Oil and Gas Well Development In an identified Special Flood Hazard Area

Applicable WV Laws

- **7-1-3v. Floodplain and mudslide area management; legislative findings; power and authority; enforcement; provisions cumulative. (County Authority)**
- **§8-12-14. Permits for construction and alteration. (Municipal authority)**

Why a Floodplain permit?

- A community must be in the National Flood Insurance Program (NFIP) so flood insurance is available within its boundaries.
- Every county in WV and all but 2 incorporated municipalities are in the NFIP.
- When a community joins the NFIP it agrees to:

Why a Floodplain Permit?

- Adopt a floodplain ordinance that is compliant with the Title 44 Code of Federal Regulations (CFR).
- Enforce the ordinance.
- Permit all development in the Special Flood Hazard Area (SFHA).

A Community must permit oil and gas wells in the SFHA because..

- As defined in 44 CFR, section 59.1

  Development-Any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials.

What is the cost of this permit?

- The cost of the floodplain permit is determined by the local Floodplain Ordinance
- **Neither NFIP nor the WV NFIP Coordinating Office determine the permit fee.**
- Each community is different.

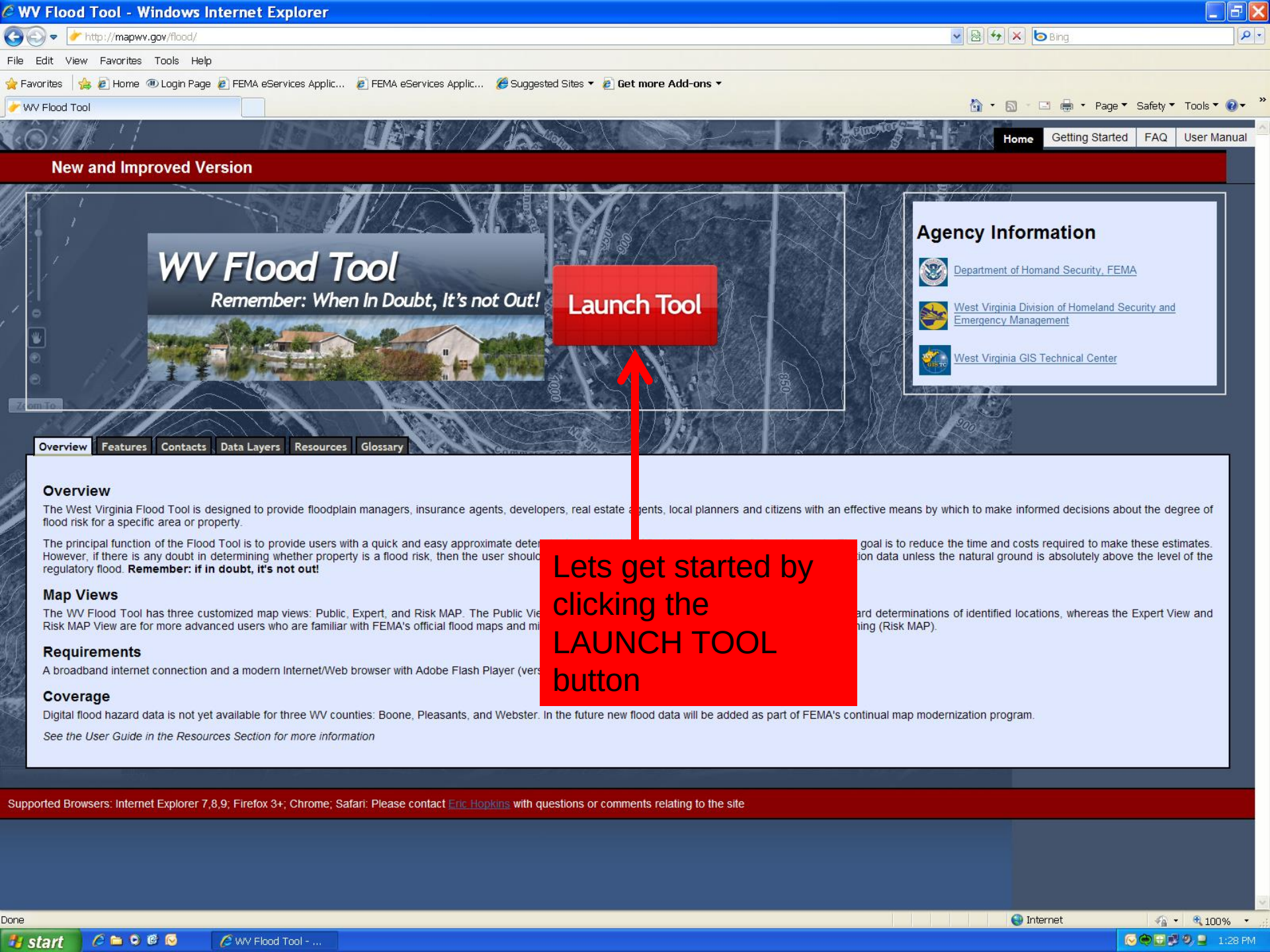
Determining the need for a Floodplain permit

