BASTROP COUNTY TEXAS

CALDWELL/TUCK/LAKEVIEW DRAINAGE IMPROVEMENTS

Supplemental Application

GENERAL LAND OFFICE CDBG-MIT SUBSTANTIAL APPLICATION FOR POSTING

within a project. A project can have one or more sites.

BUDGET TABLE:

Project Title:	Total Benes	LMI Benes	LMI %	CDBG-DR Construction	CDBG-DR Engineering	CDBG-DR Acquisition	CDBG-DR Environmental	CDBG-DR Admin	Total CDBG-DR Request	Other Funds	Activity Total	+
# Bastrop County Supplemental Application	6,540	3,775	57.72%	$857,608.12	$128,641.22	$0.00	$30,000.00	$48,899.95	$1,065,149.2	$0.00	$1,065,149.2	x
SUMMARY TOTALS:	6,540	3,775	57.72%	$857,608.12	$128,641.22	$0.00	$30,000.00	$48,899.95	$1,065,149.2	$0.00	$1,065,149.2	

Beneficiary Identification Method(s) Per Project:

Project Title: Bastrop County Supplemental Application

HUD National Objective: Benefiting low- and moderate- (L/M) income persons

Select One Benefit Type:	City-wide Benefit ☐	County-wide Benefit ☐	Area Benefit ☒	Direct Benefit ☐

Select Beneficiary Identification Method:

☐ SURVEY: An approved TxCDBG survey was used to identify the beneficiaries for this activity.

☒ HUD LMISD information was used to identify the beneficiaries for this activity.

☐ The required Census or Texas State Data Center map has been provided.

Provide the number of beneficiaries identified through each of the following methods for this activity:

TxCDBG Survey: 0 HUD LMISD: 6,540 Area Benefit: 0 Housing Activity: 0 Limited Clientele: 0

Race	# Non-Hispanic Beneficiaries	# Hispanic Beneficiaries	Total Activity Beneficiaries	+
White	3,553	1,047	4,600	X
Black African American	495	33	528	X
American Indian/Alaskan native	29	4	33	X
Asian	57	3	60	X
Native Hawaiian / Other Pacific Islander	0	0	0	X
Black African American/White	15	25	40	X
American Indian/Alaskan Native/White	14	24	38	X

REQUIRED - Census Geographic Area Data
Identify the census tract and block group(s) in which the project will take place

County Code: 055

Census Tract (6-digit)	01	02	03	04	05	06	07	08	09	10	X
9601.01	☐	☒		☐	☐	☐					

Asian/White	3	6	9	X
American Indian/Alaskan Native/Black African A	1	2	3	X
Other Multi-Racial	66	1,163	1,229	X
	4,233	2,307	6,540	
Gender	Total Males	Total Females	Total Benes	
	3327	3213	6540	

Click here to ADD ANOTHER Table 1

Click here to REMOVE the last Table 1

REQUIRED - Census Geographic Area Data

Identify the census tract and block group(s) in which the project will take place

County Code	+
021	

Census Tract (6-digit)	01	02	03	04	05	06	07	08	09	10	X
9508.02	☒	☐		☐	☐	☐					

APPLICANT INFORMATION

(Please enter the name of the organization and project title as is appears on the application form)

Name of Organization:	**Bastrop County**
Project Title:	**Caldwell Road, Tuck Street, Lakeview Drive Drainage Improvement Project**

BUDGET SUMMARY

(THE INFORMATION BELOW IS AUTO-CALCULATED - **PLEASE FILL IN EACH TAB AT THE BOTTOM)**

Materials and Equipment Total	$688,689.30
Labor Costs Total	$0.00
Other Costs Total	$168,918.82
Project Total	**$857,608.12**

Name of Organization:	Bastrop County
Project Title:	Caldwell Road, Tuck Street, Lakeview Drive Drainage Improvement Project

