May 14, 2025

HEC-RAS Modeling

Building an MT-2 Submission

Indiana Department of Natural Resources

Paul Brayton
FEMA LOMR Review Partners
Division of Water

FEMA MT-2 Model Requirements

Minimum Model Submission

- Duplicate Effective
  - Ensures Effective data is loaded on your computer.
- Corrected Effective
  - Fixes error(s) in the Duplicate Effective model and prepares the follow-on models. All evaluation cross sections are input to the base conditions.
- Existing Conditions
  - Will let FEMA know what the pre-project conditions look like.
- Proposed/Revised/As-Built Conditions
  - Will let FEMA know what your changes to the Effective data will look like.

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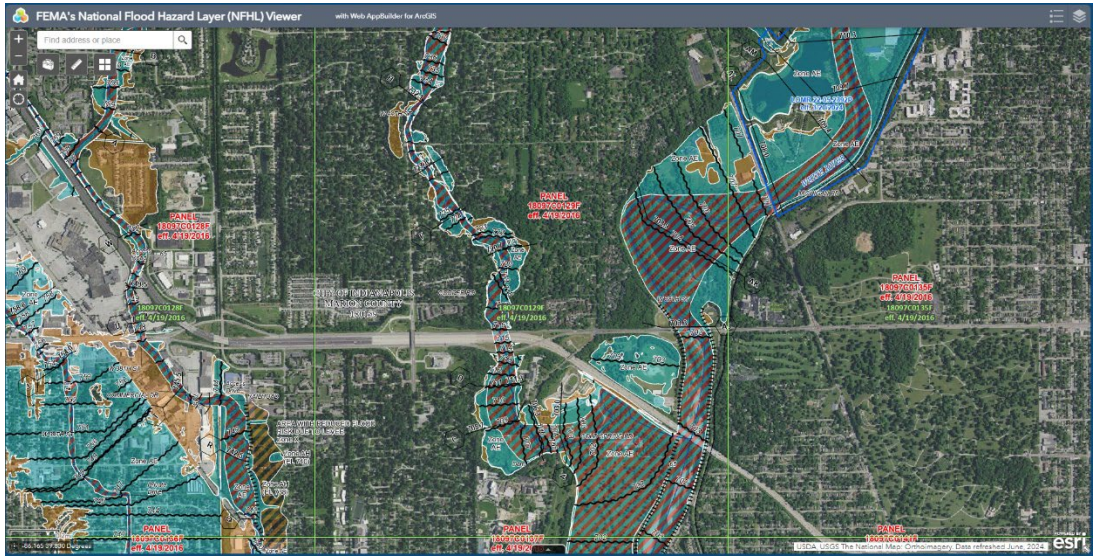
LOMR Modeling Steps

- Verify the Effective Data.
- Locate the Effective Data.
- Create the Duplicate Effective Model.
- Determine natural changes or man-made modifications.
- Create the Corrected Effective Model.
- Build the Existing Conditions.
- Determine the Proposed Conditions.

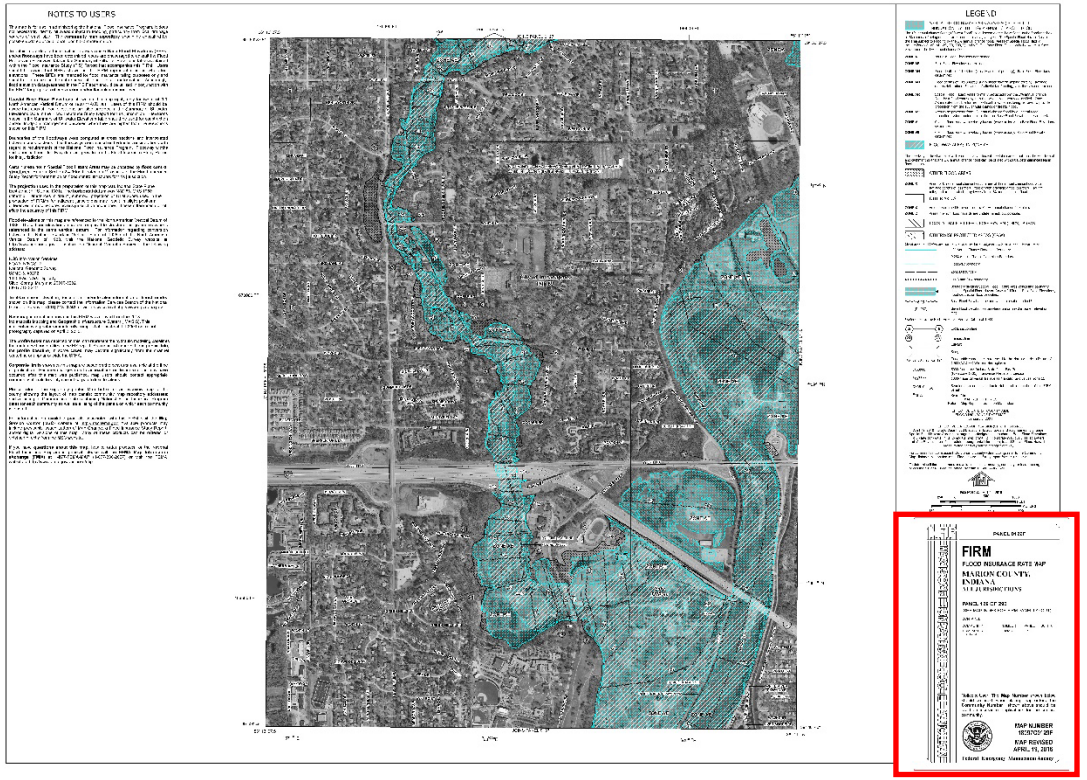
Example

Verify the Effective Date

FEMA National Flood Hazard Layer Viewer

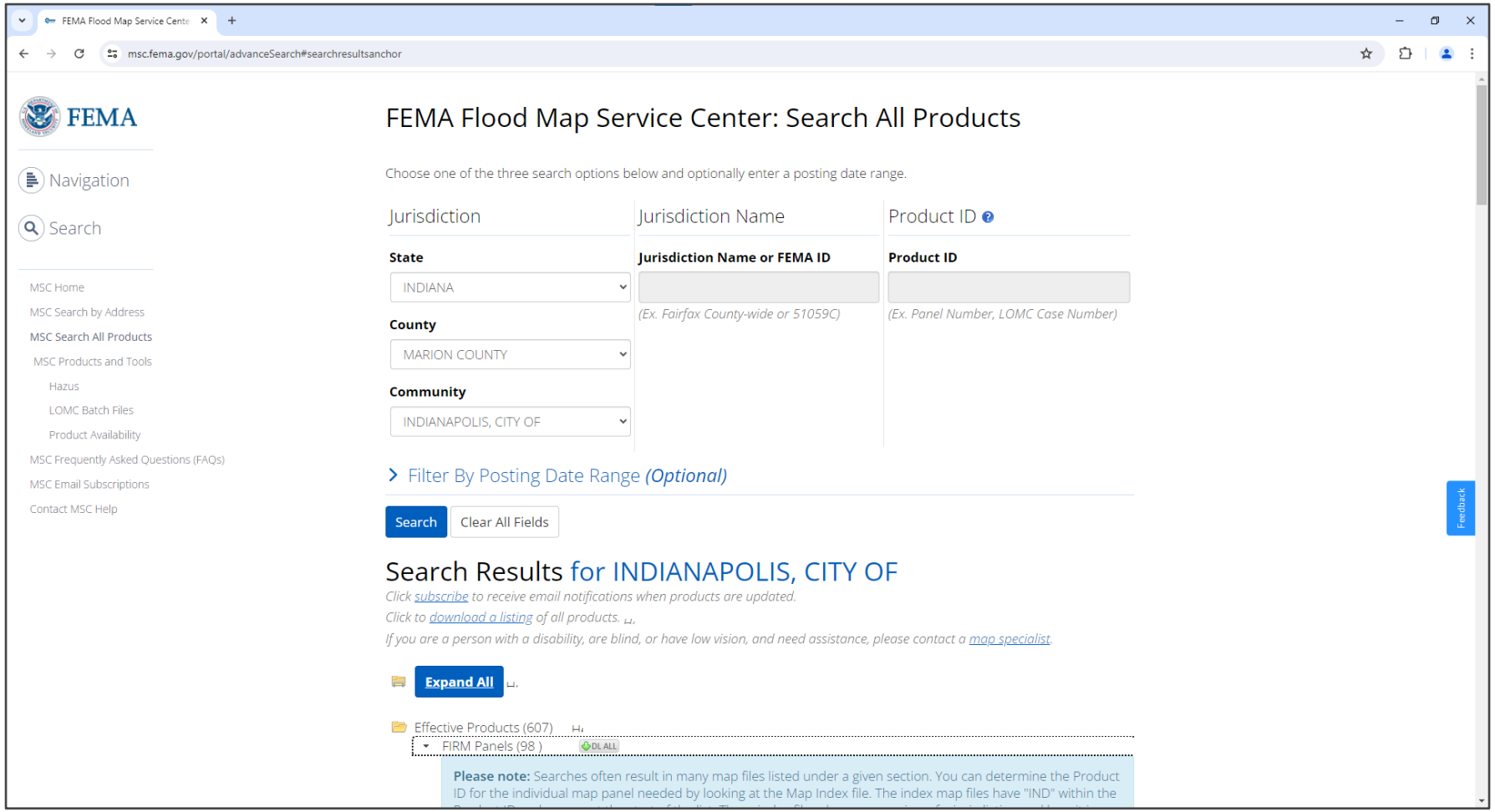


Flood Insurance Rate Map



Example

Verify the Effective Data Date



Example

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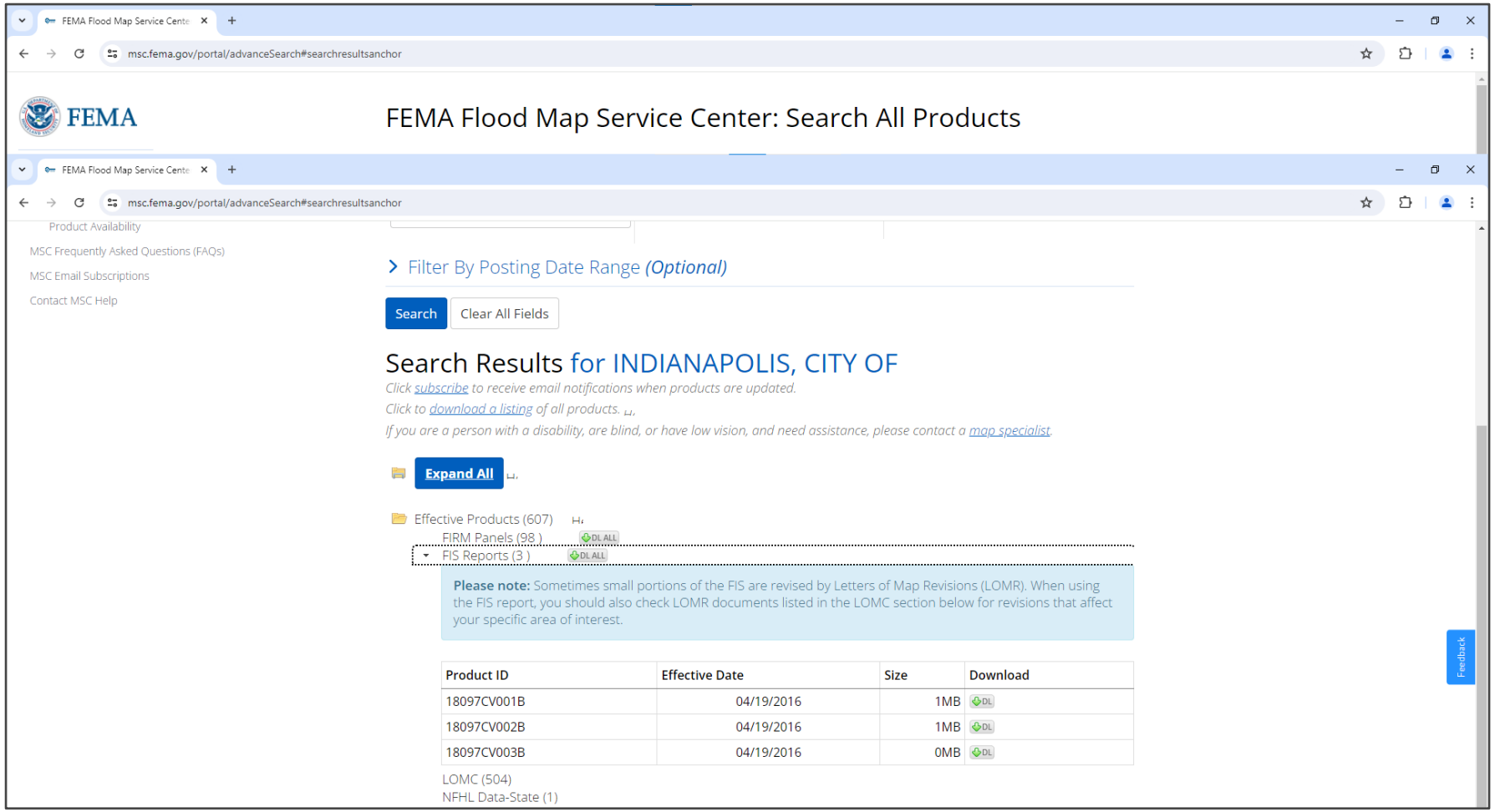

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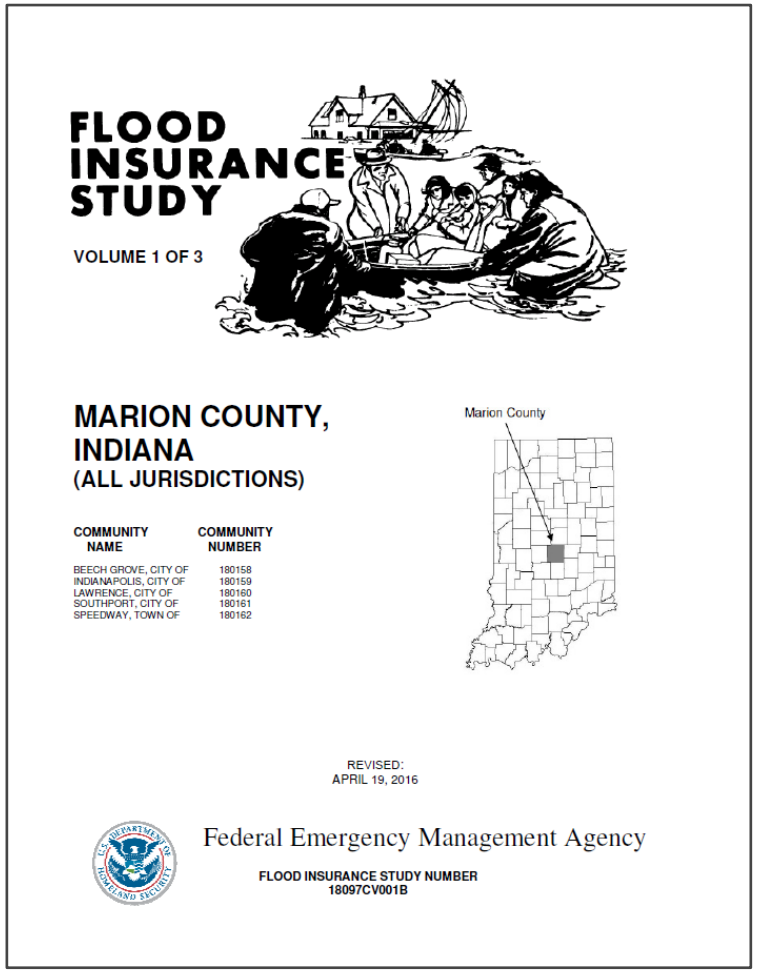
Example

Verify the Effective Data Date



FLOOD INSURANCE STUDY

VOLUME 1 OF 3

MARION COUNTY, INDIANA
(ALL JURISDICTIONS)

COMMUNITY NAME	COMMUNITY NUMBER
BEECH GROVE, CITY OF	180158
INDIANAPOLIS, CITY OF	180159
LAWRENCE, CITY OF	180160
SOUTHPORT, CITY OF	180161
SPEEDWAY, TOWN OF	180162

Marion County

REVISED:
APRIL 19, 2016

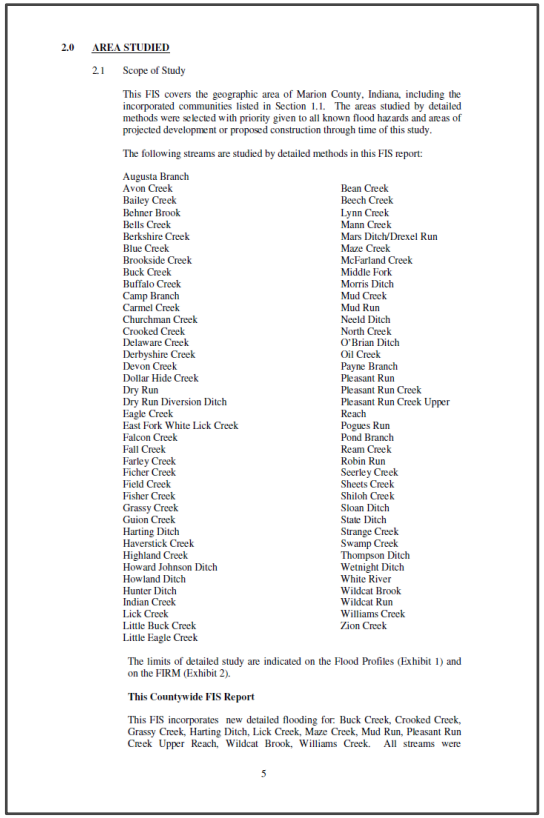
Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
18097CV001B

Example

Verify the Effective Date

Flood Insurance Study Scope



2.0 **AREA STUDIED**

2.1 Scope of Study

This FIS covers the geographic area of Marion County, Indiana, including the incorporated communities listed in Section 1.1. The areas studied by detailed methods were selected with priority given to all known flood hazards and areas of projected development or proposed construction through time of this study.

The following streams are studied by detailed methods in this FIS report:

Augusta Branch
Avon Creek
Bailey Creek
Behner Brook
Bells Creek
Berkshire Creek
Blue Creek
Brookside Creek
Buck Creek
Buffalo Creek
Camp Branch
Carmel Creek
Churchman Creek
Crooked Creek
Delaware Creek
Derbyshire Creek
Devon Creek
Dollar Hide Creek
Dry Run
Dry Run Diversion Ditch
Eagle Creek
East Fork White Lick Creek
Falcon Creek
Fall Creek
Farley Creek
Ficher Creek
Field Creek
Fisher Creek
Grassy Creek
Guion Creek
Harting Ditch
Haverstick Creek
Highland Creek
Howard Johnson Ditch
Howland Ditch
Hunter Ditch
Indian Creek
Lick Creek
Little Buck Creek
Little Eagle Creek
Bean Creek
Beech Creek
Lynn Creek
Mann Creek
Mars Ditch/Drexel Run
Maze Creek
McFarland Creek
Middle Fork
Morris Ditch
Mud Creek
Mud Run
Neeld Ditch
North Creek
O'Brian Ditch
Oil Creek
Payne Branch
Pleasant Run
Pleasant Run Creek
Pleasant Run Creek Upper Reach
Pogues Run
Pond Branch
Ream Creek
Robin Run
Seerley Creek
Sheets Creek
Shiloh Creek
Sloan Ditch
State Ditch
Strange Creek
Swamp Creek
Thompson Ditch
Wetnight Ditch
White River
Wildcat Brook
Wildcat Run
Williams Creek
Zion Creek

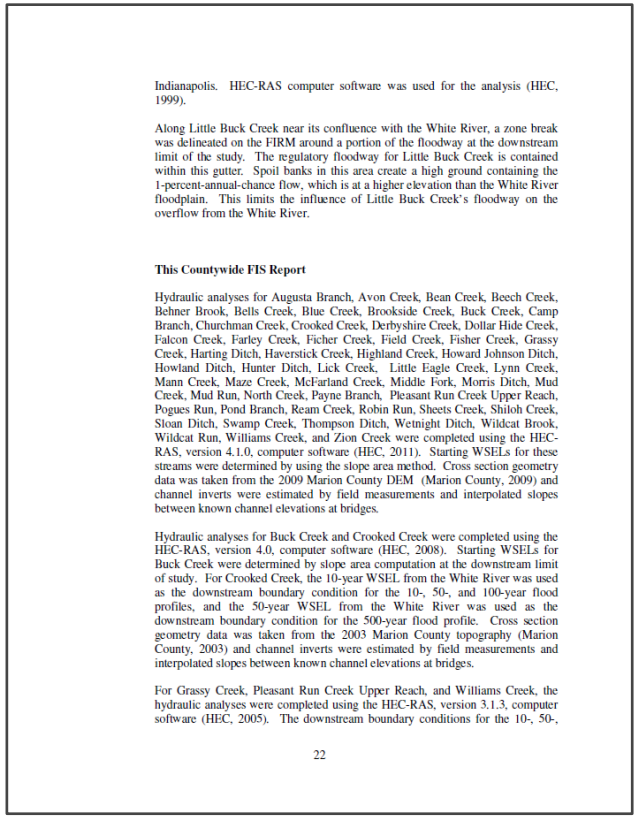
The limits of detailed study are indicated on the Flood Profiles (Exhibit 1) and on the FIRM (Exhibit 2).

This Countywide FIS Report

This FIS incorporates new detailed flooding for: Buck Creek, Crooked Creek, Grassy Creek, Harting Ditch, Lick Creek, Maze Creek, Mud Run, Pleasant Run Creek Upper Reach, Wildcat Brook, Williams Creek. All streams were

5

Flood Insurance Study Engineering Method



Indianapolis. HEC-RAS computer software was used for the analysis (HEC, 1999).

Along Little Buck Creek near its confluence with the White River, a zone break was delineated on the FIRM around a portion of the floodway at the downstream limit of the study. The regulatory floodway for Little Buck Creek is contained within this gutter. Spoil banks in this area create a high ground containing the 1-percent-annual-chance flow, which is at a higher elevation than the White River floodplain. This limits the influence of Little Buck Creek's floodway on the overflow from the White River.

This Countywide FIS Report

Hydraulic analyses for Augusta Branch, Avon Creek, Bean Creek, Beech Creek, Behner Brook, Bells Creek, Blue Creek, Brookside Creek, Buck Creek, Camp Branch, Churchman Creek, Crooked Creek, Derbyshire Creek, Dollar Hide Creek, Falcon Creek, Farley Creek, Ficher Creek, Field Creek, Fisher Creek, Grassy Creek, Harting Ditch, Haverstick Creek, Highland Creek, Howard Johnson Ditch, Howland Ditch, Hunter Ditch, Lick Creek, Little Eagle Creek, Lynn Creek, Mann Creek, Maze Creek, McFarland Creek, Middle Fork, Morris Ditch, Mud Creek, Mud Run, North Creek, Payne Branch, Pleasant Run Creek Upper Reach, Pogues Run, Pond Branch, Ream Creek, Robin Run, Sheets Creek, Shiloh Creek, Sloan Ditch, Swamp Creek, Thompson Ditch, Wetnight Ditch, Wildcat Brook, Wildcat Run, Williams Creek, and Zion Creek were completed using the HEC-RAS, version 4.1.0, computer software (HEC, 2011). Starting WSELs for these streams were determined by using the slope area method. Cross section geometry data was taken from the 2009 Marion County DEM (Marion County, 2009) and channel inverts were estimated by field measurements and interpolated slopes between known channel elevations at bridges.

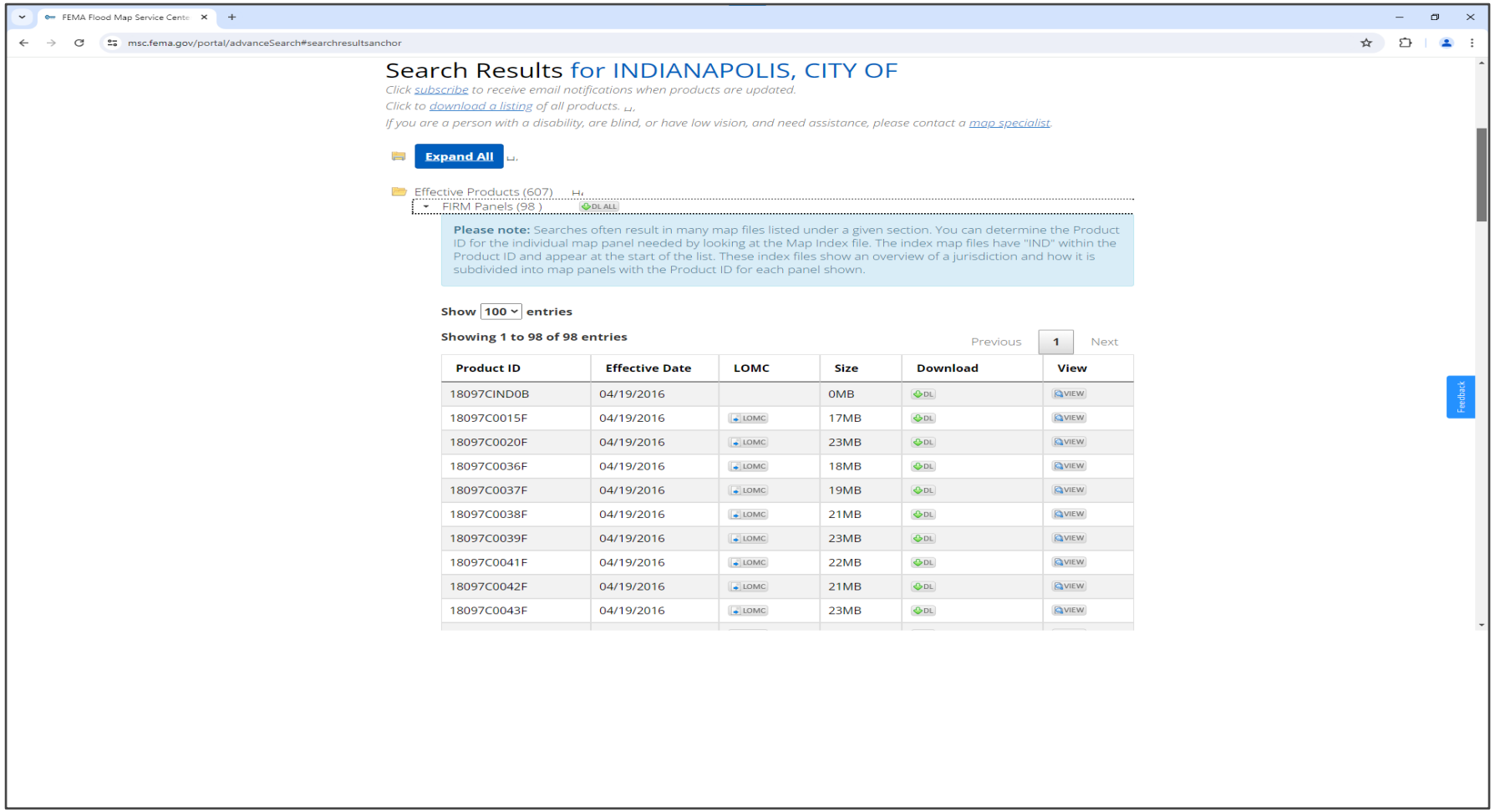
Hydraulic analyses for Buck Creek and Crooked Creek were completed using the HEC-RAS, version 4.0, computer software (HEC, 2008). Starting WSELs for Buck Creek were determined by slope area computation at the downstream limit of study. For Crooked Creek, the 10-year WSEL from the White River was used as the downstream boundary condition for the 10-, 50-, and 100-year flood profiles, and the 50-year WSEL from the White River was used as the downstream boundary condition for the 500-year flood profile. Cross section geometry data was taken from the 2003 Marion County topography (Marion County, 2003) and channel inverts were estimated by field measurements and interpolated slopes between known channel elevations at bridges.

For Grassy Creek, Pleasant Run Creek Upper Reach, and Williams Creek, the hydraulic analyses were completed using the HEC-RAS, version 3.1.3, computer software (HEC, 2005). The downstream boundary conditions for the 10-, 50-,

22

Example

Verify the Effective Data Date



Example

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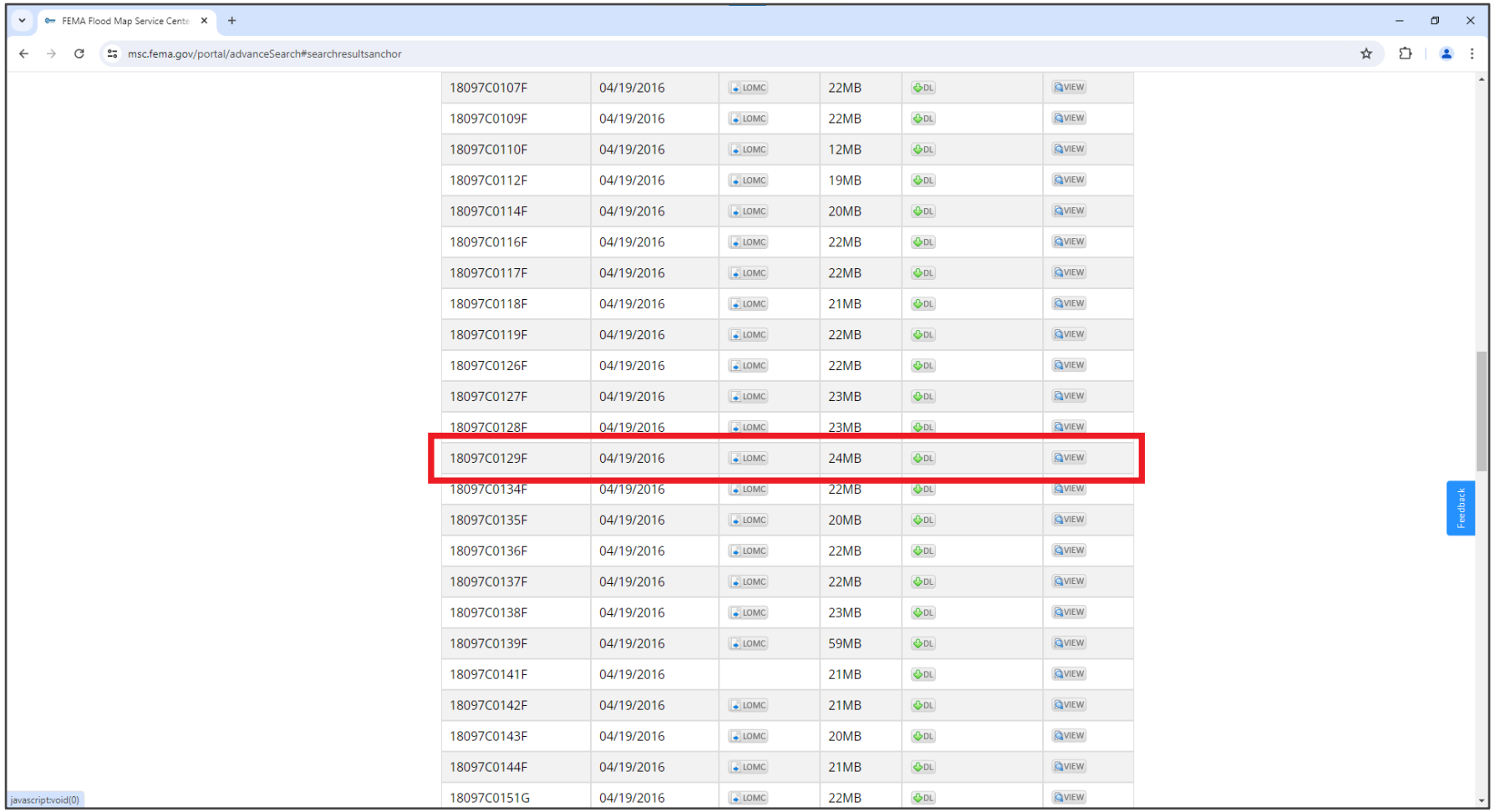

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Example

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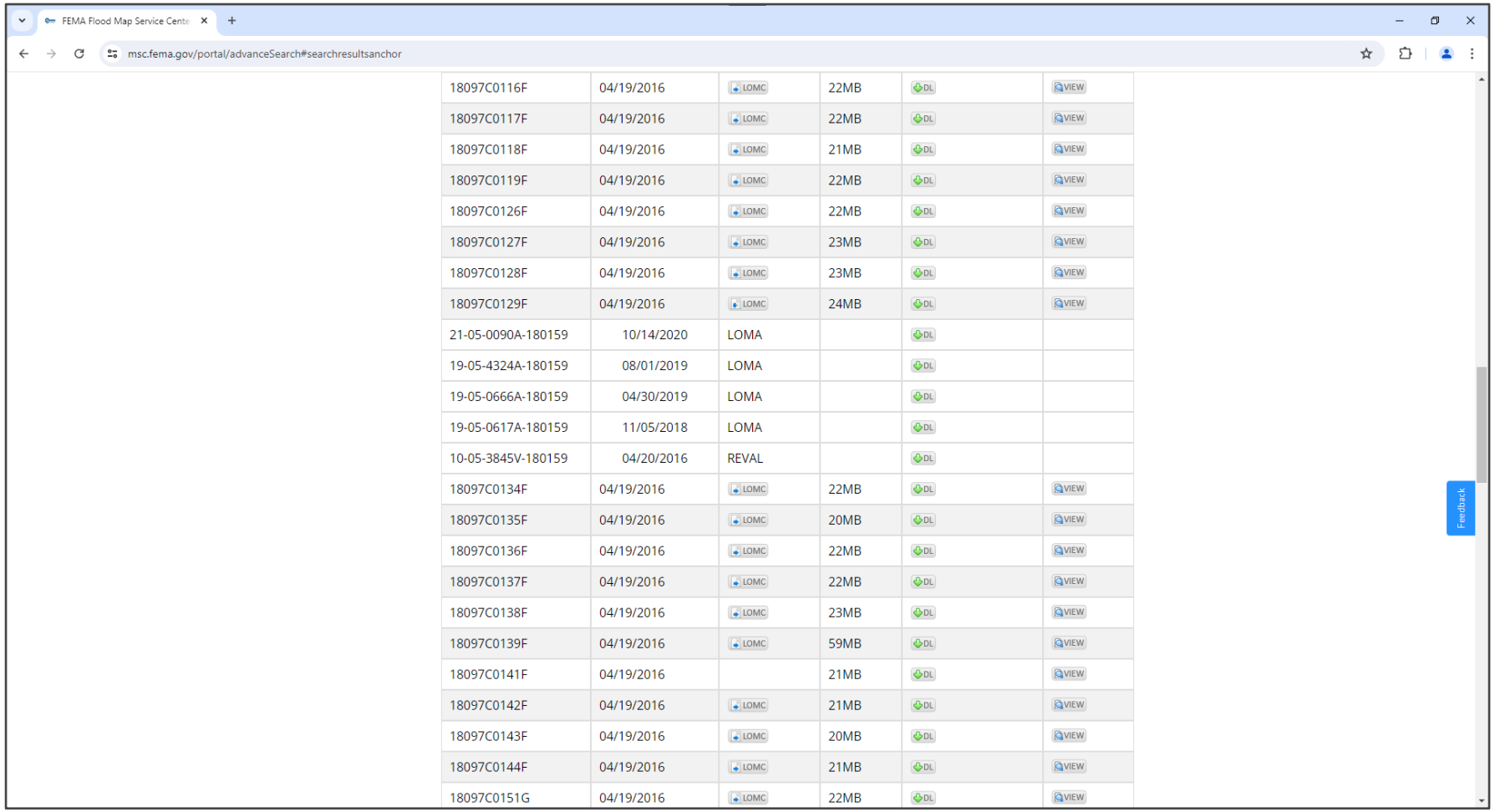

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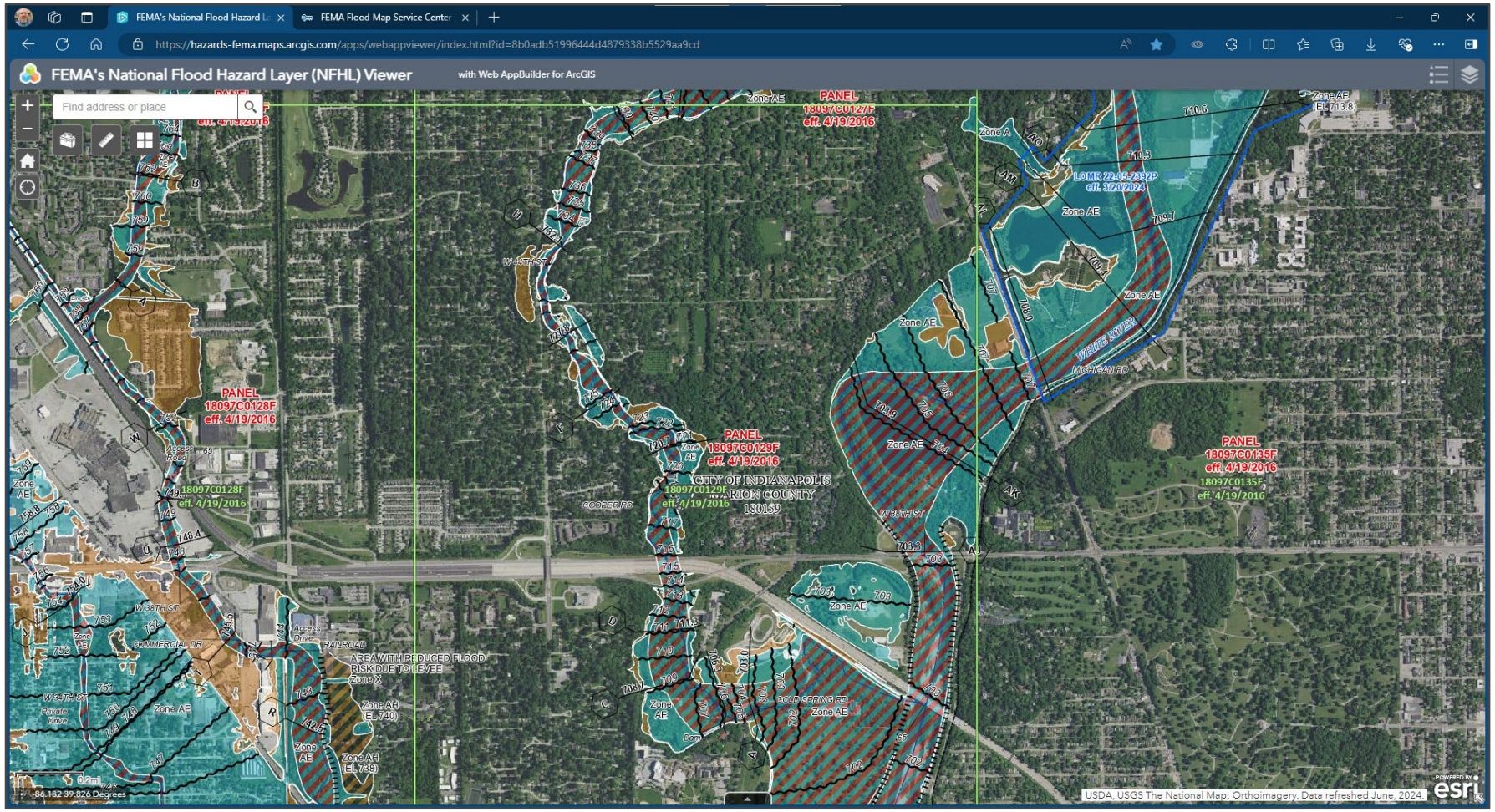
Example

Verify the Effective Data Date



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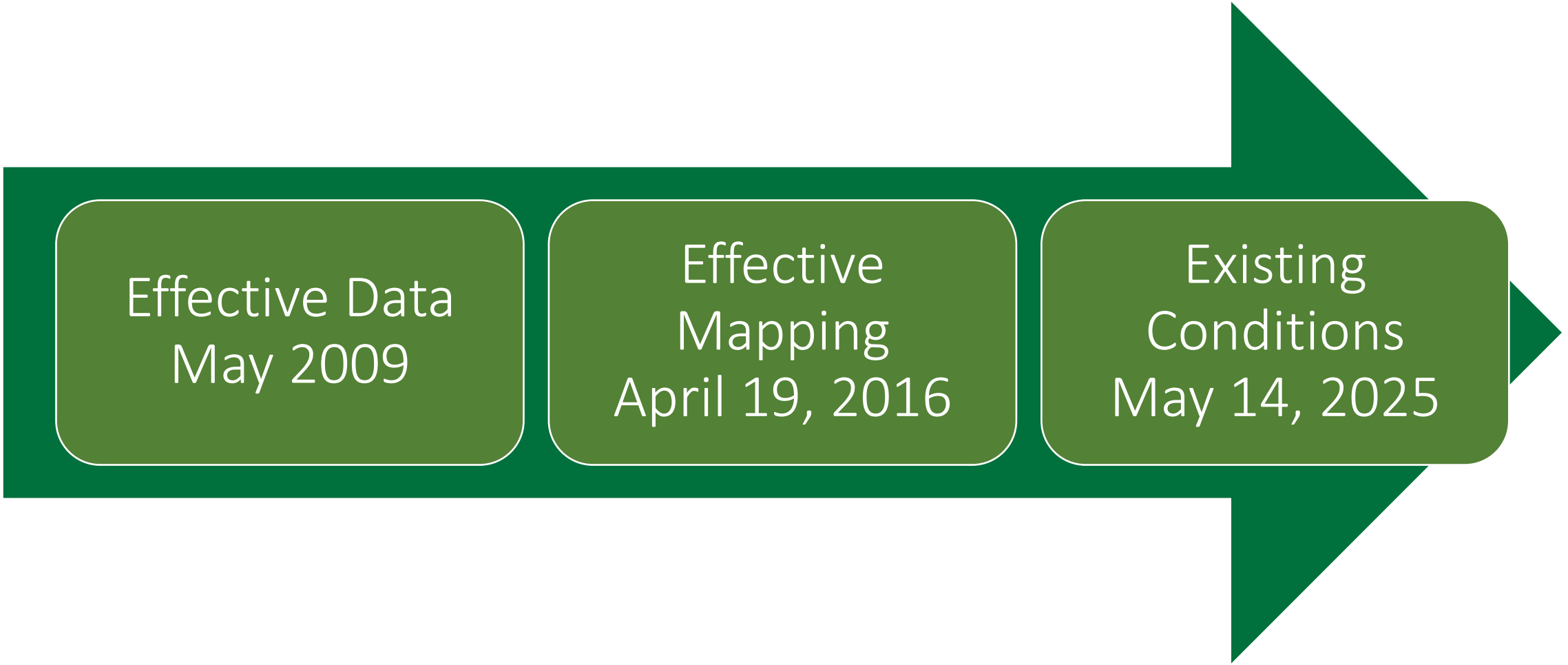
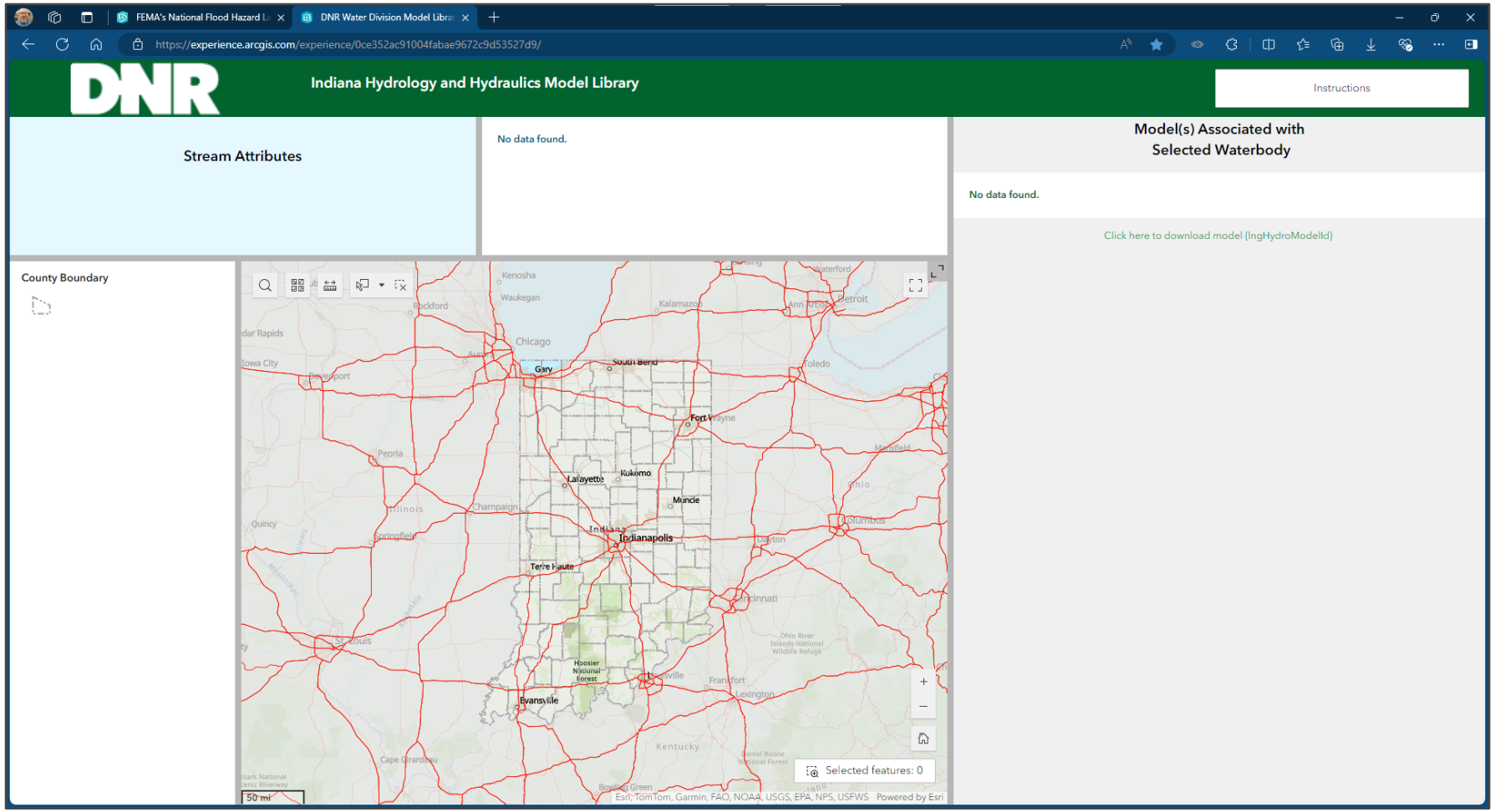