- Is this going to be in the floodplain?
- Is there fill going to be placed for site prep?
- Have all other permits been obtained?
- Is there a site plan?
- Does this development encroach in the Floodway?
- Has there been a Floodplain Study done?

How do you know if your proposed site is in the SFHA?

- www.mapwv.gov/flood
- Contact the community Floodplain Manager.
- Look at the FEMA flood maps at

www.msc.fema.gov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Remember: When In Doubt, It's not Out!
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West Virginia Division of Homeland Security and Emergency Management
West Virginia GIS Technical Center
Overview Features Contacts Data Layers Resources Glossary
Overview
The West Virginia Flood Tool is designed to provide floodplain managers, insurance agents, developers, real estate agents, local planners and citizens with an effective means by which to make informed decisions about the degree of flood risk for a specific area or property.
The principal function of the Flood Tool is to provide users with a quick and easy approximate deter goal is to reduce the time and costs required to make these estimates. However, if there is any doubt in determining whether property is a flood risk, then the user should ion data unless the natural ground is absolutely above the level of the regulatory flood. Remember: if in doubt, it's not out!
Map Views
The WV Flood Tool has three customized map views: Public, Expert, and Risk MAP. The Public Vie ard determinations of identified locations, whereas the Expert View and Risk MAP View are for more advanced users who are familiar with FEMA's official flood maps and mi ning (Risk MAP).
