on the effective map panels and the topographic work map
3. Notification to affected adjacent communities

### Revisions in Riverine Areas

1. Hydrologic analysis (if the discharges in the effective FIS report are not used)
2. Effective hydraulic model run duplicating original hydraulic model (multiple profile and floodway). See Appendix C, Subsection C.5.2.1 of these Guidelines for information on FEMA's policy for conversion to HEC-RAS.
3. Existing hydraulic model (multiple profile and floodway) if the calibration hydraulic model run does not reflect the floodplain conditions prior to the start of the project
4. Revised hydraulic model (multiple profile and floodway)
5. Floodplain and/or floodway boundary delineations on the effective map panels and the topographic work map

### 2.1.6 Technical Review

The processing Mapping Partner shall review the technical, scientific, and other information submitted by the revision requester to ensure that the data are technically accurate, consistent with standard engineering practice and FEMA standards, and sufficient to warrant a revision. The extent of the technical review would, generally, be limited to a review of the information presented on the application/certification forms and the supporting documentation submitted with them.

For revisions involving the addition of detailed flood hazard information or changes to flooding sources originally studied by detailed methods, analyses and other supporting data for the 10-, 50-, 100-, and 500-year floods and regulatory floodway may be required. At a minimum, the analyses and other supporting data provided in support of a revision request must meet the original standards employed by FEMA for the preparation of the FIS report, FIRM, and FBFM, which are documented in Appendices J and K of these Guidelines.

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### 2.1.7 Reporting and Project Officer Approval

Upon request, the processing Mapping Partner shall advise the revision requester, the FEMA RO, the FEMA PO, or his/her designee about the current status of a technical review. When the technical review is complete, the processing Mapping Partner shall discuss the results of the review, any additional data required to support the requested revision, and any problems encountered during the review with the FEMA PO or his/her designee. If appropriate, the FEMA PO or his/her designee shall direct the processing Mapping Partner to finalize the technical review by one of the following options:

- Requesting by telephone or letter, additional or revised data to complete the technical review;
- Preparing a LOMR or Physical Map Revision (PMR)

### 2.1.9 Preparation of Preliminary Copies of Maps and Reports

Once the revision requester has submitted all required data in accordance with Part 65 of the NFIP regulations and the processing Mapping Partner has completed the technical review and discussed findings with the FEMA PO and his/her designee, The processing Mapping Partner shall prepare Preliminary copies of the revised map panel(s) in accordance with Section 1.4.6 of these Guidelines. The processing Mapping Partner also may prepare a revised FIS report if required by FEMA.

Occasionally, FIRM and/or FBFM panels may be revised to include changes that do not significantly affect the FIS report, such as redelineations of floodplain boundaries to reflect new or updated topographic data. However, because most Physical Map Revisions (PMRs) would involve significant changes affecting BFEs, flood risk zones, and floodplain and floodway boundary delineations, revisions to the FIS report as well as the FIRM and FBFM would be necessary.

### 2.1.9 Community Review and Comment

At the request of FEMA, the processing Mapping Partner shall transmit Preliminary copies of the revised map panels and FIS report to the community CEO and floodplain management official, revision requester (if other than the CEO or floodplain management official), and others for review and comment. For all revisions, the community shall receive at least a 30- day review period. When BFEs are changed, the statutory 90-day appeal period shall be required.

#### 90-Day Appeal Period

For PMRs that involve new or modified BFEs, the processing Mapping Partner shall initiate the statutory 90-day appeal period to provide residents of the affected community an opportunity to appeal the new or modified BFEs. As in the processing of studies and restudies, the proposed or proposed modified BFEs must be published in a local newspaper with wide circulation and in the Federal Register to initiate the appeal period and must be finalized after the appeal period has elapsed, if no appeals are received. (Refer to Volume 1, Subsection 1.4.3.6 of these Guidelines for the procedures to be followed.)

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For PMRs, the appeal period is held either before the start of or concurrent with the printing process for the revised FIS report, FIRM, and/or FBFM. The appeal period would occur prior to printing for revisions involving new or higher BFEs and may be concurrent with the printing process for revisions resulting in lower BFEs. For both the prior and concurrent procedures, the appeal period must elapse and the BFEs must be finalized before the revised FIS report, FIRM, and/or FBFM may become effective.

### 2.1.9.1 Revised Preliminary Processing

During or subsequent to the review and comment period, the FEMA PO or his/her designee may decide that revisions to the FIS report, and/or FIRM/DFIRM, and/or FBFM, and/or database are warranted. In such cases, the processing Mapping Partner, at the direction of FEMA, shall prepare and distribute Revised Preliminary copies of the appropriate materials. In most cases, the Revised Preliminary copies shall be sent to the community with the official notification of the start of the 90-day appeal period. However, at the request of FEMA in coordination with the community and other Project Team members, the processing Mapping Partner shall prepare and distribute Revised Preliminary copies for review before the statutory 90-day appeal period is initiated.

When Revised Preliminary copies are prepared and submitted to the community for review, the processing Mapping Partner shall generate a SOMA and conduct a review similar to that conducted before the Preliminary copies were issued. When required, the processing Mapping Partner shall revise the Preliminary SOMA and submit it to FEMA for review with a special transmittal letter to the community. The processing Mapping Partner shall mail the revised SOMA to the CEO, RO, and State NFIP Coordinator with the special transmittal letter.