Example

Locate the Effective Data



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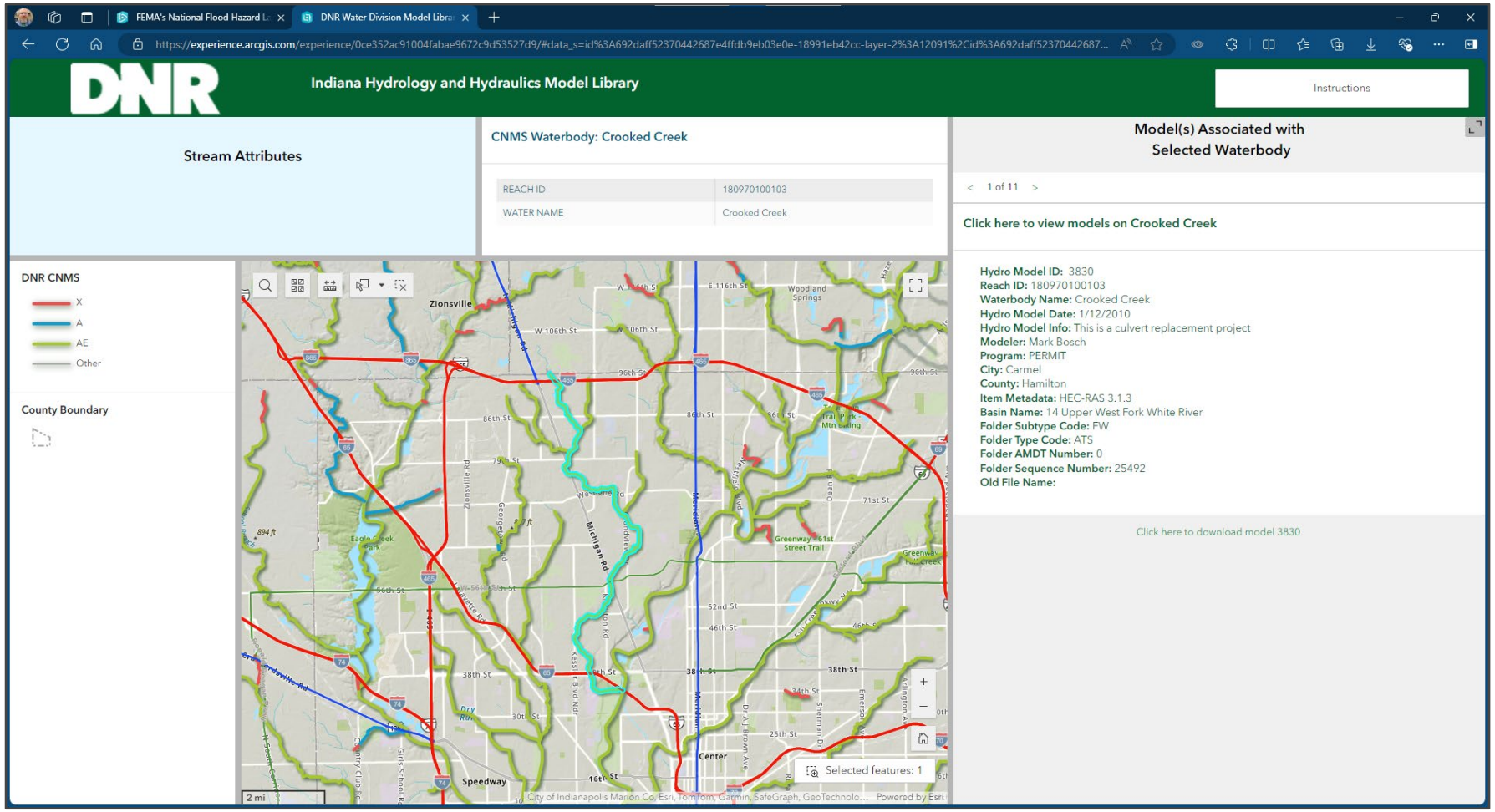

Example

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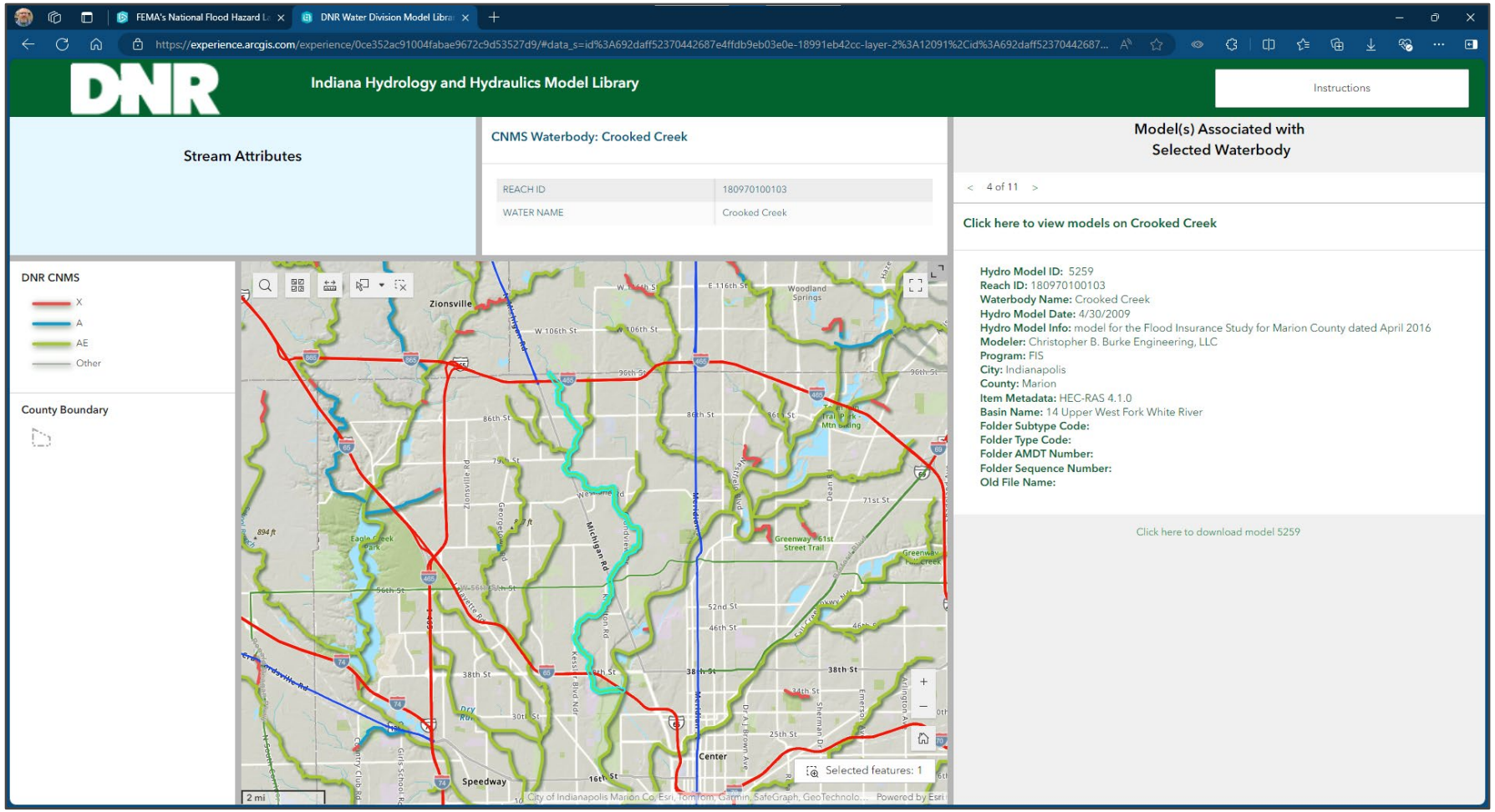

Example

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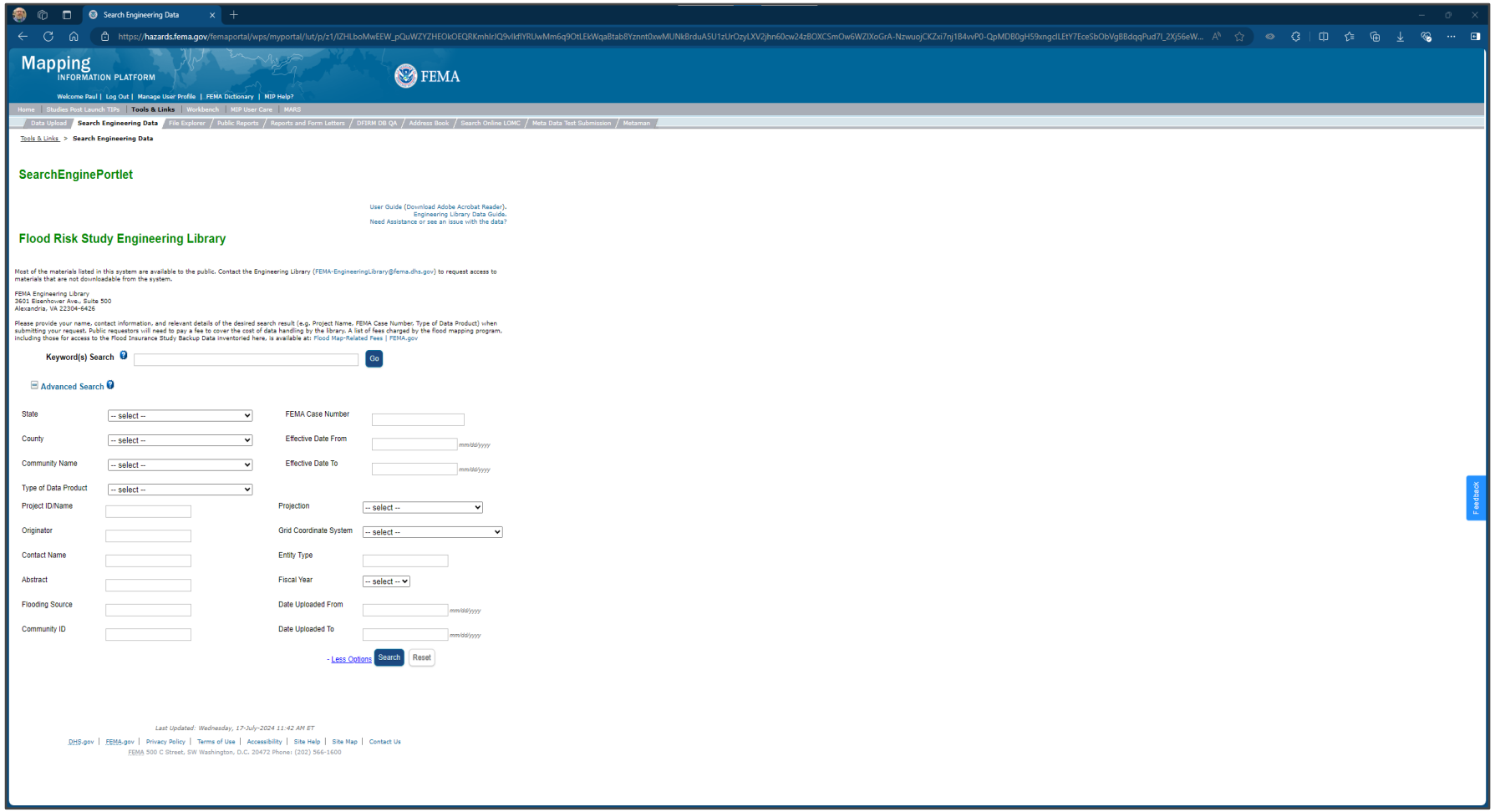

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Example

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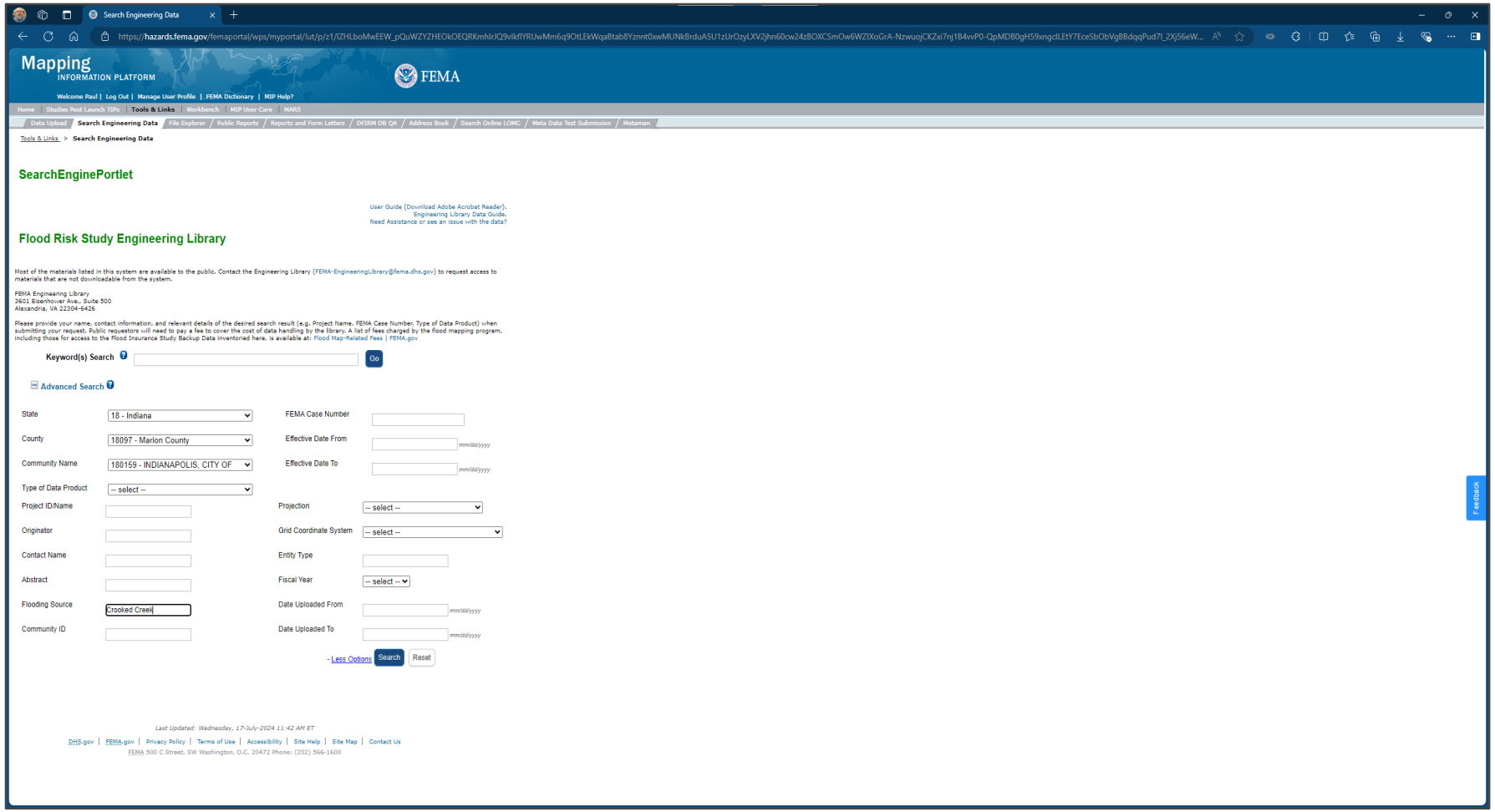

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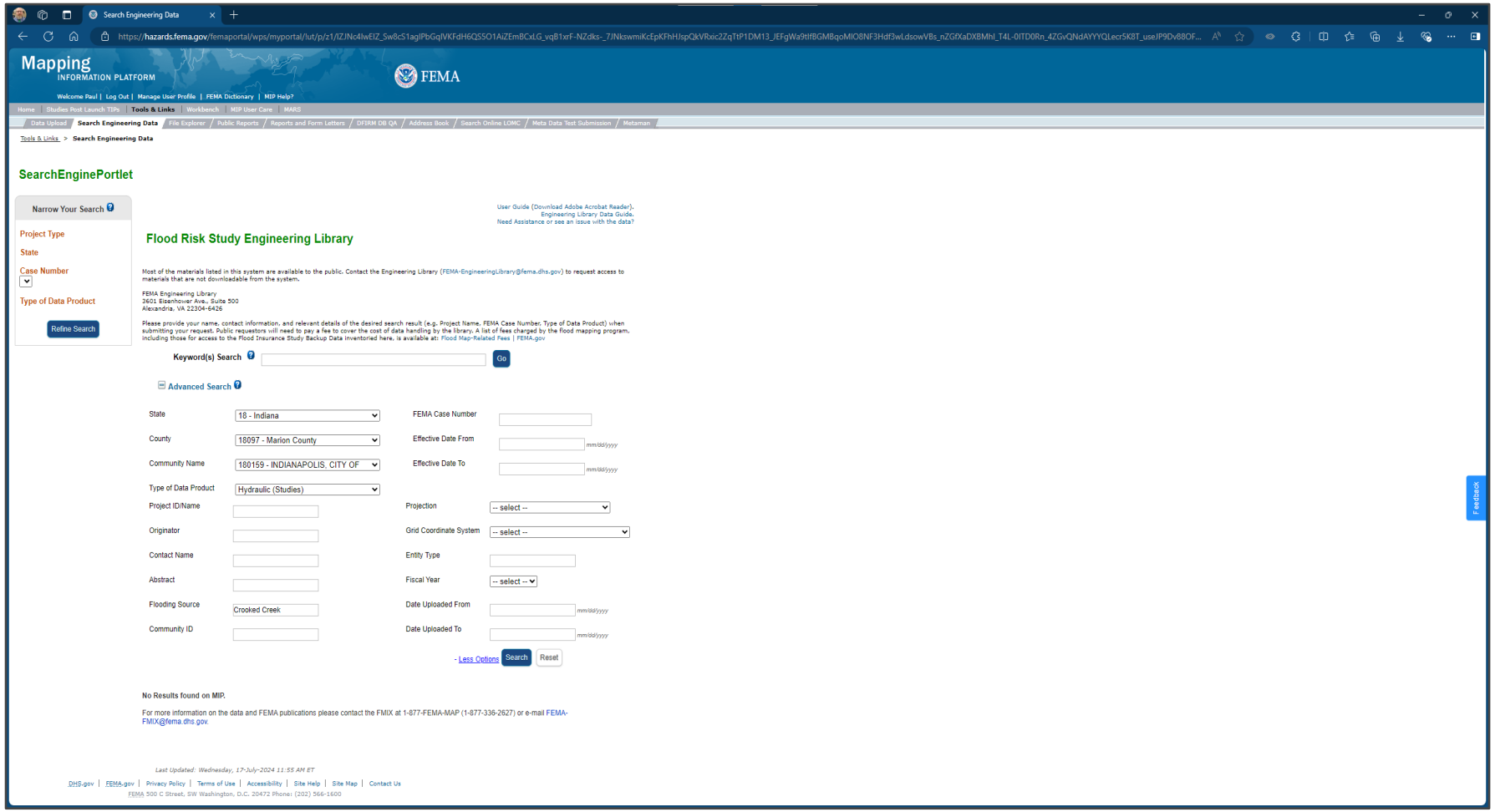

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Example

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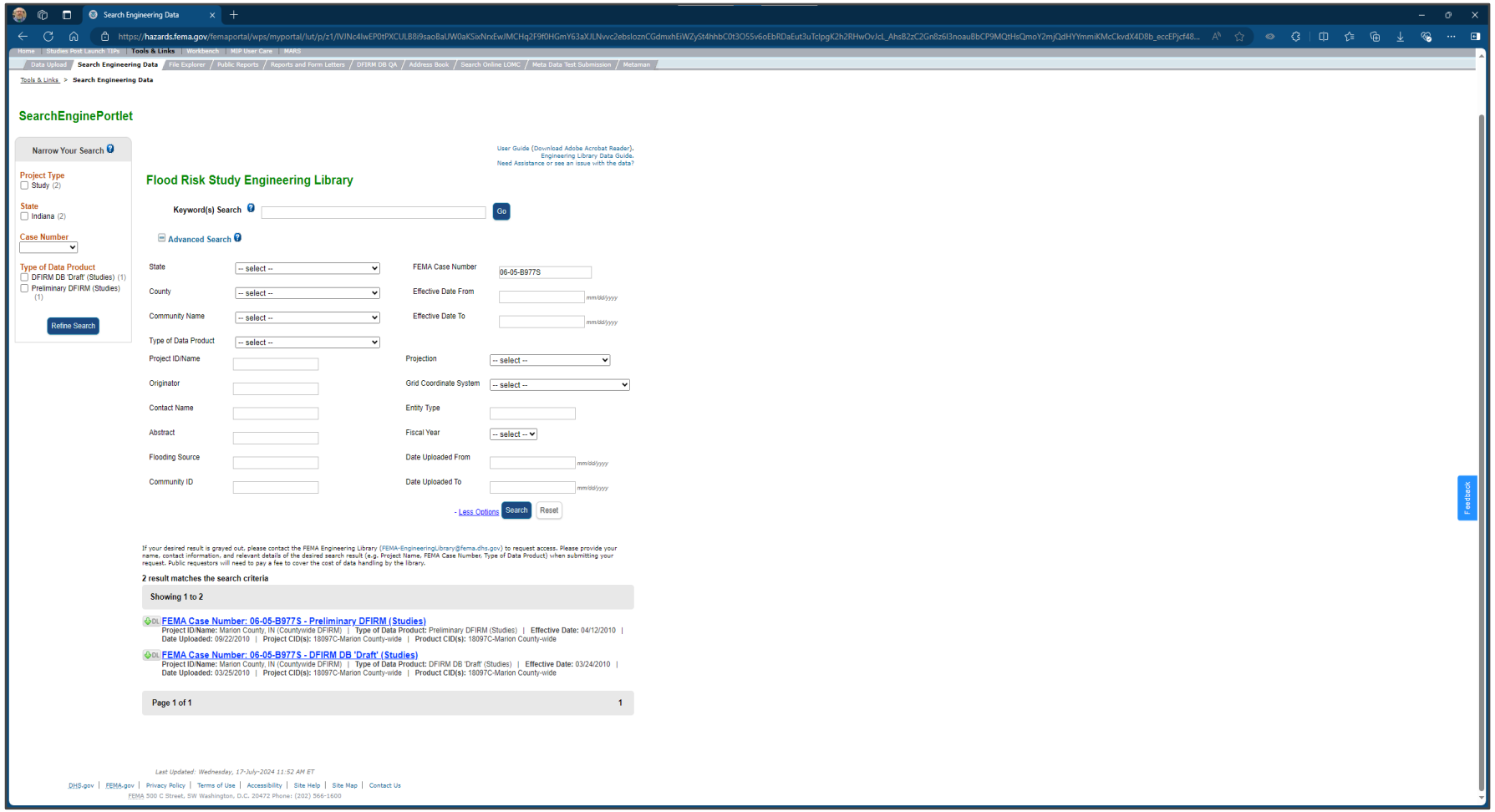
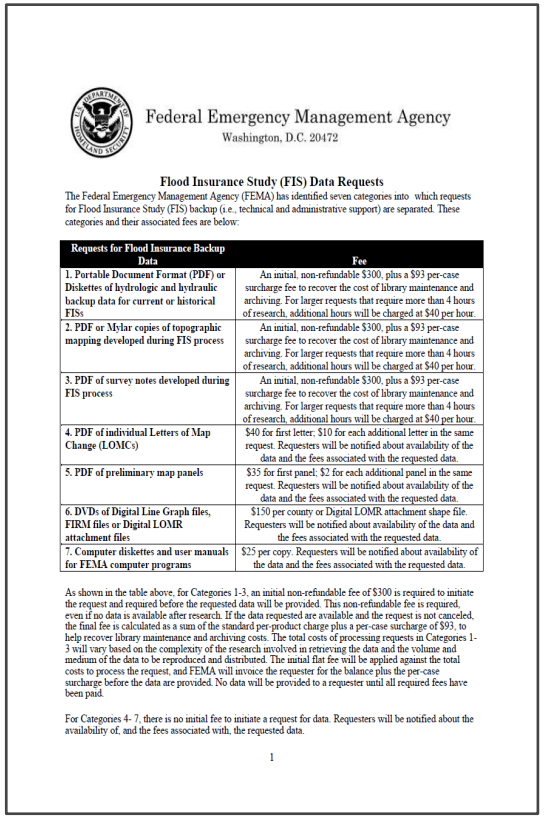


Example

Locate the Effective Data

FEMA Engineering Library Data Request



Federal Emergency Management Agency
Washington, D.C. 20472

Flood Insurance Study (FIS) Data Requests

The Federal Emergency Management Agency (FEMA) has identified seven categories into which requests for Flood Insurance Study (FIS) backup (i.e., technical and administrative support) are separated. These categories and their associated fees are below:

Requests for Flood Insurance Backup Data	Fee
1. Portable Document Format (PDF) or Diskettes of hydrologic and hydraulic backup data for current or historical FISs	An initial, non-refundable $300, plus a $93 per-case surcharge fee to recover the cost of library maintenance and archiving. For larger requests that require more than 4 hours of research, additional hours will be charged at $40 per hour.
2. PDF or Mylar copies of topographic mapping developed during FIS process	An initial, non-refundable $300, plus a $93 per-case surcharge fee to recover the cost of library maintenance and archiving. For larger requests that require more than 4 hours of research, additional hours will be charged at $40 per hour.
3. PDF of survey notes developed during FIS process	An initial, non-refundable $300, plus a $93 per-case surcharge fee to recover the cost of library maintenance and archiving. For larger requests that require more than 4 hours of research, additional hours will be charged at $40 per hour.
4. PDF of individual Letters of Map Change (LOMCs)	$40 for first letter; $10 for each additional letter in the same request. Requesters will be notified about availability of the data and the fees associated with the requested data.
5. PDF of preliminary map panels	$35 for first panel; $2 for each additional panel in the same request. Requesters will be notified about availability of the data and the fees associated with the requested data.
6. DVDs of Digital Line Graph files, FIRM files or Digital LOMR attachment files	$150 per county or Digital LOMR attachment shape file. Requesters will be notified about availability of the data and the fees associated with the requested data.
7. Computer diskettes and user manuals for FEMA computer programs	$25 per copy. Requesters will be notified about availability of the data and the fees associated with the requested data.

As shown in the table above, for Categories 1-3, an initial non-refundable fee of $300 is required to initiate the request and required before the requested data will be provided. This non-refundable fee is required, even if no data is available after research. If the data requested are available and the request is not canceled, the final fee is calculated as a sum of the standard per-product charge plus a per-case surcharge of $93, to help recover library maintenance and archiving costs. The total costs of processing requests in Categories 1-3 will vary based on the complexity of the research involved in retrieving the data and the volume and medium of the data to be reproduced and distributed. The initial flat fee will be applied against the total costs to process the request, and FEMA will invoice the requester for the balance plus the per-case surcharge before the data are provided. No data will be provided to a requester until all required fees have been paid.

For Categories 4- 7, there is no initial fee to initiate a request for data. Requesters will be notified about the availability of, and the fees associated with, the requested data.

1

- Costs $300
- Takes time
- Call DNR first. We can bypass the fee.
  - We’re a CTP so we might have it.

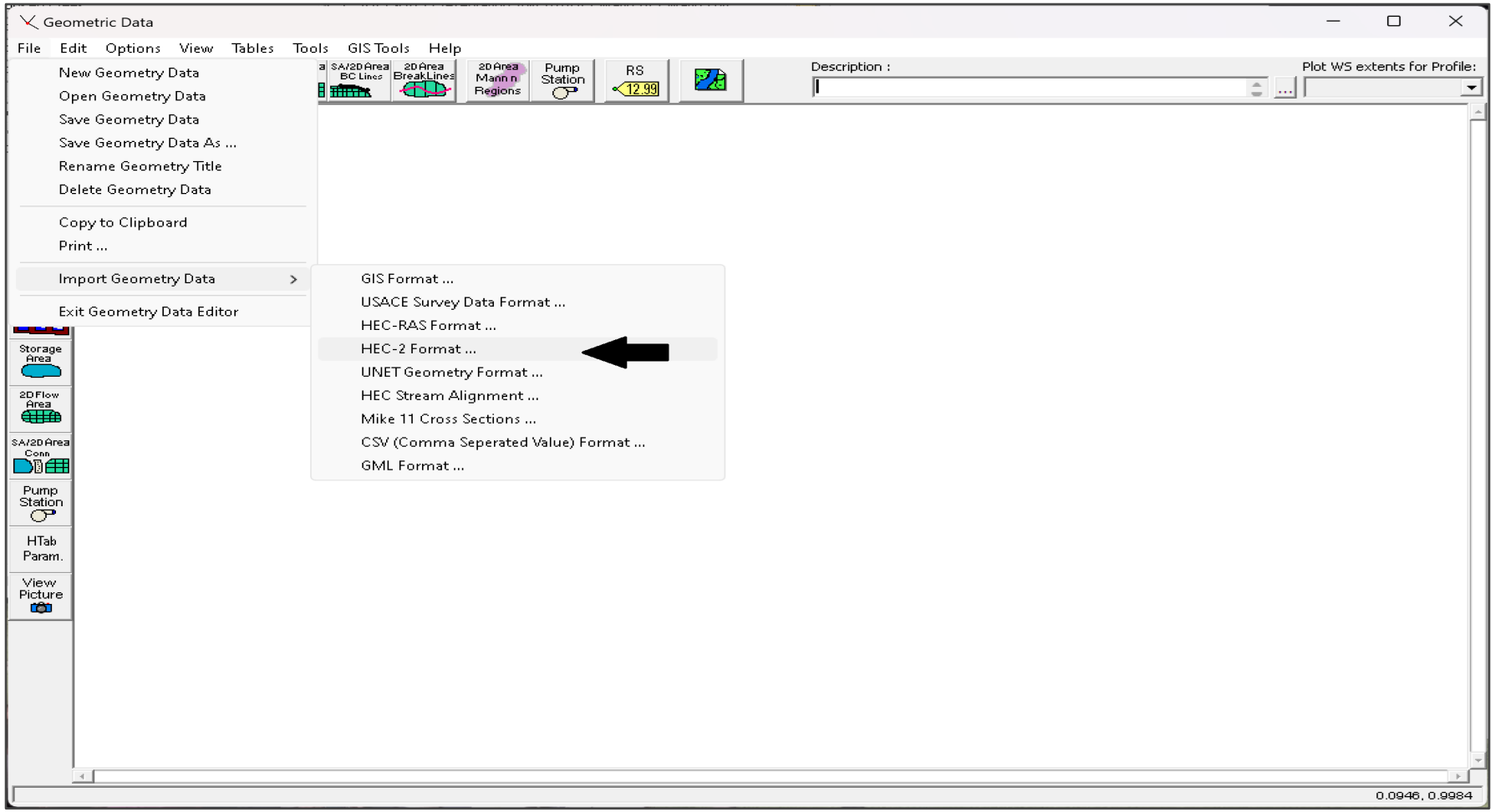
Create the Duplicate Effective Model

- **"The effective HEC-2 model should be rerun on the requestor's computer in HEC-RAS to create the duplicate effective model."**

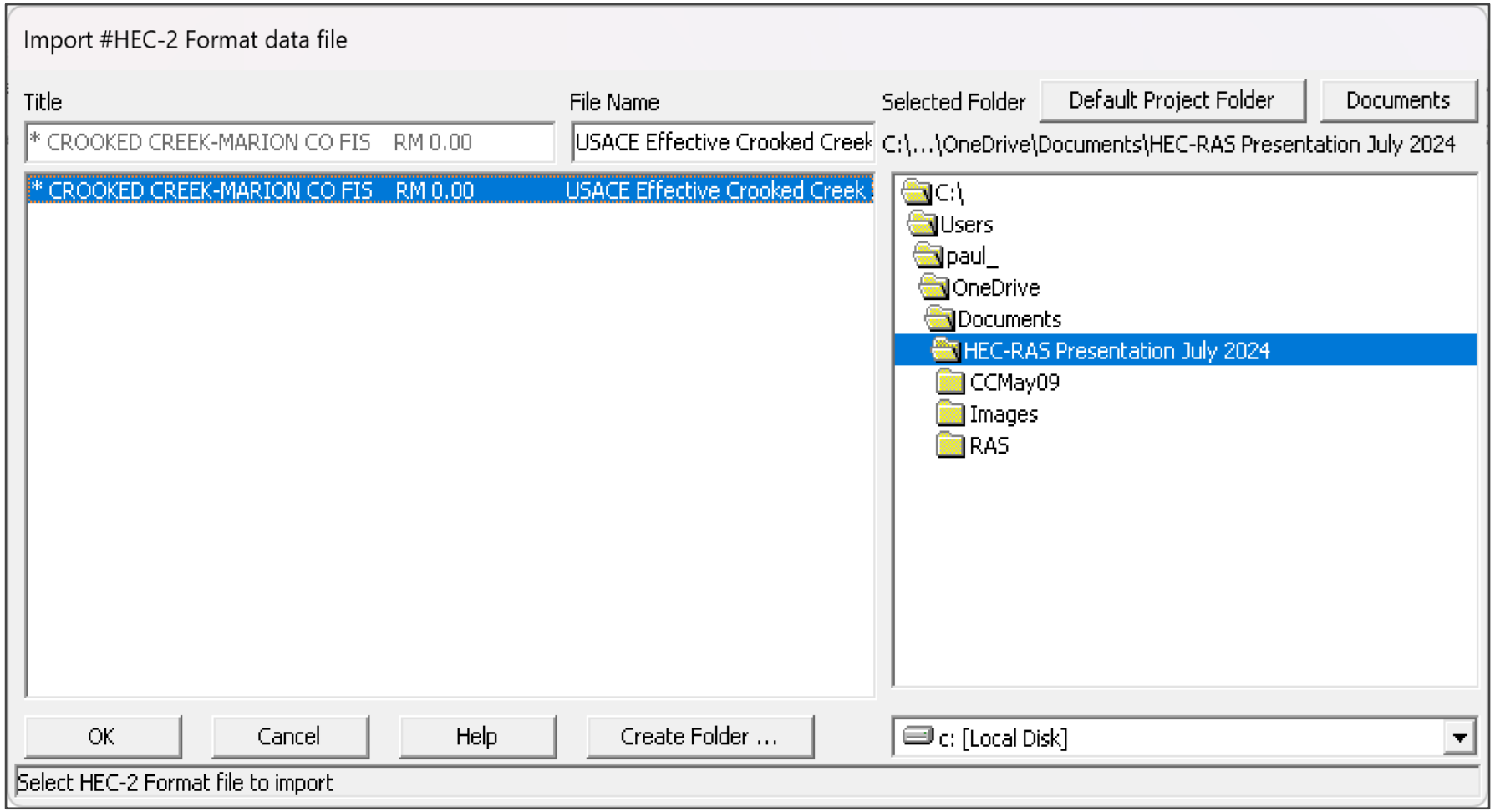
Acceptable Software Versions

- HEC-RAS v3.1.1 and up
- HEC-RAS v4 and up
- HEC-RAS v5 and up
- HEC-RAS v6 and up
- **HEC-2**

Create the Duplicate Effective Model

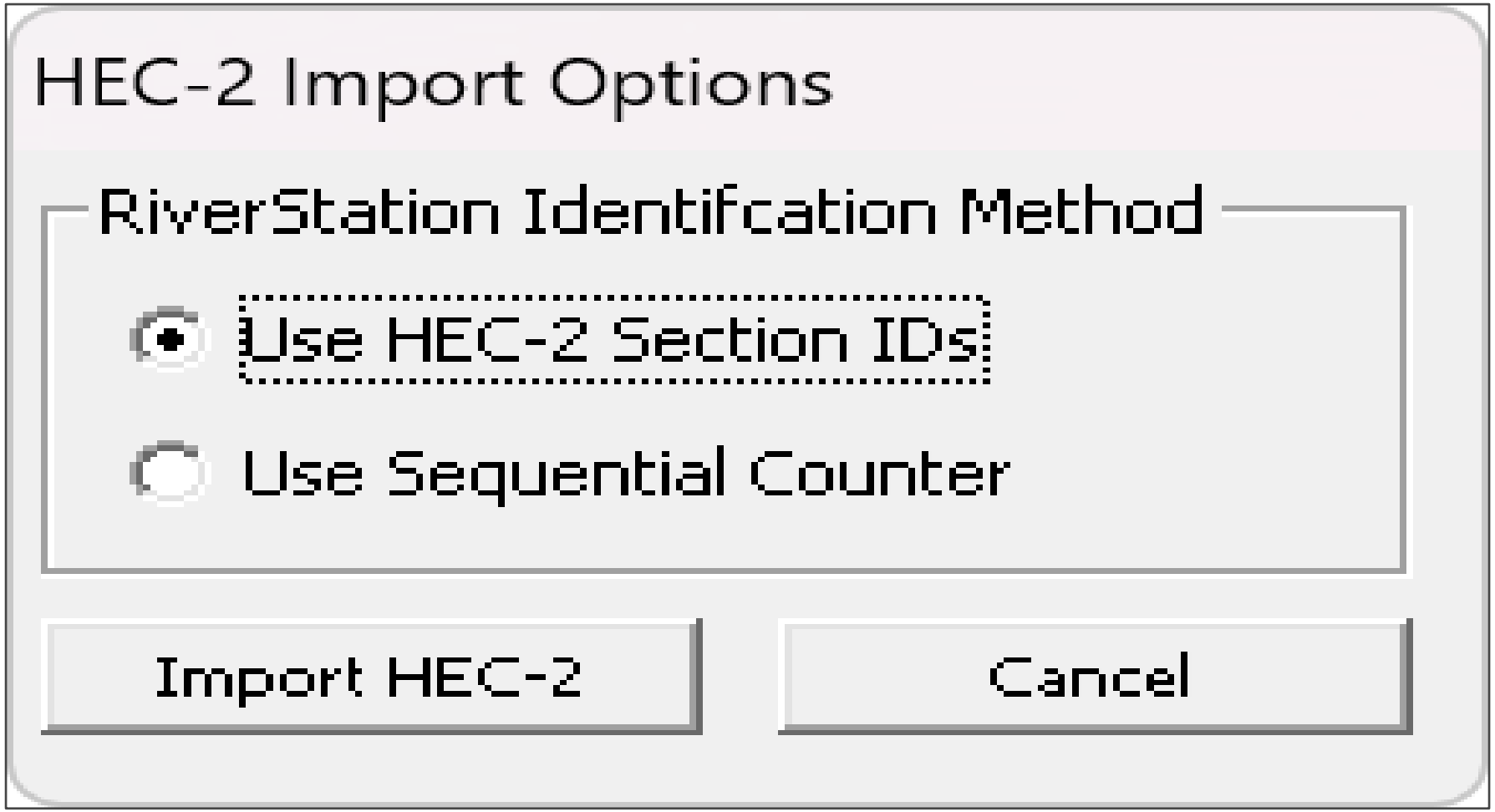


Create the Duplicate Effective Model



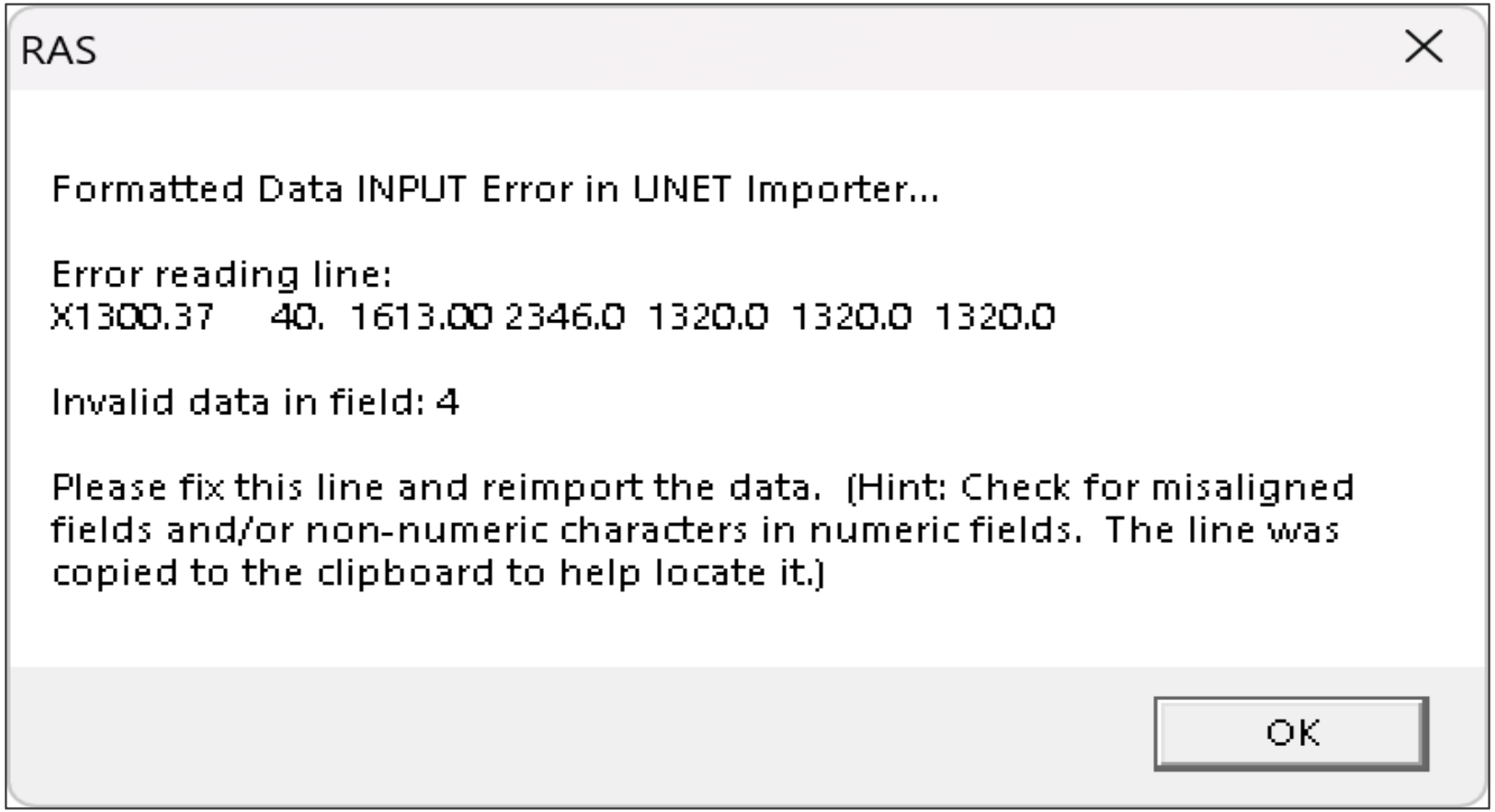
Example

Create the Duplicate Effective Model



Example

Create the Duplicate Effective Model



Example

Create the Duplicate Effective Model

C:\Users\paul_\OneDrive\Documents\HEC-RAS Presentation July 2024\USACE Effective Crooked Creek 2001.dat - Notepad++

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?