Requirements
A broadband internet connection and a modern Internet/Web browser with Adobe Flash Player (vers
Coverage
Digital flood hazard data is not yet available for three WV counties: Boone, Pleasants, and Webster. In the future new flood data will be added as part of FEMA's continual map modernization program.
See the User Guide in the Resources Section for more information
Lets get started by clicking the LAUNCH TOOL button
Supported Browsers: Internet Explorer 7,8,9; Firefox 3+; Chrome; Safari: Please contact Eric Hopkins with questions or comments relating to the site
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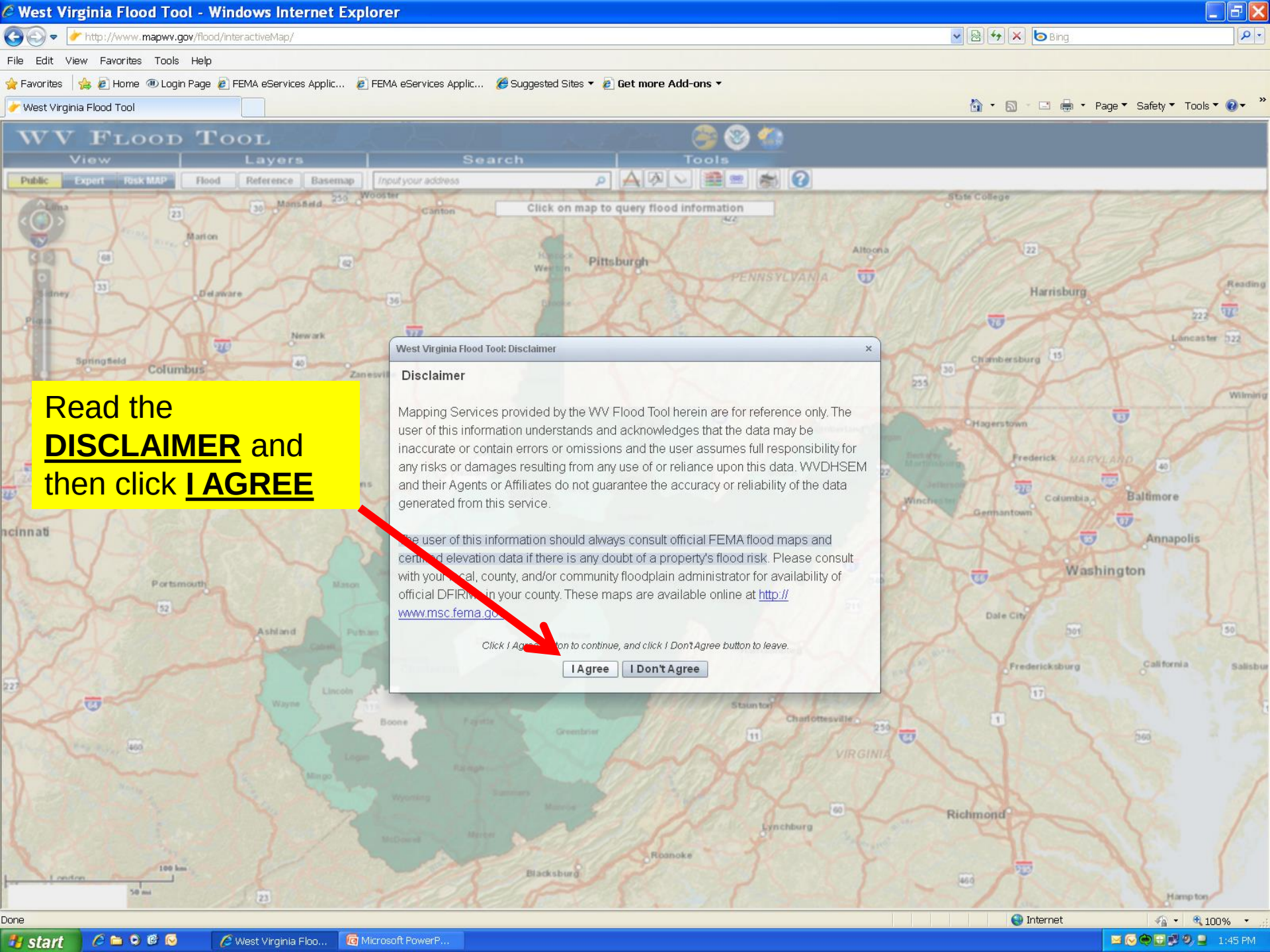
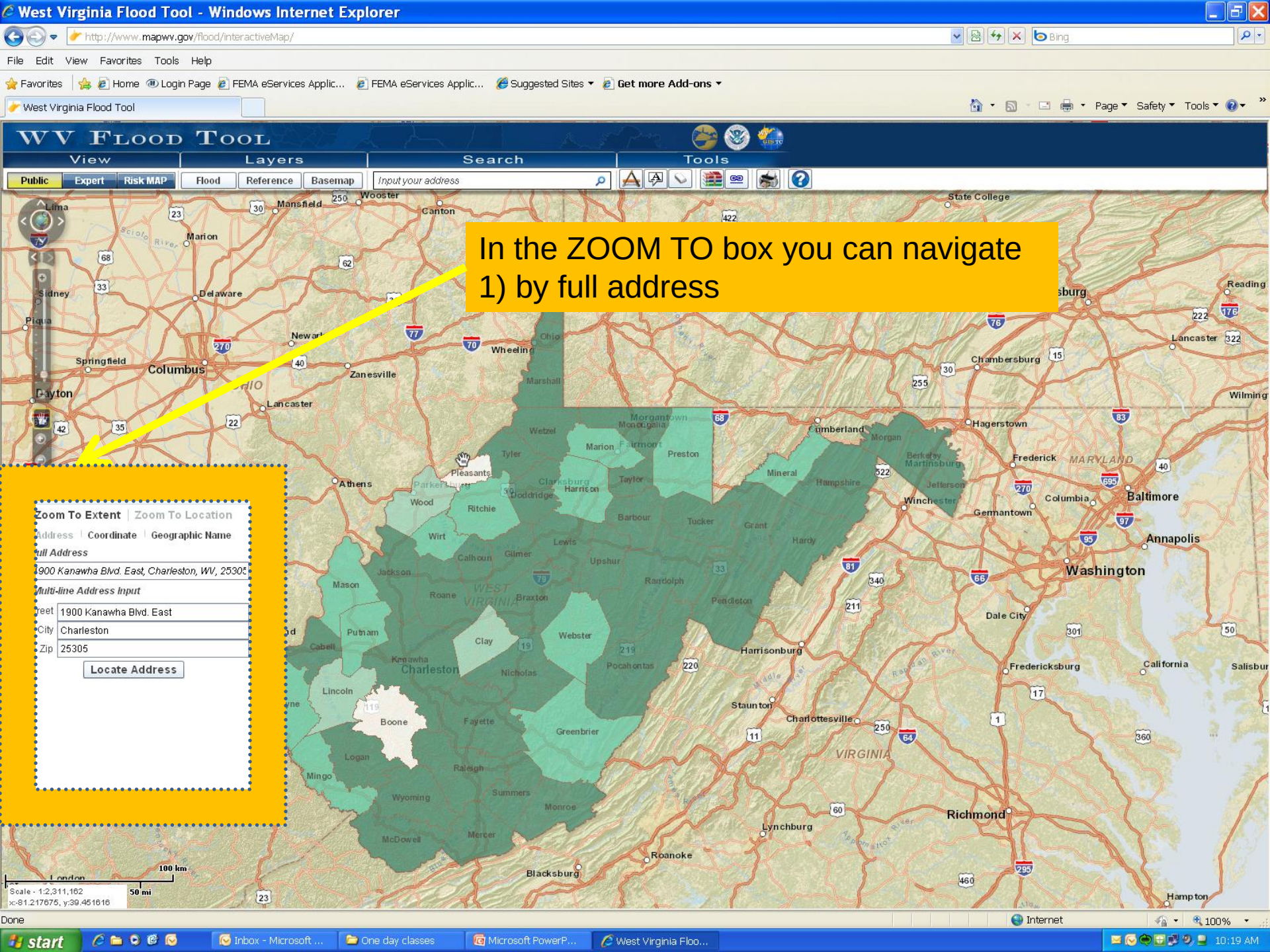

