

SUPPLEMENTAL WORK AUTHORIZATION NO. 3
TO
WORK AUTHORIZATION NO. 4

WILLIAMSON COUNTY ROAD BOND PROJECT:
Atlas 14 Floodplain Mapping Update – Study Area Analysis (“Project”)

This Supplemental Work Authorization No. 3 to Work Authorization No. 4 is made pursuant to the terms and conditions of the Williamson County Contract for Engineering Services, being dated March 24, 2020 (“Contract”) and entered into by and between Williamson County, Texas, a political subdivision of the State of Texas, (the "County") and Halff Associates, Inc. (the "Engineer").

WHEREAS, pursuant to Article 14 of the Contract, amendments, changes and modifications to a fully executed Work Authorization shall be made in the form of a Supplemental Work Authorization; and

WHEREAS, it has become necessary to amend, changed and modify the Work Authorization.

AGREEMENT

NOW, THEREFORE, premises considered, the County and the Engineer agree that the Work Authorization shall be amended, changed and modified as follows:

- I. The Services to be Provided by the Engineer that were set out in the original Attachment “B” of the Work Authorization are hereby amended, changed and modified as shown in the attached revised Attachment “B” (must be attached).
- II. The Work Authorization shall terminate on December 31, 2025. The Services to be Provided by the Engineer shall be fully completed on or before said date unless extended by an additional Supplemental Work Authorization. The revised Work Schedule is attached hereto as Attachment “C” (must be attached).
- III. The maximum amount payable for services under the Work Authorization is hereby increased by \$455,652.00 from \$3,311,409 to \$3,767,061.00. The revised Work Schedule is attached hereto as Attachment “D” (must be attached).

Except as otherwise amended by prior or future Supplemental Work Authorizations, all other terms of the Work Authorization are unchanged and will remain in full force and effect.

The Supplemental Work Authorization does not waive the parties’ responsibilities and obligations provided under the Contract.

IN WITNESS WHEREOF, the County and the Engineer have executed this Supplemental Work Authorization No. 3 to Work Authorization No. 4, in duplicate, to be effective as of the date of the last party's execution below.

ENGINEER:
Halff Associates, Inc.

By: Stephen Crawford
Signature

Stephen Crawford
Printed Name

Vice President
Title

May 15, 2025
Date

COUNTY:
Williamson County, Texas

By: Steven Snell
Signature

Steven Snell
Printed Name

County Judge
Title

Date

LIST OF ATTACHMENTS

Attachment B - Services to be Provided by Engineer
Attachment C - Work Schedule
Attachment D - Fee Schedule