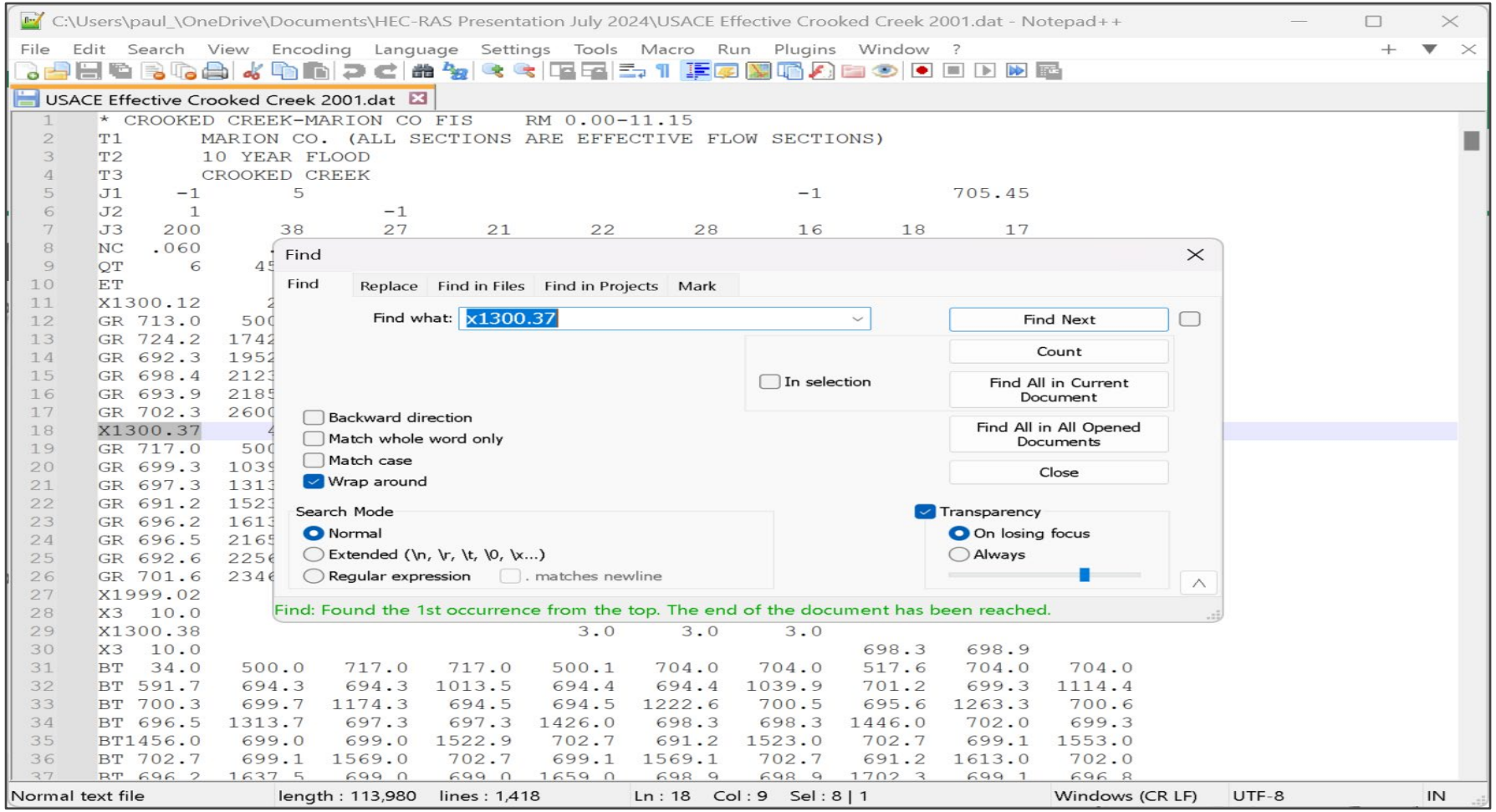
USACE Effective Crooked Creek 2001.dat

```
* CROOKED CREEK-MARION CO FIS     RM 0.00-11.15
T1       MARION CO. (ALL SECTIONS ARE EFFECTIVE FLOW SECTIONS)
T2       10 YEAR FLOOD
T3       CROOKED CREEK
J1    -1        5                                      -1          705.45
J2     1                -1
J3   200       38       27       21       22       28       16       18       17
NC  .060      .06     .045       .1       .3
QT     6     4500     3500     6000     7500    10050     7500
ET                                                     1.4
X1300.12      28.   1619.1    2214.    528.2    528.2    528.2
GR 713.0    500.0    699.8    500.1    701.5   1515.7    699.2   1536.5    723.9   1619.1
GR 724.2   1742.9    707.2   1812.9    708.4   1842.9    705.9   1860.0    693.5   1945.0
GR 692.3   1952.0    691.9   1986.0    692.1   2020.0    693.6   2073.0    694.0   2095.0
GR 698.4   2123.0    698.3   2132.0    694.8   2144.0    693.8   2156.0    693.1   2172.0
GR 693.9   2185.0    699.1   2214.0    700.5   2317.0    701.1   2388.0    703.7   2476.0
GR 702.3   2600.0    703.5   3062.0    713.0   3062.1
X1300.37      40.   1613.00 2346.0   1320.0   1320.0   1320.0
GR 717.0    500.0    704.0    500.1    704.0    517.6    694.3    591.7    694.4   1013.5
GR 699.3   1039.9    699.7   1114.4    694.5   1174.3    695.6   1222.6    696.5   1263.3
GR 697.3   1313.7    698.3   1426.0    699.3   1446.0    699.0   1456.0    691.2   1522.9
GR 691.2   1523.0    691.0   1538.0    690.9   1553.0    691.2   1569.0    691.2   1569.1
GR 696.2   1613.0    699.0   1637.5    698.9   1659.0    696.8   1702.3    696.7   1829.1
GR 696.5   2165.7    699.5   2196.6    699.4   2219.0    692.8   2238.0    692.6   2256.3
GR 692.6   2256.4    692.5   2272.0    691.4   2304.0    690.9   2310.0    691.4   2316.0
GR 701.6   2346.0    698.9   2426.0    702.0   2483.9    702.5   2859.7    717.0   2859.8
X1999.02                                 51.0     51.0     51.0
X3  10.0                                                    698.3    698.9
X1300.38                                  3.0      3.0      3.0
X3  10.0                                                    698.3    698.9
BT  34.0    500.0    717.0    717.0    500.1    704.0    704.0    517.6    704.0    704.0
BT 591.7    694.3    694.3   1013.5    694.4    694.4   1039.9    701.2    699.3   1114.4
BT 700.3    699.7   1174.3    694.5    694.5   1222.6    700.5    695.6   1263.3    700.6
BT 696.5   1313.7    697.3    697.3   1426.0    698.3    698.3   1446.0    702.0    699.3
BT1456.0    699.0    699.0   1522.9    702.7    691.2   1523.0    702.7    699.1   1553.0
BT 702.7    699.1   1569.0    702.7    699.1   1569.1    702.7    691.2   1613.0    702.0
BT 696.2   1637.5    699.0    699.0   1659.0    698.9    698.9   1702.3    699.1    696.8
```

Normal text file | length : 113,980 | lines : 1,418 | Ln : 52 | Col : 57 | Pos : 3,635 | Windows (CR LF) | UTF-8 | IN

Example

Create the Duplicate Effective Model



Example

Create the Duplicate Effective Model

C:\Users\paul_\OneDrive\Documents\HEC-RAS Presentation July 2024\USACE Effective Crooked Creek 2001.dat - Notepad++

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?

USACE Effective Crooked Creek 2001.dat

```
* CROOKED CREEK-MARION CO FIS     RM 0.00-11.15
T1       MARION CO. (ALL SECTIONS ARE EFFECTIVE FLOW SECTIONS)
T2       10 YEAR FLOOD
T3       CROOKED CREEK
J1    -1        5                                        -1          705.45
J2     1                -1
J3   200       38       27       21       22       28       16       18       17
NC  .060      .06     .045       .1       .3
QT     6     4500     3500     6000     7500    10050     7500
ET                                                     1.4
X1300.12      28.   1619.1   2214.    528.2    528.2    528.2
GR 713.0    500.0    699.8    500.1    701.5   1515.7    699.2   1536.5    723.9   1619.1
GR 724.2   1742.9    707.2   1812.9    708.4   1842.9    705.9   1860.0    693.5   1945.0
GR 692.3   1952.0    691.9   1986.0    692.1   2020.0    693.6   2073.0    694.0   2095.0
GR 698.4   2123.0    698.3   2132.0    694.8   2144.0    693.8   2156.0    693.1   2172.0
GR 693.9   2185.0    699.1   2214.0    700.5   2317.0    701.1   2388.0    703.7   2476.0
GR 702.3   2600.0    703.5   3062.0    713.0   3062.1
X1300.37      40.   1613.00  2346.0   1320.0   1320.0   1320.0
GR 717.0    500.0    704.0    500.1    704.0    517.6    694.3    591.7    694.4   1013.5
GR 699.3   1039.9    699.7   1114.4    694.5   1174.3    695.6   1222.6    696.5   1263.3
GR 697.3   1313.7    698.3   1426.0    699.3   1446.0    699.0   1456.0    691.2   1522.9
GR 691.2   1523.0    691.0   1538.0    690.9   1553.0    691.2   1569.0    691.2   1569.1
GR 696.2   1613.0    699.0   1637.5    698.9   1659.0    696.8   1702.3    696.7   1829.1
GR 696.5   2165.7    699.5   2196.6    699.4   2219.0    692.8   2238.0    692.6   2256.3
GR 692.6   2256.4    692.5   2272.0    691.4   2304.0    690.9   2310.0    691.4   2316.0
GR 701.6   2346.0    698.9   2426.0    702.0   2483.9    702.5   2859.7    717.0   2859.8
X1999.02                                 51.0     51.0     51.0
X3  10.0                                                    698.3    698.9
X1300.38                                  3.0      3.0      3.0
X3  10.0                                                    698.3    698.9
BT  34.0    500.0    717.0    717.0    500.1    704.0    704.0    517.6    704.0    704.0
BT 591.7    694.3    694.3   1013.5    694.4    694.4   1039.9    701.2    699.3   1114.4
BT 700.3    699.7   1174.3    694.5    694.5   1222.6    700.5    695.6   1263.3    700.6
BT 696.5   1313.7    697.3    697.3   1426.0    698.3    698.3   1446.0    702.0    699.3
BT1456.0    699.0    699.0   1522.9    702.7    691.2   1523.0    702.7    699.1   1553.0
BT 702.7    699.1   1569.0    702.7    699.1   1569.1    702.7    691.2   1613.0    702.0
BT 696.2   1637.5    699.0    699.0   1659.0    698.9    698.9   1702.3    699.1    696.8
```

Normal text file | length : 113,980 | lines : 1,418 | Ln : 18 | Col : 9 | Sel : 8 | 1 | Windows (CR LF) | UTF-8 | IN

Example

Create the Duplicate Effective Model

C:\Users\paul_\OneDrive\Documents\HEC-RAS Presentation July 2024\USACE Effective Crooked Creek 2001.dat - Notepad++

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?

USACE Effective Crooked Creek 2001.dat

```
* CROOKED CREEK-MARION CO FIS     RM 0.00-11.15
T1       MARION CO. (ALL SECTIONS ARE EFFECTIVE FLOW SECTIONS)
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T3       CROOKED CREEK
J1    -1         5                                    -1           705.45
J2     1                  -1
J3   200        38        27        21        22        28        16        18        17
NC  .060       .06      .045        .1        .3
QT     6      4500      3500      6000      7500     10050      7500
ET                                                     1.4
X1300.12      28.    1619.1    2214.    528.2    528.2    528.2
GR 713.0    500.0     699.8     500.1    701.5   1515.7    699.2   1536.5    723.9   1619.1
GR 724.2   1742.9     707.2    1812.9    708.4   1842.9    705.9   1860.0    693.5   1945.0
GR 692.3   1952.0     691.9    1986.0    692.1   2020.0    693.6   2073.0    694.0   2095.0
GR 698.4   2123.0     698.3    2132.0    694.8   2144.0    693.8   2156.0    693.1   2172.0
GR 693.9   2185.0     699.1    2214.0    700.5   2317.0    701.1   2388.0    703.7   2476.0
GR 702.3   2600.0     703.5    3062.0    713.0   3062.1
X1300.37      40.    1613.0    2346.0   1320.0   1320.0   1320.0
GR 717.0    500.0     704.0     500.1    704.0    517.6    694.3    591.7    694.4   1013.5
GR 699.3   1039.9     699.7    1114.4    694.5   1174.3    695.6   1222.6    696.5   1263.3
GR 697.3   1313.7     698.3    1426.0    699.3   1446.0    699.0   1456.0    691.2   1522.9
GR 691.2   1523.0     691.0    1538.0    690.9   1553.0    691.2   1569.0    691.2   1569.1
GR 696.2   1613.0     699.0    1637.5    698.9   1659.0    696.8   1702.3    696.7   1829.1
GR 696.5   2165.7     699.5    2196.6    699.4   2219.0    692.8   2238.0    692.6   2256.3
GR 692.6   2256.4     692.5    2272.0    691.4   2304.0    690.9   2310.0    691.4   2316.0
GR 701.6   2346.0     698.9    2426.0    702.0   2483.9    702.5   2859.7    717.0   2859.8
X1999.02                                  51.0     51.0     51.0
X3  10.0                                                    698.3    698.9
X1300.38                                   3.0      3.0      3.0
X3  10.0                                                    698.3    698.9
BT  34.0    500.0     717.0     717.0    500.1    704.0    704.0    517.6    704.0    704.0
BT 591.7    694.3     694.3    1013.5    694.4    694.4   1039.9    701.2    699.3   1114.4
BT 700.3    699.7    1174.3     694.5    694.5   1222.6    700.5    695.6   1263.3    700.6
BT 696.5   1313.7     697.3     697.3   1426.0    698.3    698.3   1446.0    702.0    699.3
BT1456.0    699.0     699.0    1522.9    702.7    691.2   1523.0    702.7    699.1   1553.0
BT 702.7    699.1    1569.0     702.7    699.1   1569.1    702.7    691.2   1613.0    702.0
BT 696.2   1637.5     699.0     699.0   1659.0    698.9    698.9   1702.3    699.1    696.8
```
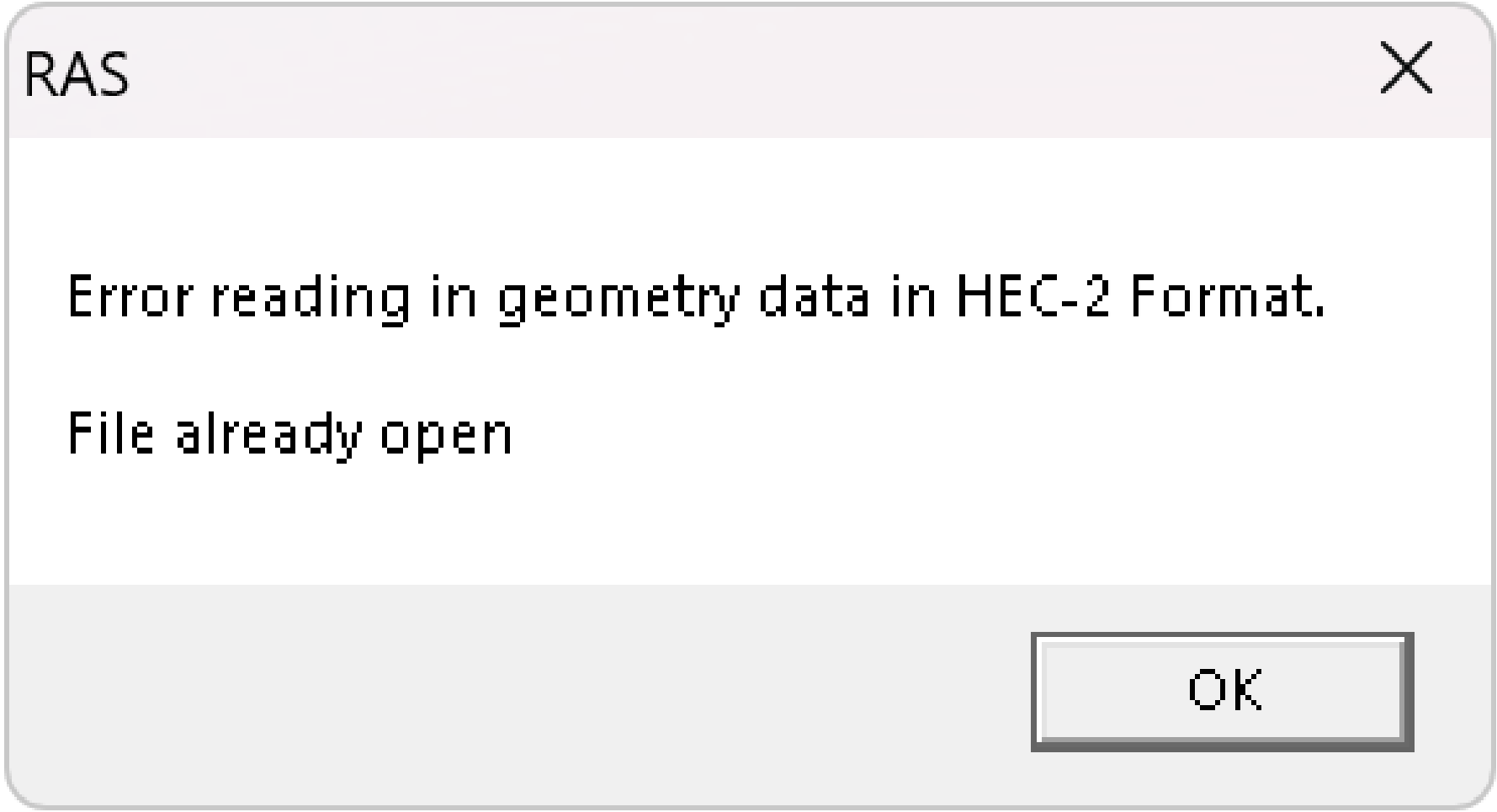

Normal text file | length : 113,980 | lines : 1,418 | Ln : 18 | Col : 26 | Pos : 1,033 | Windows (CR LF) | UTF-8 | IN