West Virginia Flood Tool - Windows Internet Explorer
WV Flood Tool
View
Layers
Search
Tools
Click on map to query flood information
West Virginia Flood Tool: Disclaimer
Disclaimer
Mapping Services provided by the WV Flood Tool herein are for reference only. The user of this information understands and acknowledges that the data may be inaccurate or contain errors or omissions and the user assumes full responsibility for any risks or damages resulting from any use of or reliance upon this data. WVDHSEM and their Agents or Affiliates do not guarantee the accuracy or reliability of the data generated from this service.
I Agree
I Don't Agree
Read the DISCLAIMER and then click I AGREE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Beckley
Bluefield
Hagerstown
Frederick
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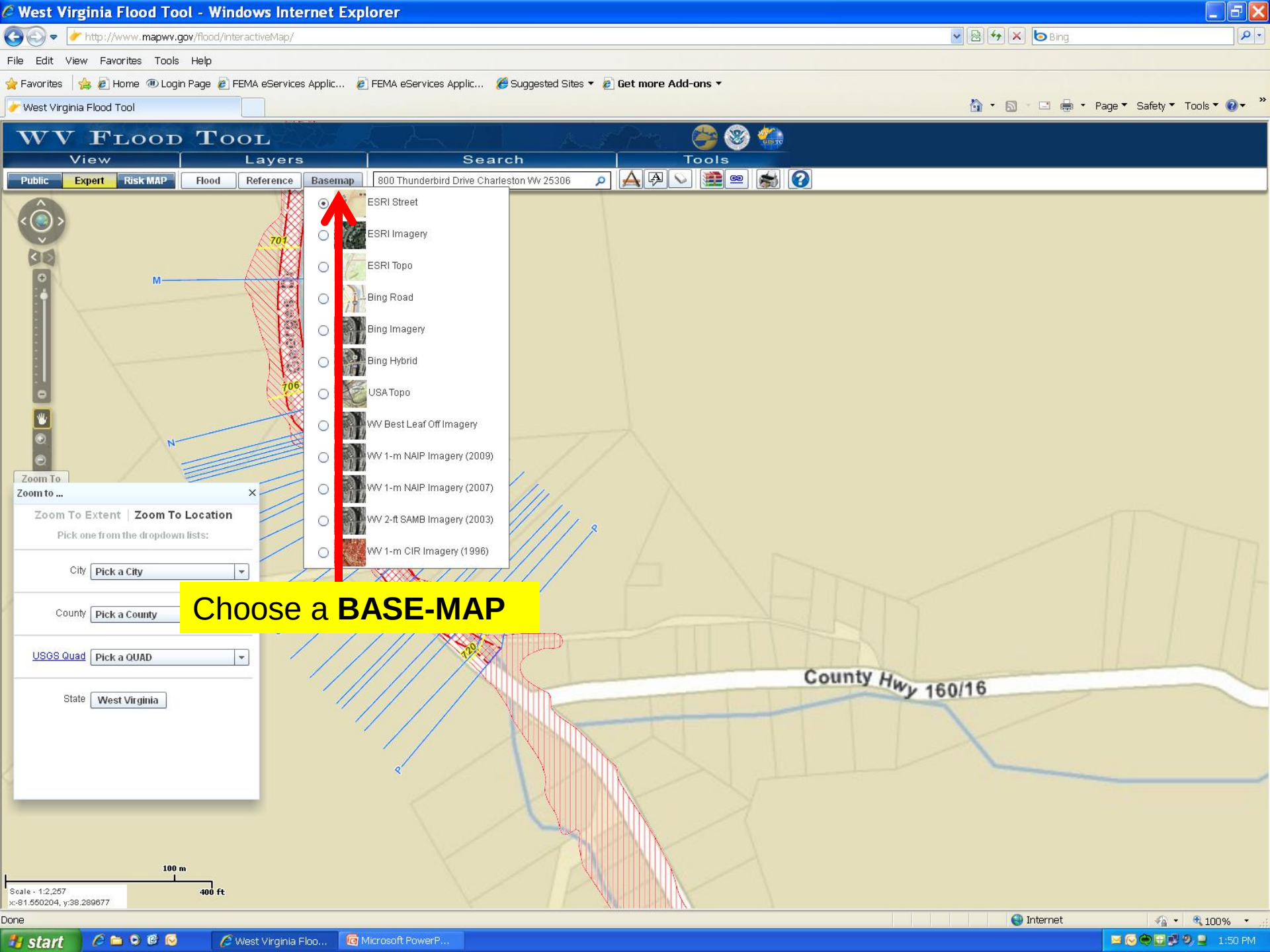
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Bing Road
Bing Imagery
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USA Topo
WV Best Leaf Off Imagery
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WV 2-ft SAMB Imagery (2003)
WV 1-m CIR Imagery (1996)
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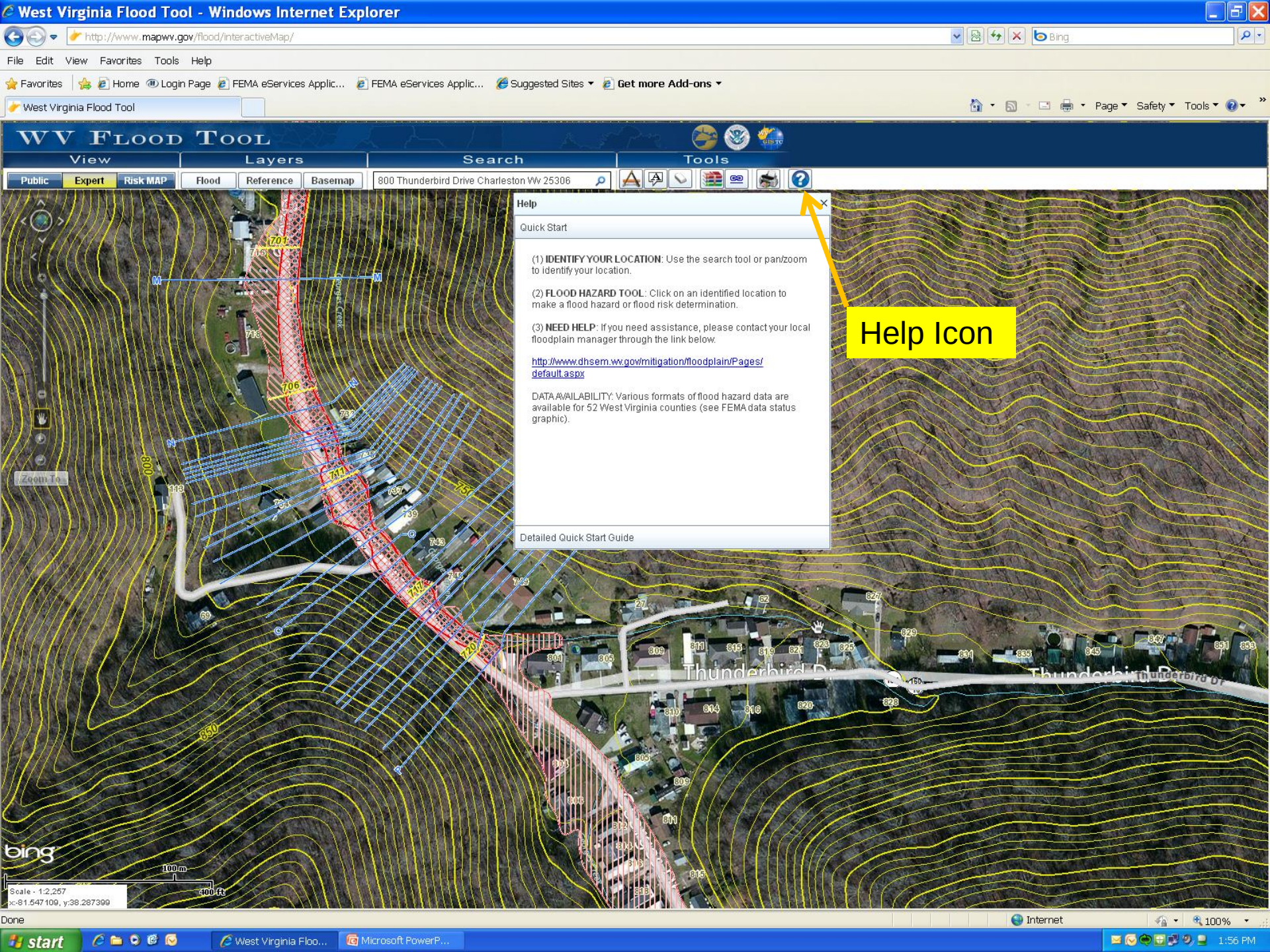
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View
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Public
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Basemap
