

FLOOD MANAGEMENT TASK FORCE

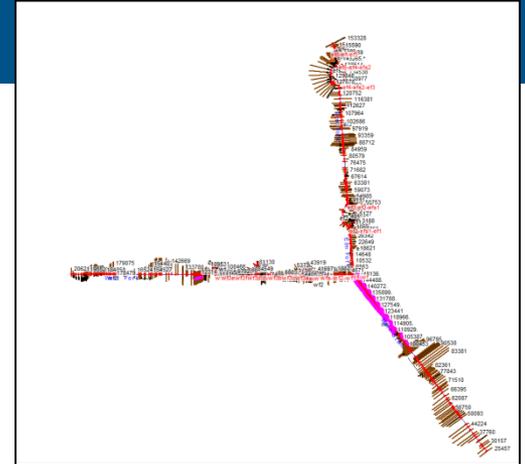
June 10, 2016



FEMA

Upper Trinity River Corridor Development Certificate Model Georeferencing

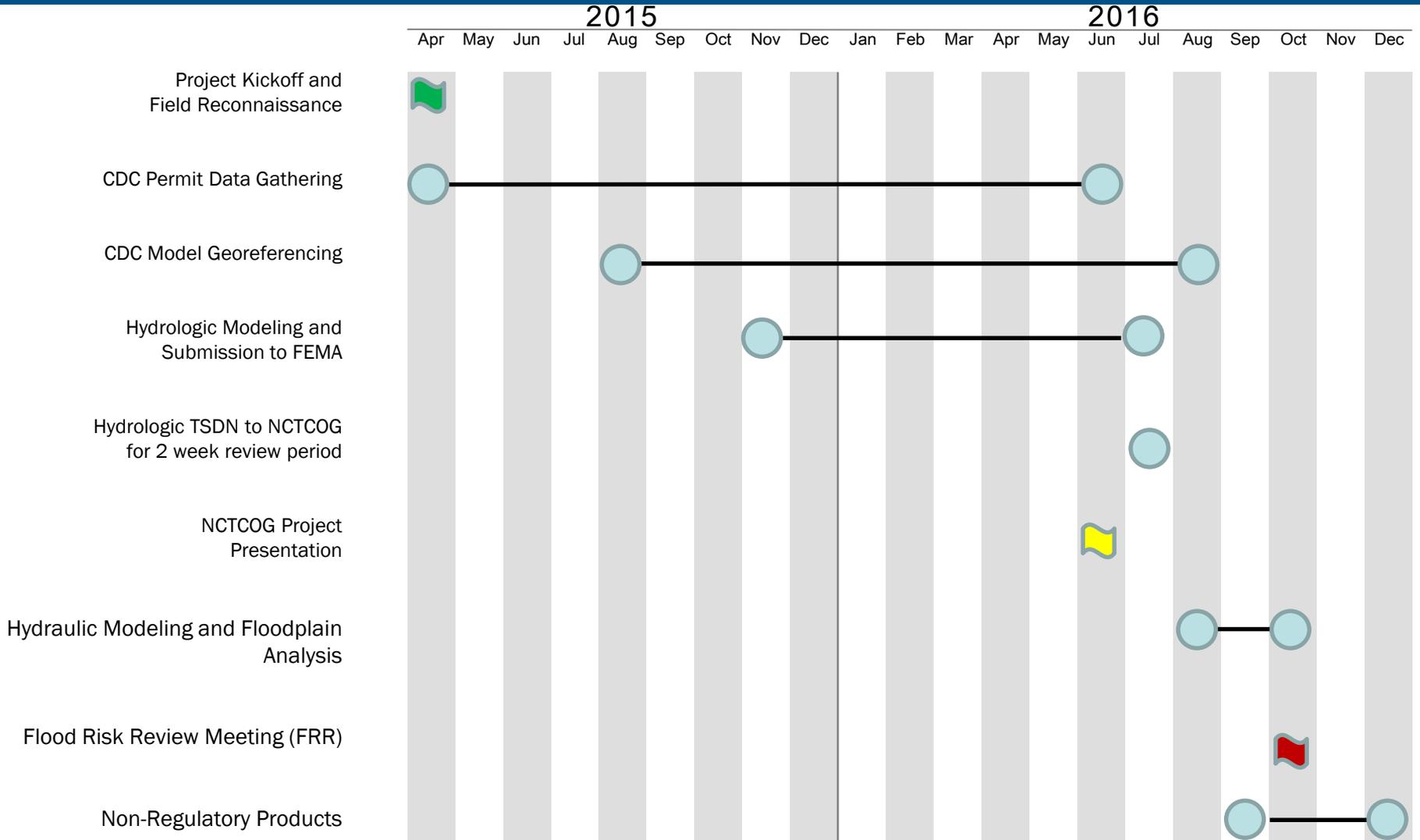
Dallas – Fort Worth Metroplex
North Central Texas Council of Governments
June 10, 2016