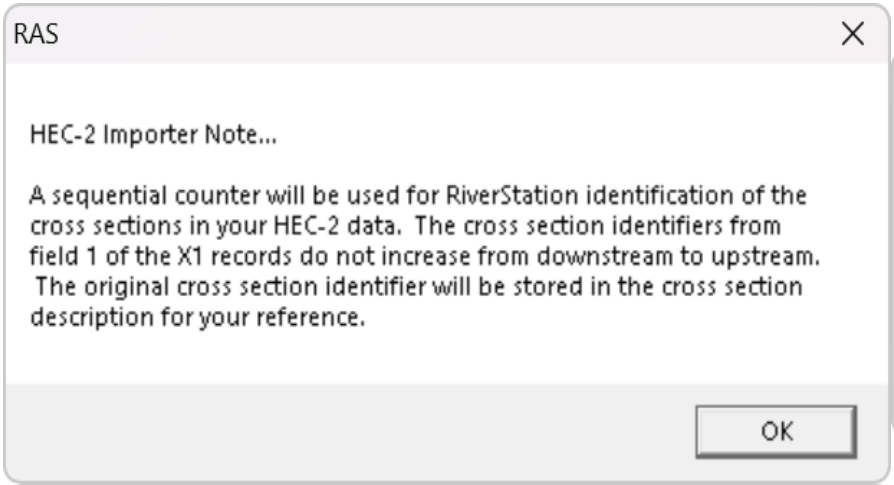
Example

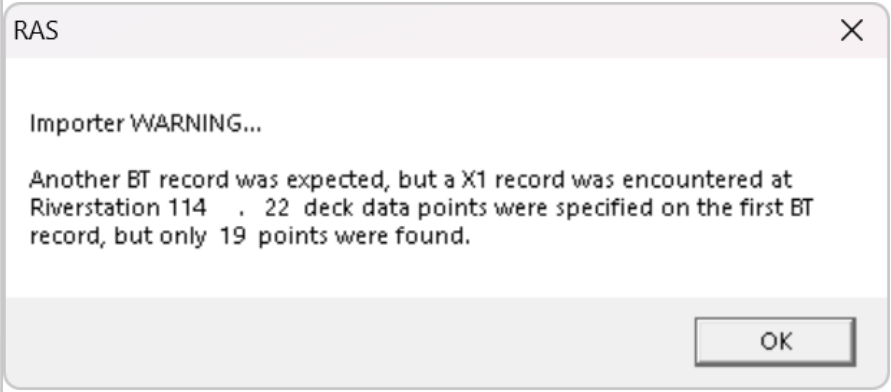
Create the Duplicate Effective Model

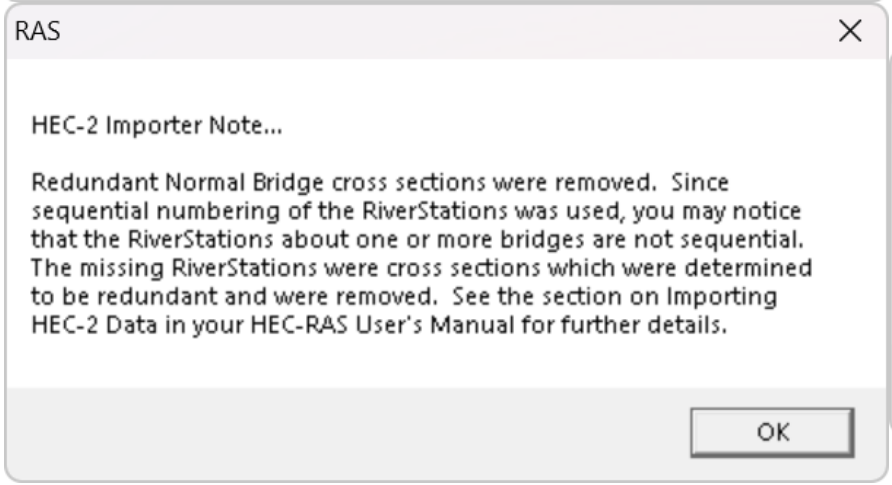


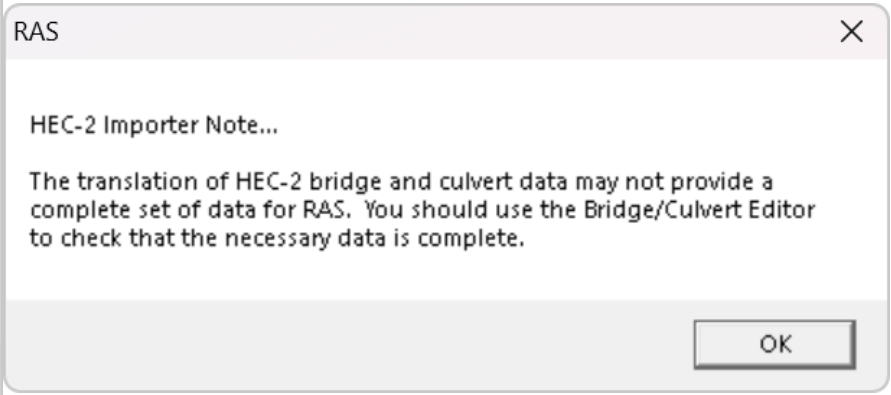
Example

Create the Duplicate Effective Model

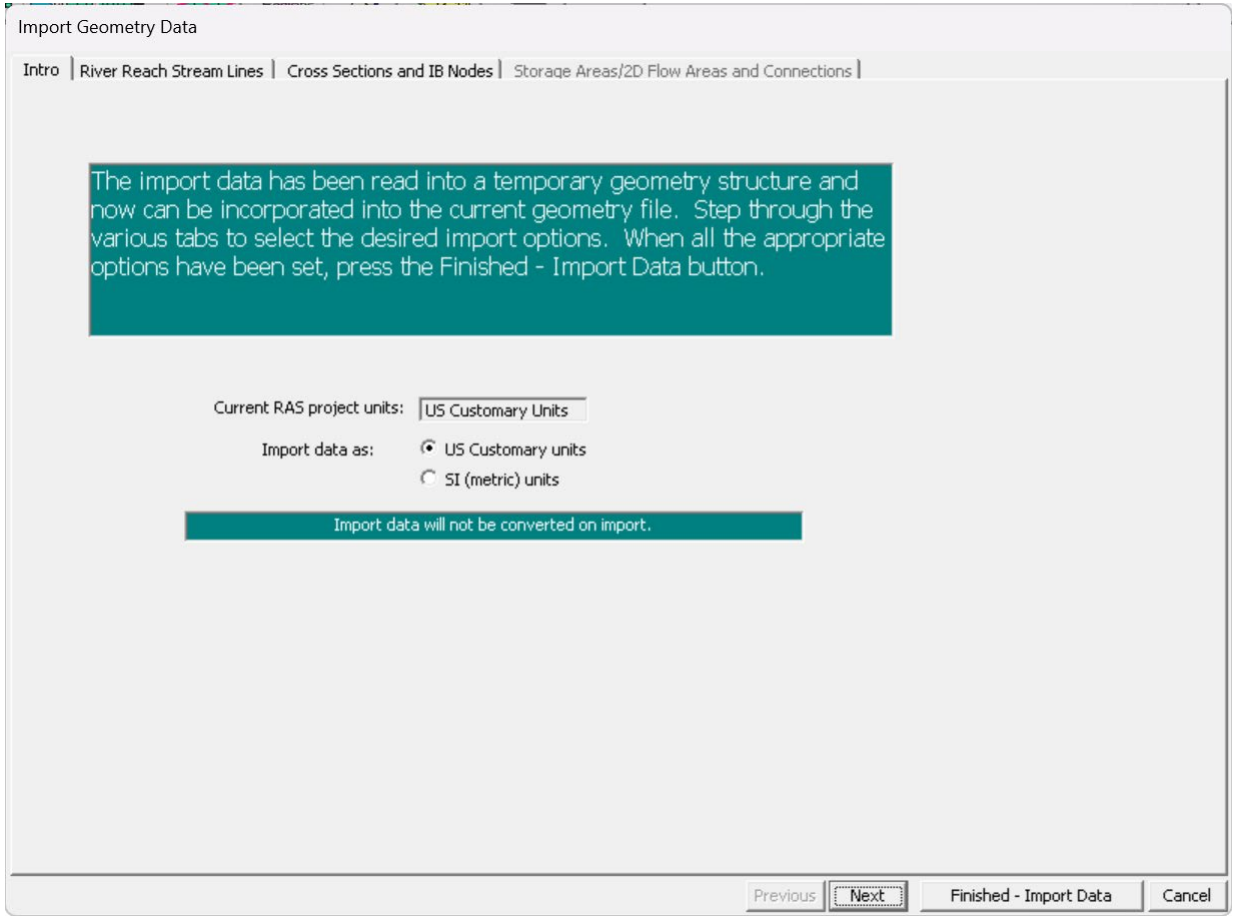




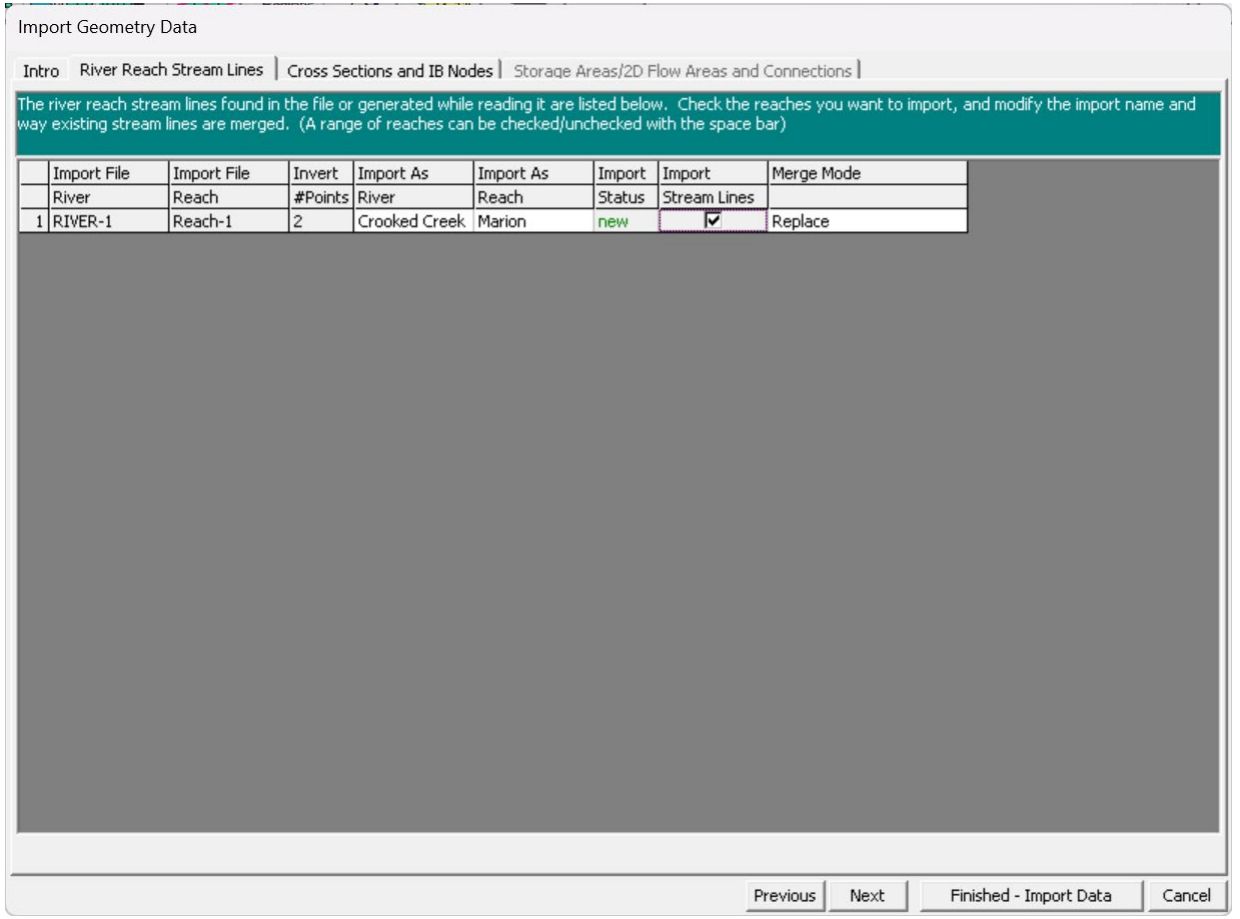




Create the Duplicate Effective Model

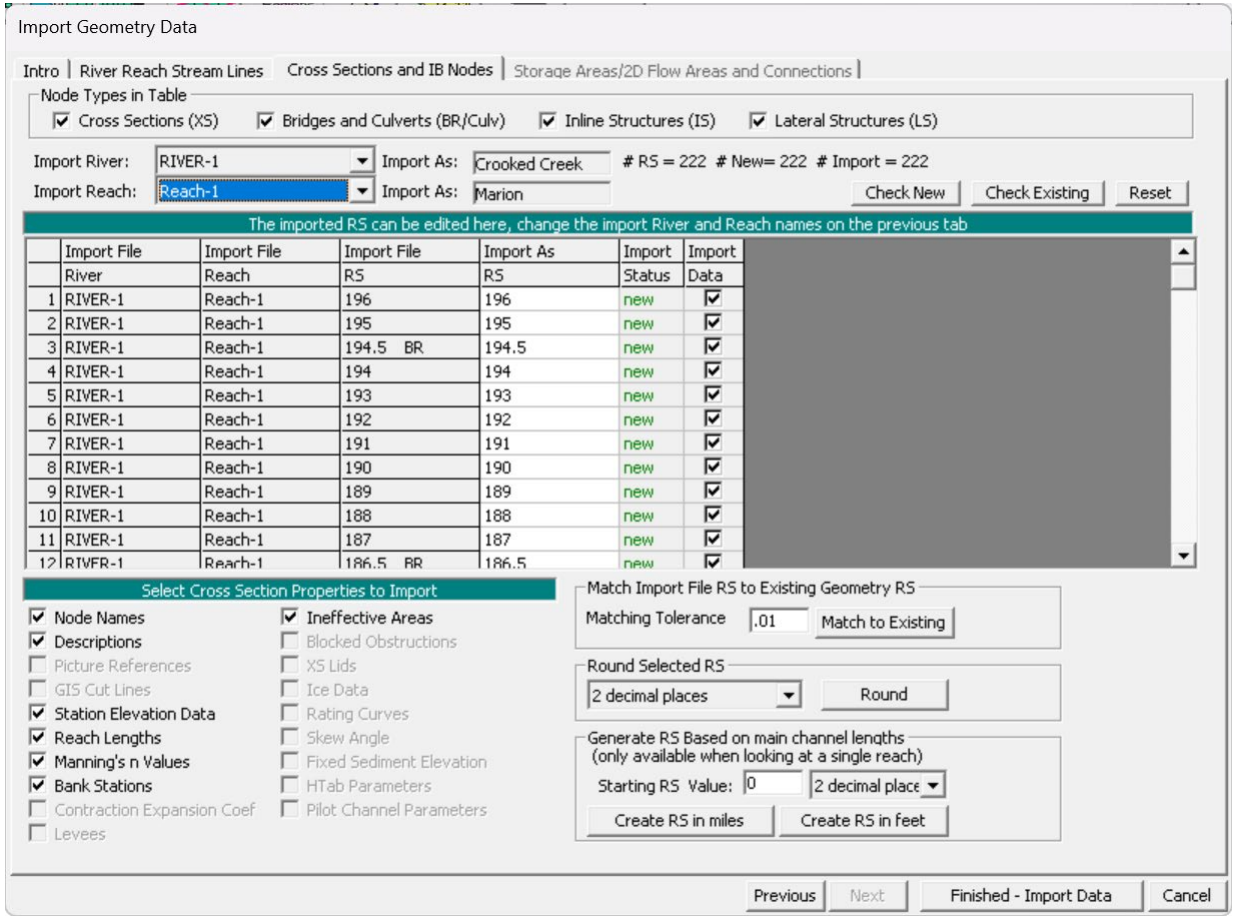


Create the Duplicate Effective Model



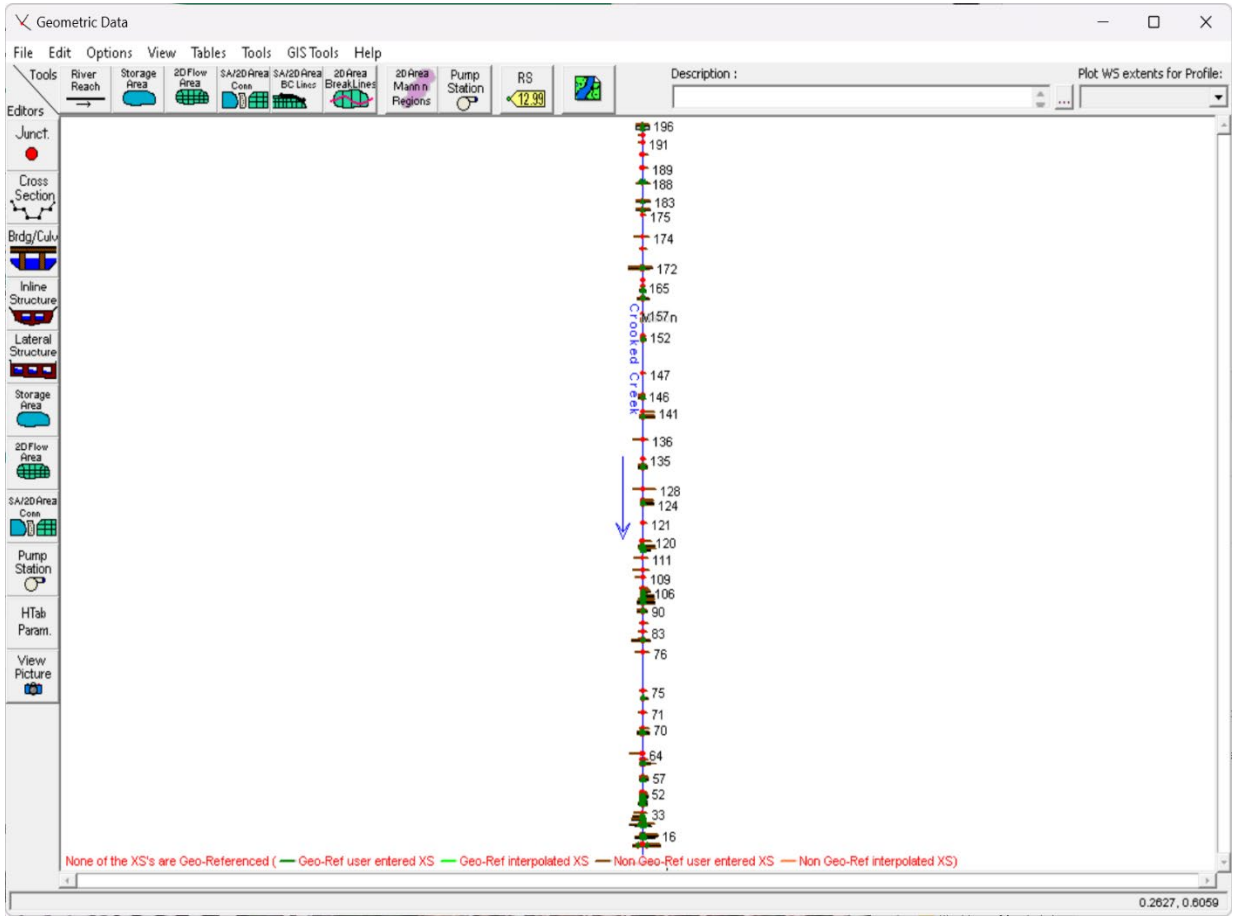
Example

Create the Duplicate Effective Model



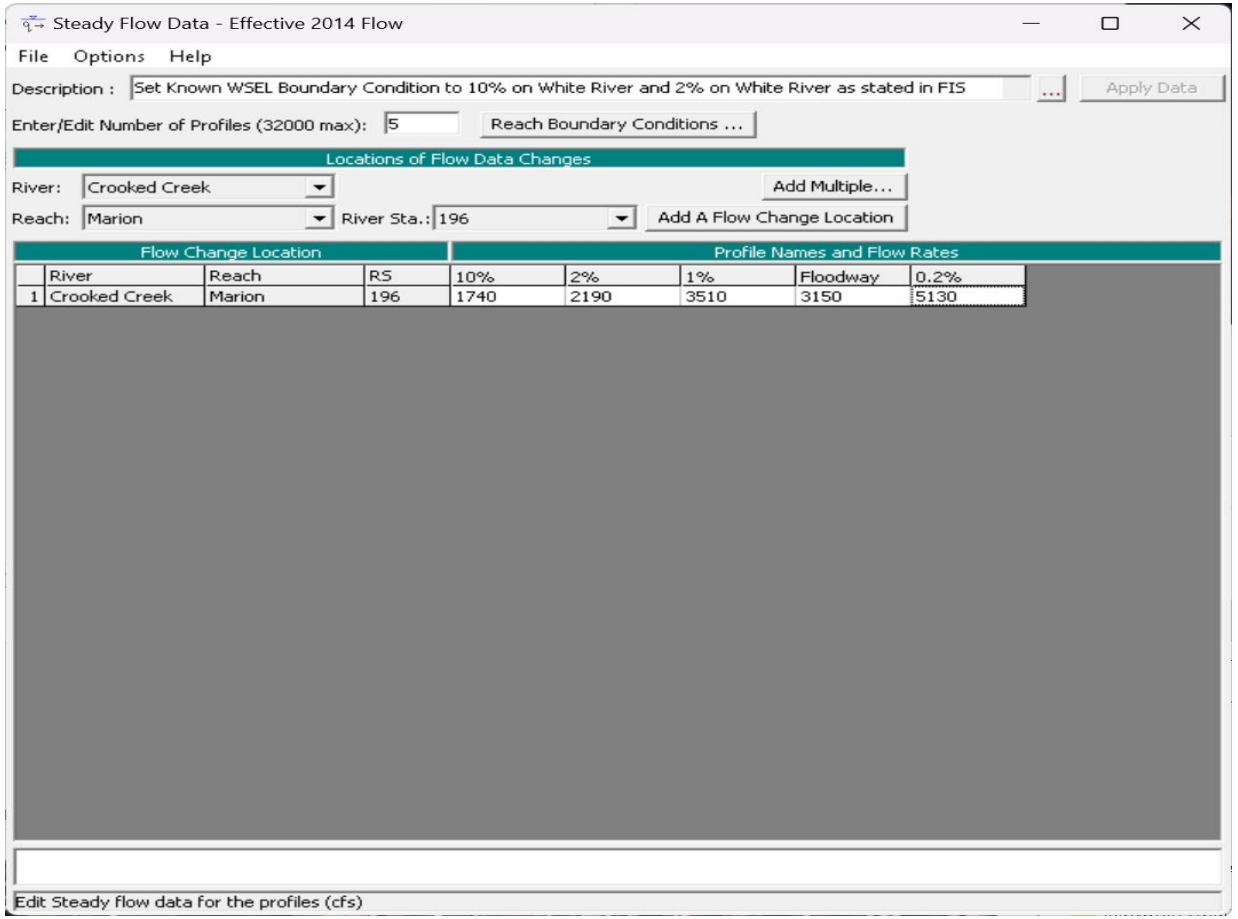
Example

Create the Duplicate Effective Model

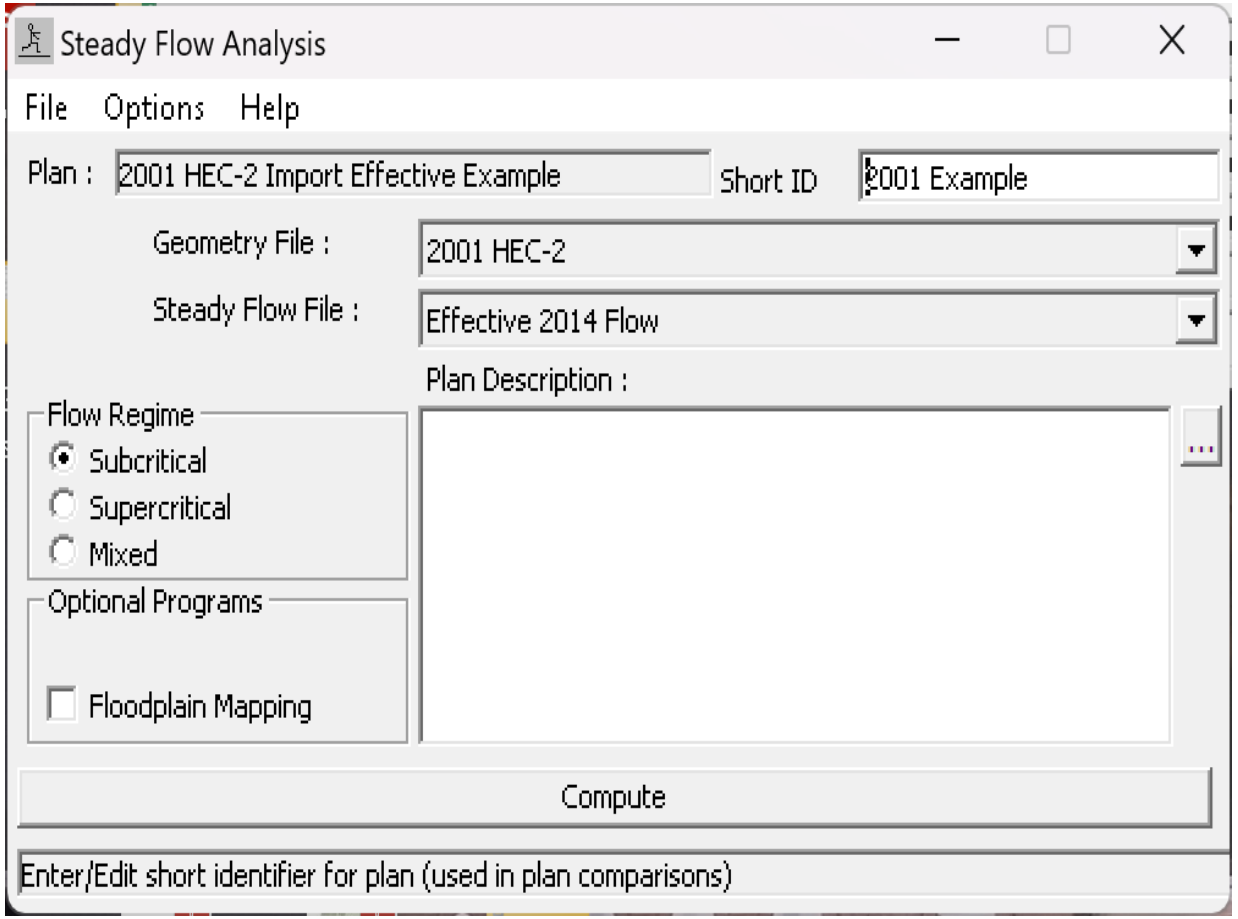


Example

Create the Duplicate Effective Model

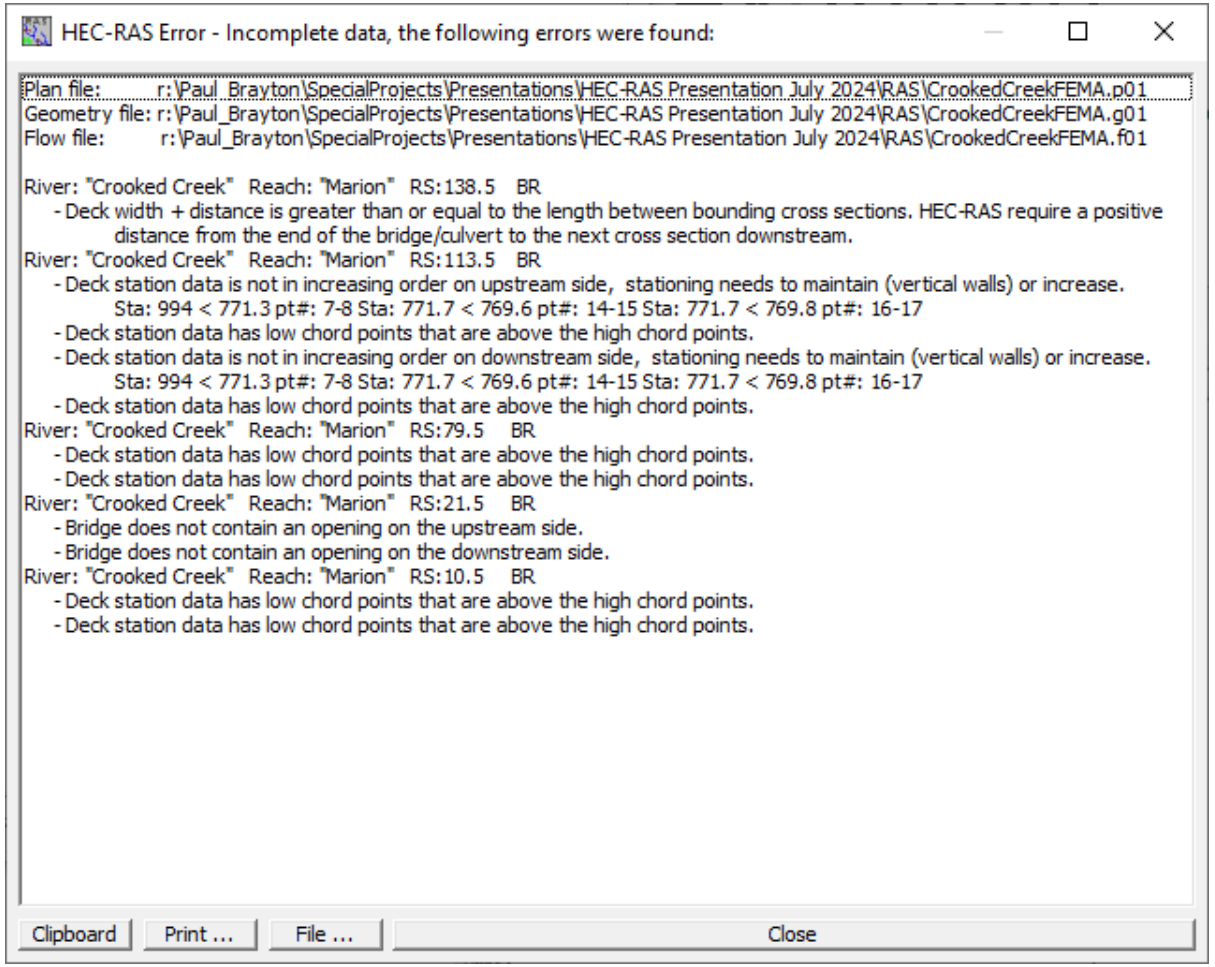


Create the Duplicate Effective Model

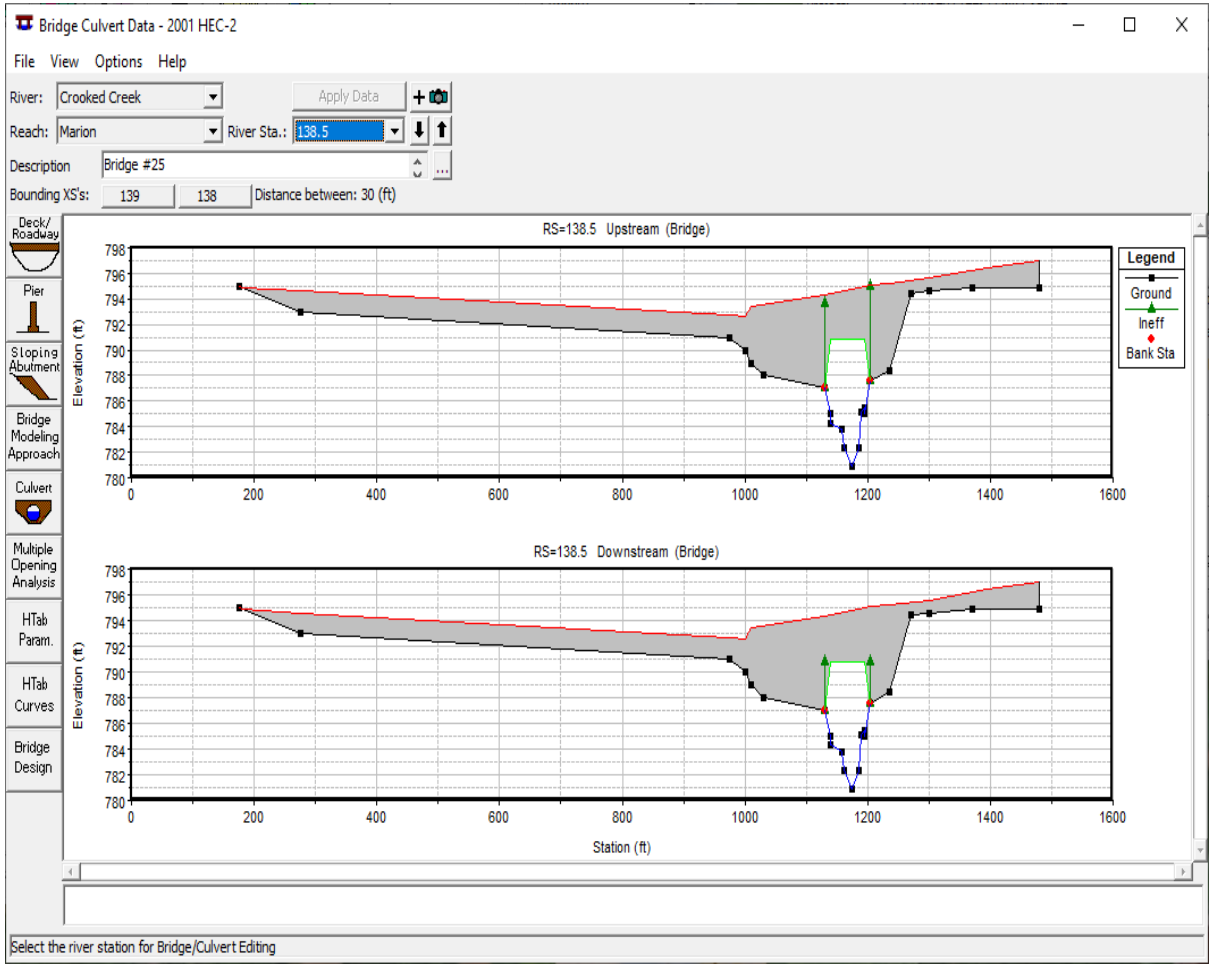


Example

Create the Duplicate Effective Model

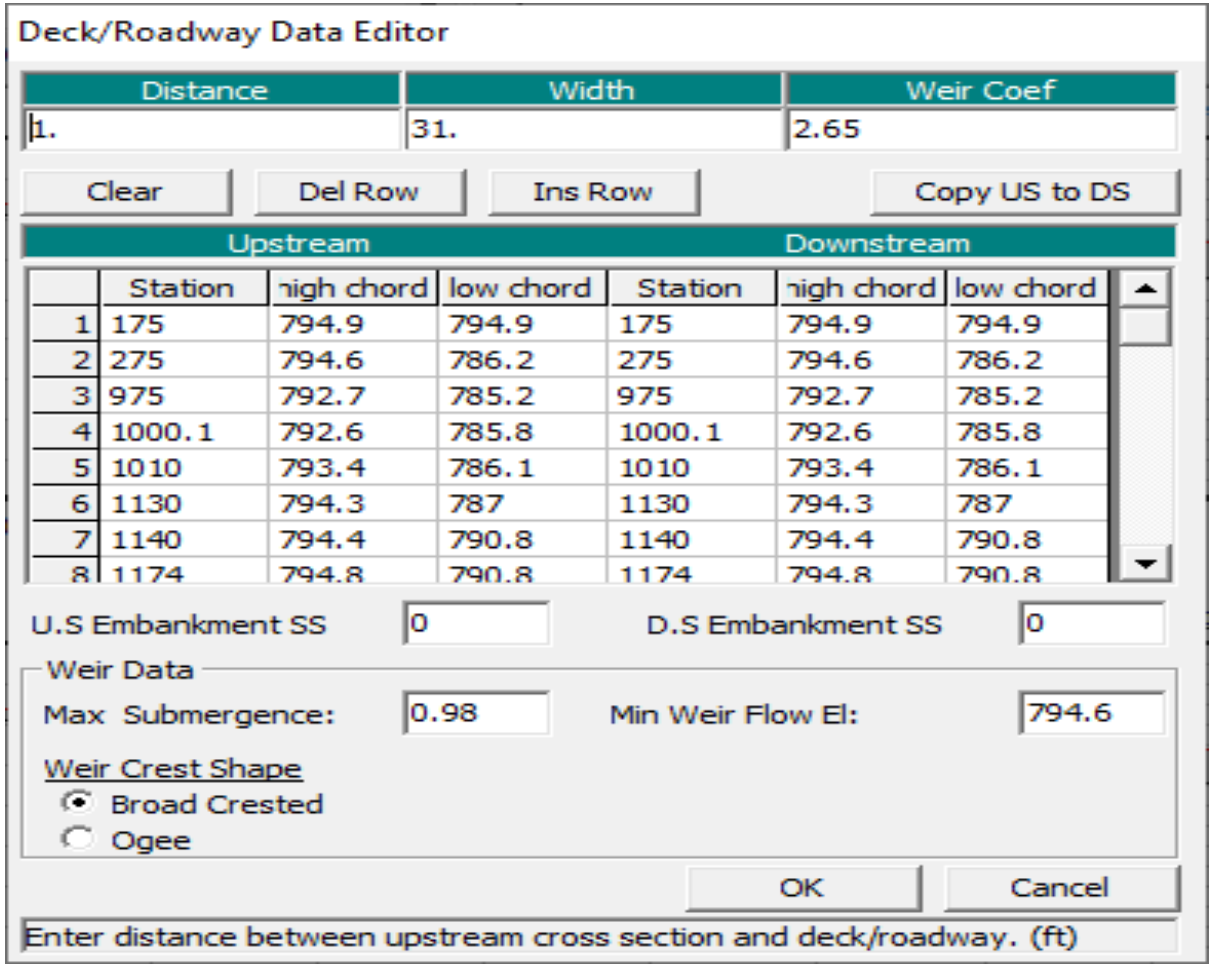


Create the Duplicate Effective Model



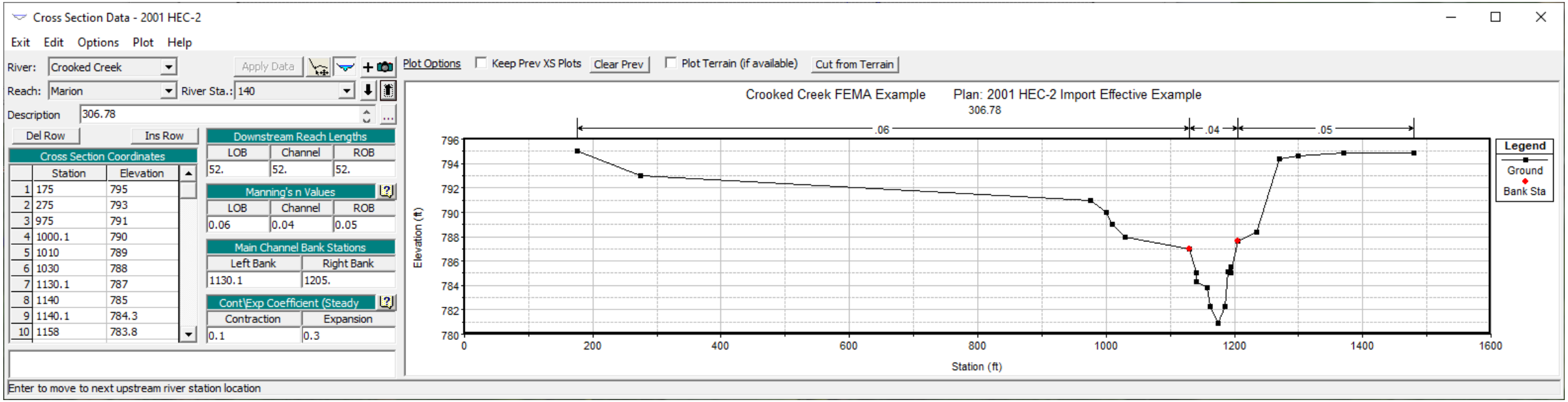
Example

Create the Duplicate Effective Model



Example

Create the Duplicate Effective Model



Example

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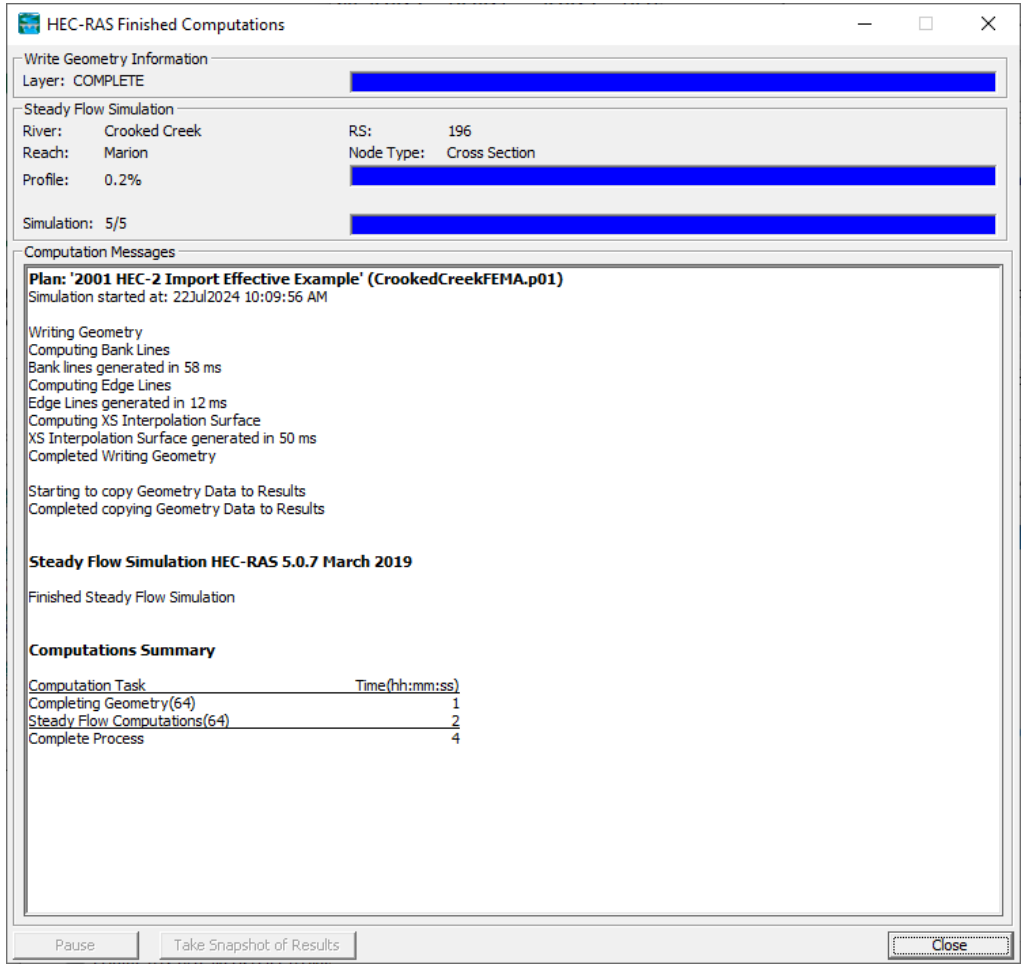
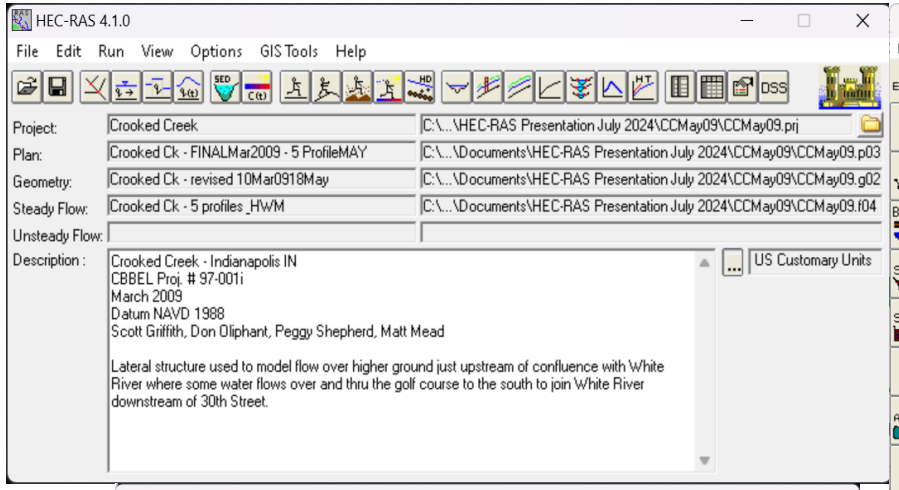
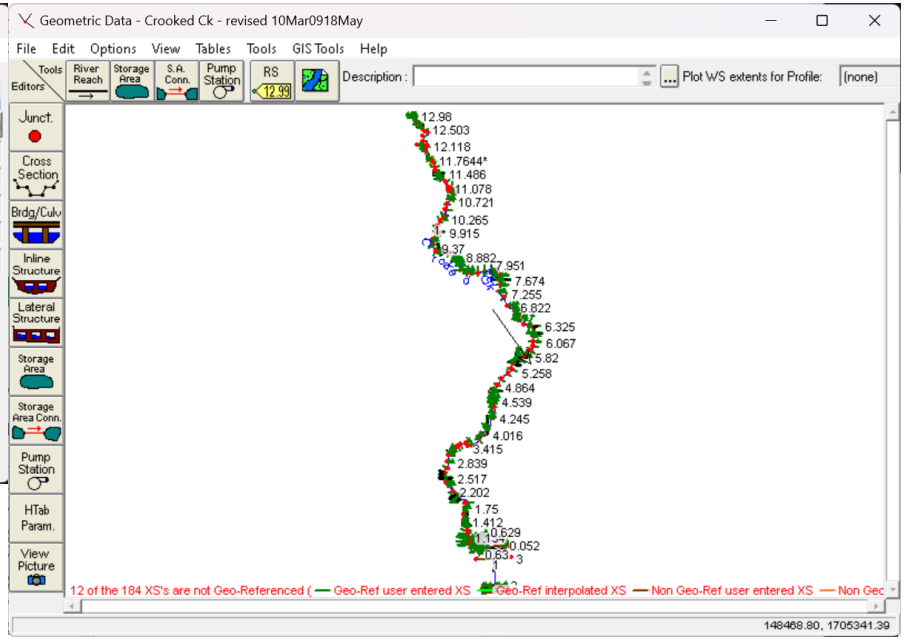
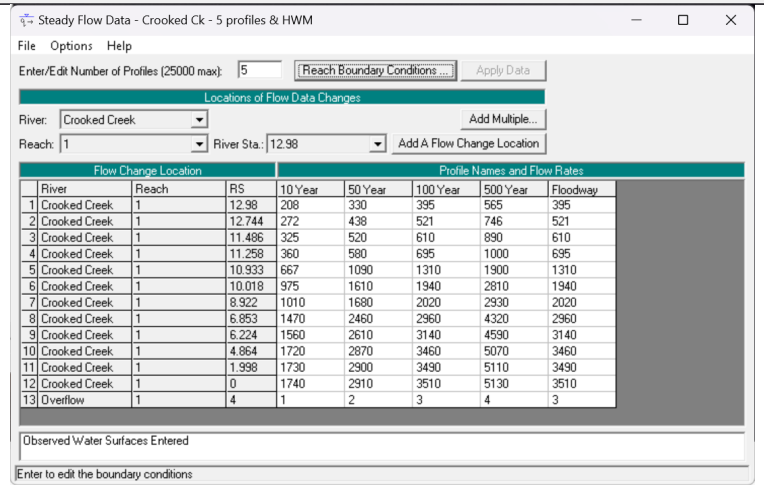
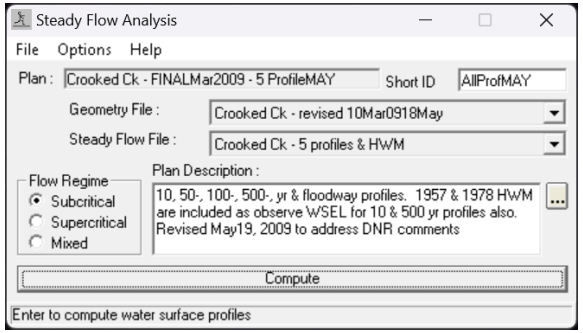


Create the Duplicate Effective Model



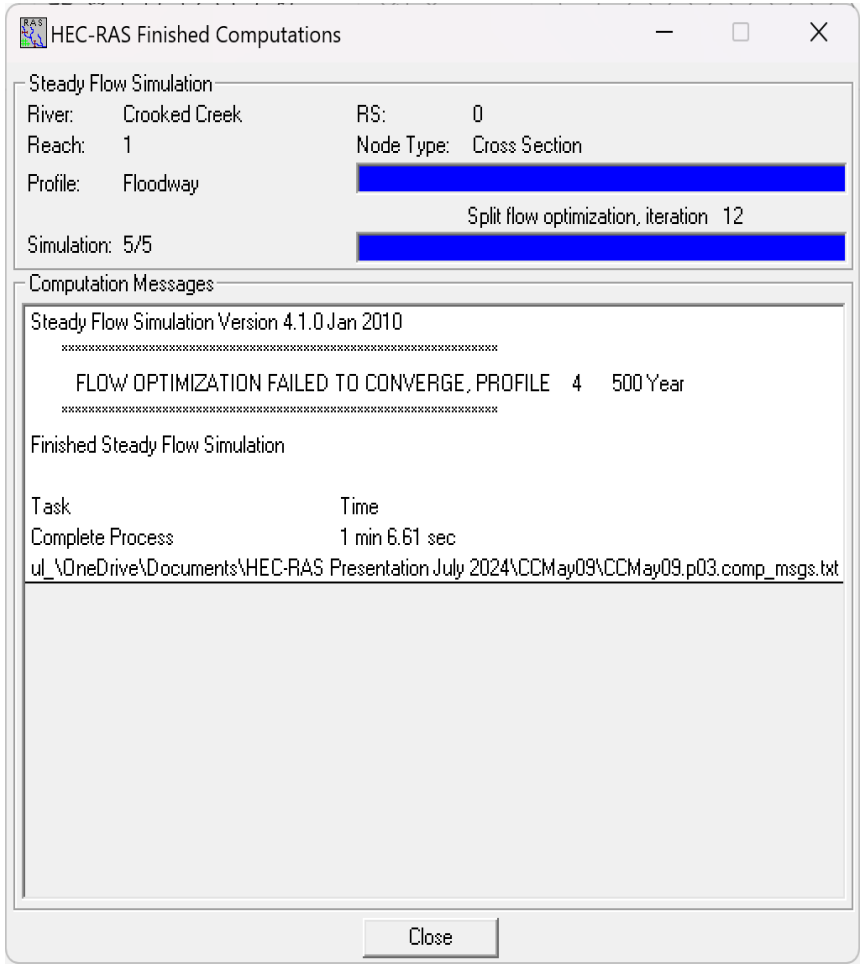






Example

Create the Duplicate Effective Model



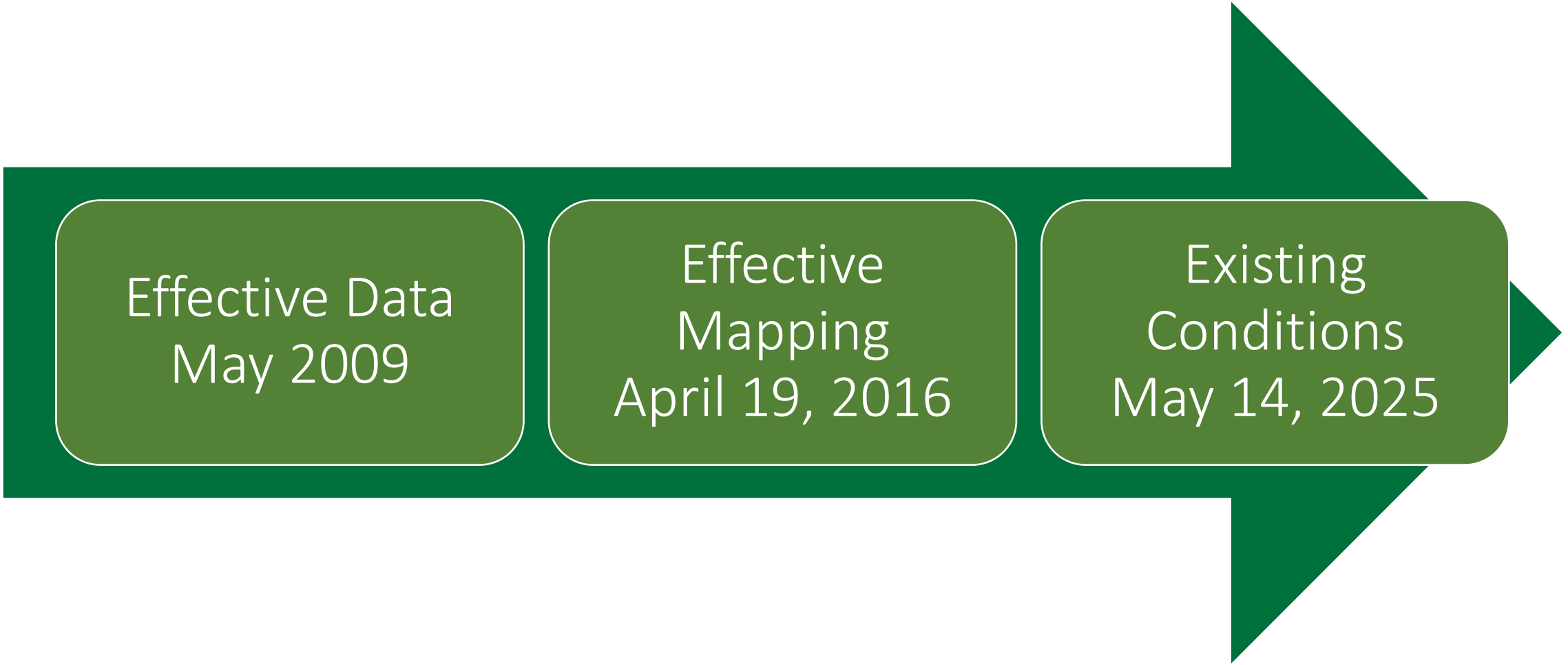
Example

Create the Duplicate Effective Model

Model		FWDT			
Station	WS 100 Year	Letter	Section	BFE	Delta
3878	703.0	A	3878	703.0	0.0
4345	706.3	B	4345	706.3	0.0
5331	708.7	C	5331	708.7	0.0
6143	711.3	D	6143	711.3	0.0
9561	720.7	E	9561	720.7	0.0
11102	724.9	F	11102	725.0	0.1
12440	727.8	G	12440	727.8	0.0
14188	732.1	H	14188	732.1	0.0
16792	739.1	I	16792	739.1	0.0
17927	741.9	J	17927	741.9	0.0
19956	746.8	K	19956	746.8	0.0
22244	751.7	L	22244	751.7	0.0
22688	753.4	M	22688	753.4	0.0
23684	756.0	N	23684	756.0	0.0
26281	760.6	O	26281	760.6	0.0
28197	763.5	P	28197	763.5	0.0
29655	767.1	Q	29655	767.1	0.0
31932	771.8	R	31932	771.8	0.0
33816	775.8	S	33816	775.8	0.0
35431	779.2	T	35431	779.2	0.0
38155	783.2	U	38155	783.2	0.0
39699	786.5	V	39699	786.5	0.0
40627	788.8	W	40627	788.8	0.0
43298	796.6	X	43298	796.7	0.1
44915	799.8	Y	44915	799.8	0.0
46276	803.7	Z	46276	803.7	0.0

Example

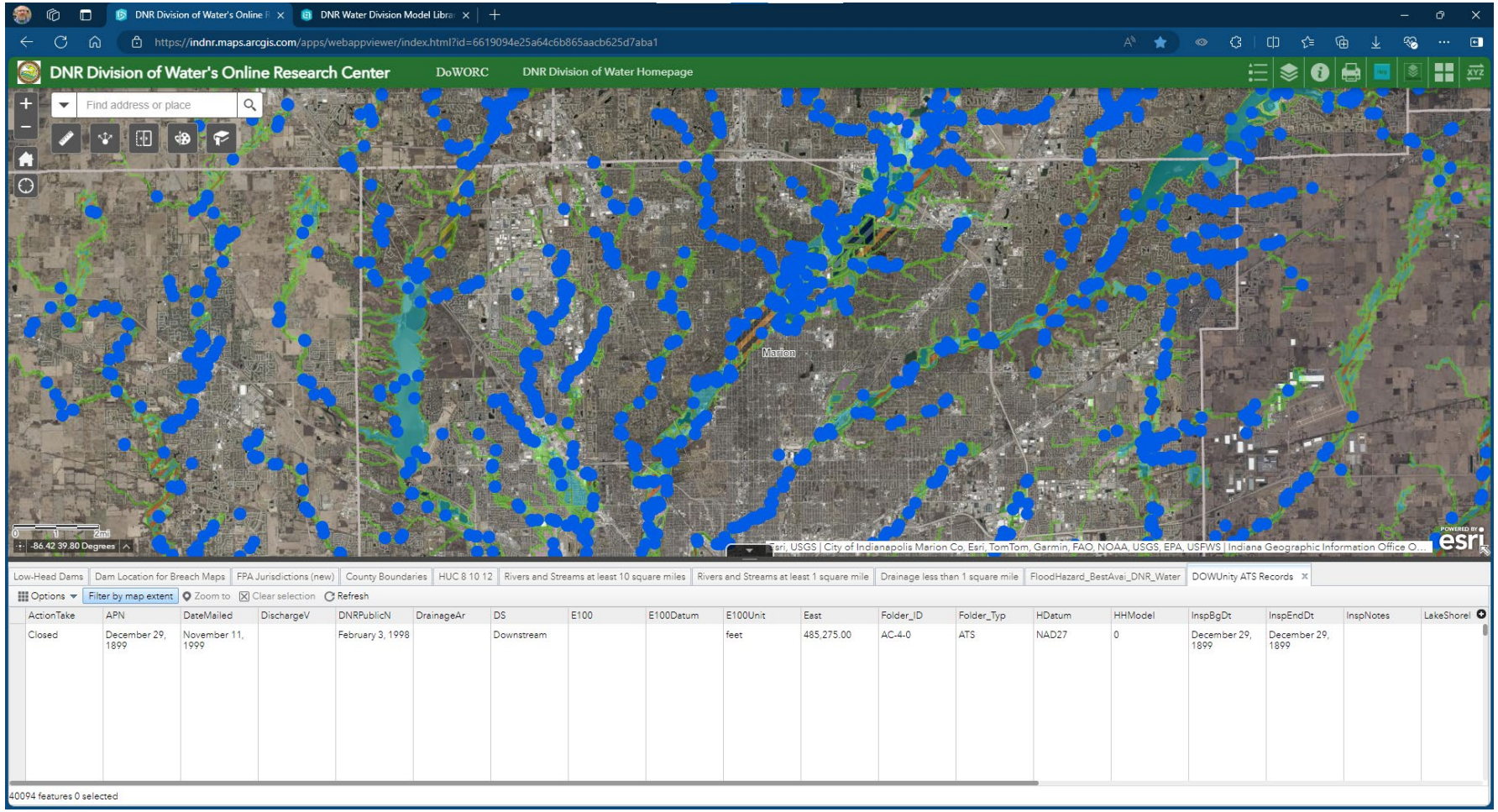
Gaps between the Data Development and Mapping