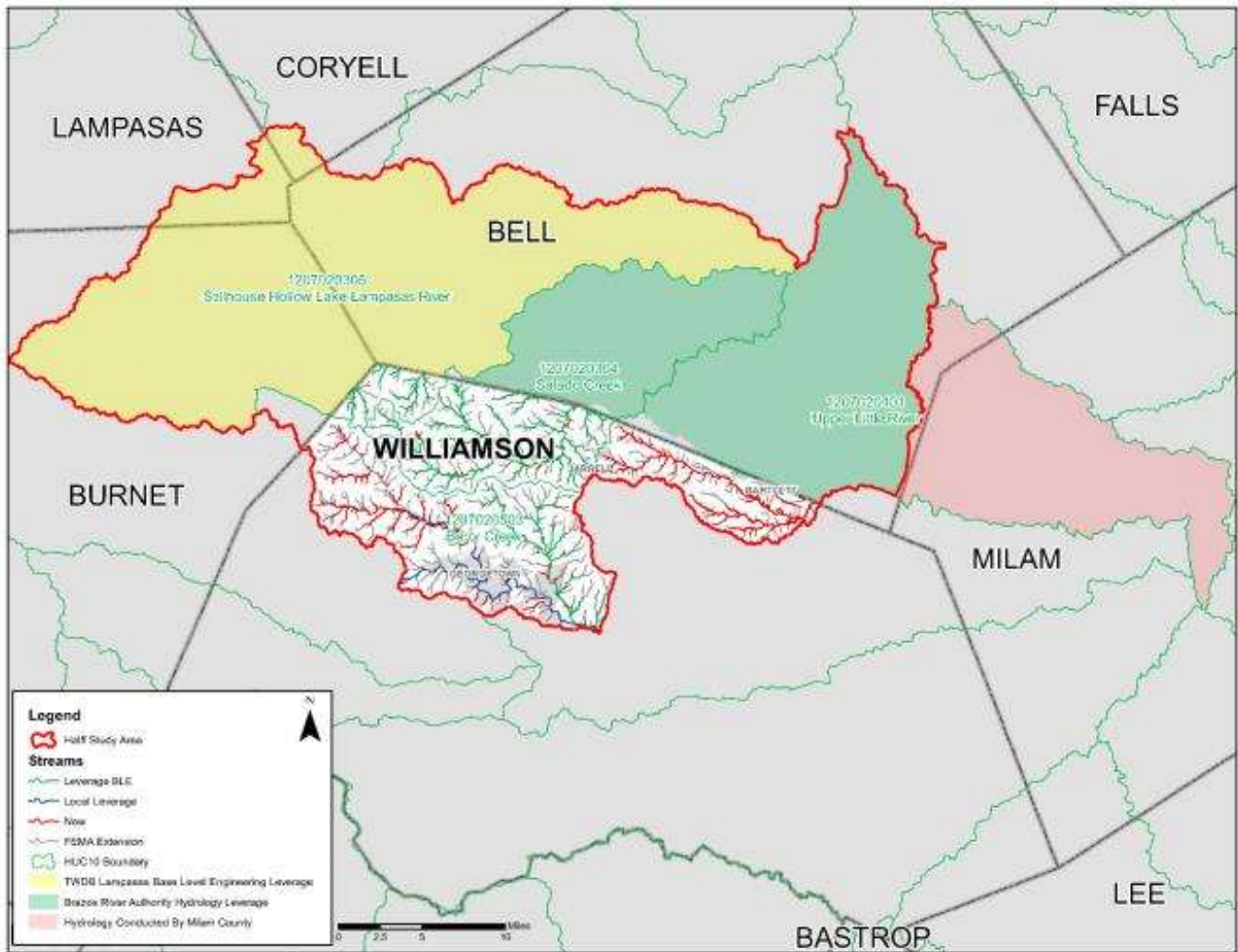
APPROVED
By Christen Eschberger at 2:18 pm, May 21, 2025

ATTACHMENT B
SERVICES TO BE PROVIDED BY THE ENGINEER
FOR Atlas 14 Floodplain Mapping
Work Authorization No. 4 - Supplemental Work Authorization No. 3
Study Area LiDAR Update of Unincorporated Areas
in the Salado Basin plus Berry Creek Hydraulics
& Limited County-wide Technical Program Management Tasks

PROJECT DESCRIPTION

Project Area

Areas within the Williamson County Atlas 14 Floodplain Mapping Project for Salado and Berry Creek watershed extents. The primary area is Williamson County with hydrology including portions of Burnet, Lampasas, Coryell and Bell Counties.



Proposed Project

Provide the County with technical program management (TPM) services for two stakeholder meetings, terrain development and analysis, as well as independent quality assurance and quality control (QA/QC). Conduct existing condition hydrology, hydraulics, and mapping updates utilizing newly available 2024 LiDAR in areas where significant changes have occurred. All analysis shall be in accordance with the Williamson County bulleted Technical Standards developed specifically for the Atlas 14 Floodplain Mapping Project. The analysis shall also be in accordance with FEMA guidance and mapping standards.

The analysis will include the streams shown in the Project Area graphic. Table 1 displays the study stream types and associated stream miles. The recurrence intervals listed in Table 2 shall be used to develop the hydrologic and hydraulic models and associated floodplain mapping products.