RiskMAP
Increasing Resilience Together

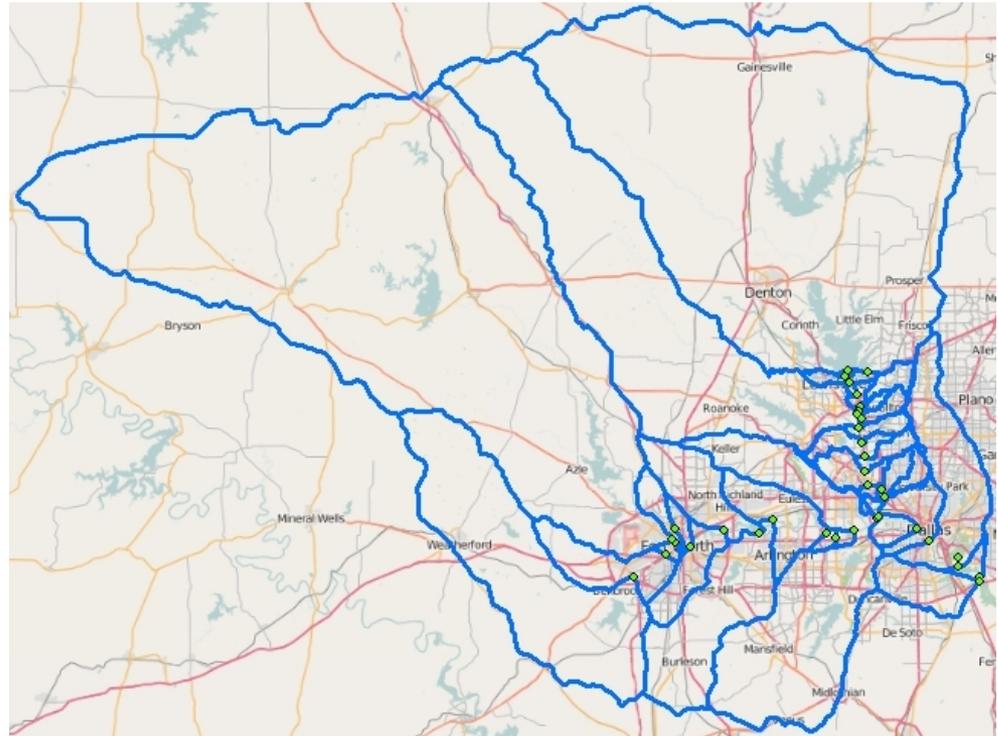


Project Timeline



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

River	Reach	HEC-HMS Model	Frequency Rainfall
Clear Fork	All	Upper Trinity	Uniform
West Fork	Above Clear Fork	Upper Trinity	Eagle Mountain Centering
West Fork	Below Clear Fork	Upper Trinity	Walker Branch Centering
Elm Fork	All	Elm Fork Detailed	Uniform
Trinity River	All	Upper Trinity	Walker Branch Centering

Table 1 – Lewisville Lake Dam Discharges

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

Benbrook Dam - Frequency Outflows

Based on a 1996 Period of Record Analysis

These match the numbers on the currently effective FIRM maps

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

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:

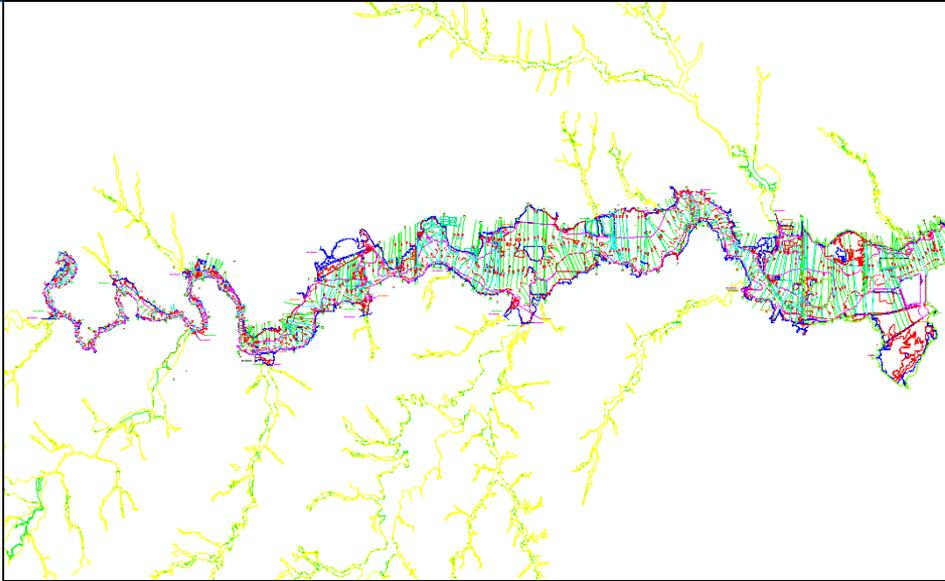
- Mapping (e.g. floodplains, streamlines, cross sections, levees)
- Compatibility with more graphically enhanced softwares
- Updated to FEMA Specifications
- Future modeling

Thus far.....

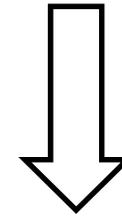
Solely focused on model's spatial data and creating a mappable format with real coordinates.

1. Environmental Systems Research Institute (ESRI) definition of georeferencing

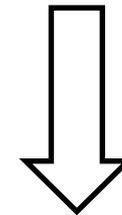
Data Gathering



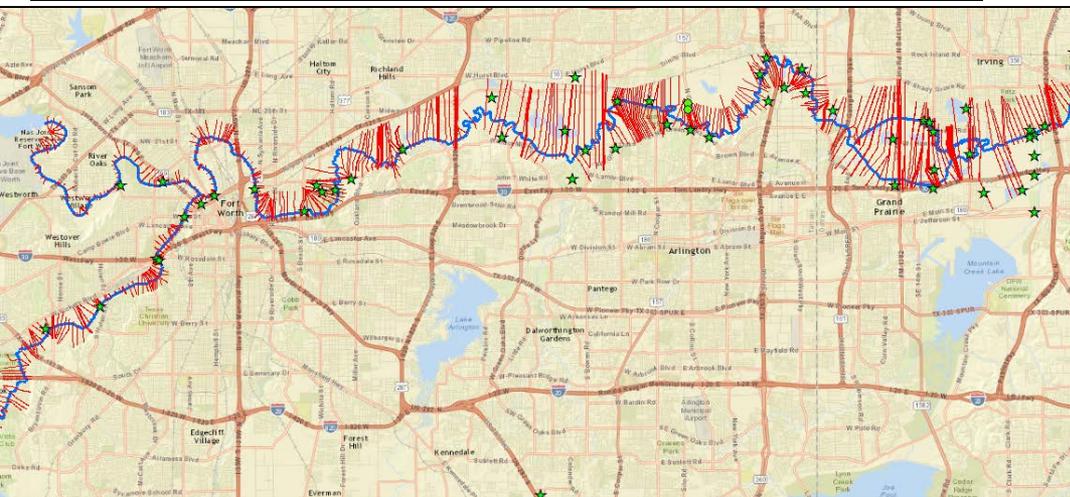
DGN Files from October 1996 and March 2000 containing original cross sections