800 Thunderbird Drive Charleston Wv 25306
Help
Quick Start
(1) IDENTIFY YOUR LOCATION: Use the search tool or pan/zoom to identify your location.
(2) FLOOD HAZARD TOOL: Click on an identified location to make a flood hazard or flood risk determination.
(3) NEED HELP: If you need assistance, please contact your local floodplain manager through the link below.
http://www.dhsem.wv.gov/mitigation/floodplain/Pages/default.aspx
DATA AVAILABILITY: Various formats of flood hazard data are available for 52 West Virginia counties (see FEMA data status graphic).
Detailed Quick Start Guide
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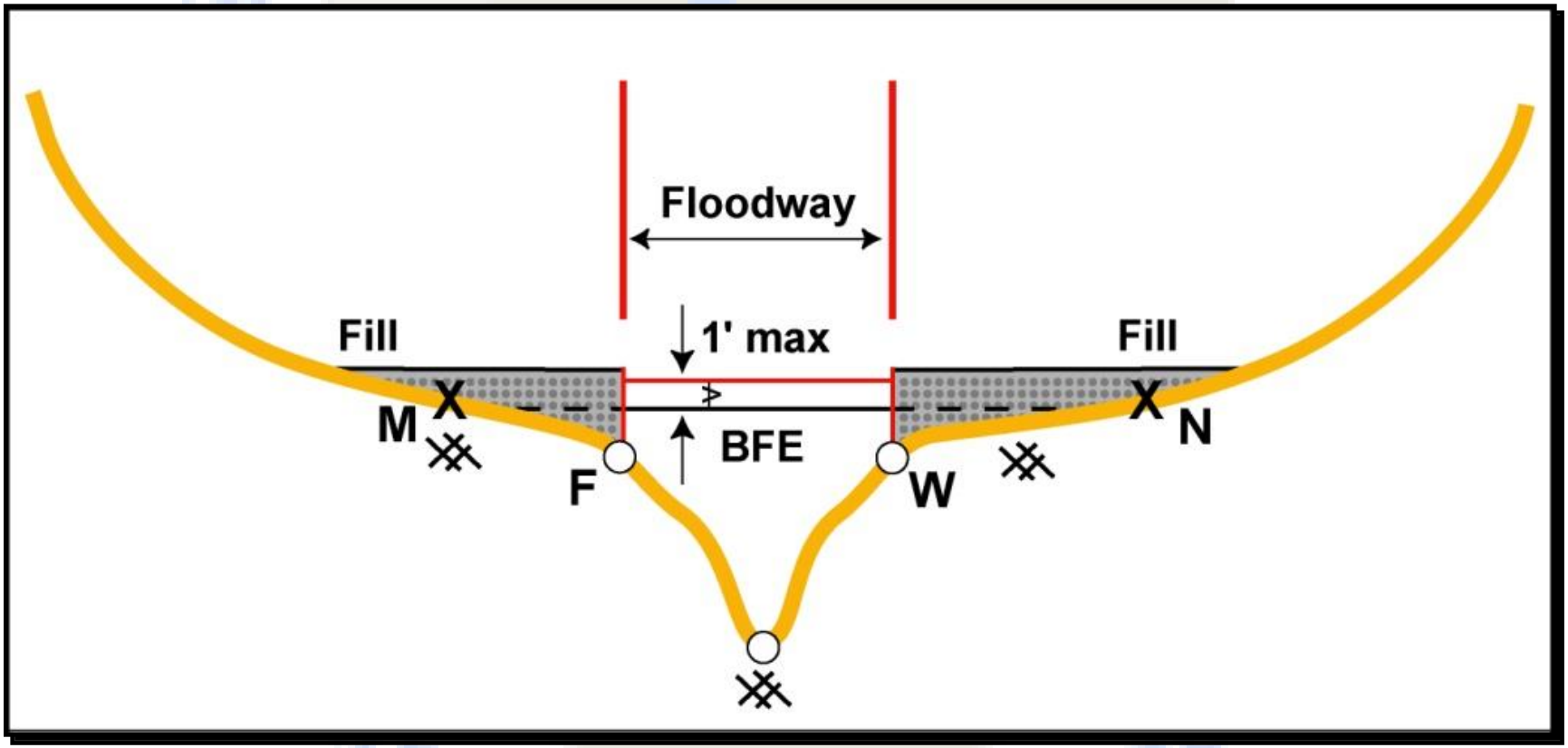
Different flood zones