Materials and Equipment Costs

Item/Description	Quantity	Unit of Measure	Cost Per Unit	Total Cost
6 - 4'x34' box culverts (Caldwell)	108	Linear Foot	$300.00	$32,400.00
6 - 6' x 3' Box Culverts (Lakeview)	134	Linear Foot	$610.00	$81,740.00
6 - 6' x 4' Box Culvertsv (Tuck)	180	Linear Foot	$610.00	$109,800.00
Headwall (PW) Height = 5' (Caldwell)	4	Each	$15,000.00	$60,000.00
Headwall (PW) Height = 6' (Tuck and Lakeview)	6	Each	$15,000.00	$90,000.00
Excavation Roadway (Caldwell)	94	Cubic Yard	$10.00	$940.00
Excavation Roadway (Lakeview)	230	Cubic Yard	$10.00	$2,300.00
Excavation Roadway (Tuck)	40	Cubic Yard	$10.00	$400.00
Excavation Channel (Caldwell)	1109	Cubic Yard	$18.00	$19,962.00
Excavation Channel (Lakeview)	87	Cubic Yard	$18.00	$1,566.00
Embankment (Caldwell)	160	Cubic Yard	$25.00	$4,000.00
Embankment (Lakeview)	40	Cubic Yard	$25.00	$1,000.00
Embankment (Tuck)	10	Cubic Yard	$25.00	$250.00
Asphalt - 2" thick (Caldwell)	1760	Square Yard	$10.00	$17,600.00
Asphalt - 2" thick (Lakeview)	670	Square Yard	$10.00	$6,700.00
Asphalt - 2" thick (Tuck)	1060	Square Yard	$10.00	$10,600.00
Subgrade - 8" flex base (Caldwell)	1760	Square Yard	$10.00	$17,600.00
Subgrade - 8" flex base (Lakeview)	670	Square Yard	$10.00	$6,700.00
Subgrade - 8" flex base (Tuck)	1060	Square Yard	$10.00	$10,600.00
Riprap for Roadway Edge Protection - 16" thick (Caldwell)	119	Square Yard	$75.00	$8,925.00
Riprap for Roadway Edge Protection - 16" thick (Lakeview)	155	Square Yard	$75.00	$11,625.00
Riprap for Roadway Edge Protection - 16" thick (Tuck)	390	Square Yard	$75.00	$29,250.00
Temporary Erosion Protection (Caldwell / Lakeview / Tuck)	3	Each	$4,500.00	$13,500.00
Barricades, Signs, Traffic Handling (Caldwell / Lakeview / Tuck)	3	Each	$4,500.00	$13,500.00
Mobilization (Caldwell / Lakeview / Tuck)	3	Each	$15,000.00	$45,000.00
Removal of existing Culverts (Caldwell)	36	Linear Foot	$22.00	$792.00
Removal of existing Culverts (Lakeview)	240	Linear Foot	$22.00	$5,280.00
Removal of existing Culverts (Tuck)	91.5	Linear Foot	$22.00	$2,013.00
Removal of existing roadway (Caldwell)	1760	Square Yard	$7.00	$12,320.00
Removal of existing roadway (Lakeview)	670	Square Yard	$7.00	$4,690.00
Removal of existing roadway (Tuck)	1060	Square Yard	$7.00	$7,420.00
Seeding (Caldwell)	618	Square Yard	$0.35	$216.30
H&H Analysis of both sites	1	Each	$60,000.00	$60,000.00
				$0.00
				$0.00
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				$0.00

Name of Organization:	Bastrop County
Project Title:	Caldwell Road, Tuck Street, Lakeview Drive Drainage Improvement Project

Materials and Equipment Costs

Item/Description	Quantity	Unit of Measure	Cost Per Unit	Total Cost
				$0.00
				$0.00
				$0.00
				$0.00
				$0.00
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				$0.00
				$0.00
				$0.00
Total - Materials and Equipment			**$116,033.35**	**$688,689.30**

Name of Organization:	Bastrop County
Project Title:	Caldwell Road, Tuck Street, Lakeview Drive Drainage Improvement Project

Other Costs *(including fees paid and other project costs)*

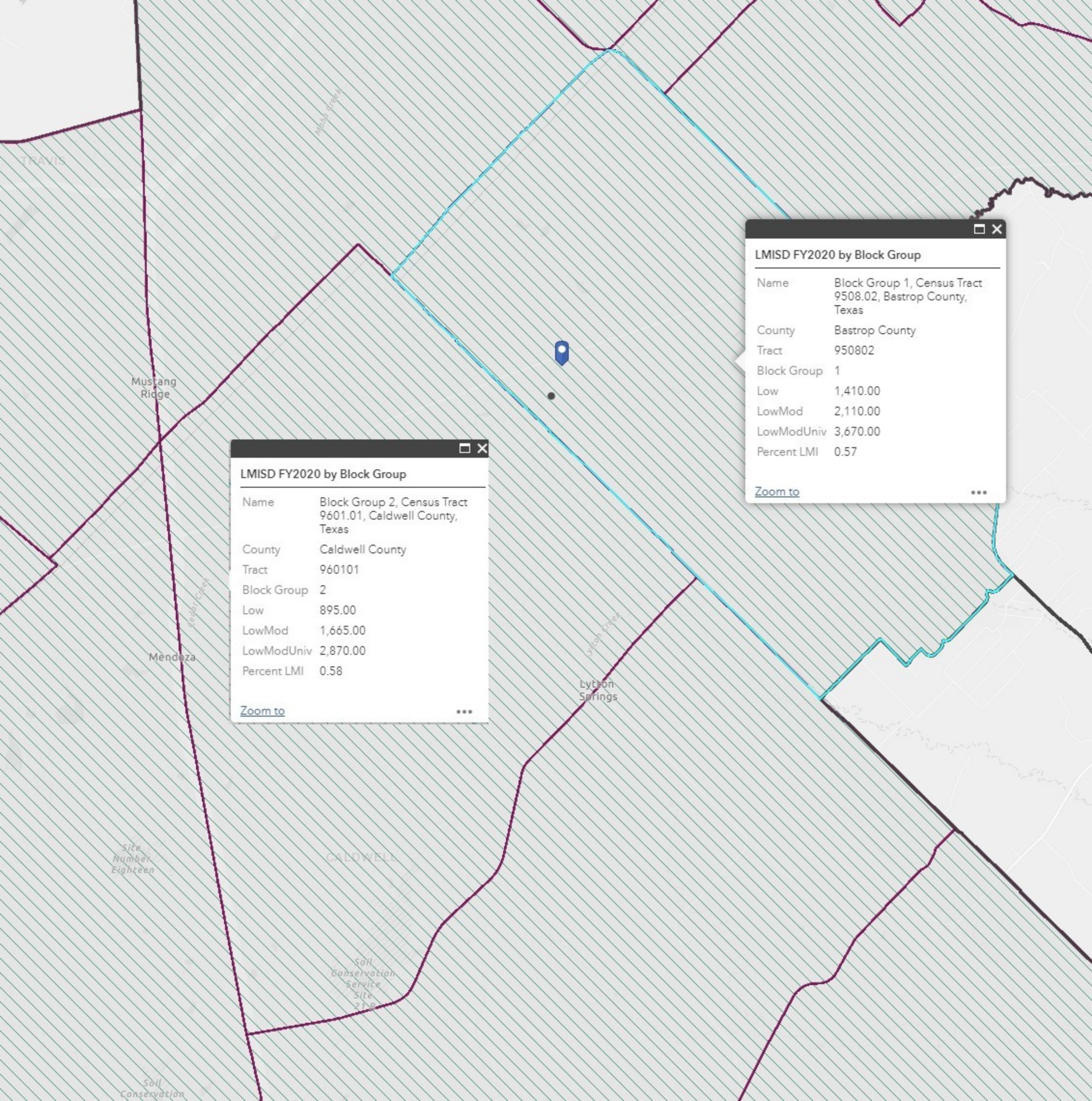
Item/Description	Quantity	Unit of Measure	Unit Cost/Rate	Total Cost
Engineering	1	Each	$98,503.40	$98,503.40
Environmental	1	Each	$10,000.00	$10,000.00
Grant Administration	1	Each	$60,415.42	$60,415.42
				$0.00
				$0.00
				$0.00