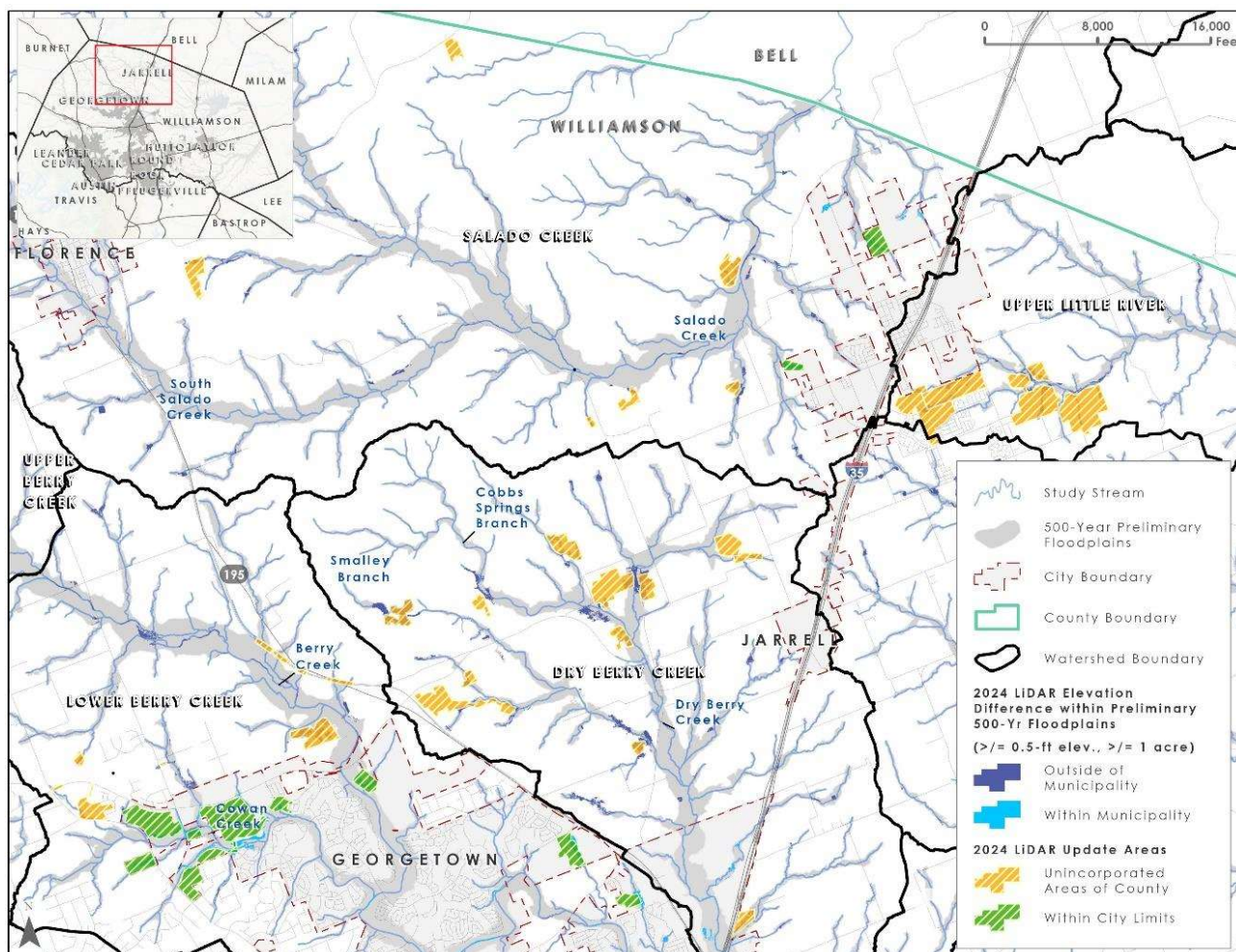
Table 1. Study Stream Types and Mileage

Study Classifications	Stream Miles
Zone AE	117
Zone A (Extensions)	50
Totals	167

Table 2. Study Requirements for Modeling and Mapping

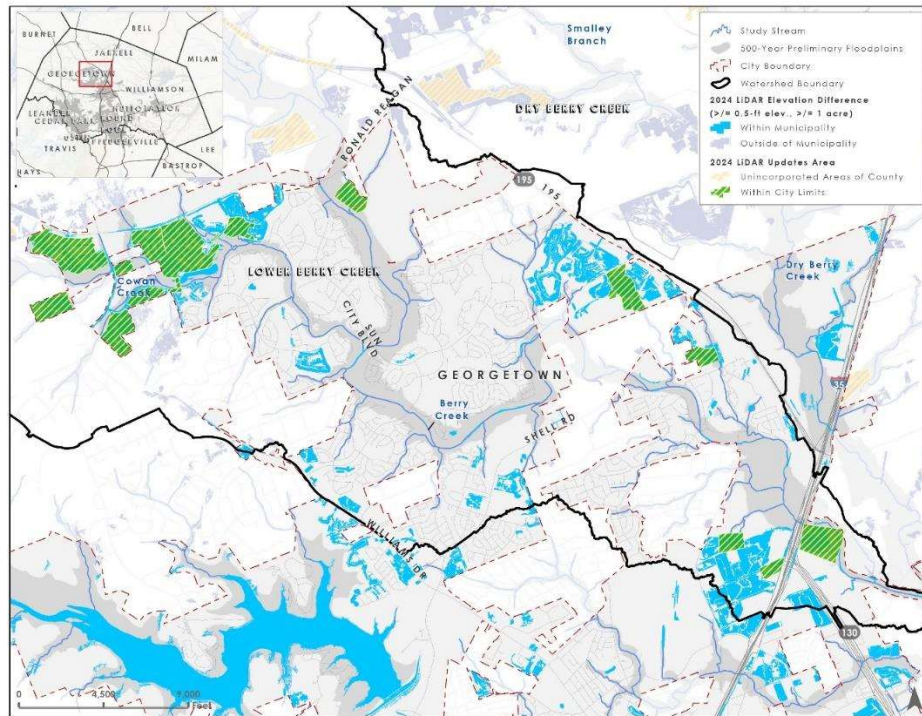
(F = required by FEMA)		Land-Use Conditions					
(W = required by Wilco)		Existing Conditions					
Recurrence Interval Years (Annual % Chance Event)		2 (50%)	10 (10%)	25 (4%)	50 (2%)	100 (1%)	500 (0.2%)
Models	Hydrology	W	F	F	F	F	F
	Hydraulics	W	F	F	F	F	F
Detailed Analysis (Zone AE) Products	Floodplains					F	F
	Water Surface Elevation Grids					F	F
	Depth Grids					F	F
Limited Detailed Analysis (Zone A) Products	Floodplains					F	
	Water Surface Elevation Grids					F	
	Depth Grids					F	

