FLOOD MANAGEMENT TASK FORCE

June 10, 2016
Project Timeline

2015
- Project Kickoff and Field Reconnaissance
- CDC Permit Data Gathering
- CDC Model Georeferencing
- Hydrologic Modeling and Submission to FEMA
- Hydrologic TSDN to NCTCOG for 2 week review period
- NCTCOG Project Presentation
- Hydraulic Modeling and Floodplain Analysis
- Flood Risk Review Meeting (FRR)
- Non-Regulatory Products

2016
Hydrology

- Hydrologic Modeling
- Received HEC-HMS model for the Upper Trinity dated 2012 with 2005 landuse data & HEC-HMS model for the Elm Fork Trinity dated 2012 with 2005 landuse data
- RAMPP reviewed modeling and vetted questions through USACE
- RAMPP delivered the CDC Hydrology package to FEMA
Hydrology (Special Considerations)

- There were two HEC-HMS models used. One model covers the Lower West Fork, Clear Fork, and Upper Trinity while the other covers the Elm Fork Trinity.
- For both the Clear Fork and Elm Fork downstream of the large dams, there are controlled releases whose discharges supersede that of the local rainfall runoff.
- Local rainfall runoff discharges from the HEC-HMS model are used upstream to the point the Lake discharges become dominant.

### Hydrologic Methods used in the CDC Model Update

<table>
<thead>
<tr>
<th>River</th>
<th>Reach</th>
<th>HEC-HMS Model</th>
<th>Frequency Rainfall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear Fork</td>
<td>All</td>
<td>Upper Trinity</td>
<td>Uniform</td>
</tr>
<tr>
<td>West Fork</td>
<td>Above Clear Fork</td>
<td>Upper Trinity</td>
<td>Eagle Mountain</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Centering</td>
</tr>
<tr>
<td>West Fork</td>
<td>Below Clear Fork</td>
<td>Upper Trinity</td>
<td>Walker Branch</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Centering</td>
</tr>
<tr>
<td>Elm Fork</td>
<td>All</td>
<td>Elm Fork Detailed</td>
<td>Uniform</td>
</tr>
<tr>
<td>Trinity River</td>
<td>All</td>
<td>Upper Trinity</td>
<td>Walker Branch</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Centering</td>
</tr>
</tbody>
</table>

### Table 1 – Lewisville Lake Dam Discharges

<table>
<thead>
<tr>
<th>Average Return Period (years)</th>
<th>Annual Chance Exceedance</th>
<th>Peak Outflows from Lewisville Lake</th>
<th>Outflow Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>50%</td>
<td>5,500</td>
<td>Main Gates</td>
</tr>
<tr>
<td>5</td>
<td>20%</td>
<td>7,000</td>
<td>Main Gates</td>
</tr>
<tr>
<td>10</td>
<td>10%</td>
<td>7,000</td>
<td>Main Gates</td>
</tr>
<tr>
<td>25</td>
<td>4%</td>
<td>7,000</td>
<td>Main Gates</td>
</tr>
<tr>
<td>50</td>
<td>2%</td>
<td>10,200</td>
<td>Spillway</td>
</tr>
<tr>
<td>100</td>
<td>1%</td>
<td>21,000</td>
<td>Spillway</td>
</tr>
<tr>
<td>500</td>
<td>0.20%</td>
<td>57,000</td>
<td>Spillway</td>
</tr>
</tbody>
</table>

### Benbrook Dam - Frequency Outflows

Based on a 1996 Period of Record Analysis

These match the numbers on the currently effective FIRM maps

<table>
<thead>
<tr>
<th>Average Return Period (years)</th>
<th>Annual Chance Exceedance</th>
<th>Pool Elevation (ft NGVD)</th>
<th>Total Outflows from Benbrook Dam (cfs)</th>
<th>Peak Outflow from Main Gates (cfs)</th>
<th>Peak Outflow from Spillway (cfs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>50%</td>
<td>698.0</td>
<td>3,000</td>
<td>3,000</td>
<td>-</td>
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<tr>
<td>5</td>
<td>20%</td>
<td>704.3</td>
<td>6,000</td>
<td>6,000</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>10%</td>
<td>708.5</td>
<td>6,000</td>
<td>6,000</td>
<td>-</td>
</tr>
<tr>
<td>25</td>
<td>4%</td>
<td>714.0</td>
<td>6,000</td>
<td>6,000</td>
<td>2,700</td>
</tr>
<tr>
<td>50</td>
<td>2%</td>
<td>718.0</td>
<td>7,500</td>
<td>6,000</td>
<td>7,500</td>
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<tr>
<td>100</td>
<td>1%</td>
<td>721.5</td>
<td>13,000</td>
<td>6,000</td>
<td>13,000</td>
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<tr>
<td>500</td>
<td>0.20%</td>
<td>729.5</td>
<td>46,000</td>
<td>6,000</td>
<td>46,000</td>
</tr>
</tbody>
</table>
Hydrology (Special Considerations)

- Hydrology provided storm centering for 2 different scenarios. For the purpose of this Task, RAMPP used the higher rainfall amount at each discharge location for precipitation. Where there is uniform rainfall data provided, that will be used.

- All correspondence for special circumstances are documented in the hydrology deliverables package.

- Hydrology to be provided to stakeholders for review.
**Georeferencing the CDC Model**

**Georeferencing**: Aligning geographic data to a known coordinate system so it can be viewed, queried, and analyzed with other geographic data. Georeferencing may involve shifting, rotating, scaling, skewing, and in some cases warping, rubber sheeting, or orthorectifying the data. ¹

**Benefits:**
- Mapping (e.g. floodplains, streamlines, cross sections, levees)
- Compatibility with more graphically enhanced softwares
- Updated to FEMA Specifications
- Future modeling

**Thus far.....**

Solely focused on model’s spatial data and creating a mappable format with real coordinates.

¹ Environmental Systems Research Institute (ESRI) definition of georeferencing
Data Gathering

DGN Files from October 1996 and March 2000 containing original cross sections

Provided a starting point for acquiring geospatial coordinates for cross sections

Gathered the CDC permit applications that corresponded with data gaps and coordinated with USACE
Georeferencing the Workmaps
Georeferencing the Workmaps
Georeferenced CDC Model
Next Steps

- **Hydraulic Modeling**
  - Completed by July 2016

- **Floodplain mapping**
  - Fall 2016

- **Flood Risk Review and Risk Assessment**
  - Winter 2016
CDC Process Discussion
Submitting a CDC Application to NCTCOG and USACE

Floodplain Administrator

1. Receive CDC Recovery Fee check and application from CDC applicant.

2. Prepare letters to USACE and NCTCOG to initiate Technical Review. Templates are now posted online.

3. Submit application to NCTCOG and USACE.
   a) NCTCOG: send check, letter, and one electronic copy of application.
   b) USACE: send letter and one paper copy of application

4. Send email to CDC participant list asking for review of application.
5. **USACE will initiate review when the check is processed and they have received their copies of the application.**
   - *USACE will send review letter to City/County and to NCTCOG.*

6. **City/County fills out “Final CDC Action/Findings Form” and submits to NCTCOG.**
Elected Officials Seminar
Potential Presentation Topics

- Flood Insurance Rates From a Resident’s Perspective
- Drainage Utility Fees: How It Can Benefit You