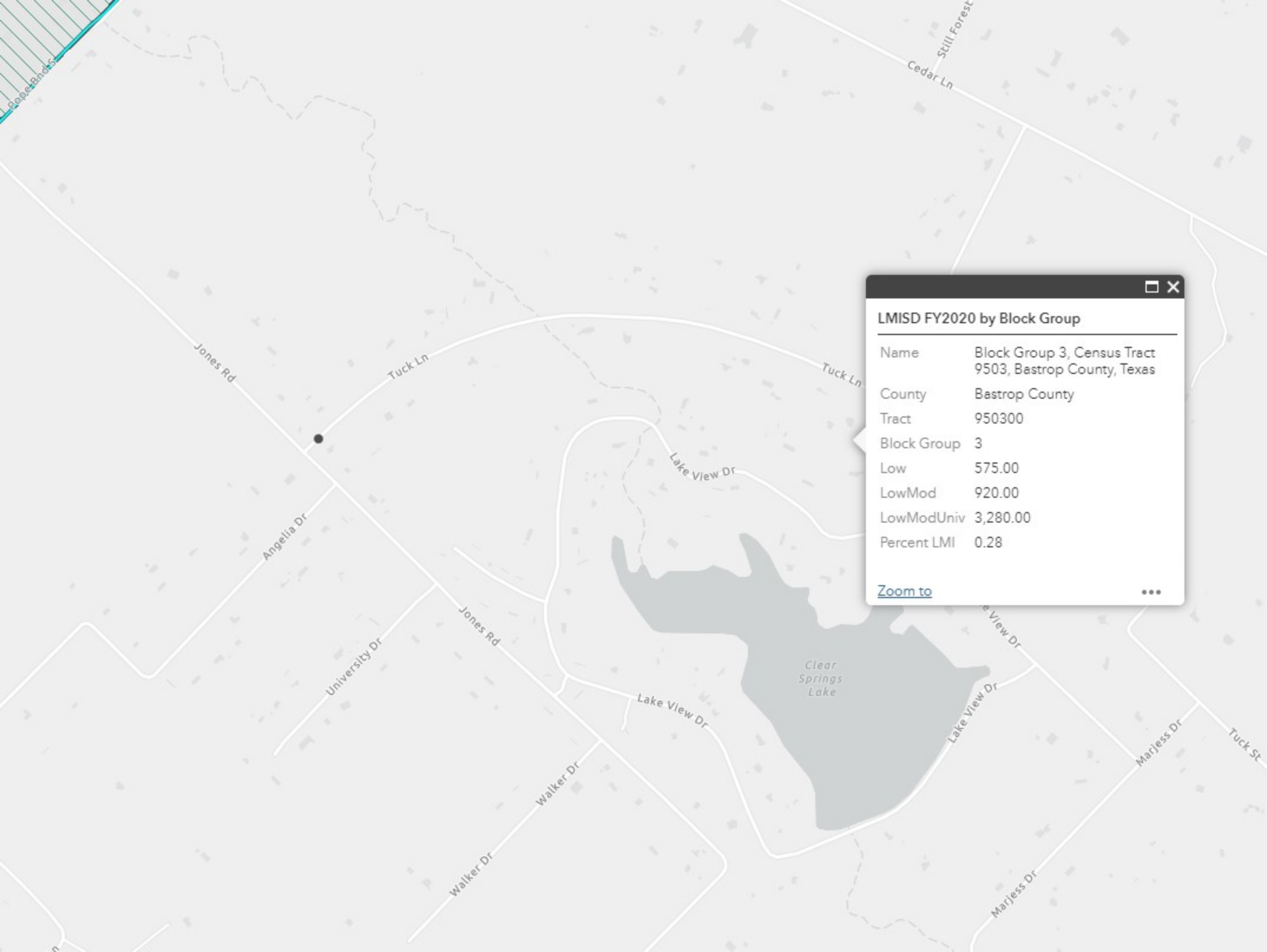
Name of Organization:	Bastrop County
Project Title:	Caldwell Road, Tuck Street, Lakeview Drive Drainage Improvement Project