The analysis for Williamson County's unincorporated areas includes hydrologic updates for 12 subbasins within the Salado watershed and hydraulic updates at 12 locations, with an additional 20 locations in the Berry Creek watershed. The areas identified for modeling and mapping are shown in the map below.

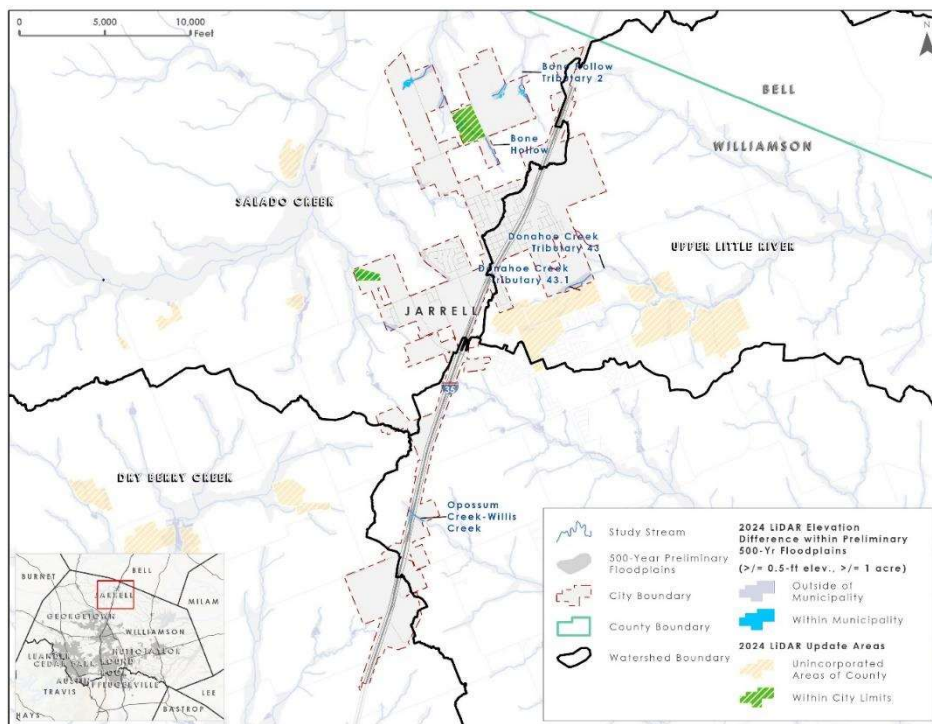


Work to be completed within this scope of work is for areas Outside of Municipality within the above listed watershed extents. Effort for Lidar updates in municipalities to be completed in a separate scope of work.

The analysis for the City of Georgetown includes hydraulic updates at 18 locations within the Berry Creek Watershed. The hydraulic updates will consist of modeling and mapping refinements. The areas of notable changes for the City of Georgetown are highlighted in the map below.