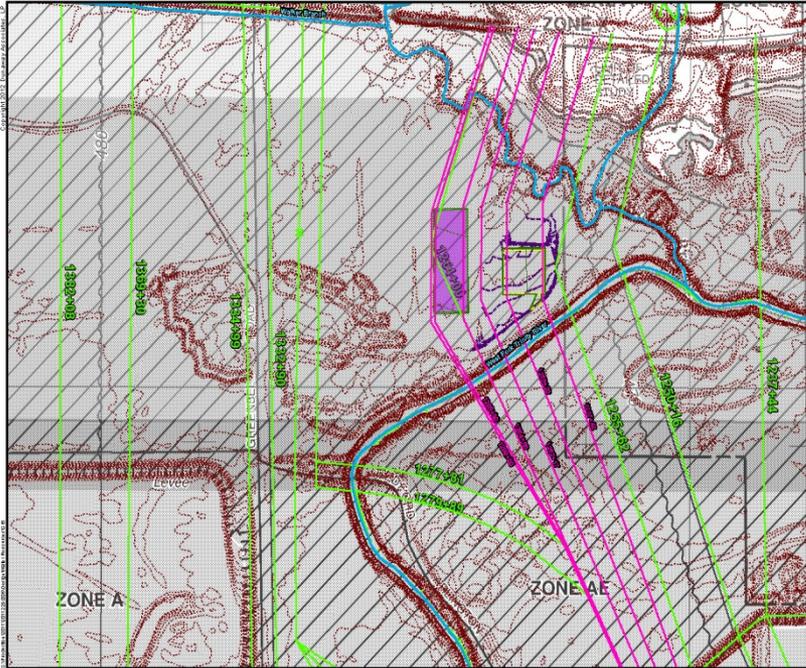


Provided a starting point for acquiring geospatial coordinates for cross sections



Gathered the CDC permit applications that corresponded with data gaps and coordinated with USACE