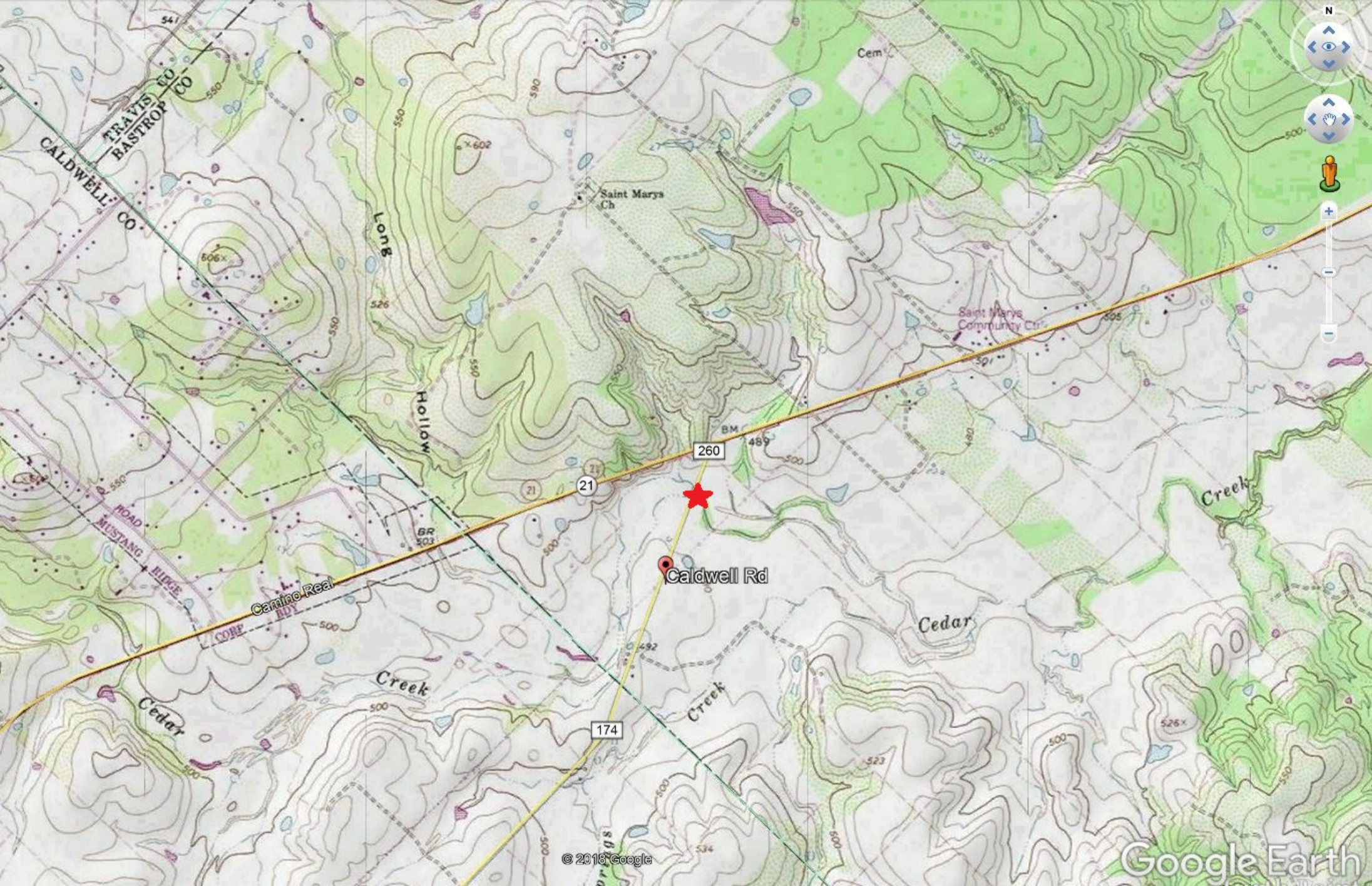
Other Costs *(including fees paid and other project costs)*

Item/Description	Quantity	Unit of Measure	Unit Cost/Rate	Total Cost
				$0.00
				$0.00
				$0.00