The analysis for the City of Jarrell includes hydraulic updates at 2 locations within the Salado Creek Watershed. The hydraulic updates will consist of modeling and mapping refinements. The areas of notable changes for the City of Jarrell are highlighted in the map below.



PROJECT SCOPE

1. PROJECT MANAGEMENT & COORDINATION

- a. Monthly Progress Report, Invoices, and Billings (12 months assumed):
 - 1. Submit monthly progress status reports to the General Engineering Consultant (GEC). Progress reports will include: deliverable table, tasks completed, tasks/objectives that are planned for the upcoming periods, lists or descriptions of items or decisions needed from the County and its representatives. Subconsultant progress will be incorporated into the monthly progress report. A copy of the monthly progress report will be uploaded to ProjectWise.
 - 2. Prepare correspondence, invoices, and progress reports on a monthly basis in accordance with current County requirements.
- b. Project Coordination & Administration:
 - 1. Prepare and maintain routine project record keeping including records of meetings and minutes. Correspondence and coordination with outside entities will be handled through and with the concurrence of the GEC.
 - 2. Manage project activities (including documenting emails, phone and conference calls, maintain project files for the length of the project, meeting agendas, meeting minutes, and schedule meetings), direct Engineer's team/staff, coordinate and review subconsultant work, correspond with the County and its representatives, and assist the County and its representatives in preparing responses to project-related inquiries. This task accounts for modeling study area and Technical Program Manager (TPM) services general project management.
- c. Stakeholder Meetings (2 virtual stakeholder meetings):
 - 1. Attend two (2) coordination meetings with study area project stakeholders (Williamson County, GEC, Technical Program Manager, TWDB, local and state partners) throughout the duration of the project. Ideally these two meetings would include a kickoff with the validation of the LiDAR update modeling methodologies as well as a flood risk meeting near the end of the project to review draft mapping and reporting.
- d. Progress/Coordination Meetings:
 - 1. TPM: Coordinate efforts for county-wide outreach consisting of two (2) virtual county-wide stakeholder meetings. The two (2) stakeholder meetings shall include: 1) county-wide kick-off meeting and 2) presentation of project results. The activities listed below are included in this task:
 - Attend up to four (4) virtual, one-hour preparation meetings with the County, GEC and outreach consultant, to discuss and develop project messaging and process prior to the stakeholder meetings. The outreach consultant is responsible for the development of meeting minutes and posting of the minutes in ProjectWise for these coordination meetings.
 - Coordinate with AECOM and Doucet prior to each stakeholder meeting to discuss watershed specific information necessary for the public meetings. No meeting minutes are necessary for this task.

- Prepare presentation slides, exhibits, and maps in digital format for each stakeholder meeting. Note: This scope assumes one draft and one final deliverable.
- Attendance and facilitation of the stakeholder meetings is conducted under Task 1c.
- Assist the County in addressing questions and inquiries following the stakeholder meetings by providing written responses. This scope assumes this effort not to exceed 20 hours.

DELIVERABLES:

1. Up to 14 Monthly Invoices and Progress Reports
2. TPM: Stakeholder Meeting content for 2 meetings (presentation slides, exhibits, and maps in digital format)

2. DATA COLLECTION

a. Terrain Development and Analysis (county-wide):

1. TPM: Obtain the 2024 LiDAR and develop a Williamson County seamless Digital Elevation Models (DEMs) for hydrologic and hydraulic analysis and mapping tasks.
2. TPM: Using the prior modeling terrains from the modeling consultants, perform a computation of hydraulic DEM differences between the 2024 LiDAR and the prior modeling (2017/2015) elevations.
3. TPM: Establish thresholds for elevation and area changes that warrant modeling updates and identify general areas with significant differences that may require updates throughout the county. These areas will be compared to previously identified new development sites and quarries.
4. TPM: Conduct internal QA/QC of the terrain, difference raster, and areas of change prior to submission to Williamson County for review.

b. Terrain Comparison:

1. Using the provided difference raster; identify locations where the terrain changes warrant updates to subbasin boundaries and hydraulic models. Generate a polygon shapefile indicating areas where existing condition models will be updated with 2024 LiDAR. (study area only)
2. Generate a final hydraulic terrain for the study area by taking the 2017/2015 DEM and incorporating areas of the 2024 LiDAR where modeling updates will be conducted. This scope assumes the terrain update to include 14 locations in the Salado watershed, 38 locations in the Berry Creek watershed and not to exceed 197 additional locations identified by other study area teams.
3. Conduct internal QA/QC on the of the terrain prior to submission to Williamson County for review.

c. Field Reconnaissance:

1. Using the latest, most accurate data available from the County and other agencies in form of as-builts; or performing field reconnaissance of no more than 24 structures to support hydraulic modeling updates.