DNR Indiana Department of Natural Resources | DIVISION OF WATER

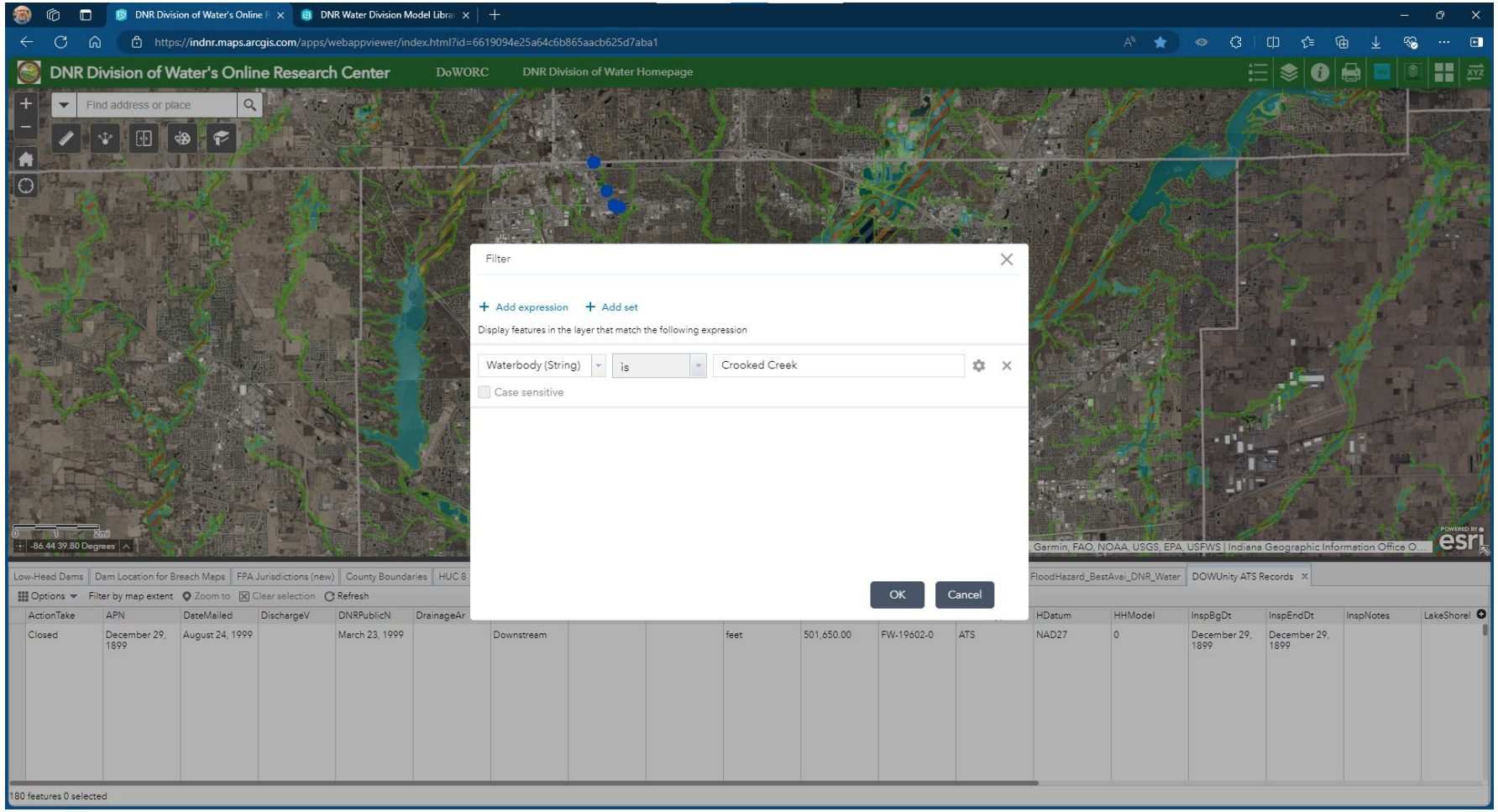
Example

Create the Corrected Effective Model



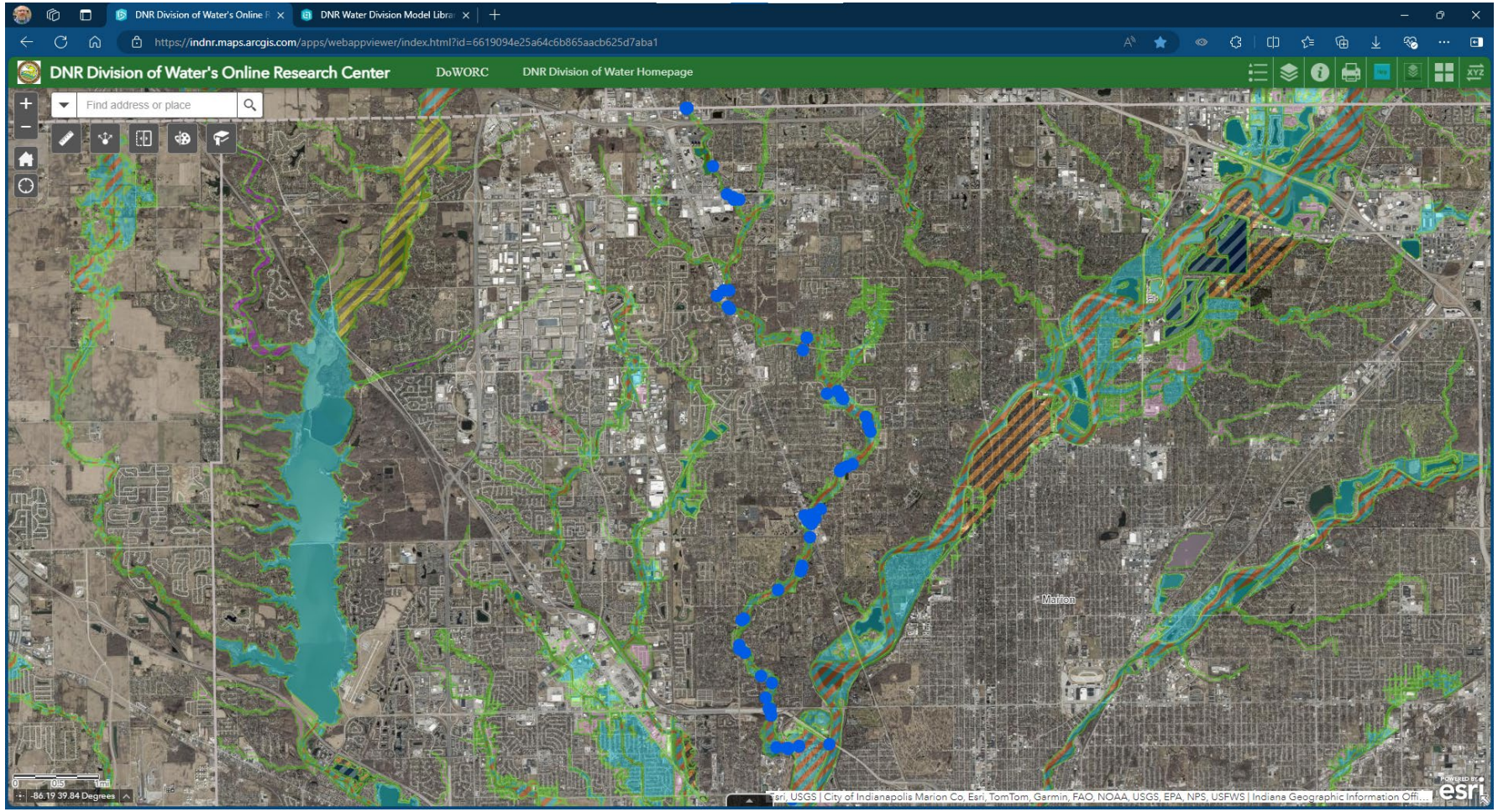
Example

Create the Corrected Effective Model



Example

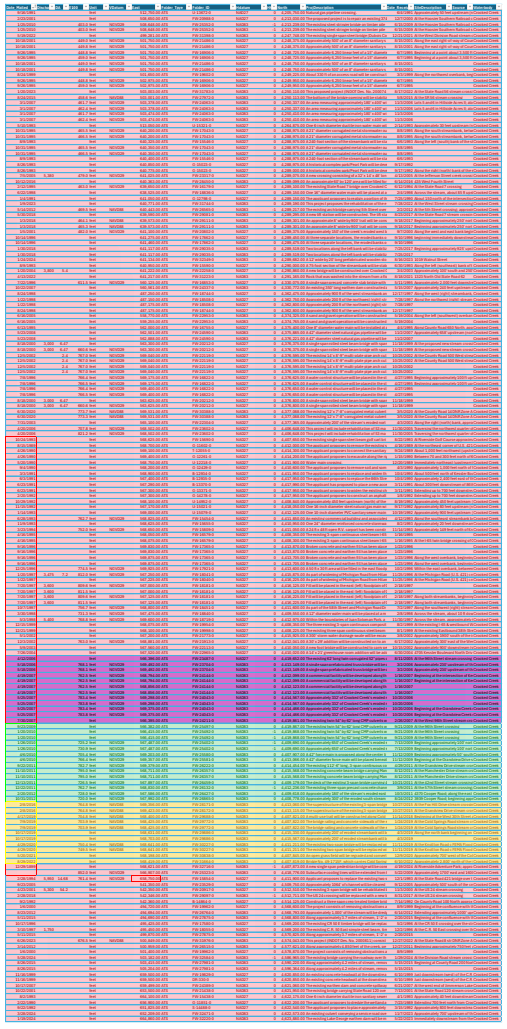
Create the Corrected Effective Model



DNR Indiana Department of Natural Resources | DIVISION OF WATER

Example

Create the Corrected Effective Model



DNR Indiana Department of Natural Resources | DIVISION OF WATER

Example

Create the Corrected Effective Model

Date_Mailed	Discha	DA	E100	Unit	VDatum	East	Folder_Tpye	Folder_ID	Hdatum	HI	North	ProjDescription	Date_Recei	SiteDescription	Source	Waterbody
10/24/1993				feet		568,625.00	ATS	FW-15690-0	NAD27	0	4,407,650.00	The existing single span steel beam golf cart bri	8/22/1993	At Riverside Golf Course approxim		Crooked Creek
8/15/1989				feet		568,700.00	ATS	G-11602-0	NAD27	0	4,412,000.00	The applicant proposes to remove the existing s	4/16/1989	At the northeast corner of U.S. 421		Crooked Creek
4/26/1990				feet		569,100.00	ATS	T-12055-0	NAD27	0	4,414,300.00	The applicant proposes to connect the sanitary	9/24/1989	About 1,000 feet northwest (upstr		Crooked Creek
4/26/1990				feet		569,400.00	ATS	G-12261-0	NAD27	0	4,414,200.00	The applicant proposes to excavate along the ri	1/15/1990	Between 70 and 300 feet north of E		Crooked Creek
5/20/1990				feet		568,750.00	ATS	U-12218-0	NAD27	0	4,411,900.00	Water main crossing.	12/20/1989	Immediately northeast (upstream)		Crooked Creek
9/4/1990				feet		568,200.00	ATS	G-12429-0	NAD27	0	4,410,600.00	The applicant proposes to remove soil and som	4/3/1990	Approximately 1,000 feet north of I		Crooked Creek
3/3/1991				feet		568,900.00	ATS	B-12934-0	NAD27	0	4,411,950.00	The applicant proposes to replace and widen th	10/4/1990	About 500 feet north of Kessler Bo		Crooked Creek
6/3/1991				feet		567,400.00	ATS	B-12935-0	NAD27	0	4,417,950.00	The applicant proposes to replace the 86th Stre	10/4/1990	Approximately 2,400 feet east of IT		Crooked Creek
6/23/1991				feet		567,290.00	ATS	B-13370-0	NAD27	0	4,417,990.00	The applicant has proposed to place a new acce	3/11/1991	About 300 feet downstream of 86th		Crooked Creek
6/23/1991				feet		567,300.00	ATS	G-13371-0	NAD27	0	4,417,950.00	The applicant proposes to widen the existing ch	3/11/1991	Extending up to 700 feet downstrea		Crooked Creek
2/20/1992				feet		567,300.00	ATS	G-14278-0	NAD27	0	4,417,950.00	The applicant proposes to construct an asphalt	1/8/1992	Extending up to 700 feet downstrea		Crooked Creek
10/29/1992				feet		568,100.00	ATS	U-14952-0	NAD27	0	4,408,840.00	Approximately 450 feet upstream (north) of the	8/19/1992	Approximately 450 feet upstream (		Crooked Creek
11/15/1992				feet		567,170.00	ATS	U-15021-0	NAD27	0	4,418,050.00	One 16-inch diameter steel natural gas main wi	9/17/1992	Approximately 80 feet upstream (n		Crooked Creek
1/14/1993				feet		569,000.00	ATS	U-15079-0	NAD27	0	4,412,125.00	One 10-inch diameter PVC sanitary sewer main	10/19/1992	Approximately 900 feet upstream (		Crooked Creek
6/28/1993			762.7	feet	NGVD29	568,825.00	ATS	FW-15454-0	NAD27	0	4,411,850.00	An existing commercial building and associatec	4/12/1993	Along the southeast streambank b		Crooked Creek
11/8/1993				feet		568,625.00	ATS	FW-15655-0	NAD27	0	4,410,950.00	One 24" diameter reinforced concrete stormwa	8/2/1993	Approximately 20 feet downstream		Crooked Creek
3/23/1994			752.0	feet	NGVD29	568,650.00	ATS	FW-15809-0	NAD27	0	4,411,050.00	A 24 ft x 48 ft open R.V. carport has been constr	11/14/1993	Approximately 149 feet north of Kn		Crooked Creek
4/16/1995				feet		568,050.00	ATS	FW-16579-0	NAD27	0	4,408,350.00	The existing 3-span continuous steel beam I-65	1/16/1995			Crooked Creek
4/16/1995				feet		568,075.00	ATS	FW-16579-0	NAD27	0	4,408,300.00	The existing 3-span continuous steel beam I-65	1/16/1995	At the I-65 twin bridge crossing of (		Crooked Creek
9/16/1996				feet		569,830.00	ATS	FW-17365-0	NAD27	0	4,413,870.00	Broken concrete and earthen fill has been place	1/23/1996			Crooked Creek
9/16/1996				feet		569,830.00	ATS	FW-17365-0	NAD27	0	4,413,870.00	Broken concrete and earthen fill has been place	1/23/1996			Crooked Creek
9/16/1996				feet		569,875.00	ATS	FW-17365-0	NAD27	0	4,413,705.00	Broken concrete and earthen fill has been place	1/23/1996	Along the west overbank, beginnin		Crooked Creek
9/16/1996				feet		569,875.00	ATS	FW-17365-0	NAD27	0	4,413,705.00	Broken concrete and earthen fill has been place	1/23/1996	Along the west overbank, beginnin		Crooked Creek
12/25/1996			774.5	feet	NGVD29	569,925.00	ATS	FW-17921-0	NAD27	0	4,413,600.00	A 50 ft x 30 ft area will be filled in the east floodp	10/2/1996	Within the east overbank, between		Crooked Creek
1/20/1997	3,475	7.2	812.0	feet	NGVD29	567,250.00	ATS	FW-18041-0	NAD27	0	4,415,875.00	As part of widening of Michigan Road from Hilar	11/25/1996	At the Michigan Road (U.S. 421) cr		Crooked Creek
1/22/1997				feet		567,225.00	ATS	FW-18040-0	NAD27	0	4,416,225.00	As part of widening of Michigan Road from Hilar	11/25/1996	At the Michigan Road (U.S. 421) cr		Crooked Creek
7/20/1997	3,600		809.6	feet	NGVD29	567,000.00	ATS	FW-18181-0	NAD27	0	4,416,125.00	Fill will be placed in the east (left) floodplain of	2/18/1997			Crooked Creek
7/20/1997	3,600		811.5	feet		567,000.00	ATS	FW-18181-0	NAD27	0	4,416,125.00	Fill will be placed in the east (left) floodplain of	2/18/1997			Crooked Creek
7/20/1997	3,600		809.6	feet	NGVD29	567,125.00	ATS	FW-18181-0	NAD27	0	4,416,225.00	Fill will be placed in the east (left) floodplain of	2/18/1997	Along both streambanks, beginnin		Crooked Creek
7/20/1997	3,600		811.5	feet		567,125.00	ATS	FW-18181-0	NAD27	0	4,416,225.00	Fill will be placed in the east (left) floodplain of	2/18/1997	Along both streambanks, beginnin		Crooked Creek
10/7/1997			756.7	feet	NGVD29	568,800.00	ATS	FW-18451-0	NAD27	0	4,411,600.00	As part of the 58th Street and Michigan Road Dr	7/2/1997	Along the southwest (right) stream		Crooked Creek
3/30/1998			731.3	feet	NGVD29	567,475.00	ATS	FW-18840-0	NAD27	0	4,409,550.00	A 12" diameter water main will be placed at a m	2/8/1998	Across the stream, about 10 ft dow		Crooked Creek
5/3/1998	5,400		768.8	feet	NGVD29	569,600.00	ATS	FW-18719-0	NAD27	0	4,412,975.00	Within the boundaries of Juan Soloman Park, a	11/30/1997	Across the stream, approximately 6		Crooked Creek
12/15/1999				feet		568,075.00	ATS	FW-19954-0	NAD27	0	4,408,350.00	The three existing 3-span continuous composit	8/2/1999	At the existing I-65 & westbound W		Crooked Creek
12/21/1999				feet		568,100.00	ATS	FW-19998-0	NAD27	0	4,408,225.00	The existing three span continuous steel beam	8/1/1999	At the existing Eastbound 38th Stre		Crooked Creek
5/1/2002				feet		567,200.00	ATS	FW-21773-0	NAD27	0	4,415,925.00	A 300' storm water drainage swale will be excav	3/8/2002	Approximately 1900' south of the in		Crooked Creek
12/3/2002			763.0	feet	NGVD29	568,881.00	ATS	FW-21913-0	NAD27	0	4,412,041.00	A 30' x 29' addition will be constructed on to an	6/17/2002	Approximately 300' east of the Wes		Crooked Creek
5/9/2003				feet		567,560.00	ATS	FW-22113-0	NAD27	0	4,410,050.00	A new foot bridge will be constructed to carry pe	10/15/2002	Approximately 900' downstream (s		Crooked Creek
7/26/2004				feet		567,520.00	ATS	FW-22965-0	NAD27	0	4,410,020.00	A 14' x 21' greenhouse room addition will be ad	6/30/2004	4705 Kessler Boulevard North Driv		Crooked Creek
4/12/2006				feet		566,396.00	ATS	FW-23487-0	NAD27	0	4,419,652.00	The existing 62' long twin corrugated 52" pipes	8/11/2005	At the 96th Street stream crossing		Crooked Creek
5/18/2006			768.1	feet	NGVD29	569,492.00	ATS	FW-23704-0	NAD83	0	4,413,149.00	A single span prefabricated truss bridge will be	3/2/2006	Approximately 230' upstream of th		Crooked Creek
5/18/2006			768.1	feet	NGVD29	569,492.00	ATS	FW-23704-0	NAD83	0	4,413,149.00	A single span prefabricated truss bridge will be	3/2/2006	Approximately 230' upstream of th		Crooked Creek
4/19/2007			762.5	feet	NGVD29	568,794.00	ATS	FW-24144-0	NAD83	0	4,412,099.00	A commercial facility will be developed along th	1/16/2007	Beginning at the intersection of Ke		Crooked Creek
4/19/2007			762.5	feet	NGVD29	568,794.00	ATS	FW-24144-0	NAD83	0	4,412,099.00	A commercial facility will be developed along th	1/16/2007	Beginning at the intersection of Ke		Crooked Creek
4/19/2007			762.5	feet	NGVD29	568,856.00	ATS	FW-24144-0	NAD83	0	4,412,123.00	A commercial facility will be developed along th	1/16/2007			Crooked Creek
4/19/2007			762.5	feet	NGVD29	568,856.00	ATS	FW-24144-0	NAD83	0	4,412,123.00	A commercial facility will be developed along th	1/16/2007			Crooked Creek
5/25/2007			783.4	feet	NGVD29	569,298.00	ATS	FW-24043-0	NAD83	0	4,414,567.00	Approximately 332' of Crooked Creek's eroded	10/20/2006			Crooked Creek
5/25/2007			783.8	feet	NGVD29	569,298.00	ATS	FW-24043-0	NAD83	0	4,414,567.00	Approximately 332' of Crooked Creek's eroded	10/20/2006			Crooked Creek
5/25/2007			783.4	feet	NGVD29	569,375.00	ATS	FW-24043-0	NAD83	0	4,414,466.00	Approximately 332' of Crooked Creek's eroded	10/20/2006	Beginning at the Grandview Creek		Crooked Creek
5/25/2007			783.8	feet	NGVD29	569,375.00	ATS	FW-24043-0	NAD83	0	4,414,466.00	Approximately 332' of Crooked Creek's eroded	10/20/2006	Beginning at the Grandview Creek		Crooked Creek
7/30/2007				feet		566,395.00	ATS	FW-24211-0	NAD83	0	4,419,861.00	The existing twin 54" by 62' long CMP culverts w	2/26/2007	At the West 96th Street stream cro		Crooked Creek
9/23/2009				feet		566,382.00	ATS	FW-25497-0	NAD83	0	4,419,867.00	The existing twin 54" by 62' long CMP culverts w	9/21/2009	At the 96th Street crossing		Crooked Creek
1/20/2010				feet		566,415.00	ATS	FW-25492-0	NAD83	-1	4,419,868.00	The existing twin 54" by 62' long CMP culverts w	9/21/2009	At the 96th Street crossing		Crooked Creek
1/20/2010				feet		566,415.00	ATS	FW-25492-0	NAD83	-1	4,419,868.00	The existing twin 54" by 62' long CMP culverts w	9/21/2009	At the 96th Street crossing		Crooked Creek
1/26/2010			725.2	feet	NGVD29	567,487.00	ATS	FW-25402-0	NAD83	-1	4,409,690.00	Approximately 650' of Crooked Creek's eroded	7/13/2009	Beginning approximately 100' nort		Crooked Creek
1/26/2010			730.9	feet	NGVD29	567,487.00	ATS	FW-25402-0	NAD83	-1	4,409,690.00	Approximately 650' of Crooked Creek's eroded	7/13/2009	Beginning approximately 100' nort		Crooked Creek
4/6/2010			705.4	feet	NGVD29	569,203.00	ATS	FW-25580-0	NAD83	0	4,407,907.00	A 42" force main is proposed along the center li	11/12/2009	Beginning approximately 50' south		Crooked Creek
4/6/2010			766.4	feet	NGVD29	569,357.00	ATS	FW-25581-0	NAD83	0	4,413,066.00	A 42" diameter force main will be placed benea	11/12/2009	Beginning at the Grandview Drive s		Crooked Creek
9/22/2011			782.7	feet	NGVD29	569,379.00	ATS	FW-26222-0	NAD83	0	4,414,454.00	The existing 112'-6" long, 3-span continuous co	4/29/2011	At the Grandview Drive stream cro		Crooked Creek
11/10/2011			795.0	feet	NGVD29	568,711.00	ATS	FW-26357-0	NAD83	0	4,415,568.00	The existing concrete beam bridge carrying Mar	8/12/2011	At the Manchester Drive stream cr		Crooked Creek
11/10/2011			795.0	feet	NGVD29	568,711.00	ATS	FW-26357-0	NAD83	0	4,415,568.00	The existing concrete beam bridge carrying Mar	8/12/2011	At the Manchester Drive stream cr		Crooked Creek
12/7/2011			726.5	feet	NGVD29	567,897.00	ATS	FW-26459-0	NAD83	0	4,409,179.00	The deck of the existing 3-span bridge carrying	10/21/2011	At the 42nd Street stream crossing		Crooked Creek
12/22/2011			762.7	feet	NGVD29	568,830.00	ATS	FW-26132-0	NAD83	-1	4,412,236.00	The existing three-span precast concrete chanr	3/9/2011	At the 57th Street stream crossing;		Crooked Creek
2/20/2012			728.0	feet	NGVD29	567,586.00	ATS	FW-26427-0	NAD83	0	4,409,618.00	Approximately 180' of the stream's eroded east	10/3/2011	4370 Cooper Road; along the east		Crooked Creek
10/31/2012			720.0	feet	NGVD29	567,992.00	ATS	FW-26865-0	NAD83	0	4,408,778.00	Approximately 300' of the eroded south stream	8/24/2012	3939 Cooper Road; beginning appr		Crooked Creek
2/8/2016			764.8	feet	NAVD88	569,356.00	ATS	FW-28171-0	NAD83	0	4,413,060.00	The superstructure of the existing 3-span bridge	10/27/2015	At the Fox Hill Drive stream crossir		Crooked Creek
2/8/2016			764.8	feet	NAVD88	569,423.00	ATS	FW-28172-0	NAD83	0	4,413,115.00	The superstructure of the existing 3-span bridge	10/27/2015	At the Grandview Drive stream cro		Crooked Creek
4/17/2019			704.8	feet	NAVD88	568,400.00	ATS	FW-29688-0	NAD83	0	4,407,821.00	A multi-use trail will be constructed along Cold	11/14/2018	Beginning at the West 30th Street c		Crooked Creek
7/9/2019			703.9	feet	NAVD88	568,425.00	ATS	FW-29772-0	NAD83	0	4,407,822.00	The bridge railing and concrete sidewalk of the	1/24/2019	At the Cold Springs Road stream cr		Crooked Creek
7/9/2019			703.9	feet	NAVD88	568,425.00	ATS	FW-29772-0	NAD83	0	4,407,822.00	The bridge railing and concrete sidewalk of the	1/24/2019	At the Cold Springs Road stream cr		Crooked Creek
10/17/2019				feet		568,631.00	ATS	FW-29886-0	NAD83	0	4,415,330.00	Approximately 200' of eroded streambank will b	4/3/2019	Along the north bank beginning on		Crooked Creek
10/17/2019				feet		568,703.00	ATS	FW-29886-0	NAD83	0	4,415,567.00	Approximately 200' of eroded streambank will b	4/3/2019			Crooked Creek
4/29/2020			750.4	feet	NAVD88	568,641.00	ATS	FW-30227-0	NAD83	0	4,411,211.00	The existing two-span bridge will be replaced w	11/11/2019	At the Knollton Road c FEMA Flood		Crooked Creek
4/29/2020			749.5	feet	NAVD88	568,641.00	ATS	FW-30227-0	NAD83	0	4,411,211.00	The existing two-span bridge will be replaced w	11/11/2019	At the Knollton Road c FEMA Flood		Crooked Creek
5/20/2021				feet		568,198.00	ATS	FW-30838-0	NAD83	0	4,407,845.00	An open grass field will be regraded and convert	12/9/2020	Approximately 700' west of the Col		Crooked Creek
8/29/2022				feet		568,419.00	ATS	FW-31664-0	NAD83	0	4,407,819.00	Bridge No. 49-1715F, which carries Cold Spring	6/10/2022	Approximately 2,800' north of the i		Crooked Creek

DNR Indiana Department of Natural Resources | DIVISION OF WATER

Example

Create the Corrected Effective Model

Date_Mailed	Discha	DA	E100	Unit	VDatum	East	Folder_Tpye	Folder_ID	Hdatum	HH	North	ProjDescription
4/12/2006				feet		566,396.00	ATS	FW-23487-0	NAD27	0	4,419,652.00	The existing 62' long twin corrugated 52" pipes
5/18/2006			768.1	feet	NGVD29	569,492.00	ATS	FW-23704-0	NAD83	0	4,413,149.00	A single span prefabricated truss bridge will be
5/18/2006			768.1	feet	NGVD29	569,492.00	ATS	FW-23704-0	NAD83	0	4,413,149.00	A single span prefabricated truss bridge will be
4/19/2007			762.5	feet	NGVD29	568,794.00	ATS	FW-24144-0	NAD83	0	4,412,099.00	A commercial facility will be developed along th
4/19/2007			762.5	feet	NGVD29	568,794.00	ATS	FW-24144-0	NAD83	0	4,412,099.00	A commercial facility will be developed along th
4/19/2007			762.5	feet	NGVD29	568,856.00	ATS	FW-24144-0	NAD83	0	4,412,123.00	A commercial facility will be developed along th
4/19/2007			762.5	feet	NGVD29	568,856.00	ATS	FW-24144-0	NAD83	0	4,412,123.00	A commercial facility will be developed along th
5/25/2007			783.4	feet	NGVD29	569,298.00	ATS	FW-24043-0	NAD83	0	4,414,567.00	Approximately 332' of Crooked Creek's eroded
5/25/2007			783.8	feet	NGVD29	569,298.00	ATS	FW-24043-0	NAD83	0	4,414,567.00	Approximately 332' of Crooked Creek's eroded
5/25/2007			783.4	feet	NGVD29	569,375.00	ATS	FW-24043-0	NAD83	0	4,414,466.00	Approximately 332' of Crooked Creek's eroded
5/25/2007			783.8	feet	NGVD29	569,375.00	ATS	FW-24043-0	NAD83	0	4,414,466.00	Approximately 332' of Crooked Creek's eroded
7/30/2007				feet		566,395.00	ATS	FW-24211-0	NAD83	0	4,419,861.00	The existing twin 54" by 62' long CMP culverts w
9/23/2009				feet		566,382.00	ATS	FW-25497-0	NAD83	0	4,419,867.00	The existing twin 54" by 62' long CMP culverts w
1/20/2010				feet		566,415.00	ATS	FW-25492-0	NAD83	-1	4,419,868.00	The existing twin 54" by 62' long CMP culverts w
1/20/2010				feet		566,415.00	ATS	FW-25492-0	NAD83	-1	4,419,868.00	The existing twin 54" by 62' long CMP culverts w
1/26/2010			725.2	feet	NGVD29	567,487.00	ATS	FW-25402-0	NAD83	-1	4,409,690.00	Approximately 650' of Crooked Creek's eroded
1/26/2010			730.9	feet	NGVD29	567,487.00	ATS	FW-25402-0	NAD83	-1	4,409,690.00	Approximately 650' of Crooked Creek's eroded
4/6/2010			705.4	feet	NGVD29	569,203.00	ATS	FW-25580-0	NAD83	0	4,407,907.00	A 42" force main is proposed along the center li
4/6/2010			766.4	feet	NGVD29	569,357.00	ATS	FW-25581-0	NAD83	0	4,413,066.00	A 42" diameter force main will be placed beneat
9/22/2011			782.7	feet	NGVD29	569,379.00	ATS	FW-26222-0	NAD83	0	4,414,454.00	The existing 112'-6" long, 3-span continuous co
11/10/2011			795.0	feet	NGVD29	568,711.00	ATS	FW-26357-0	NAD83	0	4,415,568.00	The existing concrete beam bridge carrying Mar
11/10/2011			795.0	feet	NGVD29	568,711.00	ATS	FW-26357-0	NAD83	0	4,415,568.00	The existing concrete beam bridge carrying Mar
12/13/2011			726.5	feet	NGVD29	567,897.00	ATS	FW-26459-0	NAD83	0	4,409,179.00	The deck of the existing 3-span bridge carrying
12/22/2011			762.7	feet	NGVD29	568,830.00	ATS	FW-26132-0	NAD83	-1	4,412,236.00	The existing three-span precast concrete chann
2/20/2012			728.0	feet	NGVD29	567,586.00	ATS	FW-26427-0	NAD83	0	4,409,618.00	Approximately 180' of the stream's eroded east
10/31/2012			720.0	feet	NGVD29	567,992.00	ATS	FW-26865-0	NAD83	0	4,408,778.00	Approximately 300' of the eroded south stream
2/8/2016			764.8	feet	NAVD88	569,356.00	ATS	FW-28171-0	NAD83	0	4,413,060.00	The superstructure of the existing 3-span bridge
2/8/2016			764.8	feet	NAVD88	569,423.00	ATS	FW-28172-0	NAD83	0	4,413,115.00	The superstructure of the existing 3-span bridge
4/17/2019			704.8	feet	NAVD88	568,400.00	ATS	FW-29688-0	NAD83	0	4,407,821.00	A multi-use trail will be constructed along Cold
7/9/2019			703.9	feet	NAVD88	568,425.00	ATS	FW-29772-0	NAD83	0	4,407,822.00	The bridge railing and concrete sidewalk of the
7/9/2019			703.9	feet	NAVD88	568,425.00	ATS	FW-29772-0	NAD83	0	4,407,822.00	The bridge railing and concrete sidewalk of the
10/17/2019				feet		568,631.00	ATS	FW-29886-0	NAD83	0	4,415,330.00	Approximately 200' of eroded streambank will b
10/17/2019				feet		568,703.00	ATS	FW-29886-0	NAD83	0	4,415,567.00	Approximately 200' of eroded streambank will b
4/29/2020			750.4	feet	NAVD88	568,641.00	ATS	FW-30227-0	NAD83	0	4,411,211.00	The existing two-span bridge will be replaced wi
4/29/2020			749.5	feet	NAVD88	568,641.00	ATS	FW-30227-0	NAD83	0	4,411,211.00	The existing two-span bridge will be replaced wi
5/20/2021				feet		568,198.00	ATS	FW-30838-0	NAD83	0	4,407,845.00	An open grass field will be regraded and convert
8/29/2022				feet		568,419.00	ATS	FW-31664-0	NAD83	0	4,407,819.00	Bridge No. 49-1715F, which carries Cold Spring

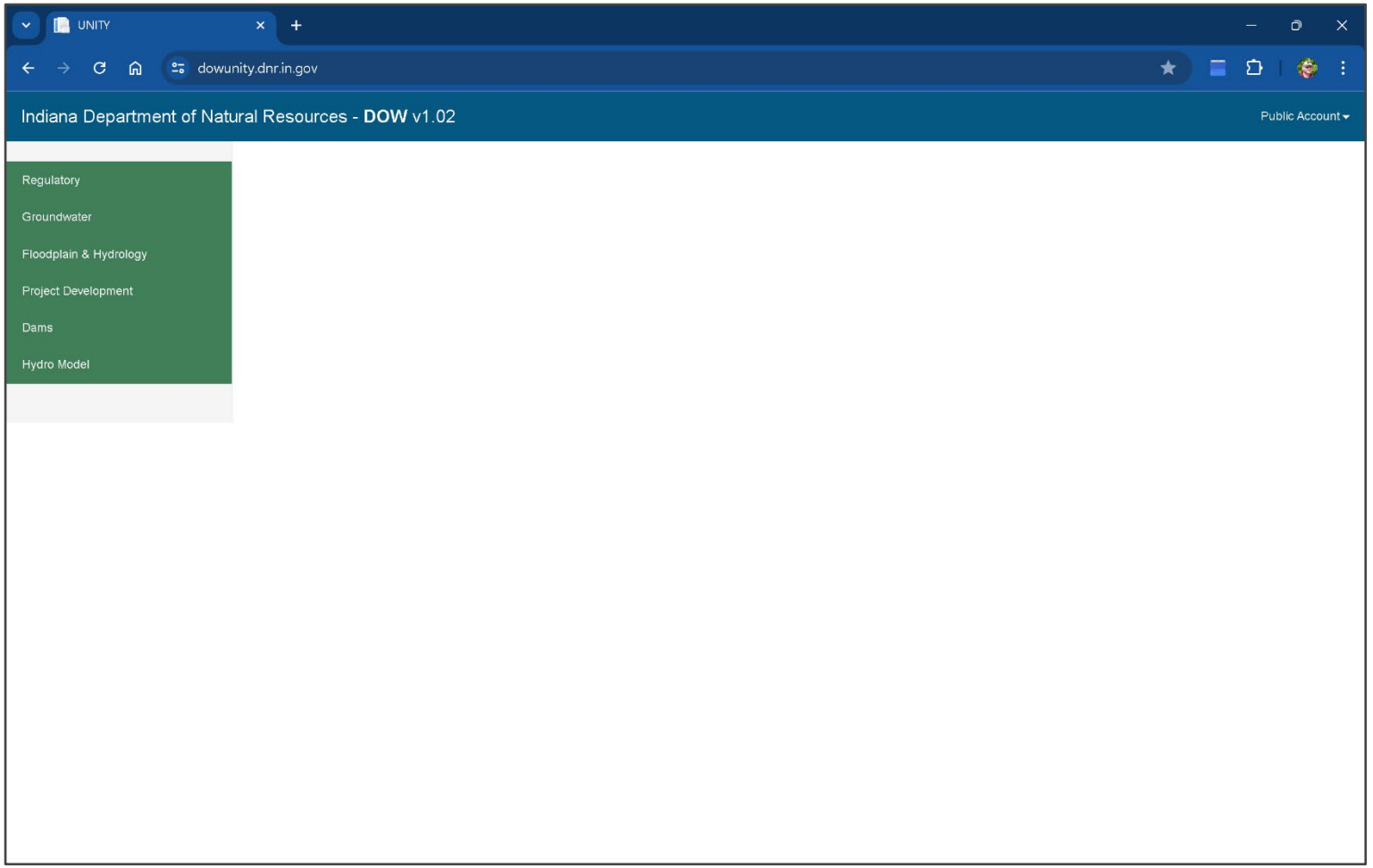
Example

Create the Corrected Effective Model

Date_Mailed	Discha	DA	E100	Unit	VDatum	East	Folder_Tpye	Folder_ID	Hdatum	HH	North	ProjDescription	Date_Receiv	SiteDescription	Source	Waterbody
9/23/2009				feet		566,382.00	ATS	FW-25497-0	NAD83	0	4,419,867.00	The existing twin 54" by 62' long CMP culverts w	9/21/2009	At the 96th Street crossing		Crooked Creek
1/20/2010				feet		566,415.00	ATS	FW-25492-0	NAD83	-1	4,419,868.00	The existing twin 54" by 62' long CMP culverts w	9/21/2009	At the 96th Street crossing		Crooked Creek
1/20/2010				feet		566,415.00	ATS	FW-25492-0	NAD83	-1	4,419,868.00	The existing twin 54" by 62' long CMP culverts w	9/21/2009	At the 96th Street crossing		Crooked Creek
1/26/2010			725.2	feet	NGVD29	567,487.00	ATS	FW-25402-0	NAD83	-1	4,409,690.00	Approximately 650' of Crooked Creek's eroded	7/13/2009	Beginning approximately 100' nort		Crooked Creek
1/26/2010			730.9	feet	NGVD29	567,487.00	ATS	FW-25402-0	NAD83	-1	4,409,690.00	Approximately 650' of Crooked Creek's eroded	7/13/2009	Beginning approximately 100' nort		Crooked Creek
4/6/2010			705.4	feet	NGVD29	569,203.00	ATS	FW-25580-0	NAD83	0	4,407,907.00	A 42" force main is proposed along the center li	11/12/2009	Beginning approximately 50' south		Crooked Creek
4/6/2010			766.4	feet	NGVD29	569,357.00	ATS	FW-25581-0	NAD83	0	4,413,066.00	A 42" diameter force main will be placed benea	11/12/2009	Beginning at the Grandview Drive s		Crooked Creek
9/22/2011			782.7	feet	NGVD29	569,379.00	ATS	FW-26222-0	NAD83	0	4,414,454.00	The existing 112'-6" long, 3-span continuous cc	4/29/2011	At the Grandview Drive stream cro		Crooked Creek
11/10/2011			795.0	feet	NGVD29	568,711.00	ATS	FW-26357-0	NAD83	0	4,415,568.00	The existing concrete beam bridge carrying Mar	8/12/2011	At the Manchester Drive stream cr		Crooked Creek
11/10/2011			795.0	feet	NGVD29	568,711.00	ATS	FW-26357-0	NAD83	0	4,415,568.00	The existing concrete beam bridge carrying Mar	8/12/2011	At the Manchester Drive stream cr		Crooked Creek
12/13/2011			726.5	feet	NGVD29	567,897.00	ATS	FW-26459-0	NAD83	0	4,409,179.00	The deck of the existing 3-span bridge carrying	10/21/2011	At the 42nd Street stream crossing		Crooked Creek
12/22/2011			762.7	feet	NGVD29	568,830.00	ATS	FW-26132-0	NAD83	-1	4,412,236.00	The existing three-span precast concrete chanr	3/9/2011	At the 57th Street stream crossing;		Crooked Creek
2/20/2012			728.0	feet	NGVD29	567,586.00	ATS	FW-26427-0	NAD83	0	4,409,618.00	Approximately 180' of the stream's eroded east	10/3/2011	4370 Cooper Road; along the east		Crooked Creek
10/31/2012			720.0	feet	NGVD29	567,992.00	ATS	FW-26865-0	NAD83	0	4,408,778.00	Approximately 300' of the eroded south stream	8/24/2012	3939 Cooper Road; beginning appr		Crooked Creek
2/8/2016			764.8	feet	NAVD88	569,356.00	ATS	FW-28171-0	NAD83	0	4,413,060.00	The superstructure of the existing 3-span bridge	10/27/2015	At the Fox Hill Drive stream crossir		Crooked Creek
2/8/2016			764.8	feet	NAVD88	569,423.00	ATS	FW-28172-0	NAD83	0	4,413,115.00	The superstructure of the existing 3-span bridge	10/27/2015	At the Grandview Drive stream cro		Crooked Creek
4/17/2019			704.8	feet	NAVD88	568,400.00	ATS	FW-29688-0	NAD83	0	4,407,821.00	A multi-use trail will be constructed along Cold	11/14/2018	Beginning at the West 30th Street a		Crooked Creek
7/9/2019			703.9	feet	NAVD88	568,425.00	ATS	FW-29772-0	NAD83	0	4,407,822.00	The bridge railing and concrete sidewalk of the	1/24/2019	At the Cold Springs Road stream cr		Crooked Creek
7/9/2019			703.9	feet	NAVD88	568,425.00	ATS	FW-29772-0	NAD83	0	4,407,822.00	The bridge railing and concrete sidewalk of the	1/24/2019	At the Cold Springs Road stream cr		Crooked Creek
10/17/2019				feet		568,631.00	ATS	FW-29886-0	NAD83	0	4,415,330.00	Approximately 200' of eroded streambank will b	4/3/2019	Along the north bank beginning on		Crooked Creek
10/17/2019				feet		568,703.00	ATS	FW-29886-0	NAD83	0	4,415,567.00	Approximately 200' of eroded streambank will b	4/3/2019			Crooked Creek
4/29/2020			750.4	feet	NAVD88	568,641.00	ATS	FW-30227-0	NAD83	0	4,411,211.00	The existing two-span bridge will be replaced wi	11/11/2019	At the Knollton Road c FEMA Flood		Crooked Creek
4/29/2020			749.5	feet	NAVD88	568,641.00	ATS	FW-30227-0	NAD83	0	4,411,211.00	The existing two-span bridge will be replaced wi	11/11/2019	At the Knollton Road c FEMA Flood		Crooked Creek
5/20/2021				feet		568,198.00	ATS	FW-30838-0	NAD83	0	4,407,845.00	An open grass field will be regraded and convert	12/9/2020	Approximately 700' west of the Col		Crooked Creek
8/29/2022				feet		568,419.00	ATS	FW-31664-0	NAD83	0	4,407,819.00	Bridge No. 49-1715F, which carries Cold Spring	6/10/2022	Approximately 2,800' north of the i		Crooked Creek

Example

Create the Corrected Effective Model



Example

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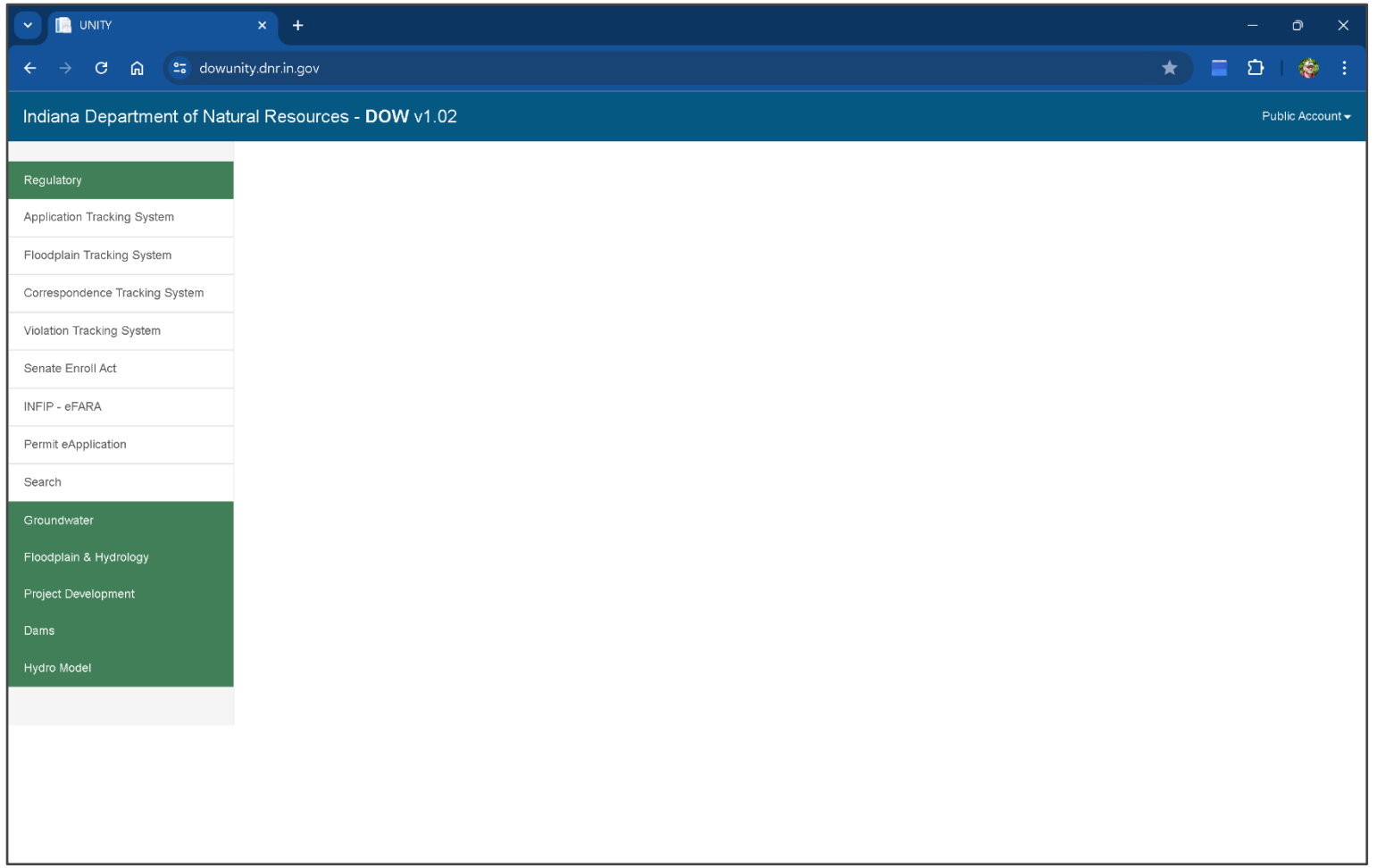

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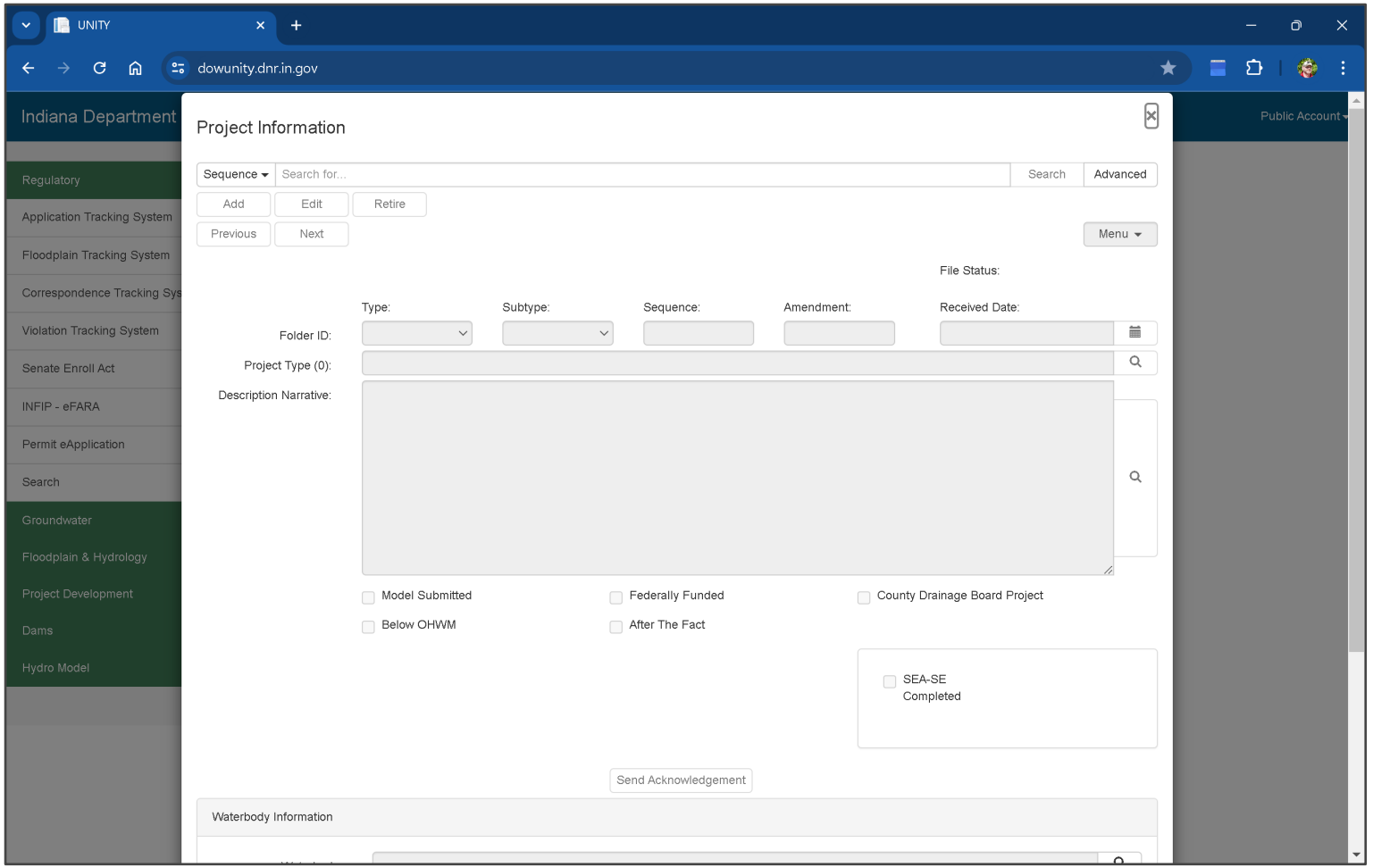

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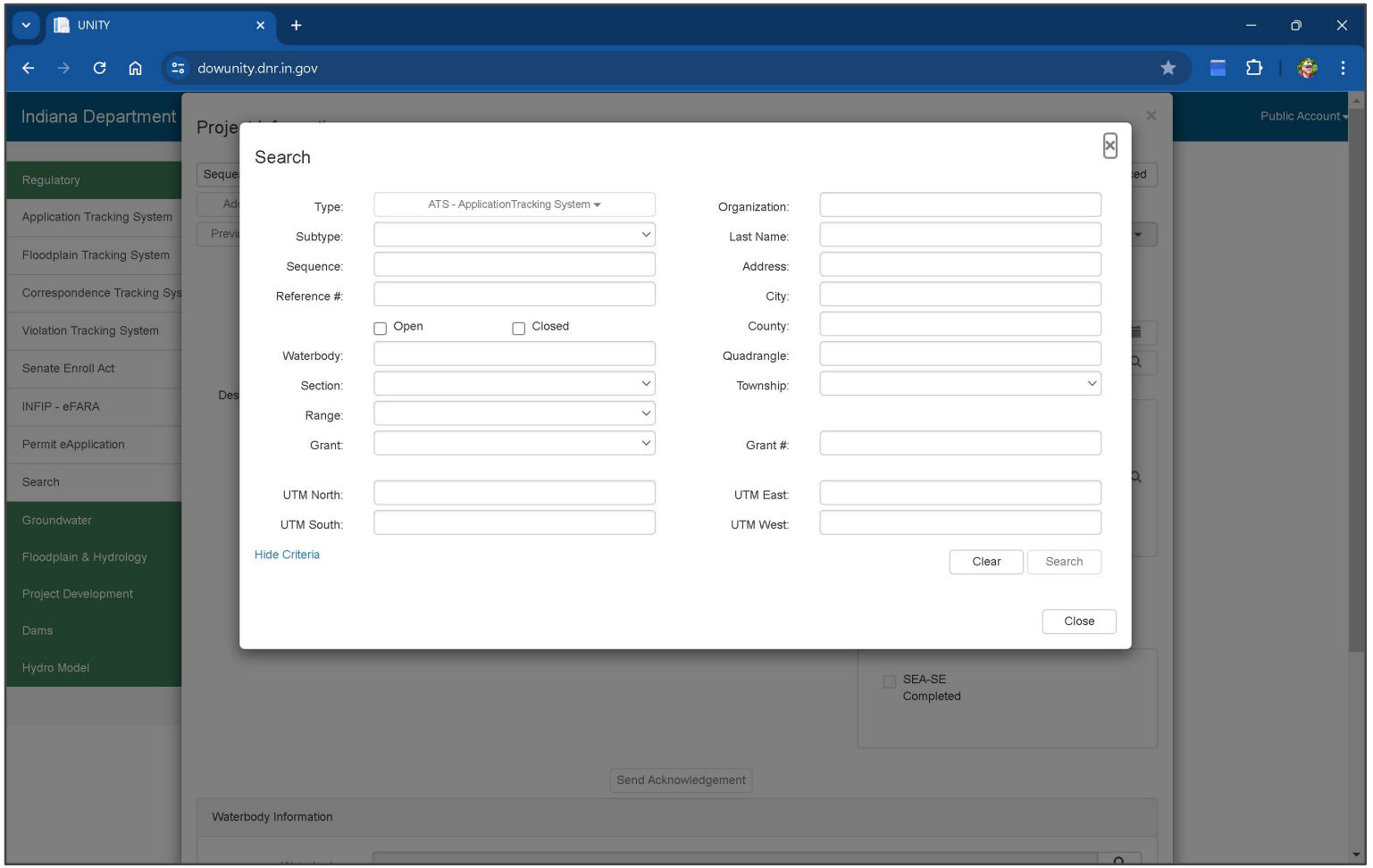