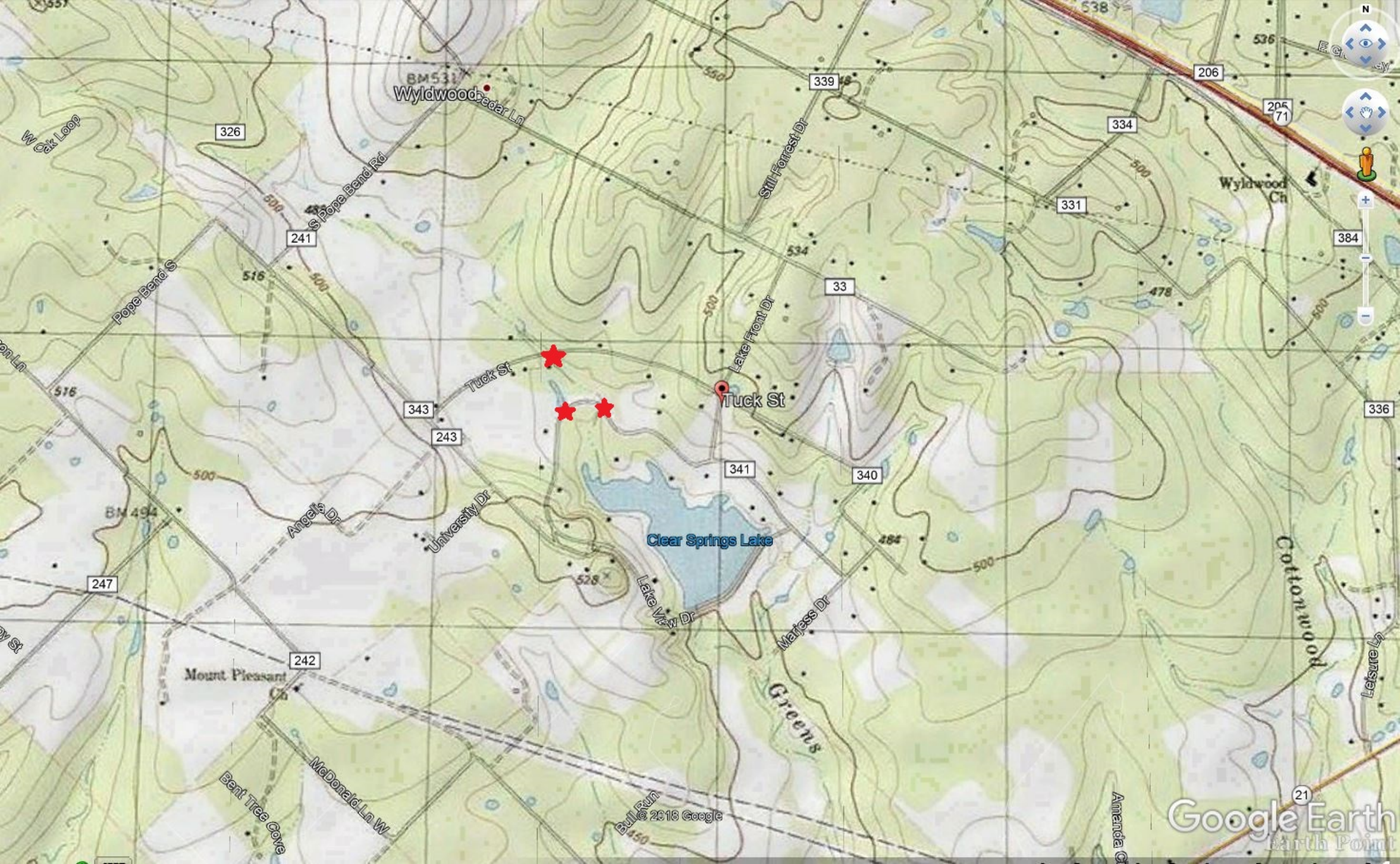
GEOID	geoname	Stus	Countyname	Stat	Count	Tract	Blck	Low	Lowmod	Lowmod	Lowmod_	MOE_LowmodPct
15000US48	Block Group 1, C	TX	Bastrop County	48	021	950802	1	1410	2110	3670	57.49%	+/-17.11
15000US48	Block Group 2, C	TX	Caldwell County	48	055	960101	2	895	1665	2870	58.01%	+/-16.72
									3775	6540		
Survey Results									37	170		
									3812	6710	56.8	


TRAVIS
Mustang Ridge
Mendoza
Cedar Creek
Lytton Springs
Lytton Creek
CALDWELL
Site Number Eighteen
Soil Conservation Service Site 2 Dam
Soil Conservation
LMISD FY2020 by Block Group
Name Block Group 2, Census Tract 9601.01, Caldwell County, Texas
County Caldwell County
Tract 960101
Block Group 2
Low 895.00
LowMod 1,665.00
LowModUniv 2,870.00
Percent LMI 0.58
Zoom to
LMISD FY2020 by Block Group
Name Block Group 1, Census Tract 9508.02, Bastrop County, Texas
County Bastrop County
Tract 950802
Block Group 1
Low 1,410.00
LowMod 2,110.00
LowModUniv 3,670.00
Percent LMI 0.57
Zoom to


Still Forest
Cedar Ln
Jones Rd
Tuck Ln
Tuck Ln
Lake View Dr
Angelia Dr
University Dr
Jones Rd
Lake View Dr
Clear Springs Lake
Lake View Dr
Walker Dr
Walker Dr
Marjess Dr
Marjess Dr
Tuck St
LMISD FY2020 by Block Group
Name Block Group 3, Census Tract 9503, Bastrop County, Texas
County Bastrop County
Tract 950300
Block Group 3
Low 575.00
LowMod 920.00
LowModUniv 3,280.00
Percent LMI 0.28
Zoom to



TRAVIS CO
BASTROP CO
CALDWELL CO
Saint Marys Ch
Long
Hollow
Saint Marys Community Ctr
Cem
260
21
BM
489
Caldwell Rd
Camino Real
MUSTANG RIDGE
ROAD
CORP BDY
Cedar
Creek
174
© 2018 Google
Google Earth