- Approximate A Zone - ***Approximate A Zones are those areas where floodplain boundaries have been established using approximate techniques without conducting detailed hydrologic and hydraulic studies.*** These approximate 100-year flood zones are shown on flood hazard maps as “unnumbered A zones” (the letter “A” with no letter or number after it).

AE Zone

- Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.

Floodway



FILL

Rules for Fill

- All WV Floodplain Ordinances contain the following language: <u>Fill may be used only to the extent it does not cause an *adverse effect on adjacent properties.*</u>




Rules for Fill

- Within any floodway, no encroachments, including fill, new construction, substantial improvements, or other development shall be permitted unless it has been demonstrated through hydrologic and hydraulic analysis performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels within the community during the occurrence of the base flood discharge.

Rules for Fill

- Within any AE Zone without Floodway area, no new construction or development shall be allowed unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the elevation of the 1% annual chance flood more than one (1) foot at any point.

Rules for Fill

- In Approximate A Zones, when data from an acceptable source is not available, the Floodplain Administrator shall review, or shall cause to be reviewed; all proposed development to determine; 1. The amount being invested and, 2. The specific flood risk at the site. The Floodplain Administrator shall then require the applicant to determine the elevation above which the development will be reasonably safe from flooding. Depending on the amount of fill the floodplain administrator may require hydrologic and hydraulic analyses (done by a professional engineer)or another technique to determine that the fill will not cause any adverse impact to adjacent property owners.

Adverse Effects of Fill

- Unacceptable increase in flood heights
- Adverse alteration of drainage from adjacent property
- Increased velocity on adjacent existing structure
- Initiation or exacerbation of erosion problems
- Other unique site conditions may need to be considered when determining whether fill will cause adverse impact to adjacent property. (Karst, Subsidence areas, etc.)

Additional Fill Requirements

- Contour fill to drain properly (avoid ponding)
- Clean fill, no trash or woody debris.
- Protect fill from erosion.
- Fill compaction standards must be appropriate to proposed post fill use (particular attention is necessary when fill is being used to elevate a structure).

- Fill must be sloped according to specific ordinance requirements (generally 2 foot horizontal for every 1 foot vertical); an engineer can propose steeper sloping by providing data to justify the steeper slope, this includes installation of retaining walls.

Protecting Well Heads

Suggestions?

Storage tanks

Because they don't make a good bobber!

Strap them down!

Stream Crossings

According to Local Floodplain Ordinance's

- Alteration of a stream includes placement of culverts, bridges or other stream crossings. The floodplain administrator may require the use of certain "best practice" techniques in the construction of bridges, culverts or stream crossings to prevent damage, loss of stream crossings and localized flooding caused by blockage. These techniques may include, but are not limited to, wing walls, trash grates or requiring openings to be of sufficient size to pass debris and/or anticipated future increases in flood heights.
- All new and replacement bridges, culverts and other stream crossings shall adhere to the relevant anchoring requirements contained in this ordinance.

According to Local Floodplain Ordinance's

- Section 4.5 <u>Alteration or relocation of a stream</u>

- Whenever a developer intends to alter or relocate a stream within the Floodplain Area the developer shall notify in writing, by certified mail, the **__(Community)___,** The Floodplain Administrator, The State Coordinating Office, any adjacent communities and any adjacent property owners of all such intended activities prior to the alteration or relocation of the stream.

What happens when the water rises?

Sediment Ponds

Sediment Ponds

- Sediment ponds as we know are temporary, however while they are being used could cause a rise in the BFE or adverse effect on adjacent properties.
- Even though it is temporary the Floodplain Manager may require a study to show no rise in the BFE or no adverse impact.

Contact Information

- To contact a community's Floodplain Manager you can find their number at; www.dhsem.wv.gov
- For State contact in Floodplain Management;

  Phone 304-957-2571

  Or you e-mail me at kevin.l.sneed@wv.gov