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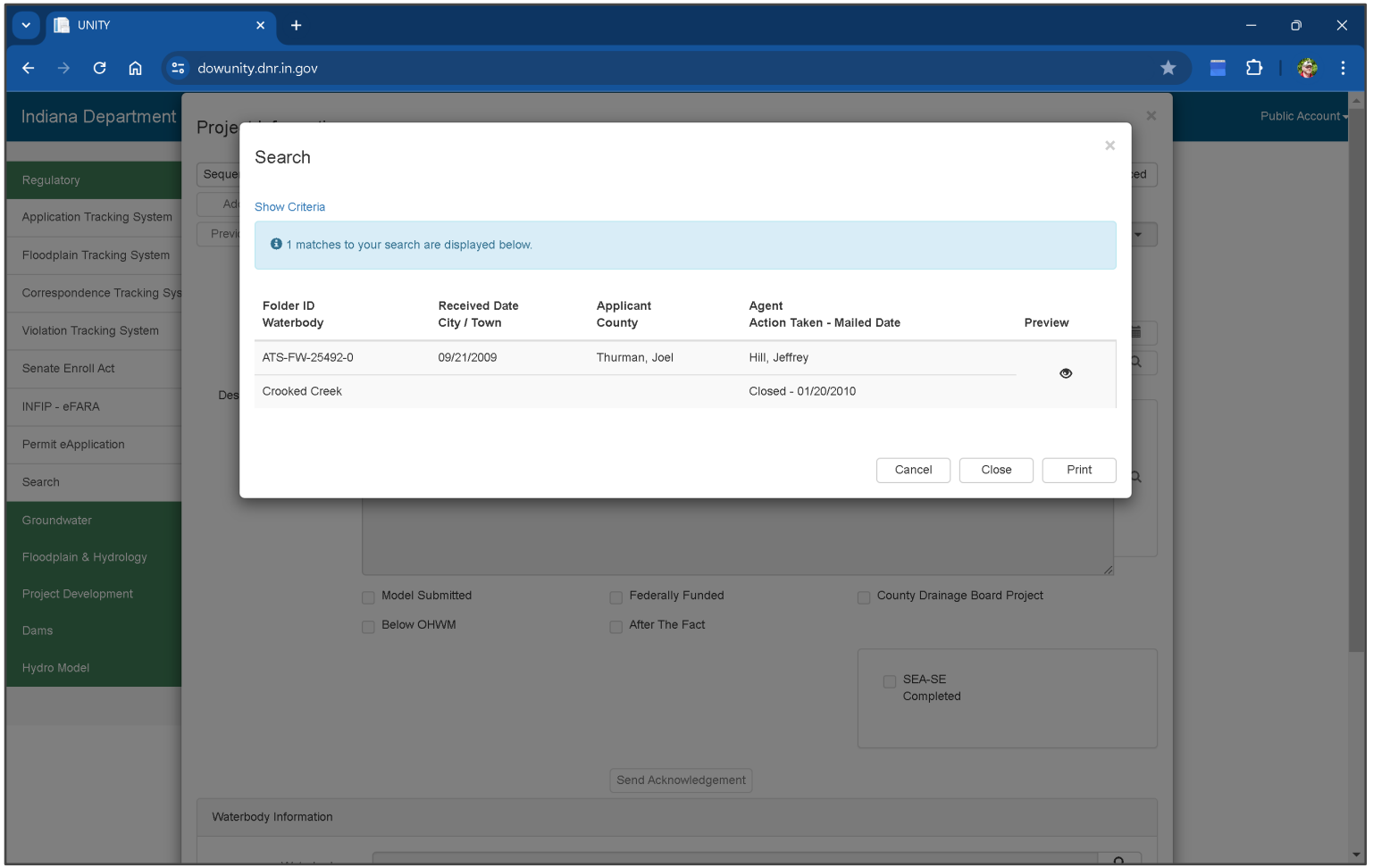

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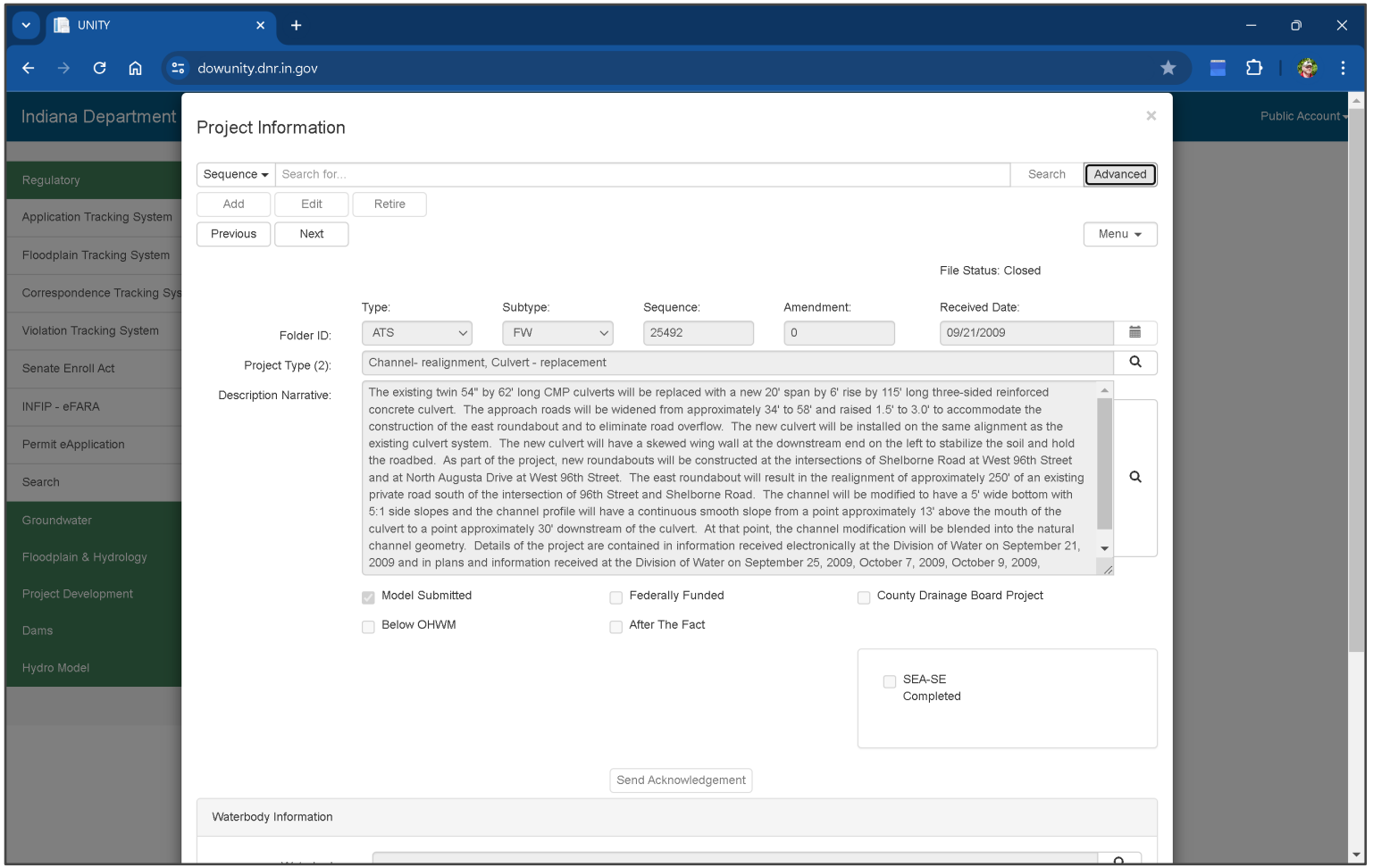

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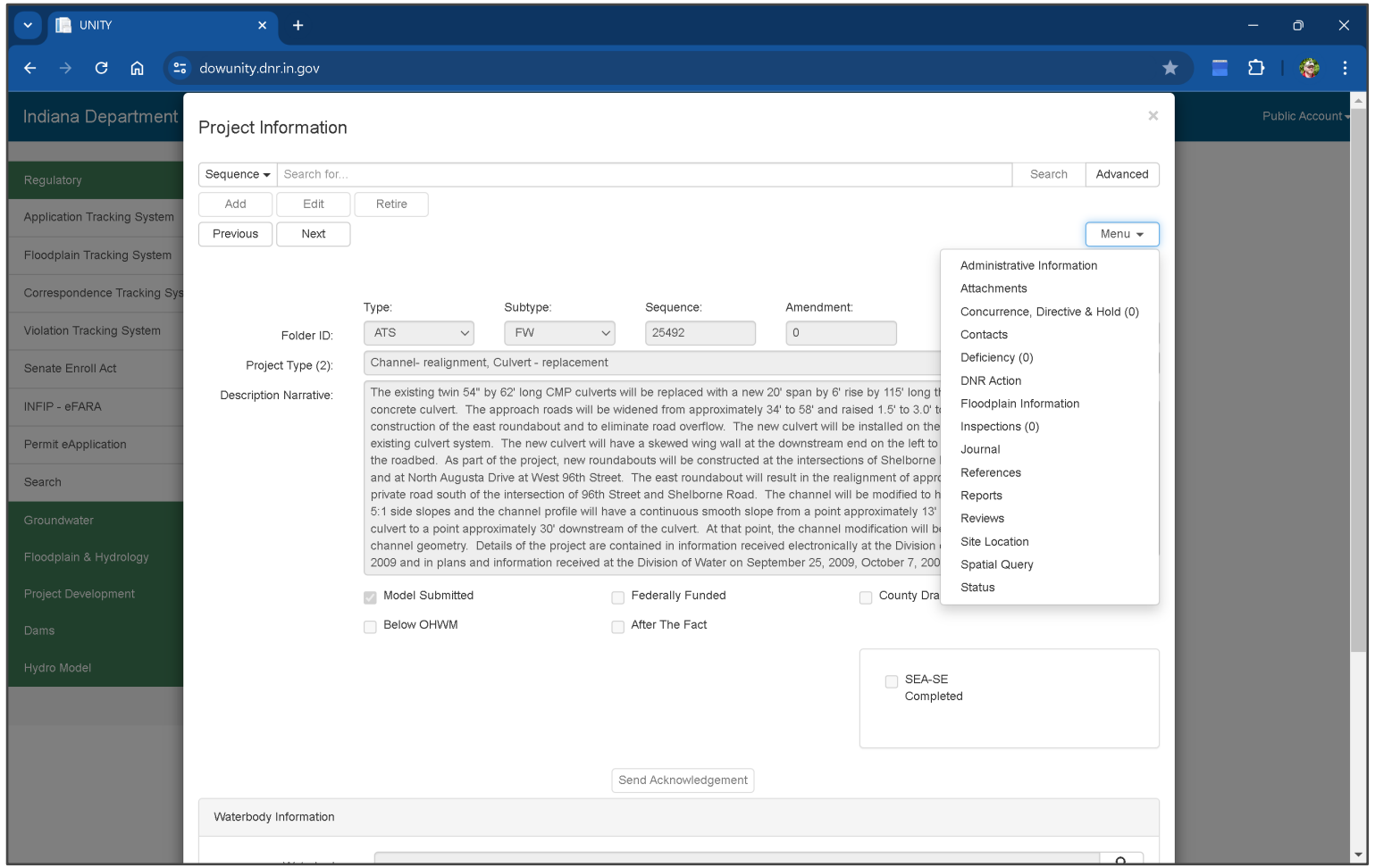
Example

Create the Corrected Effective Model



Example

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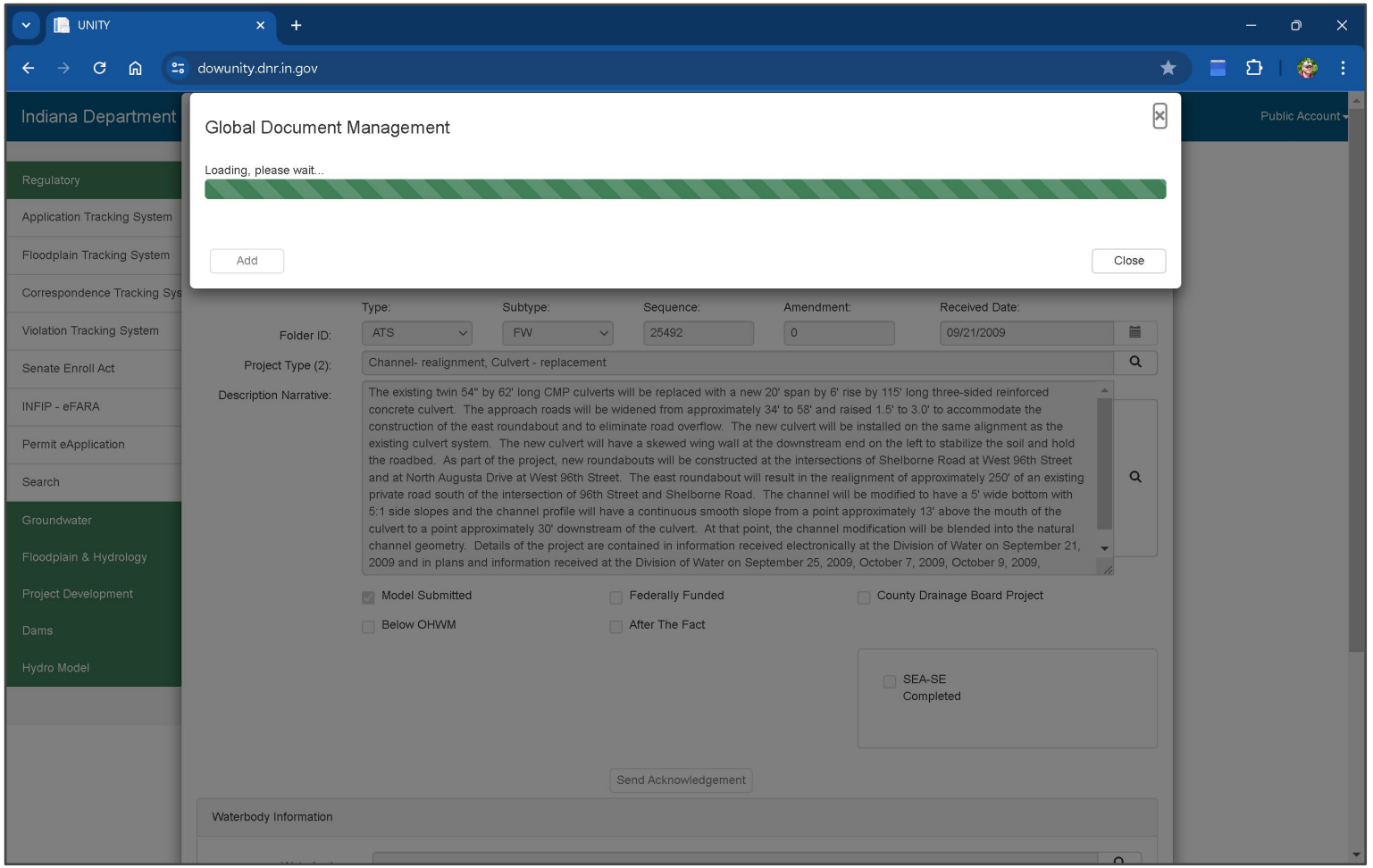

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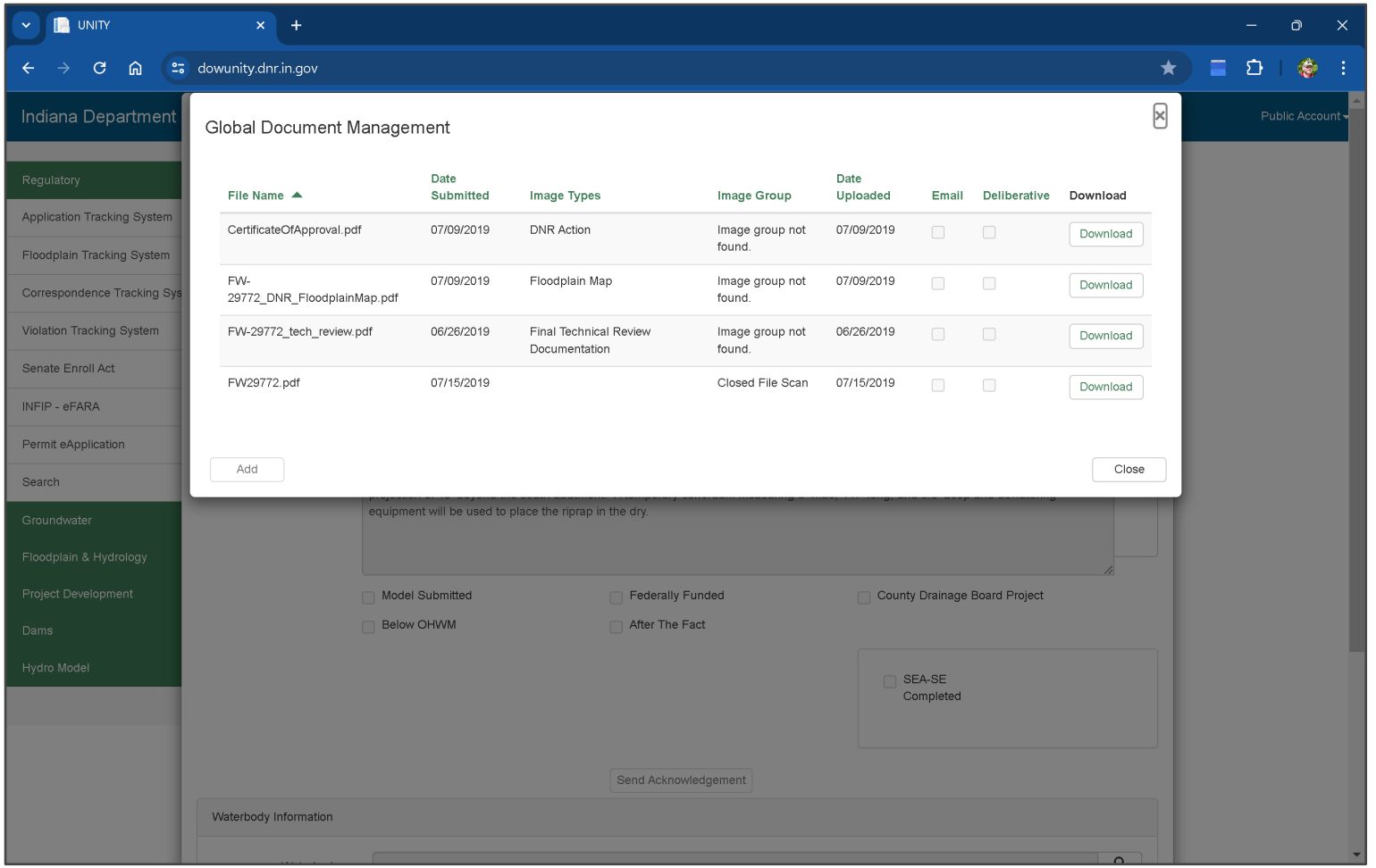

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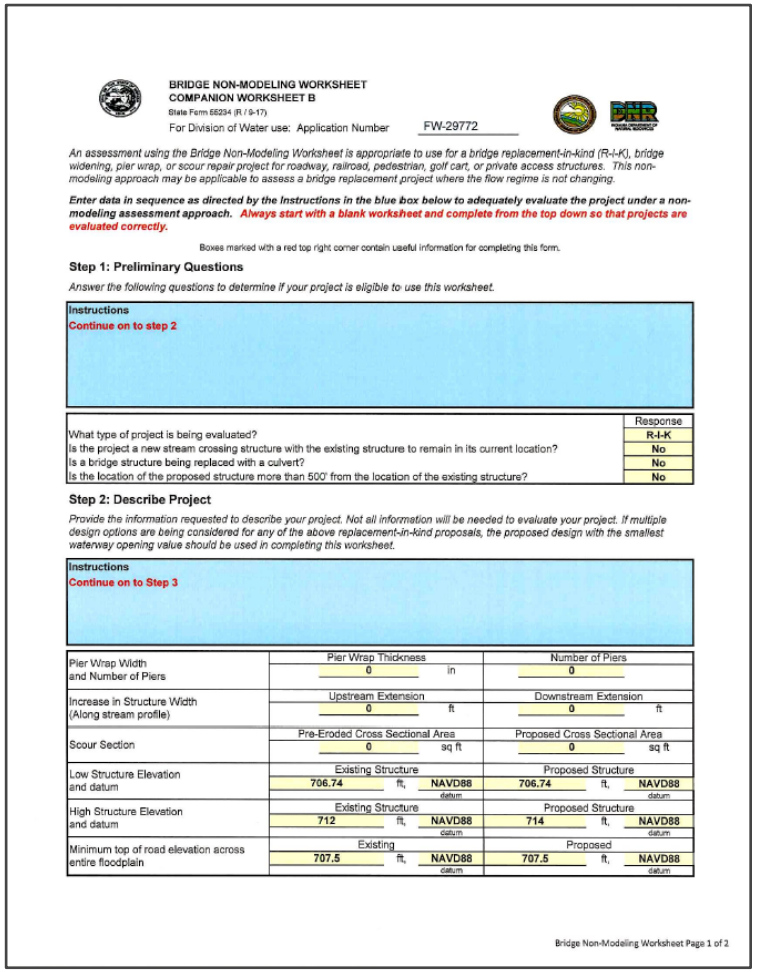


BRIDGE NON-MODELING WORKSHEET
COMPANION WORKSHEET B
State Form 55234 (R / 9-17)
For Division of Water use: Application Number FW-29772

An assessment using the Bridge Non-Modeling Worksheet is appropriate to use for a bridge replacement-in-kind (R-I-K), bridge widening, pier wrap, or scour repair project for roadway, railroad, pedestrian, golf cart, or private access structures. This non-modeling approach may be applicable to assess a bridge replacement project where the flow regime is not changing.

Enter data in sequence as directed by the Instructions in the blue box below to adequately evaluate the project under a non-modeling assessment approach. Always start with a blank worksheet and complete from the top down so that projects are evaluated correctly.

Boxes marked with a red top right corner contain useful information for completing this form.

Step 1: Preliminary Questions

Answer the following questions to determine if your project is eligible to use this worksheet.

Instructions
Continue on to step 2

	Response
What type of project is being evaluated?	R-I-K
Is the project a new stream crossing structure with the existing structure to remain in its current location?	No
Is a bridge structure being replaced with a culvert?	No
Is the location of the proposed structure more than 500' from the location of the existing structure?	No

Step 2: Describe Project

Provide the information requested to describe your project. Not all information will be needed to evaluate your project. If multiple design options are being considered for any of the above replacement-in-kind proposals, the proposed design with the smallest waterway opening value should be used in completing this worksheet.

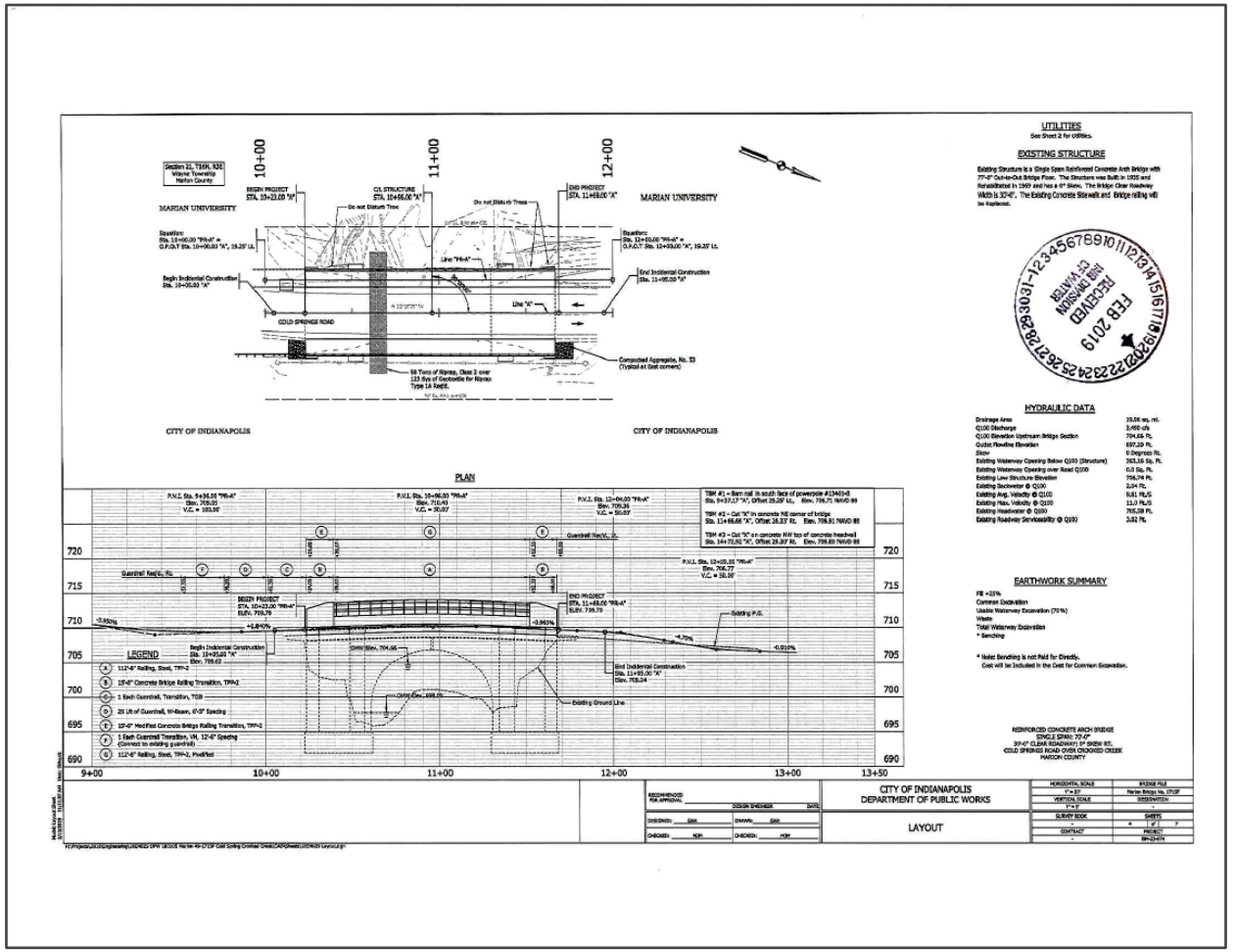
Instructions
Continue on to Step 3

Pier Wrap Width and Number of Piers	Pier Wrap Thickness: 0 in	Number of Piers: 0
Increase in Structure Width (Along stream profile)	Upstream Extension: 0 ft	Downstream Extension: 0 ft
Scour Section	Pre-Eroded Cross Sectional Area: 0 sq ft	Proposed Cross Sectional Area: 0 sq ft
Low Structure Elevation and datum	Existing Structure: 706.74 ft, NAVD88 datum	Proposed Structure: 706.74 ft, NAVD88 datum
High Structure Elevation and datum	Existing Structure: 712 ft, NAVD88 datum	Proposed Structure: 714 ft, NAVD88 datum
Minimum top of road elevation across entire floodplain	Existing: 707.5 ft, NAVD88 datum	Proposed: 707.5 ft, NAVD88 datum

Bridge Non-Modeling Worksheet Page 1 of 2

Example

Create the Corrected Effective Model



Example

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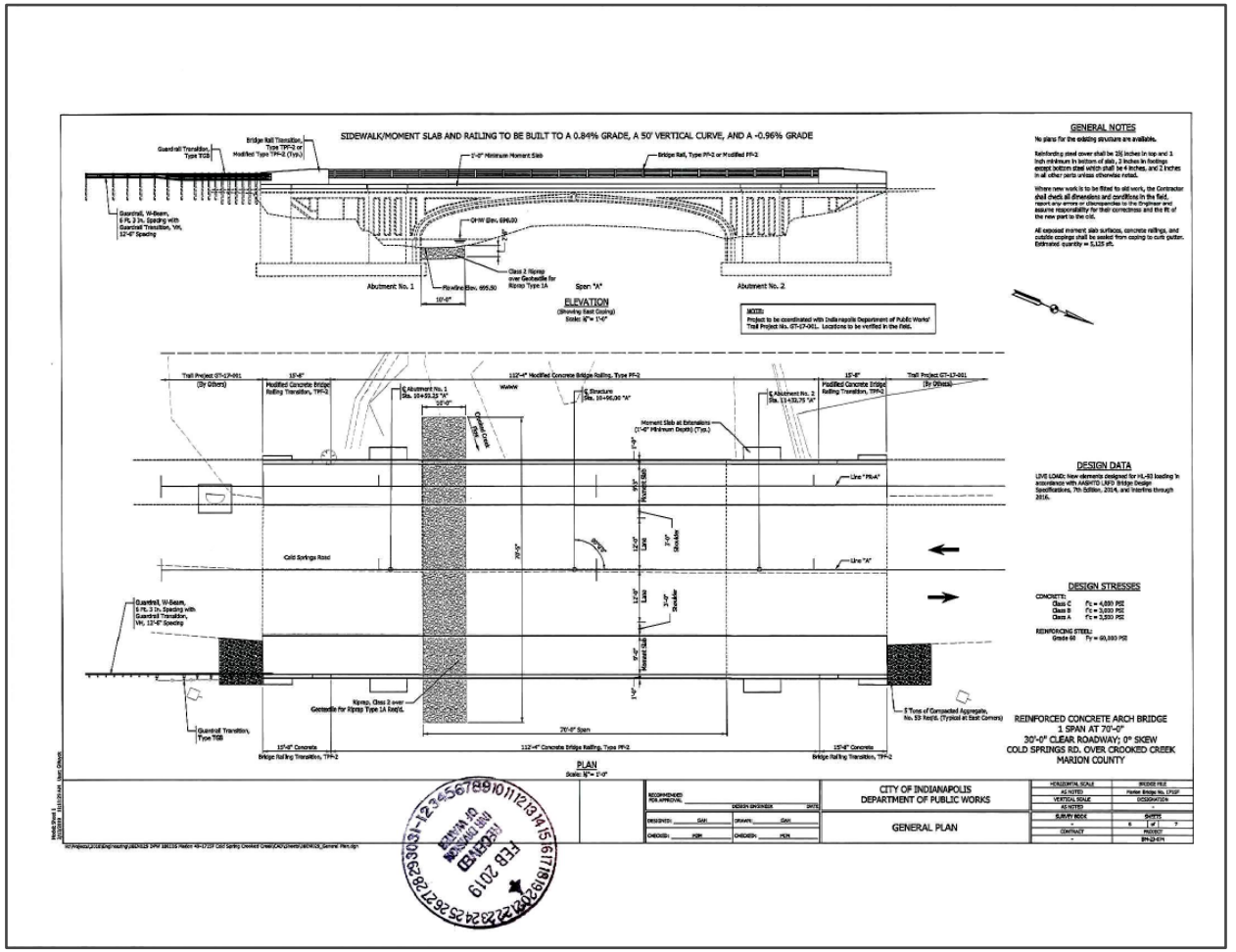

Example

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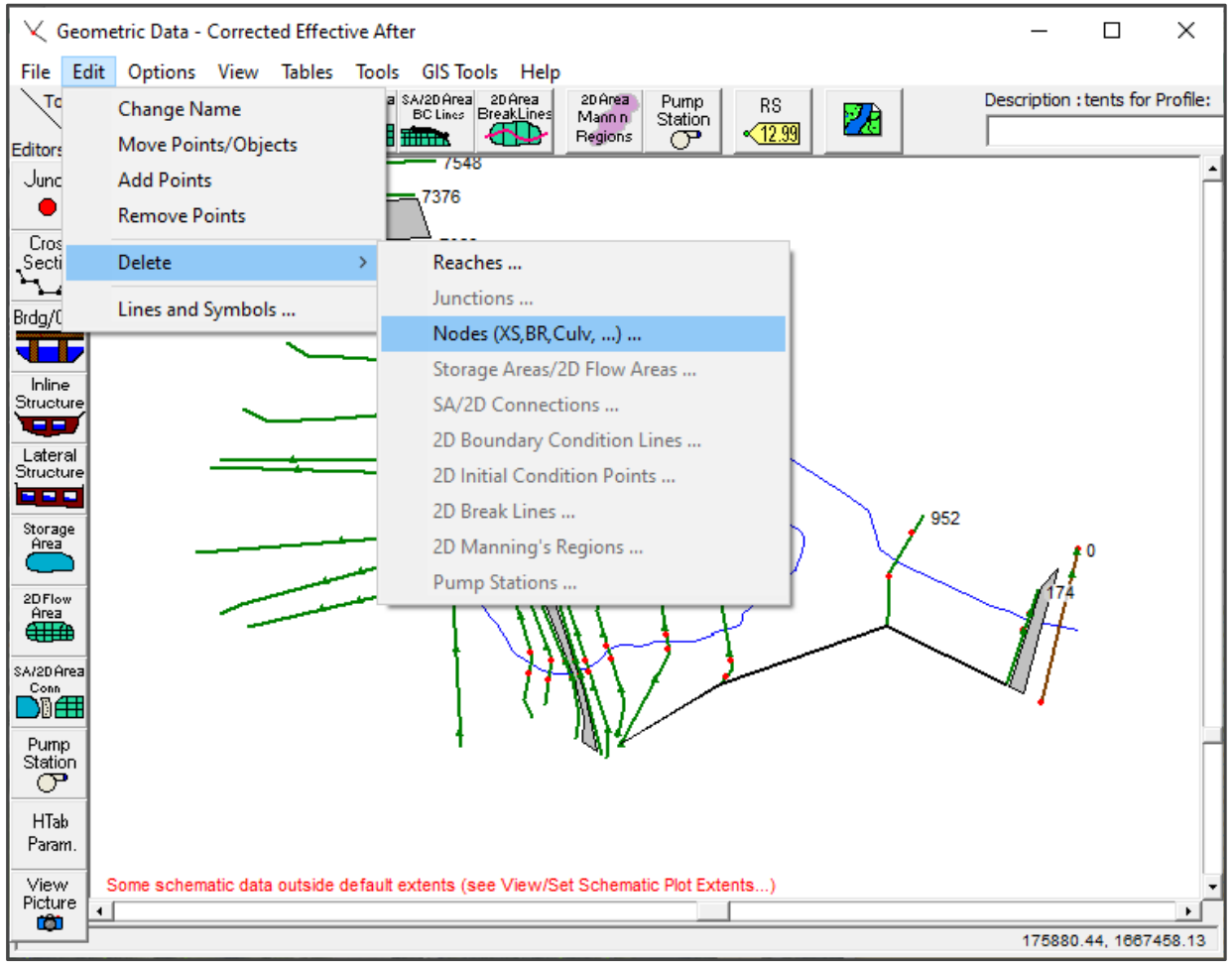

Example

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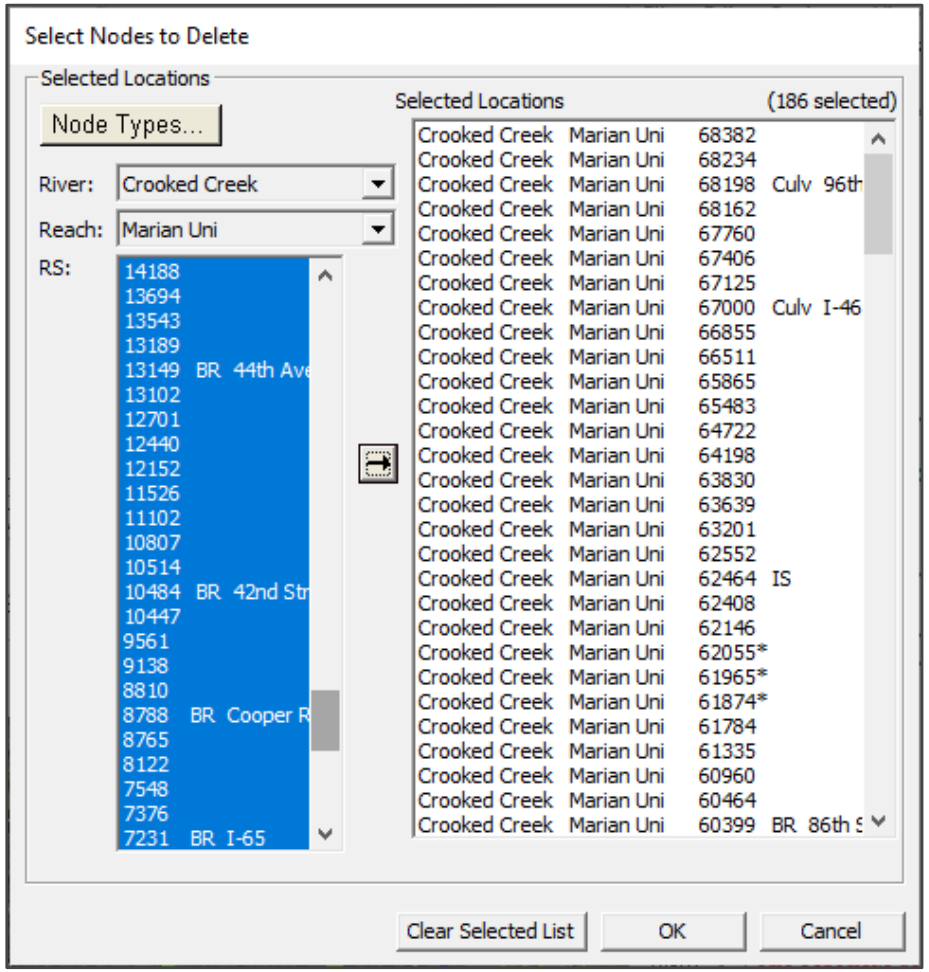

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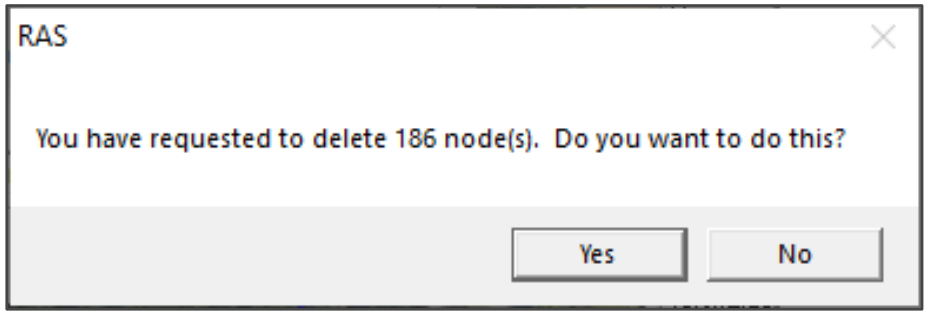

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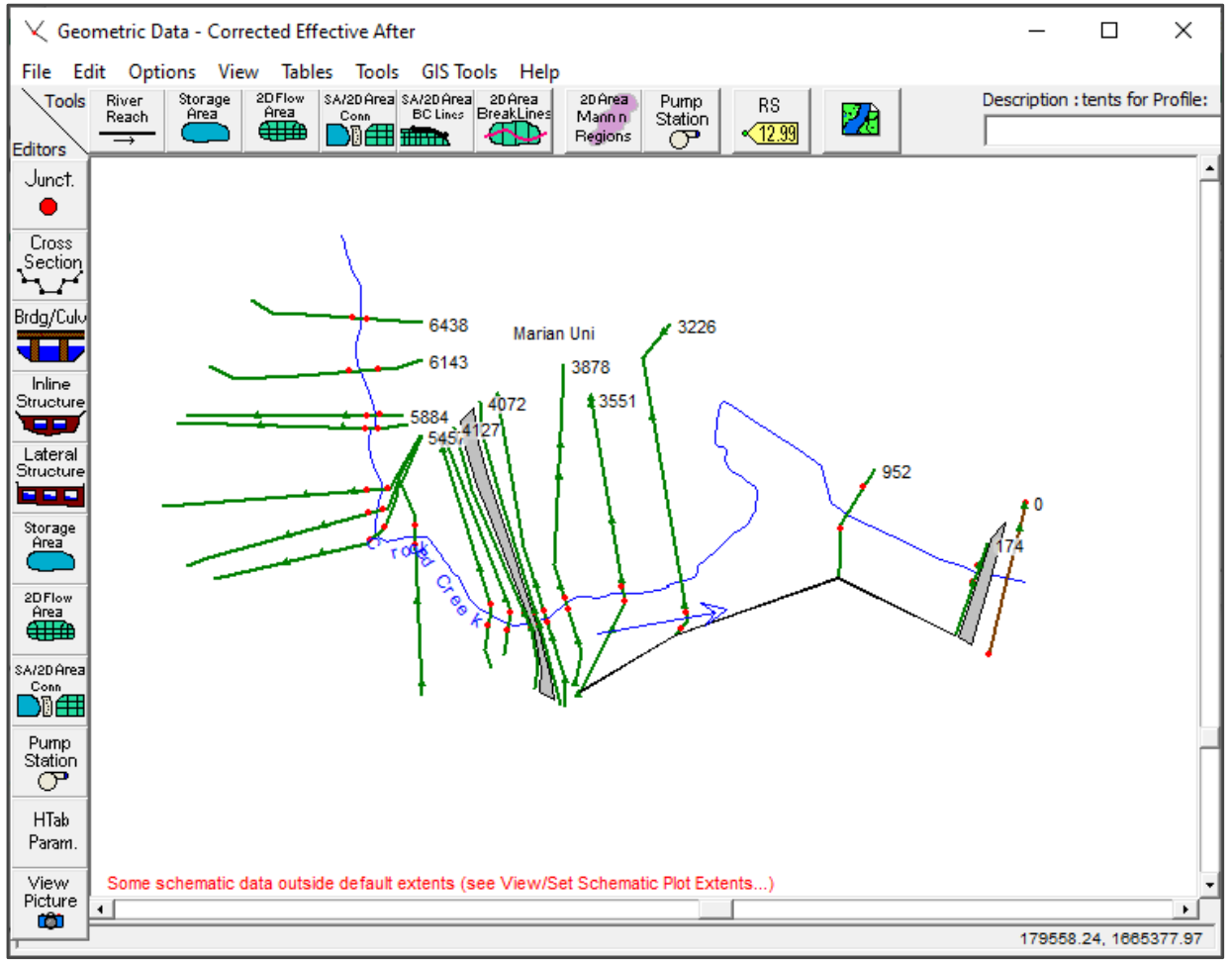