### 2.1.10 Statutory Appeal Period Requirements

When FEMA proposes new or modified BFEs as the result of a PMR, FEMA must, in accordance with Section 110 of the Flood Disaster Protection Act of 1973 (Public Law 93- 234), provide all affected communities with a 90-day appeal period. In accordance with Section 67.4 of the NFIP regulations, FEMA initiates the appeal period by publishing a proposed BFE determination notice in the *Federal Register*, by notifying the CEO of the community by certified mail, return receipt requested; and by publishing the proposed BFE determinations twice in a prominent local newspaper during the 10-day period immediately following notification of the community CEO. The proposed BFE determination notice typically is published in the legal advertisements portion of the newspaper. Although it is not required, FEMA encourages community officials to provide an even wider distribution of the notice to ensure that residents, property owners, and other interested stakeholders are aware of the proposed BFE determinations.

When a 90-day appeal period is required for a PMR, the processing Mapping Partner shall prepare and process the correspondence for initiating the appeal period and proposing the new or modified BFEs. The processing Mapping Partner shall prepare the proposed BFE notices for publication in the *Federal Register* and a local newspaper with wide circulation and prepare all FEMA letters that would be sent to the CEO and floodplain administrator of the community, the State NFIP Coordinator, and others.

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The processing Mapping Partner shall ensure that the notices are correct, that they include BFEs for all flooding sources for which revisions were made, and that they are published in the local newspaper on the correct date and in the *Federal Register*.

At the beginning of each month, the processing Mapping Partner shall compile the proposed BFE lists for all communities receiving proposed BFE determination letters and notices during the previous month and prepare the Proposed Rule for concurrence and signature and for publication in the *Federal Register*. The processing Mapping Partner shall then submit the Proposed Rule to the designated FEMA coordinator for routing, concurrence, and signature

The FEMA coordinator shall coordinate with GPO to ensure timely publication of the Proposed Rule in the *Federal Register*. The FEMA coordinator and the processing Mapping Partner shall review the published Proposed Rule to ensure it is accurate, and shall coordinate correction of the Proposed Rule through publication in the *Federal Register* when appropriate.

### 2.1.10.1 Appeal and Protest Processing Requirements

An appeal is a challenge of a proposed BFE. The sole basis of an appeal, as indicated in Section 67.6 of the NFIP regulations, is the possession of knowledge or information indicating that the BFEs proposed by FEMA are scientifically or technically incorrect. The proposed BFEs are considered scientifically incorrect if the methodology or assumptions used in the determination of the BFEs is inappropriate or incorrect. The BFEs are considered technically incorrect if the BFEs were based on insufficient or poor quality data, analysis contains mathematical or measurement errors, or physical changes have occurred in floodplain.

Comments received by FEMA during the appeal period that do not challenge proposed BFEs are considered "protests." A protest is a challenge of information or data from a Preliminary FIS Report or FIRM other than BFEs. Types of protests include, but are not limited to, the following:

- Challenges of proposed floodplain boundary delineations based on more detailed or recent topographic data;
- Challenges of proposed regulatory floodway boundaries based on better modeling, Requests that changes effected by a previous Letter of Map Change be incorporated; Base map errors; and
- Errors of omission

Appeals and protests must be supported by scientific or technical data, provide proof of error, and provide sufficient data to make revisions (bridge plans, cross-section data) and may require certification of data by a Registered Professional Engineer or Licensed Land Surveyor.

In accordance with Section 67.7 of the NFIP regulations, private persons shall submit appeals to the community CEO during the appeal period. The CEO, or a community official designated by the CEO, shall review and consolidate all appeals by private persons and prepare a written opinion stating whether or not the appeal is justifiable. The community CEO or other designated community official shall then submit the opinion and the appeal(s) to FEMA for review.

In accordance with Section 67.8 of the NFIP regulations, FEMA would "review and fully

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consider any technical or scientific data submitted by the community that tend to negate or contradict the information upon which the proposed determination is based." Although not specifically required by the regulations, FEMA also would consider all technical or scientific data submitted in support of a protest as well. To assist FEMA, the processing Mapping Partner shall review and evaluate submitted data, request additional data when required, and recommend resolutions to FEMA for all appeals and protests submitted during the 90-day appeal period. An expanded discussion of these procedures also appears in the *Guide for Community Officials* (FEMA, 1993).

At the request of FEMA, the processing Mapping Partner shall perform the following tasks:

- Acknowledge receipt of an appeal or protest
- Evaluate any data submitted;
- Request, by telephone and/or in writing, any additional data required to support the appeal or protest;
- Perform technical analyses if requested by FEMA;
- Prepare and distribute Revised Preliminary copies of the affected FIS report, materials (usually, Flood Profiles and/or data tables), FIRM/DFIRM panels, and/or FBFM panels, if requested by FEMA; and
- Assist FEMA in preparing and distributing an appeal or protest resolution letter to be sent to the community CEO and floodplain administrator and all appellants.

For most appeals, FEMA shall provide a comment period (usually 30 days) following the date the appeal or protest resolution letter is issued before proceeding with the processing of the new or revised FIS report and FIRM by preparing and issuing an LFD. FEMA, with the support of the assigned Mapping Partner and other members of the Project Team for the Flood Map Project, shall address any comments received during this comment period before proceeding with the LFD.

Changes resulting from protests usually shall be incorporated at the time that the final reproduction materials are prepared. However, if the changes are significant, the FEMA PO or his/her designee may direct the processing Mapping Partner to prepare and distribute Revised Preliminary copies of the revised FIS report, FIRM/DFIRM, and/or FBFM. If a Revised Preliminary is not required, the FEMA PO or his/her designee shall direct the processing Mapping Partner to include the protest resolution in the LFD.

### Issuance of LOMR

When the LOMR is issued, included with it would be a cover letter and LOMR Determination Form, as well as attachments such as annotated FIRMs, flood profiles, and floodway data tables.