Wyldwood
Cedar Ln
W Oak Loop
S Pope Bend Rd
Pope Bend S
Still Forrest Dr
Lake Front Dr
Tuck St
Clear Springs Lake
Angela Dr
University Dr
Lake View Dr
Marjess Dr
Greens
Cottonwood
Mount Pleasant Ch
McDonald Ln W
Bent Tree Cove
Bull Run
Amanda Ch
Leisure Ln
Wyldwood Ch
326
241
339
206
205
71
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Google Earth

SCOPE OF WORK (SOW)
BASTROP COUNTY CULVERT AND DRAINAGE IMPROVEMENT PROJECTS

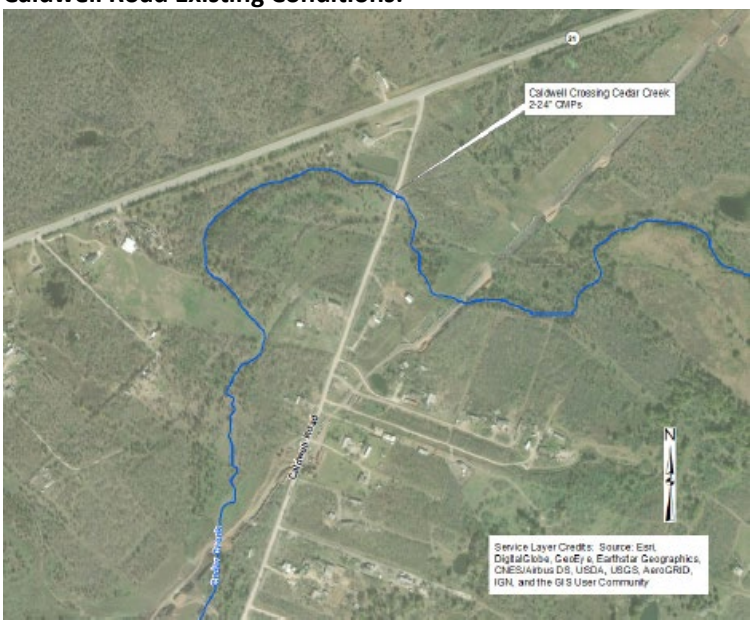
Hazard mitigation is defined as "any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards", listed in 44 Code of Federal Regulations (CFR), Subpart M, Section 206.401. Flooding in Bastrop County is a frequent natural hazard that risks human life and property almost annually, as is the case in the past 3 years and 6 federally declare disasters.

The County was impacted by 5 declared flood related disasters, DR 4223, 4245, 4269, 4272, and DR 4332, and 1 fire related disaster FM-5116, to which the County's energy and efforts have been focused on recovery and meeting the needs of those impacted by the disasters.

In preparing for HMGP grant opportunities, the Bastrop County Commissioners' Court held a workshop, which was open to the public, to discuss which drainage crossings were the most critical for the County. As Bastrop County has over 240 points where roadways flood, additional consideration was given to those sites where water is first to cover the road every time it floods, requiring closure.

3 Sites in precinct 3 have been identified as sites that require flood mitigation. The sites identified for drainage improvement are Caldwell Road at Cedar Creek, Tuck Street at Greens Creek and 2 sites on Lakeview, 1 at Greens Creek and another at an overflow channel for Greens Creek.

Caldwell Road Existing Conditions:



Caldwell Road is a gravel roadway located in western Bastrop County. The roadway crosses Cedar Creek, near State Highway 21, as 2 – 24" CMPs at 30.054032, -97.619005. The culverts are inadequate and clog with debris. The roadway is currently overtopped during the 2-year storm event. After a rainfall event the roadway is typically closed 2-4 hours and usually longer because of damage.

There are 31 homes in Bastrop County that are affected when Caldwell Road is closed. A total of 3 dead end streets gain access from Caldwell Road. The detour for residents is approximately 9 miles and adds an additional 20-30 minutes to the commute for residents when the roadway is unpassable. The detour is along more gravel roadways. There are to more 2 low water crossings on this route that at times are also

impassable. For drivers navigating around these additional low water crossings adds another 6.5 miles to their commute. School bus routes are also affected when Caldwell Road is covered with water or when damaged has occurred to the roadway. Buses will not travel through the water when it over tops the roadway and once the water recedes they will not travel the roadway until damages have been repaired. The detour causes significant delays in getting the children to and from school.

Cedar Creek has experienced 4 major flooding events since 2015. Table 1 shows a summary of these events. Three swift water rescues were performed during 2015 storm events and one swift water rescue during the Hurricane Harvey event in August 2017. Bastrop County has repaired the roadway twice, once after a flood event in May 2016, and once after Hurricane Harvey in August 2017. The costs of the repairs are summarized in Table 2.

Table 1: Storm Event Summary on Cedar Creek

Event	Rainfall (in)	Duration (hr)
May 2015	6.64	3
October 2015	5.31	6
May 2016	8.15	3
August 2017	11	24

Table 2: Caldwell Road Repair Cost Summary

Event	Damages	Description
May 2016	$4,444.47	Labor/Equipment/Materials
August 2017 (Harvey)	$2,540.17	Total Cost

Proposed Alternatives:

Alternative 1: Alternative 1 proposes to take no action to improve the project area. The roadway will continue to be a small gravel road with inadequate culverts that are filled with debris. Making no improvements to the roadway will result in continued damage and resultant repairs to the roadway after flooding events. Commuters that normally travel this route will need to make a detour approximately 9 miles long with a delay of 20-30 minutes while the roadway is unpassable. The benefits to this alternative are no upfront costs for any improvements. Costs will continually be incurred for all damages from future flood events.