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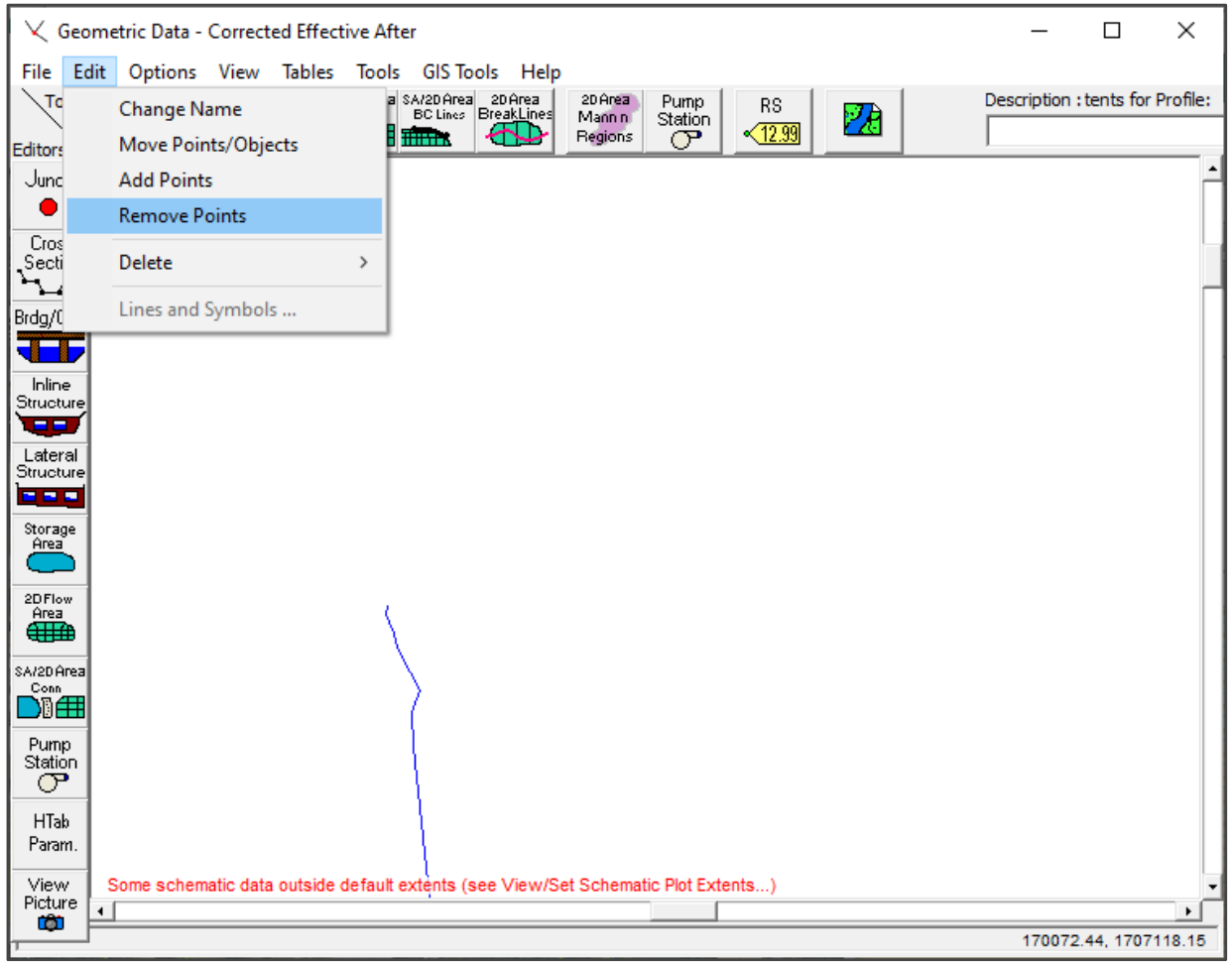

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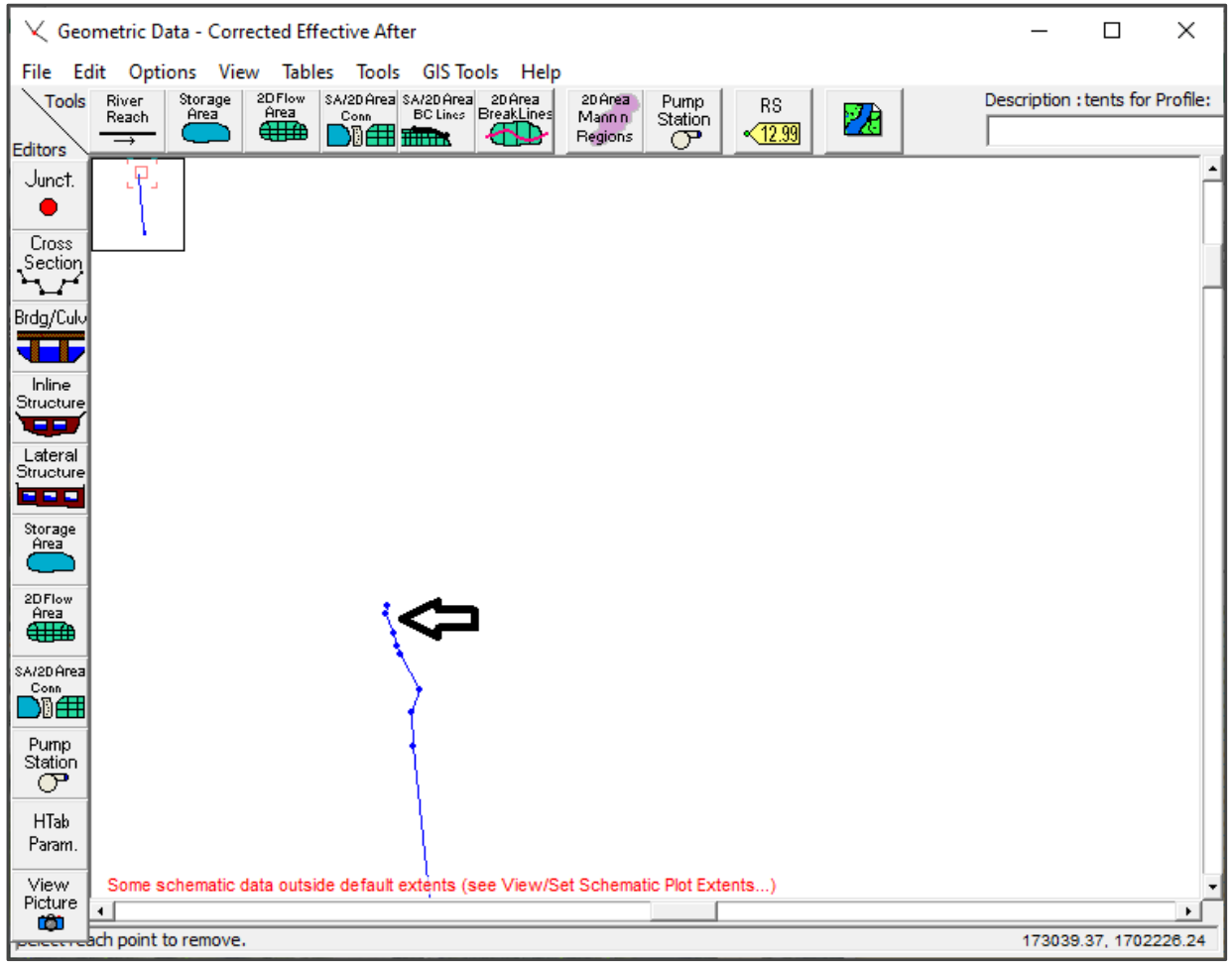

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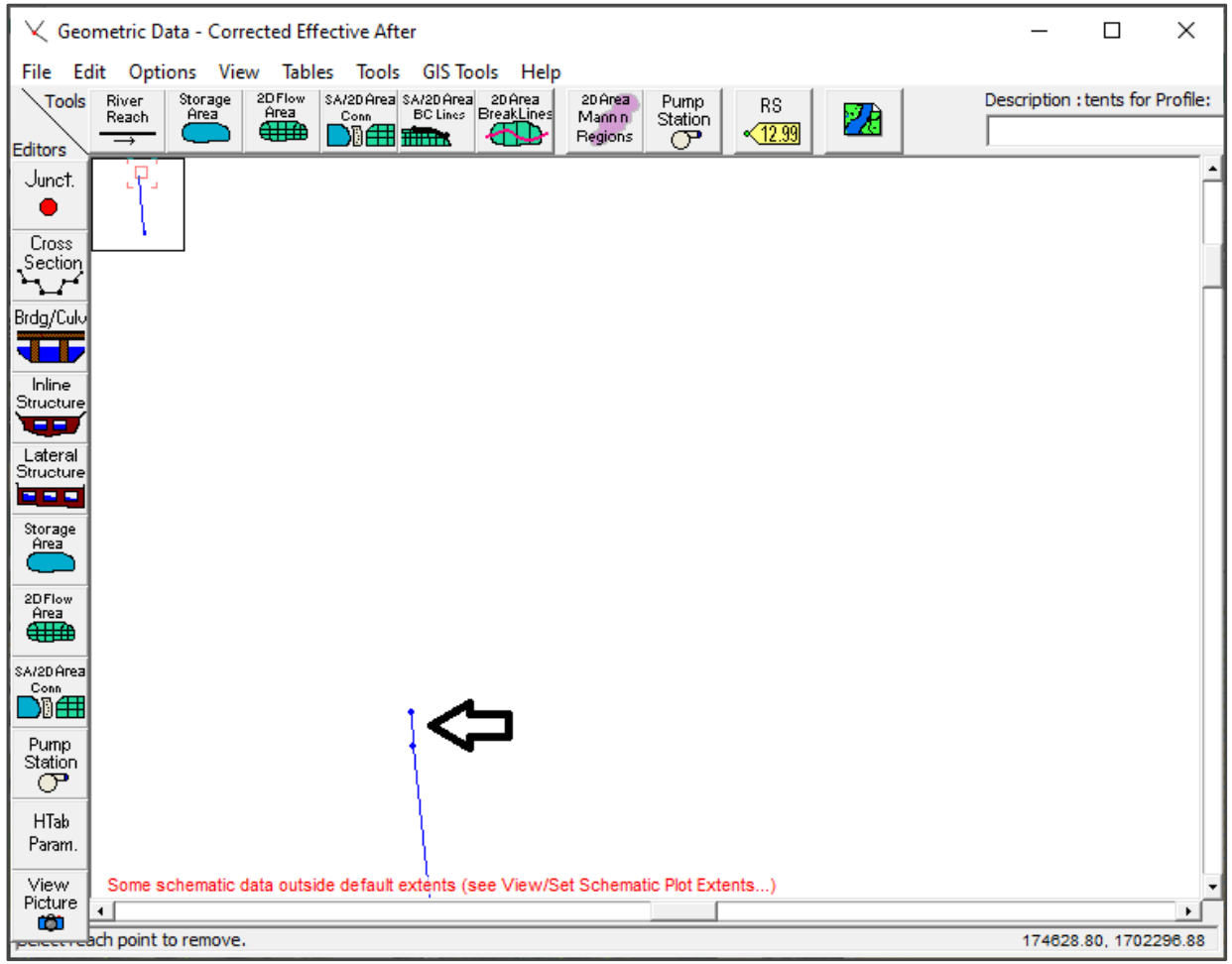

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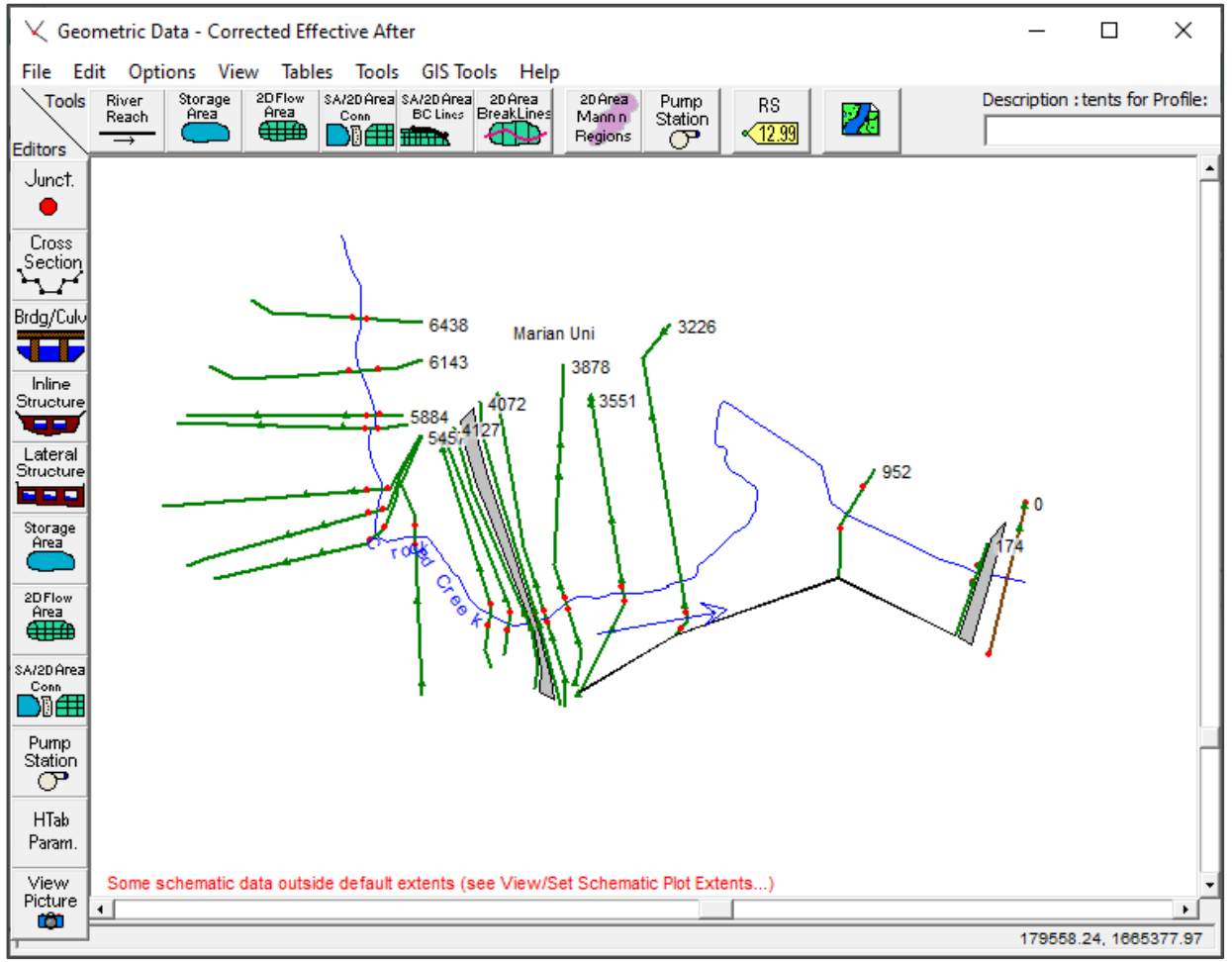

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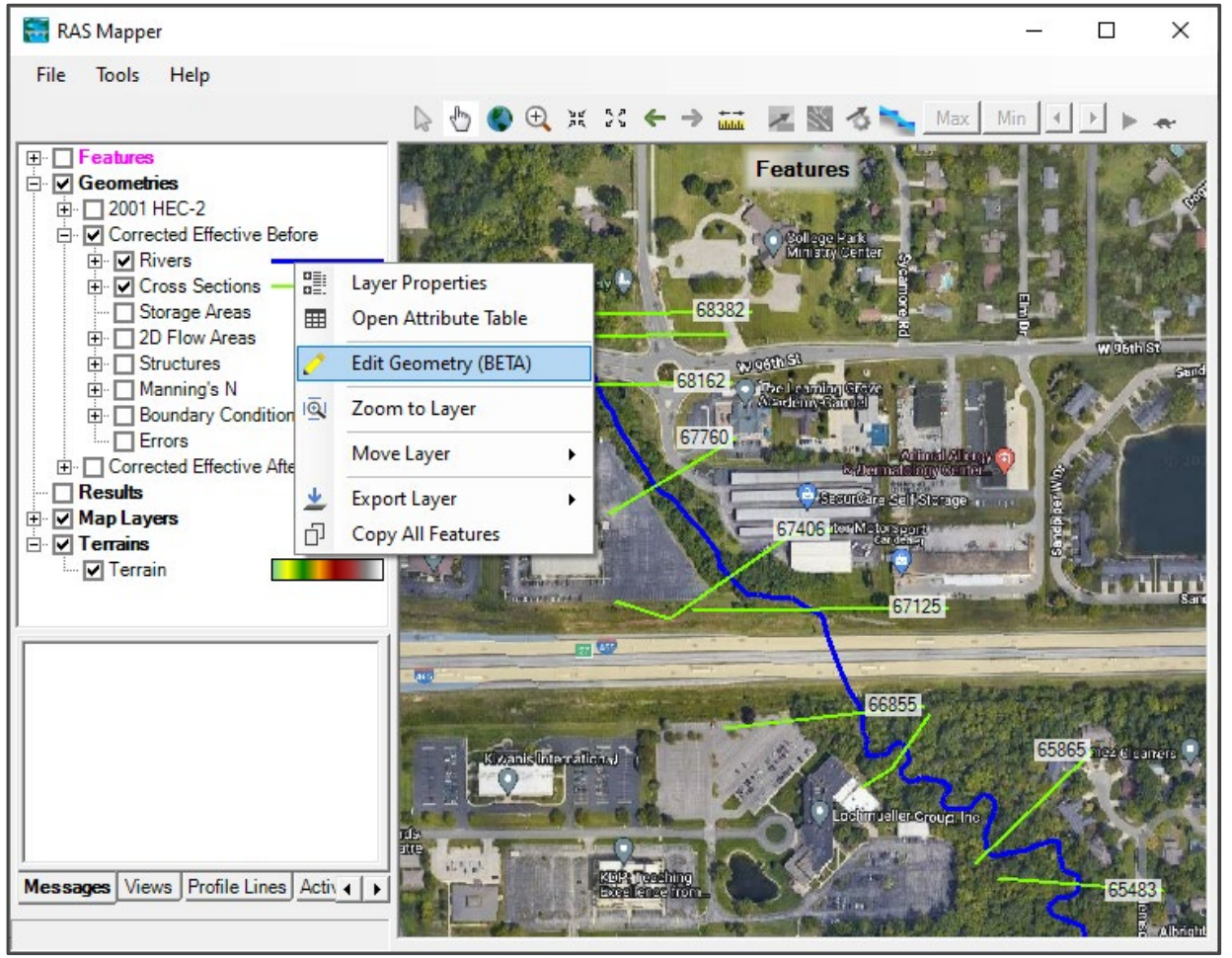

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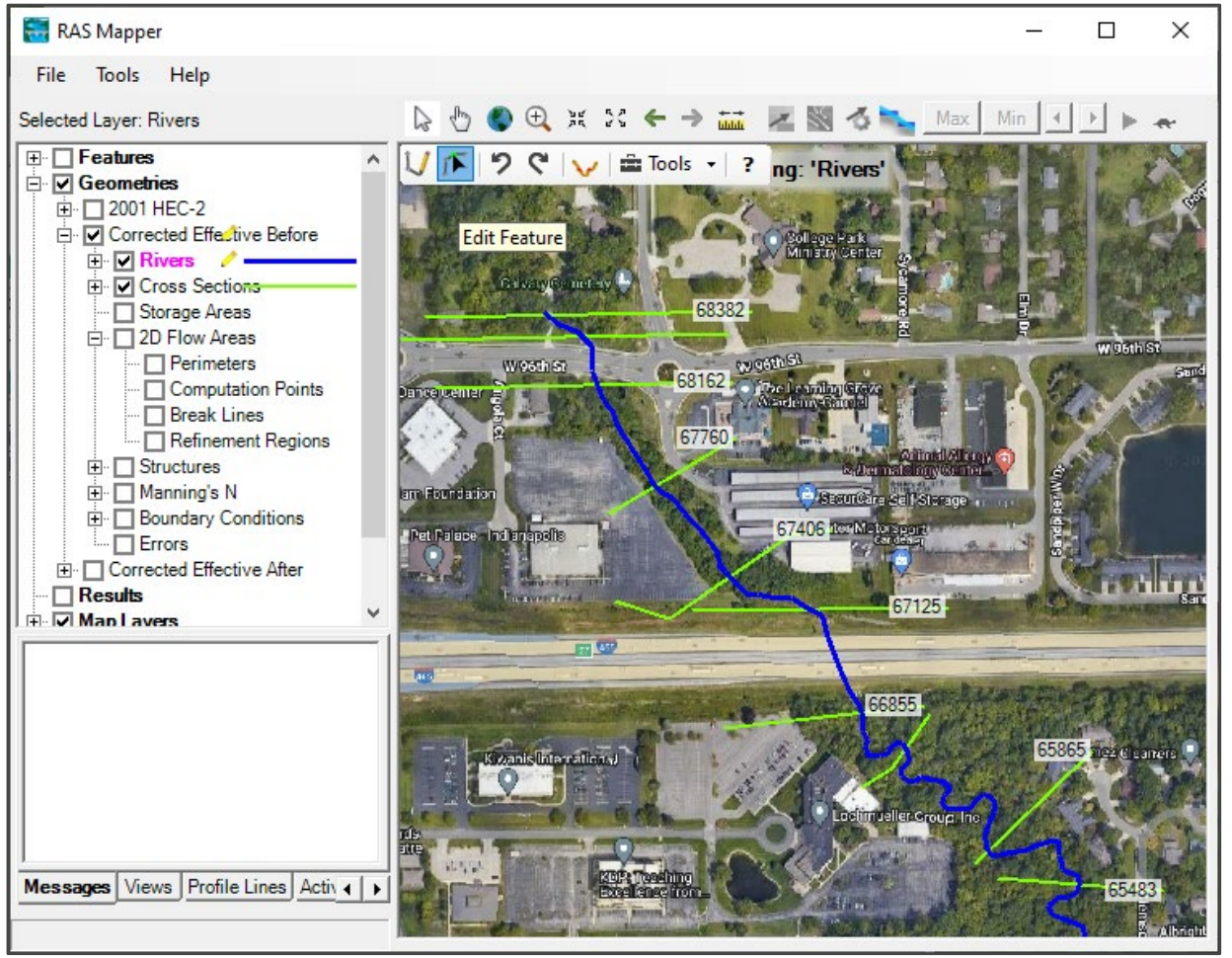

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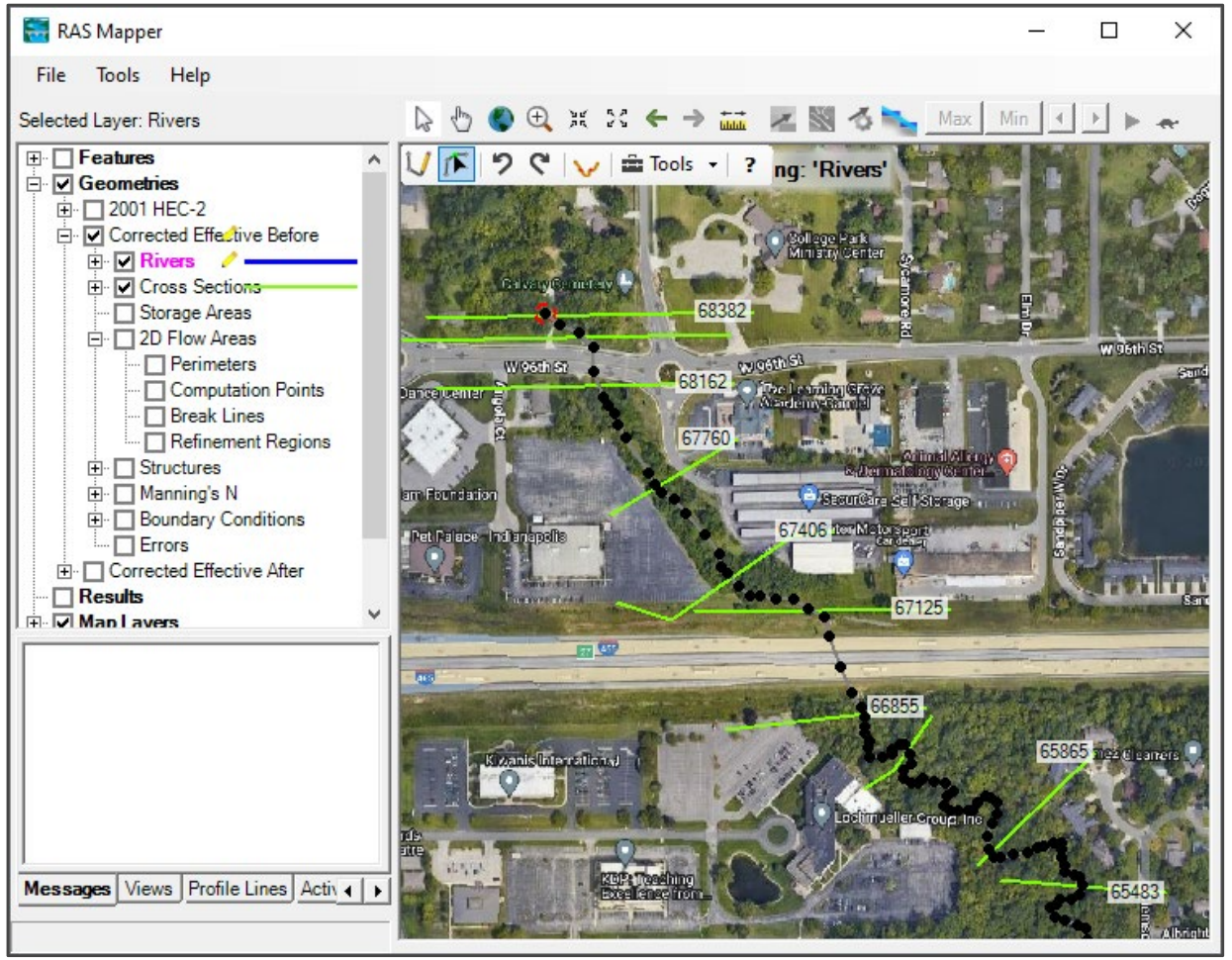

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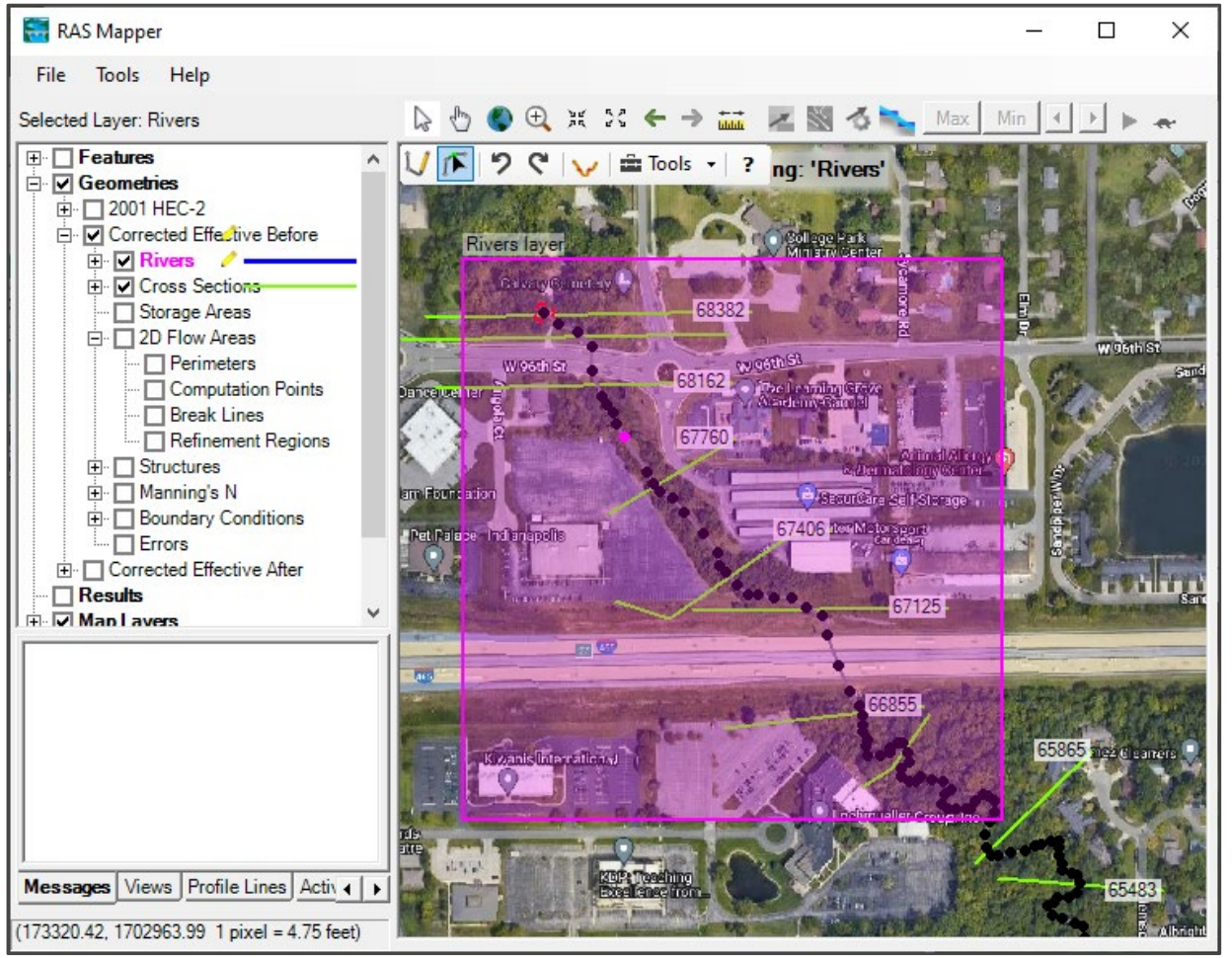

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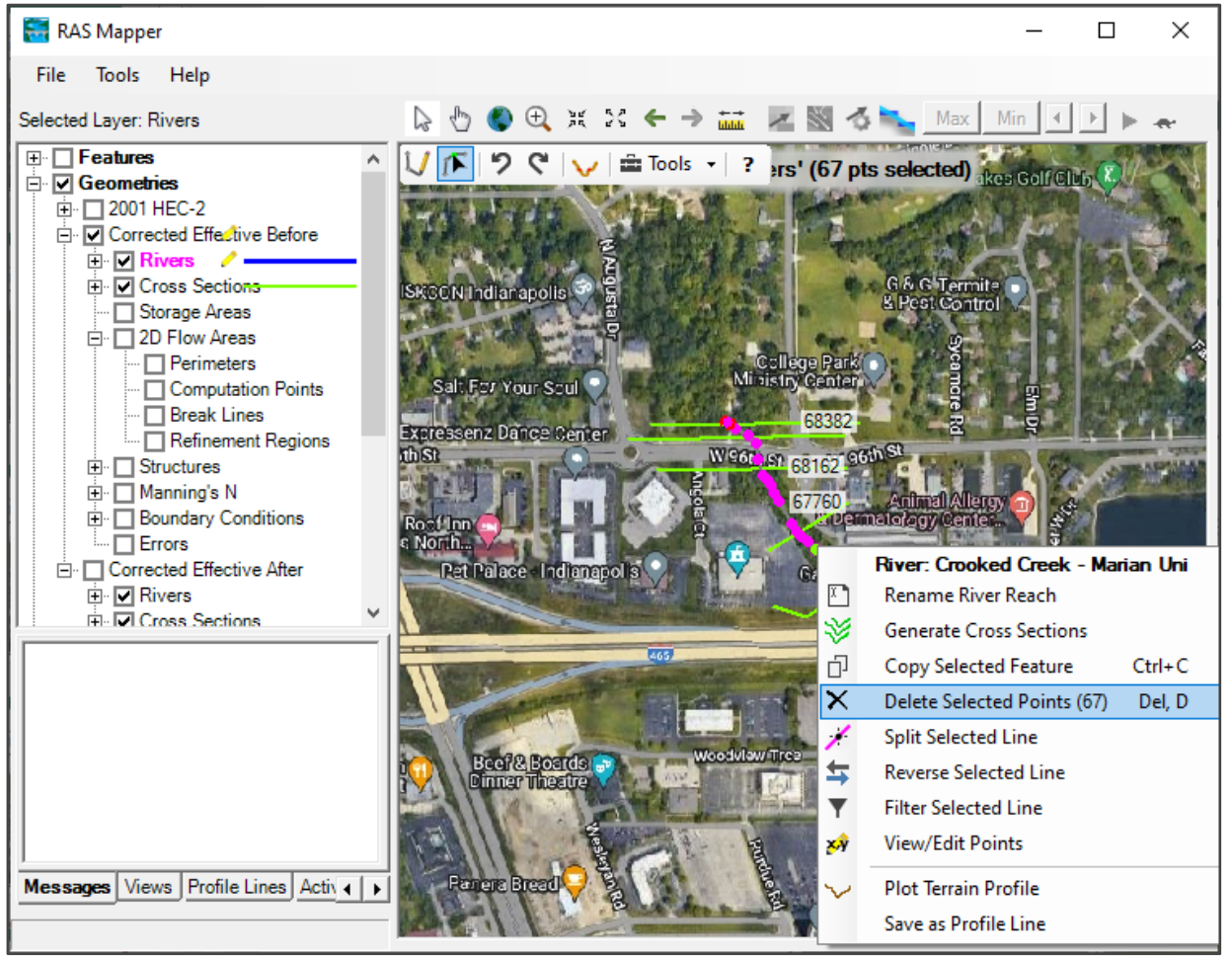

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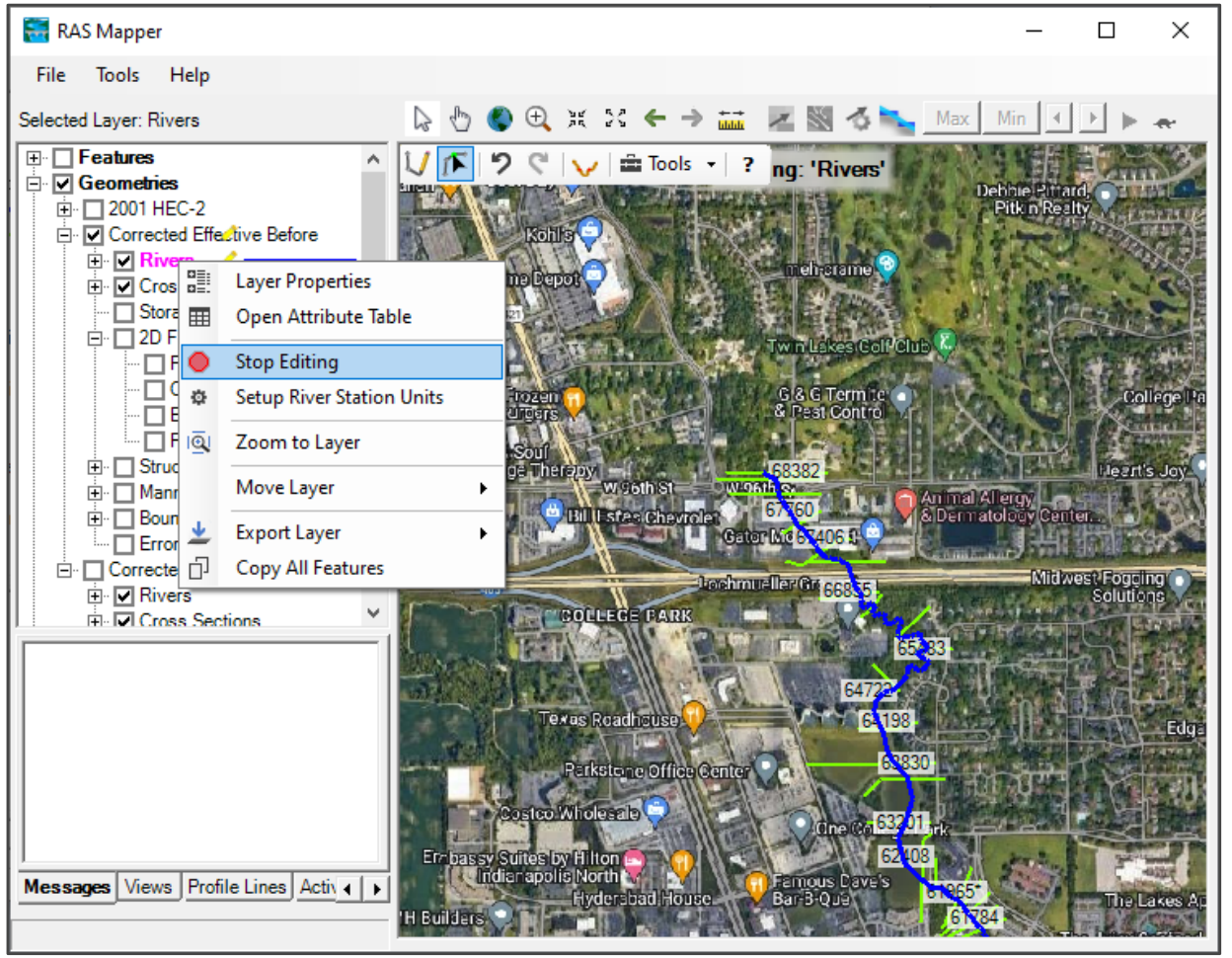

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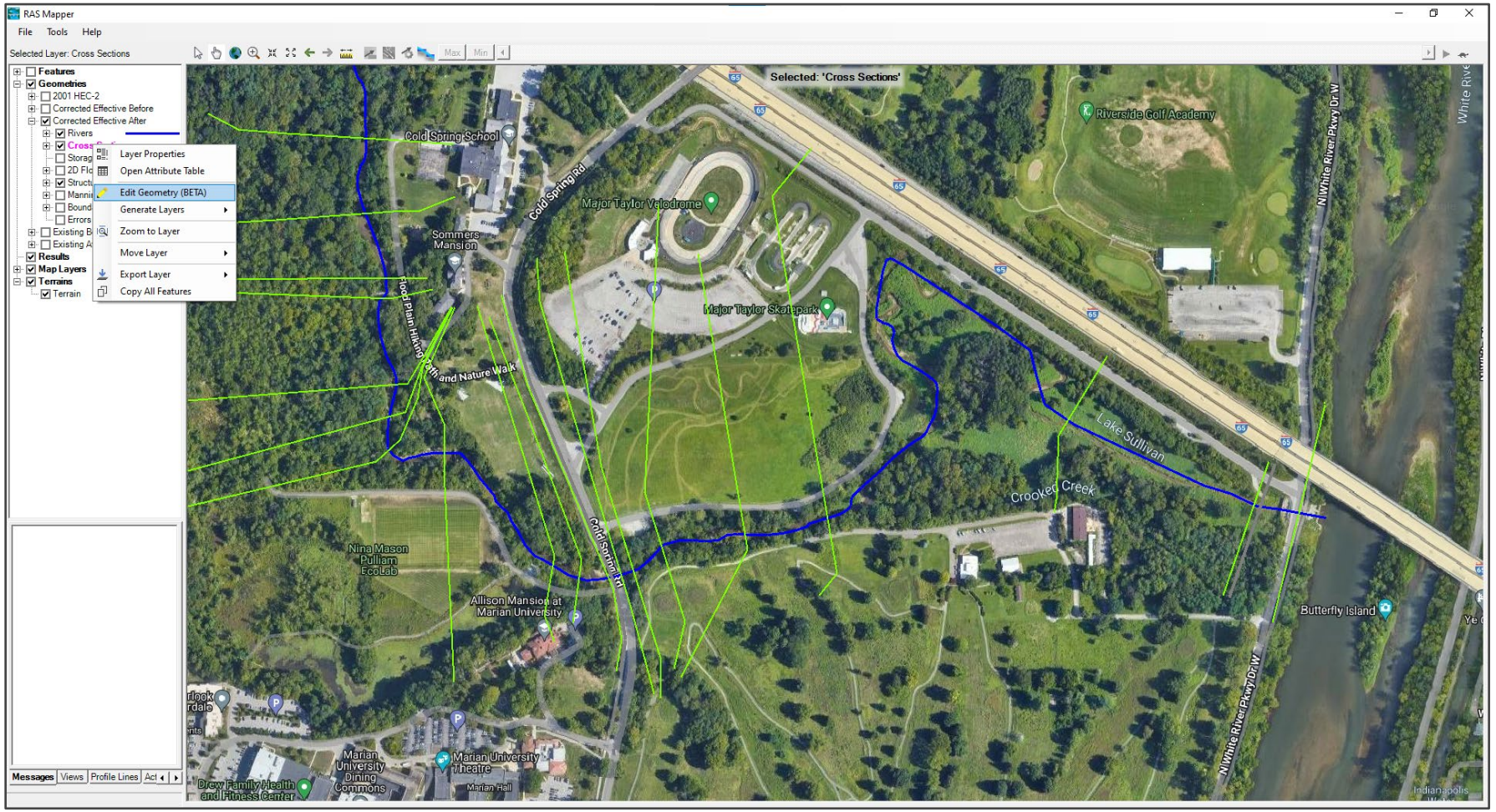

DNR Indiana Department of Natural Resources

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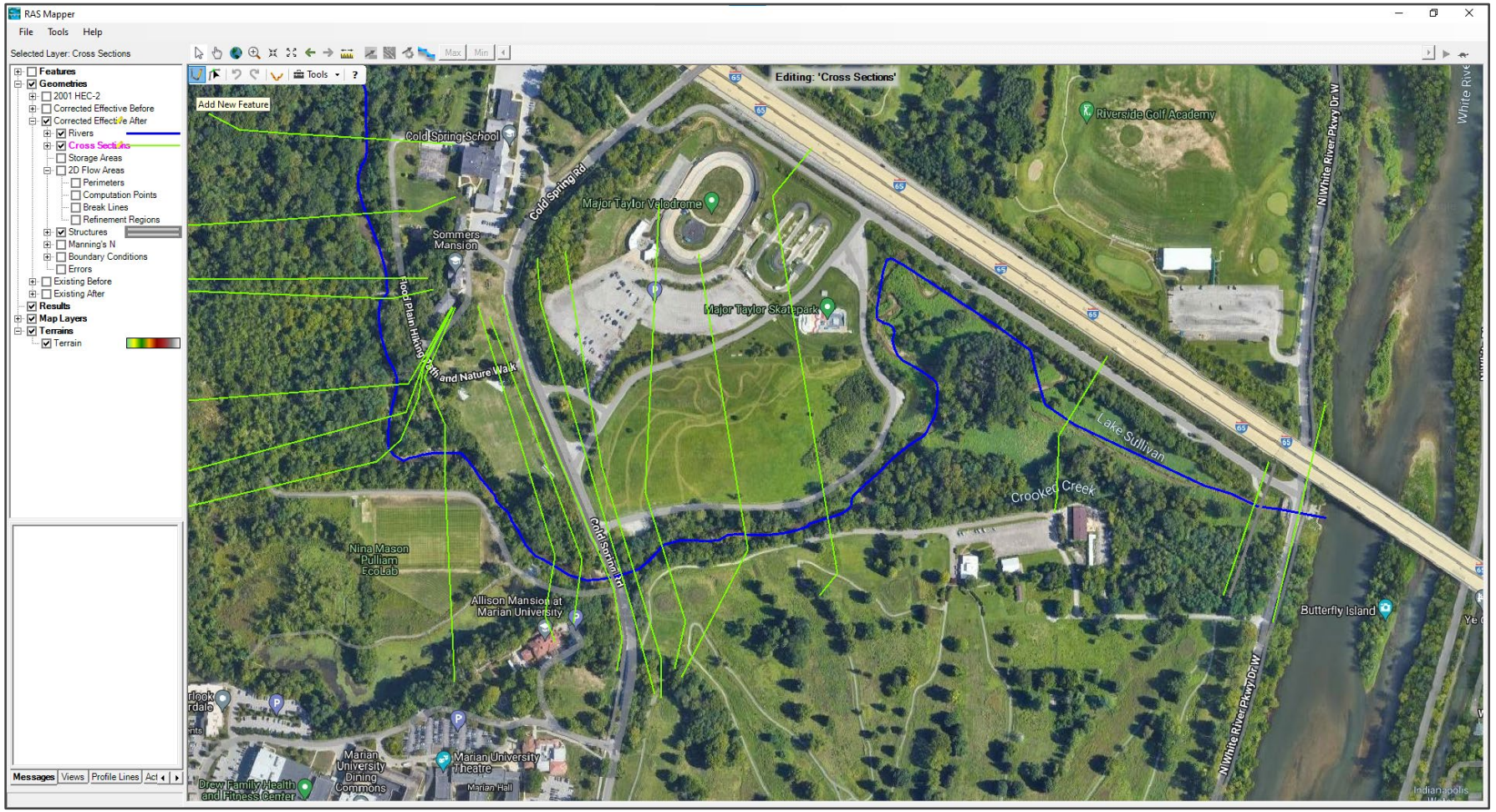
Example