**FIGURE 3
HYDRAULIC
WORKMAP**

BASS ARRLINGTON 1H & 2H
BARRINGTON COUNTY, TEXAS
APRIL, 2012

DUNAWAY
INC. #111

DATE: 04/12/2012

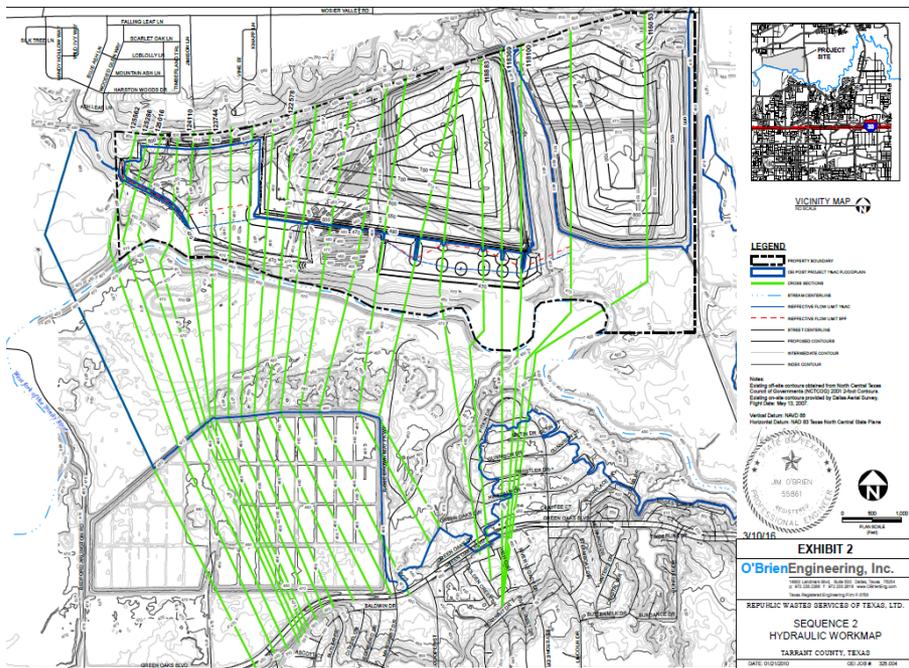


EXHIBIT 2

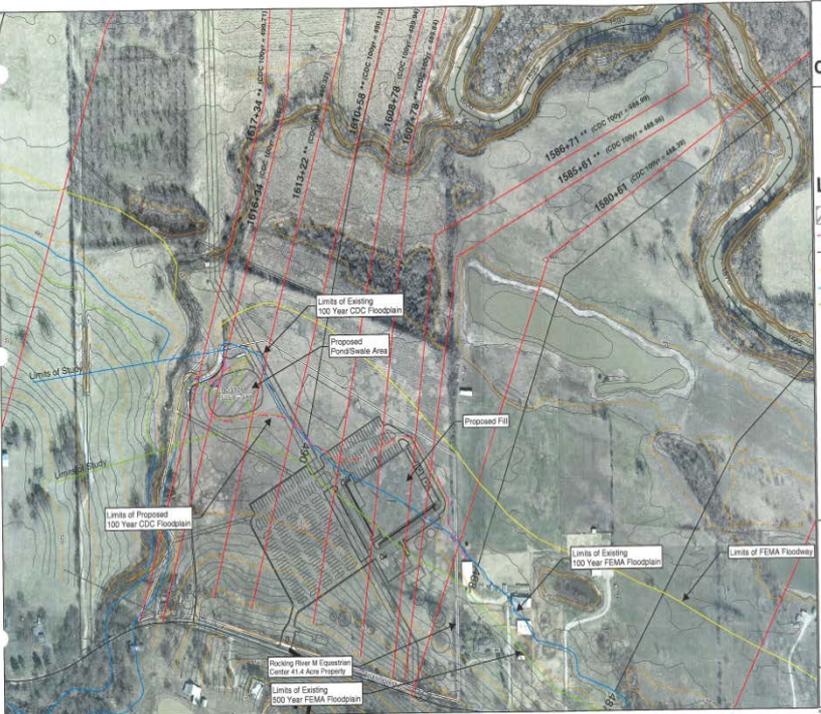
O'BrienEngineering, Inc.

REPUBLIC WASTE SERVICES OF TEXAS, LTD.

**SEQUENCE 2
HYDRAULIC WORKMAP**

BARRINGTON COUNTY, TEXAS

DATE: 05/20/2012



**Rocking River M
Equestrian Center
CDC APPLICATION**

Legend

- Proposed Pond/Swale
- Proposed 100 Year CDC FP
- Existing 100 Year CDC FP
- FEMA Floodway
- 100 Year FEMA Floodplain
- 500 Year FEMA Floodplain

Notes:
Contours are from the 1991 USACE Topographic Data.
** Denotes added Cross Section