Alternative 2: Alternative 2 proposes to protect the roadway for flood events up to the 2-year storm event. Improvements for this alternative include removing the existing 2 – 24” CMPs (30.054032, -97.619005) and gravel roadway and adding 6 – 4’ x 3’ box culverts with headwalls. The proposed roadway will upgrade the gravel surface with asphalt. The proposed length of improved roadway is approximately 875 feet. Included in the improvements will be a secondary channel. Currently a secondary channel has naturally formed within the Cedar Creek floodplain. Caldwell Road blocks this secondary channel causing erosion and ponding at the roadway. Channel improvements will allow flow to continue along its intended course and cross Caldwell Road. The proposed channel typical cross section will be trapezoidal in shape with a 10 ft bottom width, 4H:1V side slopes, and 3 feet deep. The new channel will extend approximately 160 ft from Caldwell Road until it meets with Cedar Creek. Alternative 2 is the preferred alternative as it will protect the roadway during more frequent storm events and provide protection against damage for extreme events. Costs are reasonable for this alternative versus a more expensive option such as a bridge.

Alternative 3: Alternative 3, like Alternative 2, will improve the roadway but is not the preferred alternative. This alternative proposes to protect the roadway from the 100-year storm event.

Improvements for this alternative include removing the existing 2 – 24" CMPs and gravel roadway and replacing them with a bridge structure. The bridge will allow the 100-year storm event to pass with no impacts to the surrounding structures during the 100-year storm event. The cost of a bridge will be too high when comparing to the benefits it will provide for this to be the preferred alternative.

Lakeview Drive and Tuck Street Existing Conditions:

Lakeview Drive and Tuck Street are located in western Bastrop County. Lakeview Drive crosses Greens Creek at 30.119081, -97.468353 and a small diversion channel at 30.119086,-97.469601 and Tuck Street crosses Greens Creek at 30.120781, -97.470400. Both roadways cross Greens Creek as 3 – 48" CMPs. Smaller CPMs are located at the diversion channel on Lake View Drive. All culverts are inadequate, and both roadways overtop during the 2-year storm event.

Lakeview Drive is an unimproved, gravel roadway. There are 39 homes on Lakeview Drive that are affected when the road is closed. Lakeview Drive ends in a cul-de-sac and there are no alternative routes along a public street for the residents to take; therefore, residents are forced to travel along private land when the road is inundated at Greens Creek.

Tuck Street is an asphalt roadway and spans between two roads; therefore, residents are not stranded if Tuck Street is closed. There is a short detour for residents and commuters that take Tuck Street when the road is inundated at Greens Creek.

Greens Creek has experienced 4 major flooding events since 2015. Table 3 shows a summary of these events.

Bastrop County has repaired both roadways. Bastrop County has repaired Tuck Street after the August 2017 (Hurricane Harvey) flood event. Lakeview Drive has been repaired twice after the May 2015 and August 2017 (Hurricane Harvey) flood events. The event in June 2015 caused embankment to washout, the cost of repairs are shown in Table 4.

Table 3: Storm Event Summary on Greens Creek

Event	Rainfall (in)	Duration (hr)
May 2015	5.81	2
October 2015	7.67	24
May 2016	7.18	12
August 2017	11.64	24

Table 4: Tuck St and Lakeview Drive Cost Summary

Event	Damages ($)	Description
Tuck Street		
August 2017 (Harvey)	$3,945.80	Labor/Equipment/Materials
Lakeview Drive		
May 2015	$2,895.58	Labor/Equipment/Materials
August 2017 (Harvey)	$3,134.94	Labor/Equipment/Materials

Proposed Alternatives:

Alternative 1: Alternative 1 proposes to take no action to improve the roadway. Lakeview Drive will continue to be a small gravel road and Tuck Street will be an asphalt road with both roadways having inadequate culverts. Making no improvements to the roadway will result in continued damage and repairs to the roadway after flooding events. Commuters that use Tuck Street will need to make an approximate 1-mile detour when the roadway is impassible. Residents living on Lakeview Drive will have to travel through private property while the roadway is closed because Lakeview Drive is a dead-end street with no alternate route. The benefits to this alternative are no upfront costs for any improvements. Costs will continually be incurred for all damages from future flood events.

Alternative 2: Alternative 2 proposes to protect the roadway for flood events up to the 2-year storm event. Improvements include removing the existing 3 – 48” CMPs at both roadways and adding 6 – 6’ x 4’ box culverts for Tuck Street and 6 – 6’ x 4’ box culverts distributed across Lakeview Drive and the Lakeview Drive diversion channel. The gravel road at Lakeview Drive will be replaced with an asphalt roadway. The proposed length of improved roadway for Tuck Street and Lakeview Drive is approximately 270 feet and 470 feet, respectively. Included in the improvements will be a secondary set of culverts for Lakeview Drive to allow a small diversion channel that has formed to flow through Lakeview Drive. Alternative 2 is the preferred alternative as it will protect the roadway during more frequent storm events and provide protection against damage for extreme events. Costs are reasonable when comparing to the benefits for this alternative versus a more expensive option such as a bridge.