Create the Corrected Effective Model



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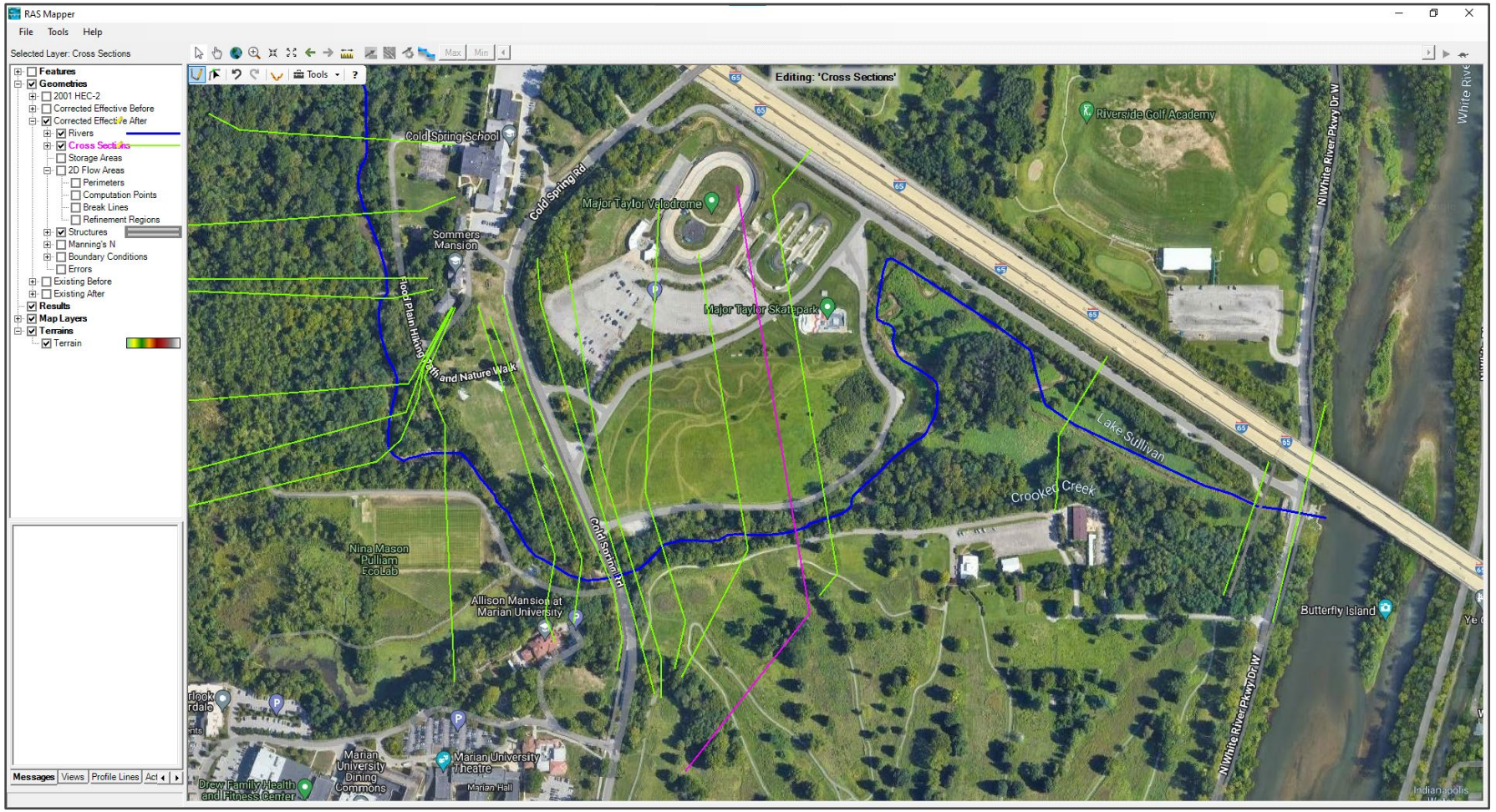

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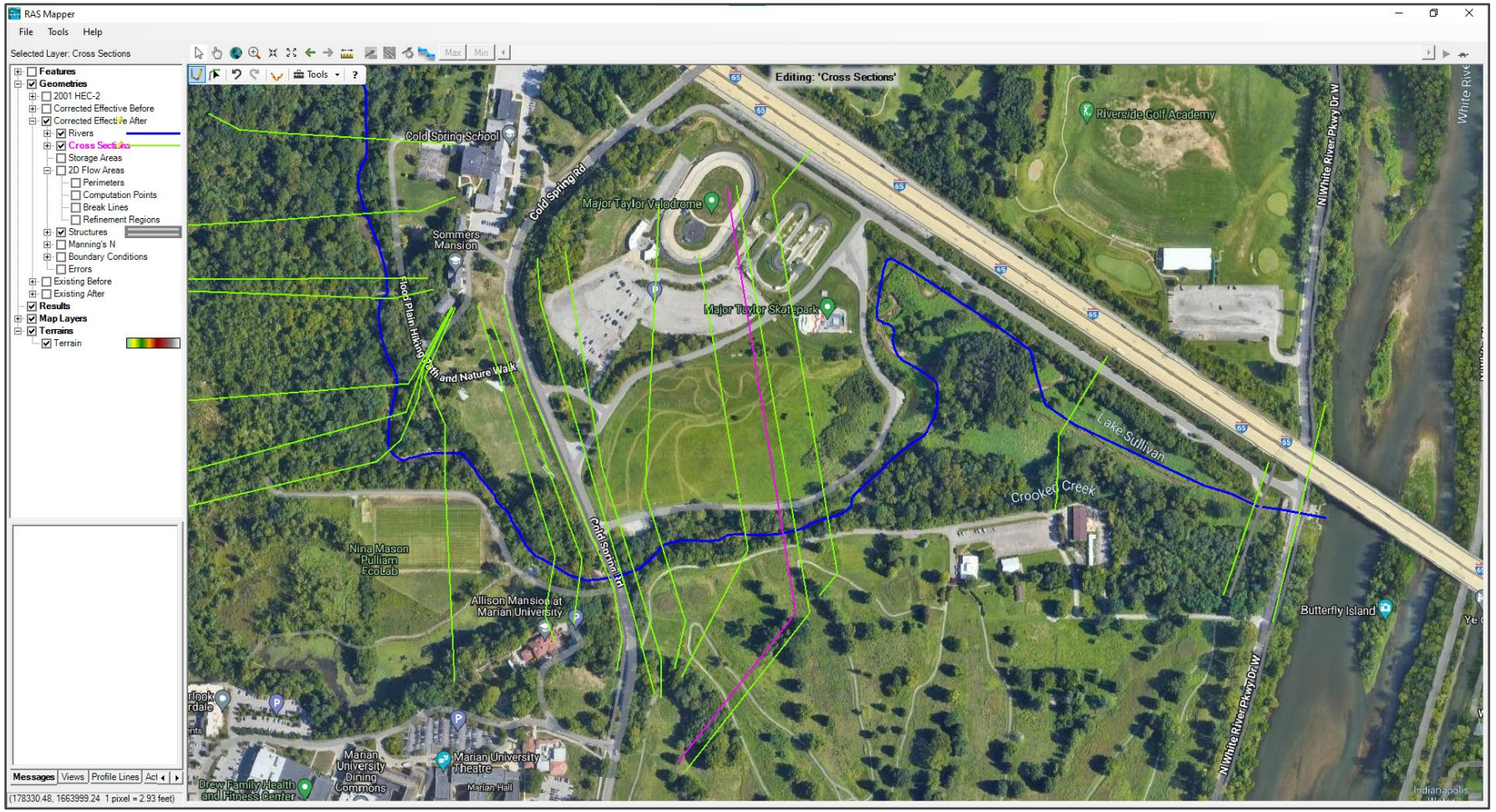

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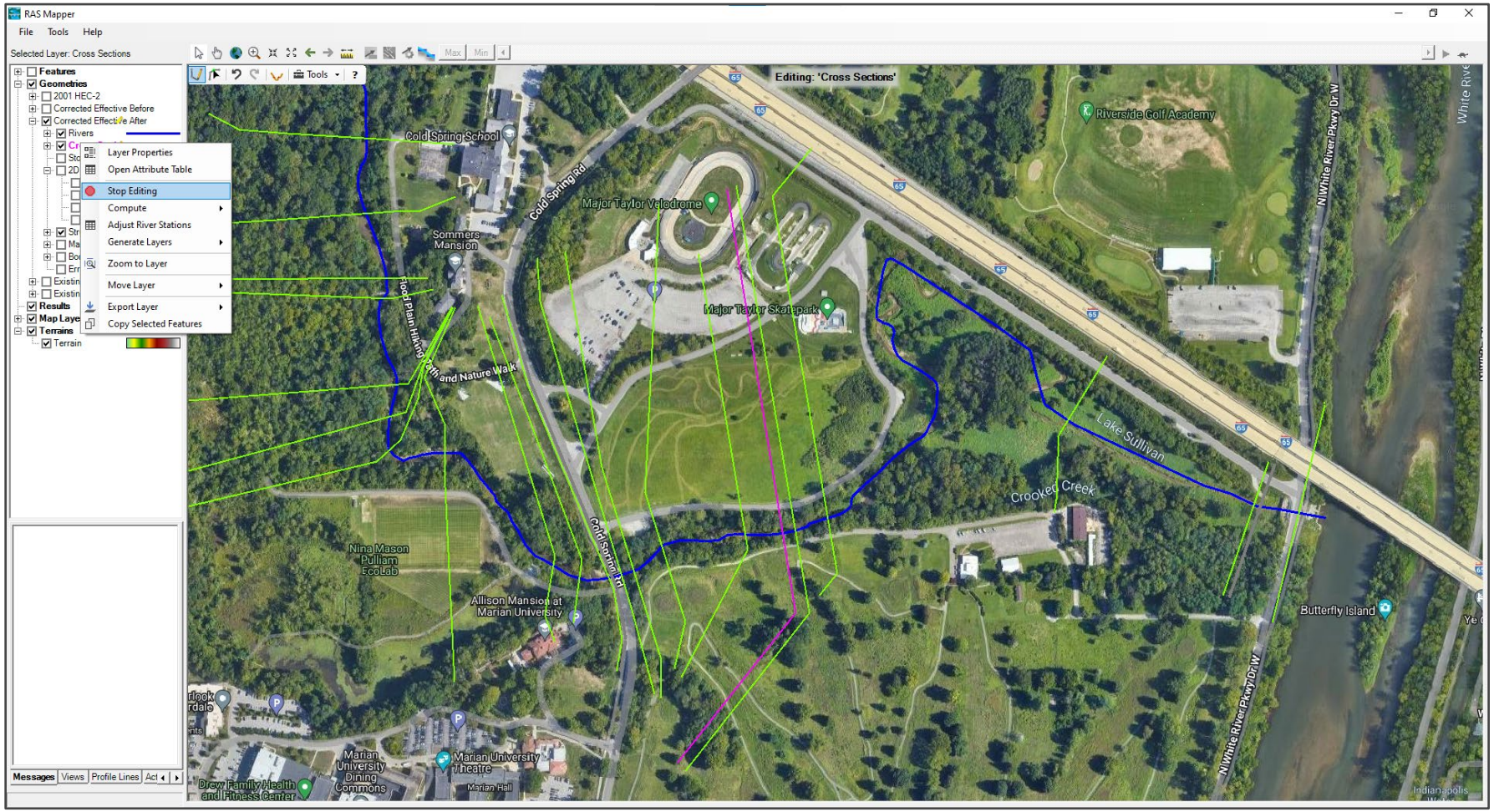

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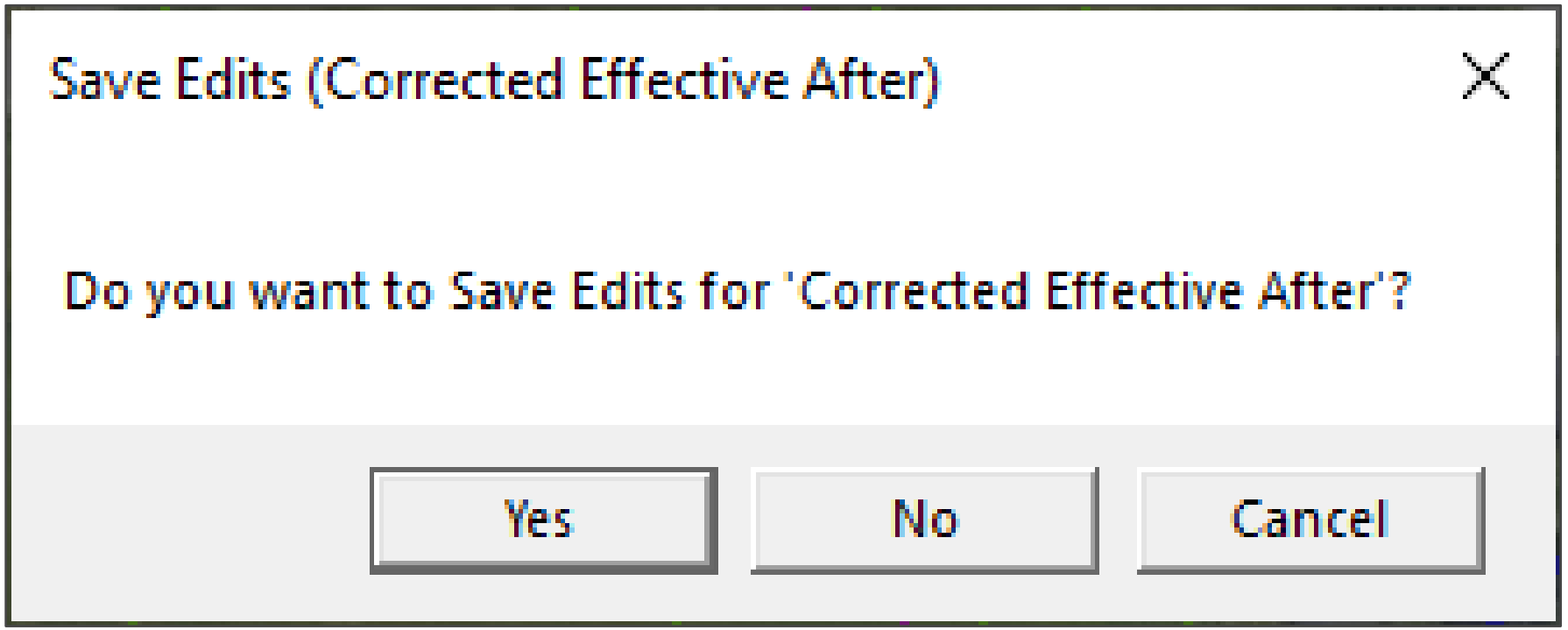

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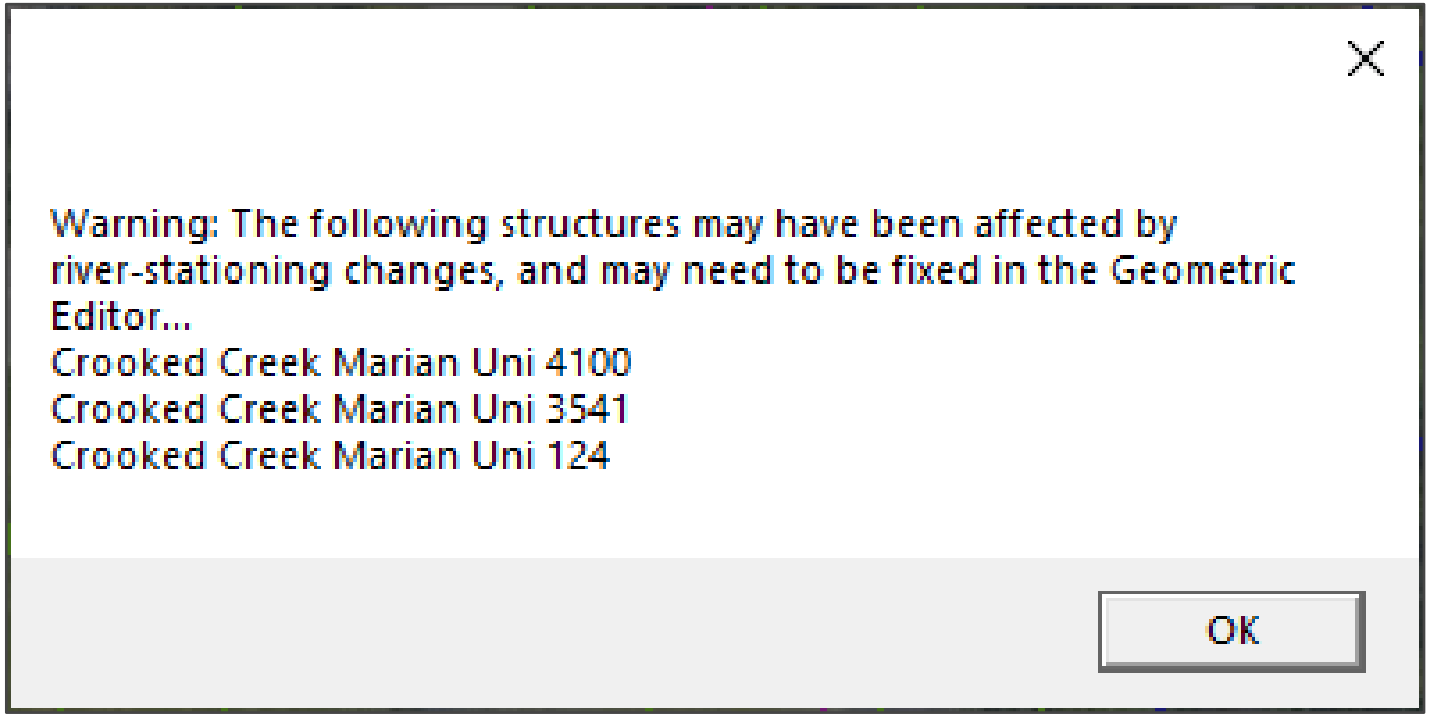

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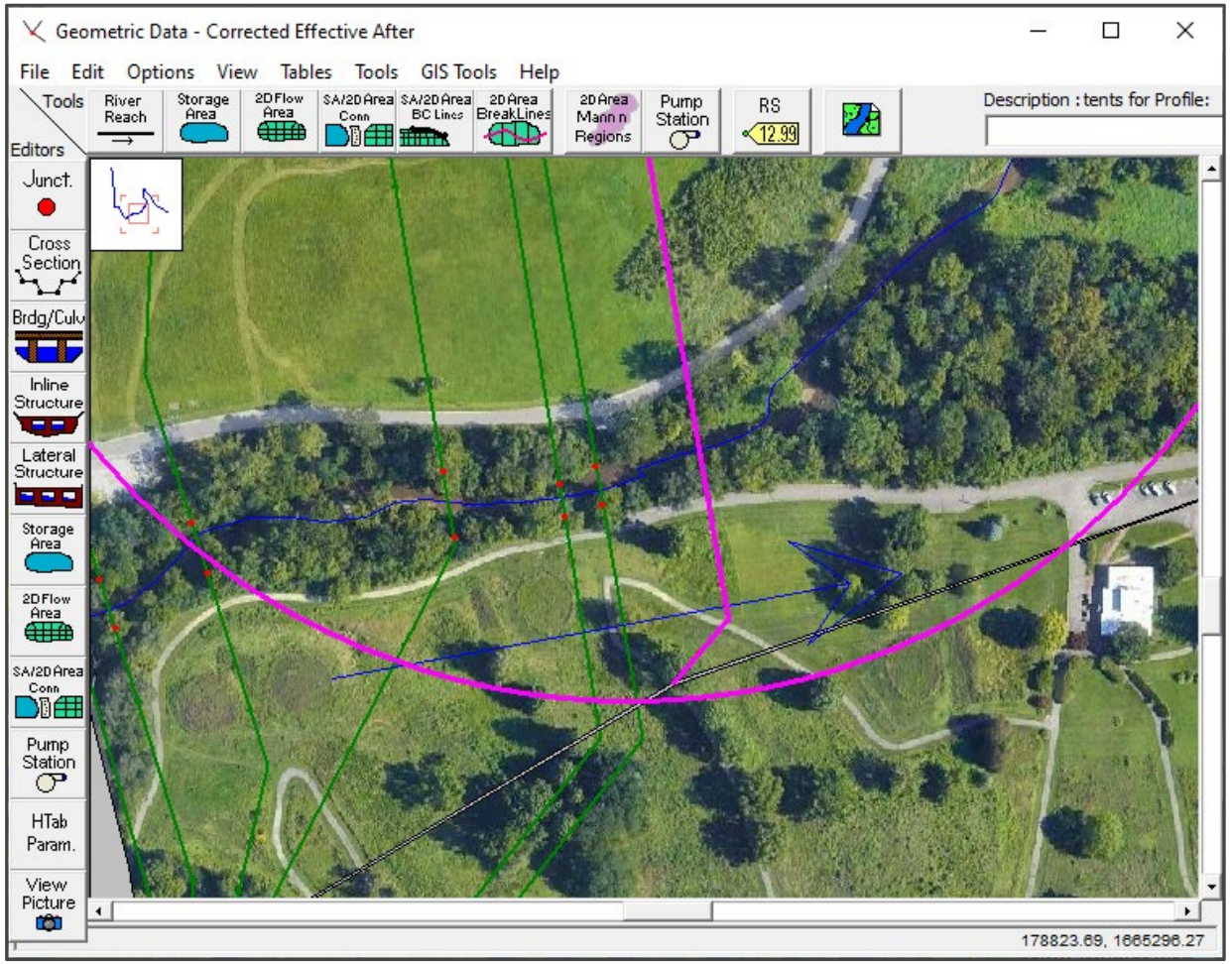
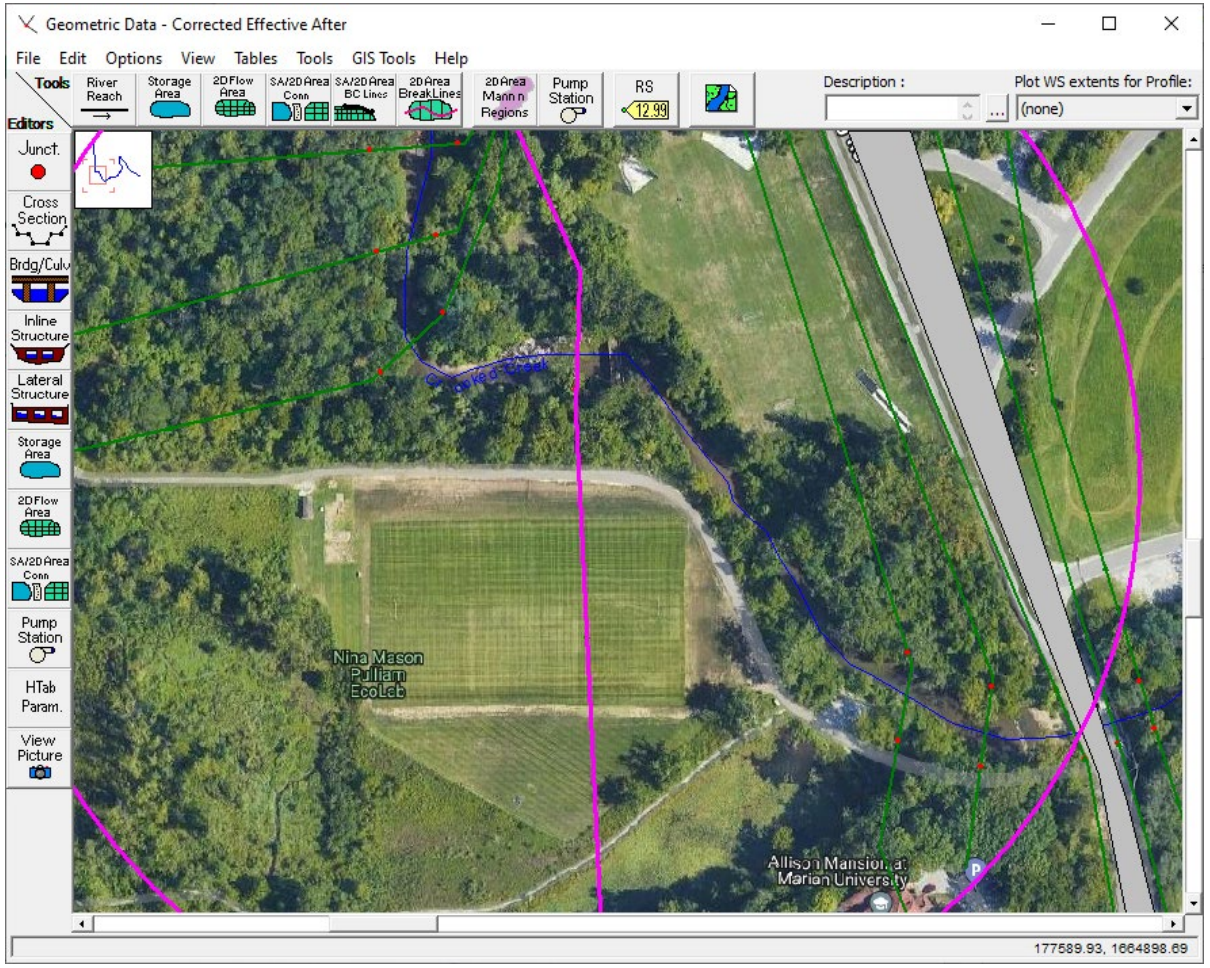


Build the Existing Condition Model

- Some construction in study reach
- All man-made changes
- Update land cover and anything else to show the current conditions
- New Topography (2016 LiDAR)

Example

Build the Existing Condition Model



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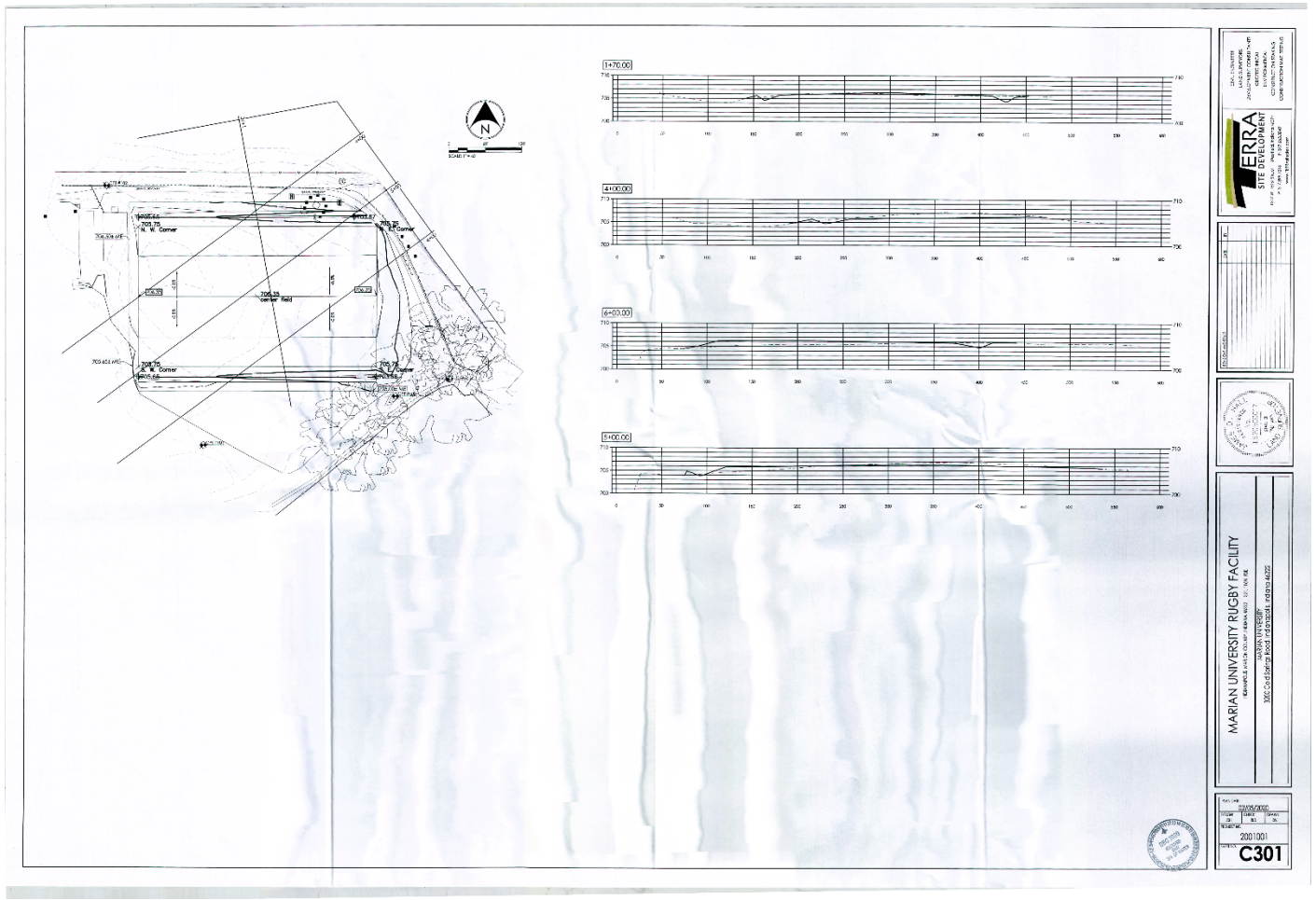

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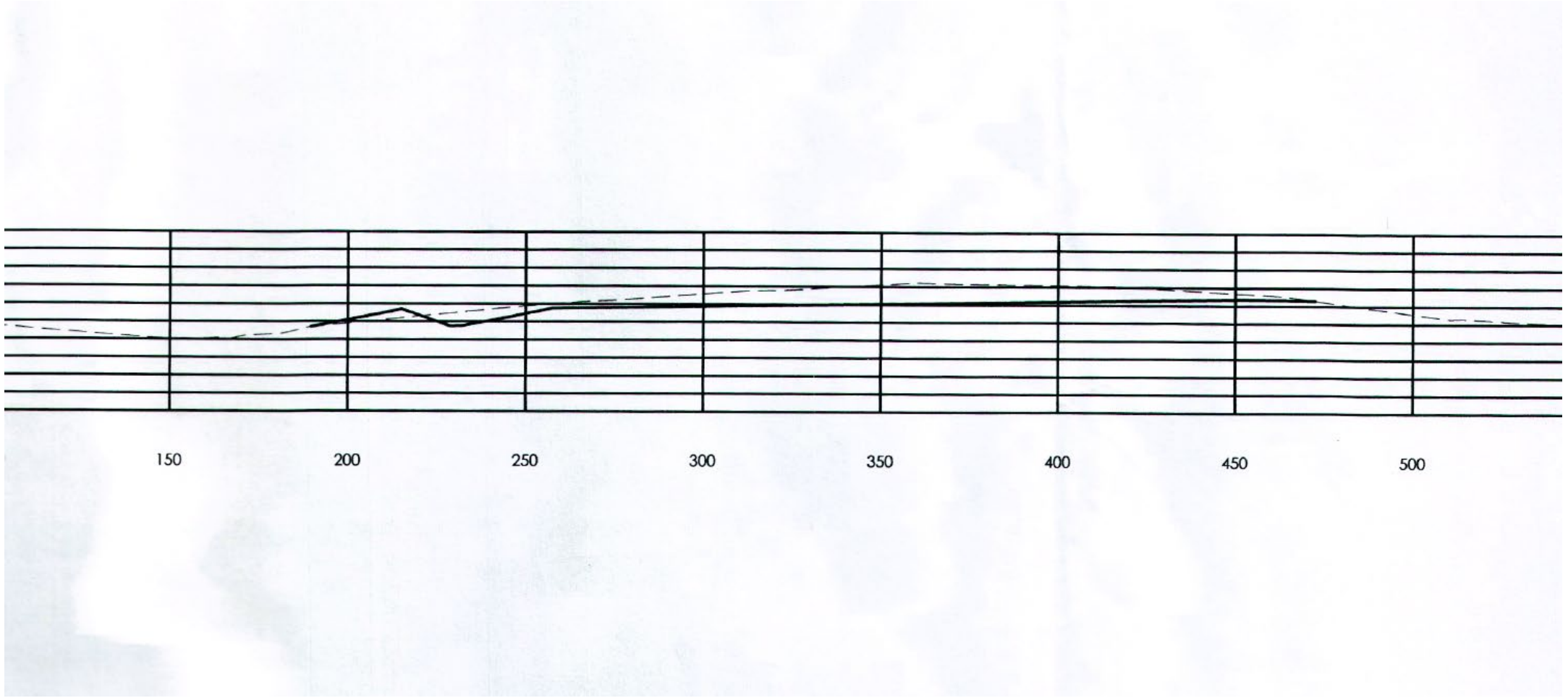

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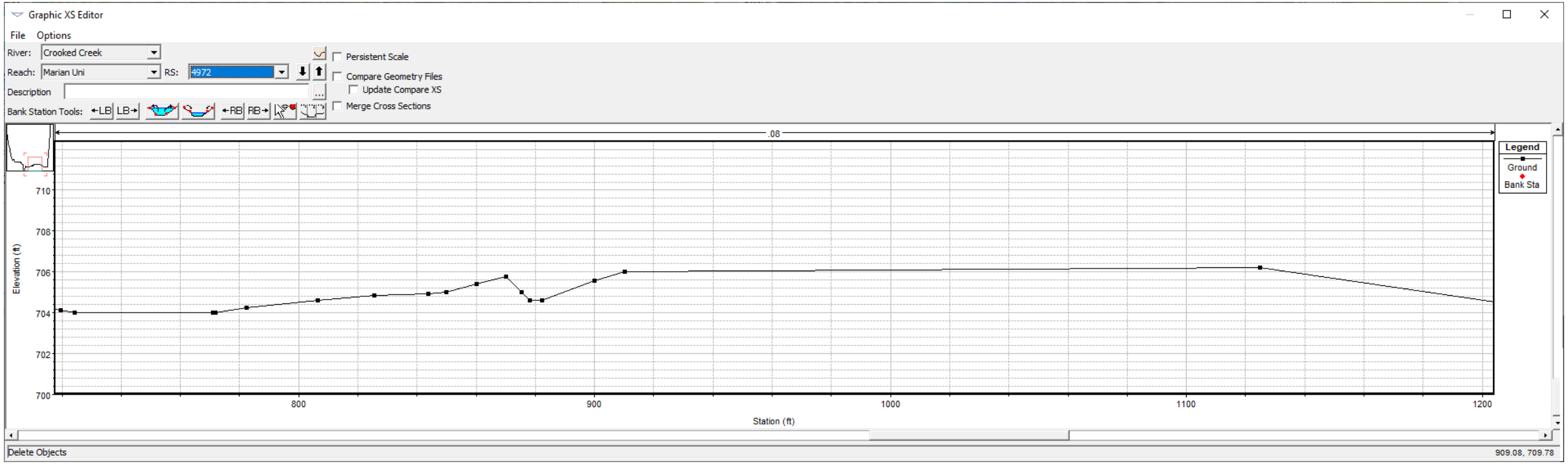


Determine the Proposed Condition Model

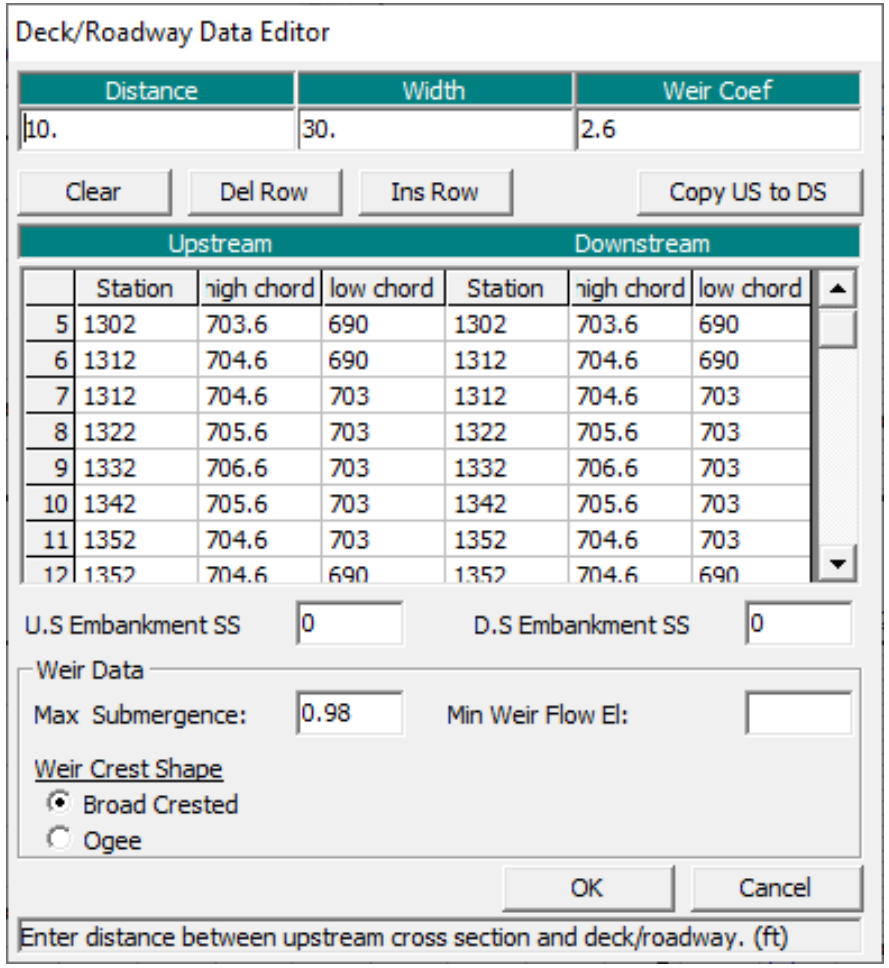
- Insert/change bridge
- Change topography (if needed)

Example

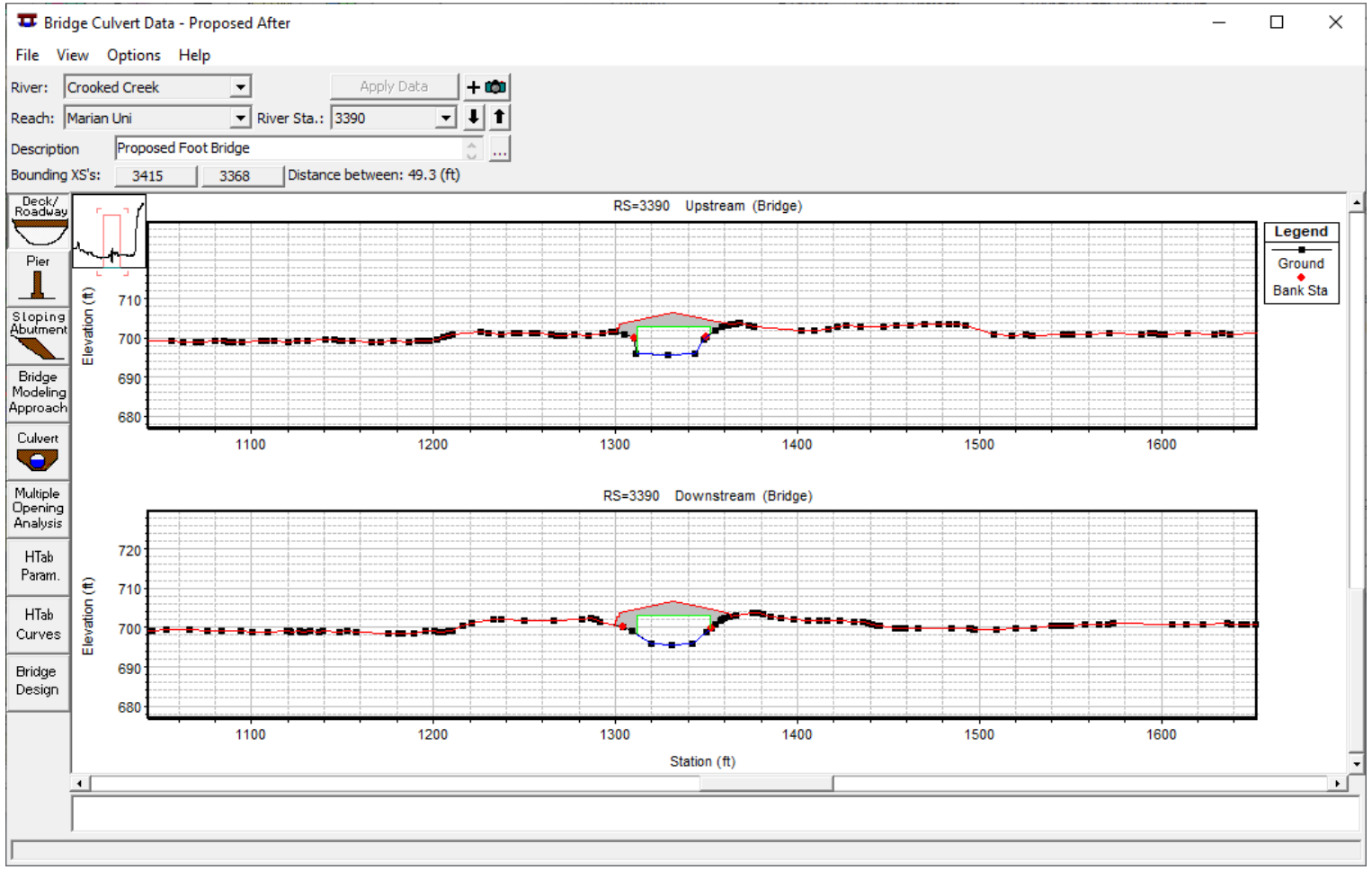
Determine the Proposed Condition Model

Sta	High	Low
1300.2	701.6	690
1301	701.6	690
1301	702.6	690
1302	702.6	690
1302	703.6	690
1312	704.6	690
1312	704.6	703
1322	705.6	703
1332	706.6	703
1342	705.6	703
1352	704.6	703
1352	704.6	690

Determine the Proposed Condition Model



Determine the Proposed Condition Model



Example

Determine the Proposed Condition Model

Station		Duplicate WSEL	Corected WSEL	Change Effective	Existing WSEL	Change Effective	Proposed WSEL	Change Effective
6438		712.46	712.46	0.00	712.46	0.00	712.46	0.00
6143		711.28	711.28	0.00	711.28	0.00	711.28	0.00
5884		710.46	710.46	0.00	710.46	0.00	710.46	0.00
5802		710.24	710.24	0.00	710.24	0.00	710.24	0.00
5457		709.06	709.10	-0.04	709.16	-0.10	709.16	-0.10
5331		708.67	708.74	-0.07	708.83	-0.16	708.83	-0.16
5202		708.22	708.38	-0.16	708.53	-0.31	708.53	-0.31
4972		707.34	707.77	-0.43	707.84	-0.50	707.84	-0.50
4345		706.27	707.22	-0.95	707.22	-0.95	707.22	-0.95
4235		705.49	706.90	-1.41	706.90	-1.41	706.9	-1.41
4127		705.23	706.69	-1.46	706.69	-1.46	706.69	-1.46
4100	Cold Springs Road							
4072		703.87	706.23	-2.36	706.23	-2.36	706.23	-2.36
4023		703.69	706.26	-2.57	706.26	-2.57	706.26	-2.57
3878		702.98	706.28	-3.30	706.28	-3.30	706.28	-3.30
3551		702.99	706.27	-3.28	706.27	-3.28	706.27	-3.28
3415			706.27		706.27		706.27	
3390	Proposed							
3368			706.27		706.27		706.27	
3226		701.86	706.26	-4.40	706.26	-4.40	706.26	-4.40
952		701.75	706.20	-4.45	706.20	-4.45	706.2	-4.45
174		701.66	706.08	-4.42	706.08	-4.42	706.08	-4.42
124	Culvert							
0		698.70	698.70	0.00	698.70	0.00	698.7	0.00

Determine the Proposed Condition Model

In this example, the discharges were not imported properly, which resulted in the unacceptable WSEL difference for the CE, Existing, and Proposed models. This would be a sign that the engineer needs to go back and do some troubleshooting before submitting the models to FEMA.

Questions?

Conclusion

- FEMA format is different.
- FEMA has tighter restrictions than DNR requirements.
- FEMA requires more input and a larger submission package.