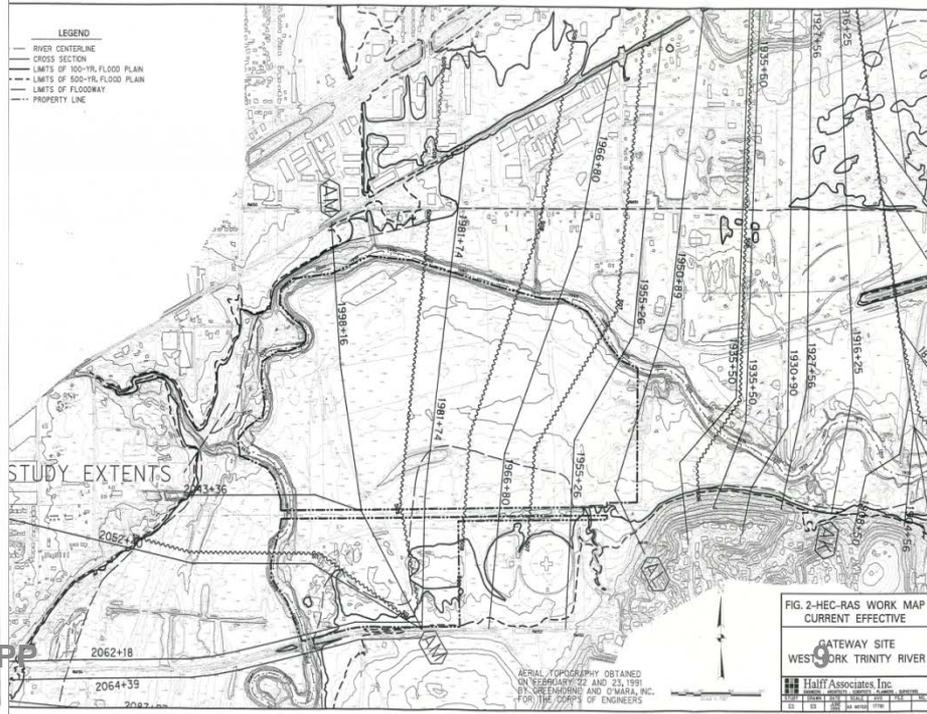
**Figure 4
Post-Project
Conditions**

0 150 300 600 Feet

1 inch equals 300 feet

RAMPP

Half Associates
INC.



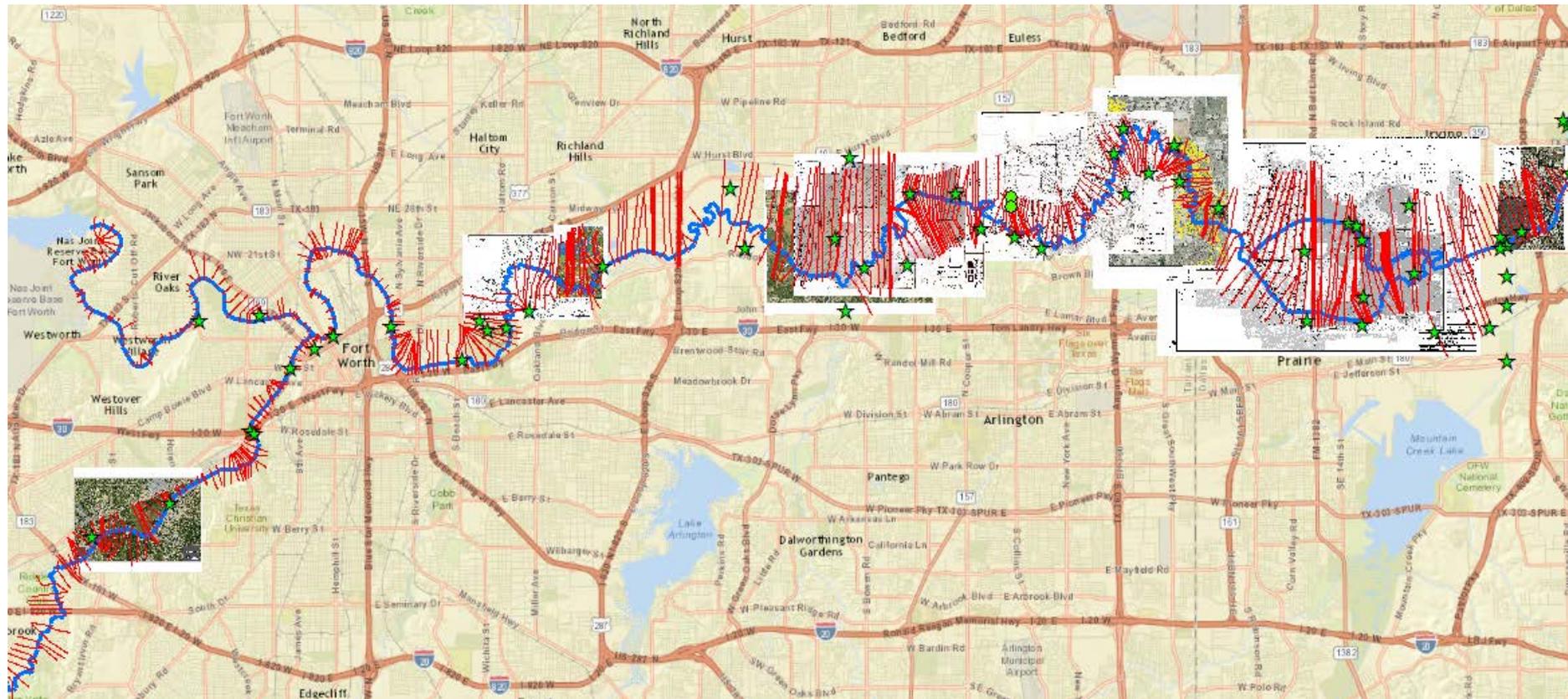
**FIG. 2-HEC-RAS WORK MAP
CURRENT EFFECTIVE**