Alternative 3: Alternative 3, like Alternative 2, will improve both roadways but is not the preferred alternative. This alternative proposes to protect the roadway from the 100-year storm event.
Improvements for this alternative include removing the existing 3 – 48” CMPs for both roadways and replacing them with a bridge structure. The bridge will allow the 100-year storm event to pass with no impacts to the surrounding structures during the 100-year storm event. The design of the bridge will present

difficulties as there are residents that gain access from both streets where the bridge will be placed.

Drainage improvements at the 3 identified sites will reduce the cost associated with recovery from future disasters by:

- Reducing the number of times the road closes due to a rain event
- Reducing the driving distance needed to drive the alternative routes during and after rain events
- Reducing lost productivity of the effective residences
- Reducing the damage to Caldwell Road, Lakeview Drive, and Tuck Street
- Increasing safety and decreasing response time of emergency first responders
- Increasing safety of county residents

Statement of Work Caldwell Road, Lakeview Drive, and Tuck Street

Phase 1 – Hydrologic and Hydraulic Alternative Analysis and Design (Starting Month: 1; Months to Complete: 6)

Task 1.1: Data Collection & Survey

Conduct a field survey and field visit to collect site data. This data includes photos, notes, and detailed data conforming to current FEMA study survey standards. Obtain available existing LiDAR information and hydrologic/hydraulic models.

Task 1.2: Hydrologic Analysis

Develop a detailed hydrologic model for the Caldwell watershed using methods appropriate for the study area. The model will include existing land use conditions, and will use existing city and county GIS data, CAPCOG data, and SSURGO soil information to generate hydrologic parameters.

The analysis will:

- Delineate contributing drainage area
- Develop watershed parameters for existing and fully developed conditions
- Develop detailed baseline hydrologic model
- Determine peak flows for design storm events
- Determine frequency of the major storm events since May2015

Task 1.3: Hydraulic Analysis

Develop a detailed hydraulic model with supporting work maps and corresponding documentation using HEC-RAS to define existing conditions.

The analysis will:

- Determine channel cross section layout
- Define hydraulic parameters
- Develop detailed baseline hydraulic models
- Delineate existing floodplain

Task 1.4: Alternative Mitigation Solutions

Develop up to 3 alternatives for flood damage reduction. Analyze alternatives for effectiveness using the updated hydrology, hydraulic models.

The analysis will:

- Develop feasible alternative solutions composed of structural and non-structural solutions (consider culvert improvements, channel improvement, detention and roadway profile changes)
- Revise hydrology and hydraulic models based on solutions
- Delineate alternative floodplains of selected solutions
- Prepare opinion of probable cost

Task 1.5: Hydrologic and Hydraulic Analysis Report

Develop a final report summarizing all modeling and alternative analysis results. Report will include exhibits, tables, and documentation of the hydrologic and hydraulic analysis.

Task 2: Environmental Assessment (Starting Month: 1; Months to Complete: 3)

- Perform an environmental assessment for the project area (if required)

Task 3: Cultural Resource Survey (Starting Month: 1; Months to Complete: 3)

- Perform a cultural resource survey for the project area (if required)

Task 4: Final Engineering and Design (Starting Month: 4; Months to Complete: 3)

- Finalize drainage design
- Develop Plans, Specifications and Estimate for the proposed roadway.

Phase 2: Construction Phase Services (Starting Month: 7; Months to Complete: 12)

The proposed structure and channelization are as follows.

Caldwell Road

- Removal of existing 2 – 24" CMPs and installation of 6 – 4' x 3' box culverts
- Construct approximately 160 ft of channel improvements in continuation of a naturally occurring secondary channel at **Caldwell Rd**. The channel will have a trapezoidal cross section 3 ft deep with a 10 ft bottom width and 4H:1V side slopes.

Lakeview Drive and Tuck Street

- Removal of existing 3 – 48" CMPs and installation of 6 – 6' x 4' box culverts to increase conveyance for Tuck Street at Greens Creek
- Removal of existing 3 – 48" CMPs and 3 – 24" CMPS and installation of 3 – 6' x 3' box culverts to increase conveyance for Lakeview Drive at Greens Creek and 3 – 6' x 3' box culverts to increase conveyance diversion channel

An engineering firm will oversee the entire project along with the following:
1 ~ Project Manager: Oversee all aspects of the project from preliminary design through construction
1 ~ Project Engineer: Update hydrology and hydraulics study, prepare design plans and bid documents, assist with solicitation of bids, bid award, contract preparation, pre-construction meeting, construction management, shop drawing review, periodic site visits, and any project closeout documentation.
1 ~ Engineer in Training (EIT): Assist project engineer with tasks described above
1 ~ CAD Technician: Assist Project Engineer and EIT with tasks described above
1 ~ Registered Professional Surveyors and Survey Field Crew: Perform topographic and geotechnical survey for design of improvements (as needed)

- 1x Grant Management/1xProject Manager - Recordkeeping (Notice of Award/contract execution,

kick-off meeting, startup documentation, establish files, maintain records, progress meetings), Reimbursement/Financial Management, Design Phase/Bids/Construction Compliance, Quarterly Reporting, Close-out/Completion