**GATEWAY SITE
WEST PARK TRINITY RIVER**

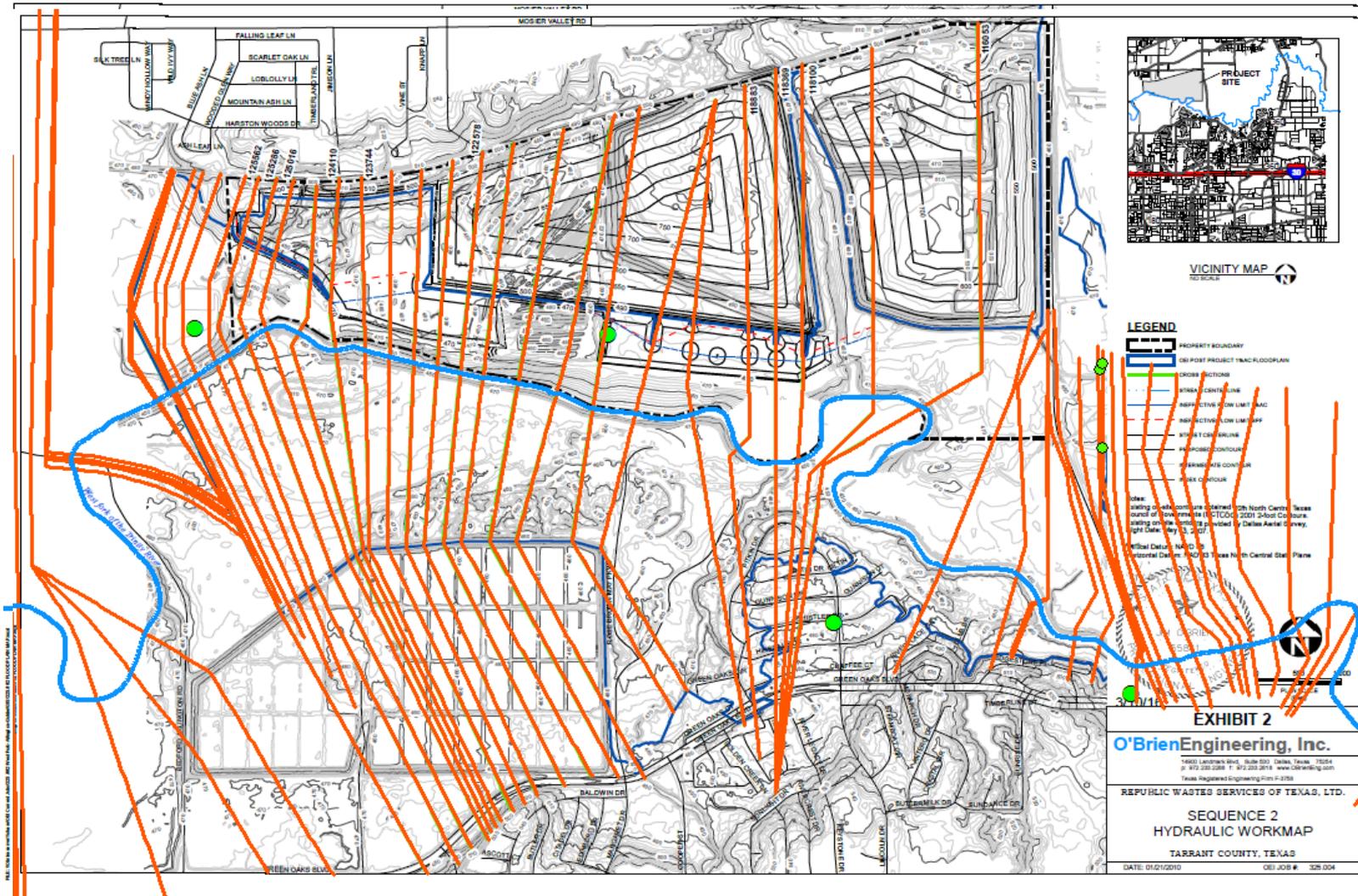
Half Associates, Inc.

DATE: 05/20/2012

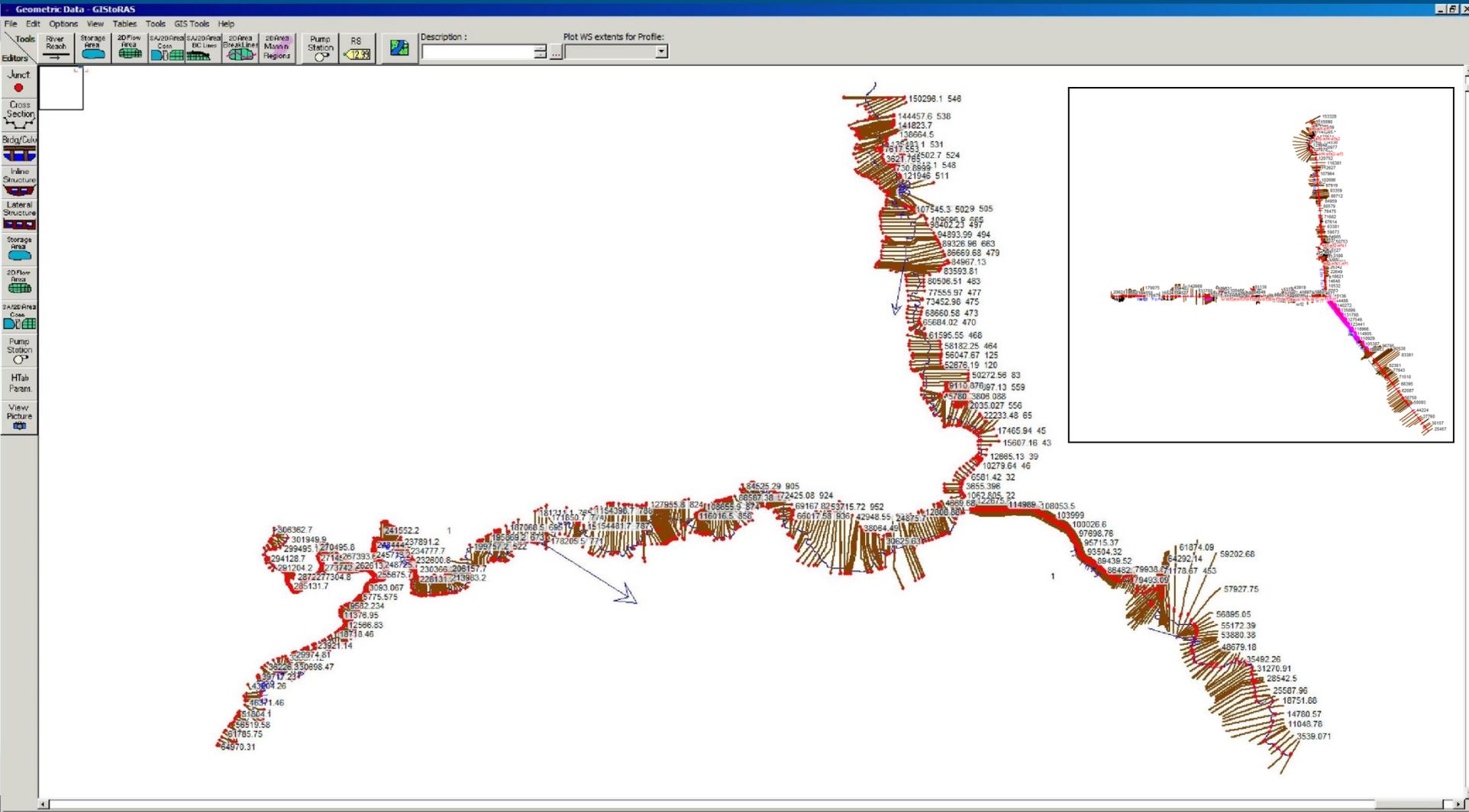
Georeferencing the Workmaps



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.*

CDC Process Discussion

Submitting a CDC Application to NCTCOG and USACE

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