DELIVERABLES:

1. TPM: County-wide 2024 hydrologic (3m) and hydraulic (1m) DEMs
2. TPM: Difference raster
3. TPM: Polygon shapefile indicating general areas with notable differences
4. Polygon shapefile indicating areas where model updates will be conducted
5. TPM: Updated county wide hydraulic DEM (mosaic of 2017/2015 LiDAR with 2024 LiDAR)
6. Field Reconnaissance photographs and field sketches.

3. HYDROLOGIC ANALYSIS

This effort includes leveraging the existing condition hydrologic analysis conducted in a prior work authorization. Minor hydrologic updates will be conducted on the existing condition hydrology to reflect updated 2024 LiDAR. Consistent with Table 2 above, updated existing condition hydrologic analysis shall include evaluation of the 2-, 10-, 25-, 50-, 100-, and 500-year frequency events. Specific tasks include:

a. Update Prior Existing Condition Hydrologic Analysis:

1. Utilizing the polygon areas identified under Task 2b, evaluate subbasin delineations within 12 locations to reflect updated LiDAR. Only in these 12 locations, perform subbasin delineation adjustments where model results will have a measurable (5%) impact.
2. For only the subbasins that were altered, compute updated hydrologic parameters (updates to existing land use, curve number, percent impervious, flow path, time of concentration, and routing) following technical methodologies consistent with the prior existing condition analysis.
3. Update the prior existing condition hydrologic analysis to compute updated/new existing condition hydrologic results for the 2-, 10-, 25-, 50-, 100-, and 500-year frequency events.

b. Internal QA/QC:

1. Conduct internal QA/QC of the updated existing condition hydrologic results prior to submission to Williamson County for review. Two milestone reviews are anticipated for existing condition hydrologic updates.
 - Subbasin and Parameter Adjustments – Review of 2024 LiDAR adjusted subbasin delineations and computed hydrologic parameters for adjusted subbasins relative to the prior hydrologic analysis.
 - Updated Existing Conditions Hydrology – Review of updated hydrologic models, calculation/comparison spreadsheets, supporting data, and reporting.
2. Submit hydrologic data and internal review checklists for county review. It is anticipated that these two (2) hydrologic milestone reviews include one initial review and one backcheck to clear comments. It also assumes two (2) virtual coordination meetings to efficiently coordinate QC comments and resolution.
3. Reconcile county comments or reach a mutual agreement regarding comment resolution and re-submittal of final hydrologic deliverables.

DELIVERABLES:

1. Bulleted summary of existing condition hydrologic changes
2. Internal QA/QC forms
3. Reconciled external QA/QC forms
4. Updated existing condition hydrologic memorandum and dataset submittal (hydrologic modeling notebook, reporting support, hydrologic model, supporting calculation spreadsheets, and GIS files – final updated land use, soils, subbasins, and longest flow paths)

4. HYDRAULIC ANALYSIS AND MAPPING

This effort includes leveraging the existing condition hydraulic analysis conducted in a prior work authorization. Minor hydraulic updates will be conducted on the existing condition hydraulics to reflect updated 2024 LiDAR. Existing condition hydraulic analysis shall include evaluation of the 2-, 10-, 25-, 50-, 100-, and 500-year frequency events. Consistent with the existing condition analysis, all hydraulic analysis will include one-dimensional (1D), steady-state modeling using detailed analysis (Zone AE) for 117 stream miles and limited detailed analysis (model-backed Zone A) for 50 stream miles. Specific tasks include:

a. Update Prior Existing Condition Hydraulic Analysis:

1. Utilizing the polygon areas identified under Task 2b, evaluate cross-section alignments within 52 locations to reflect updated LiDAR. Only in these 52 locations, perform cross-section alignments adjustments.
2. For only the cross-sections that were altered, compute updated hydraulic parameters (elevations, roughness coefficients, expansion/contraction coefficients, ineffective areas and blocked obstructions) following technical methodologies consistent with the prior existing condition analysis.
3. This task assumes the inclusion of 24 new crossings in the 52 locations that were updated. These new crossings will be based on as-built plans provided by the County and municipalities or measurements collected during field reconnaissance. It is assumed no manual terrain modifications are necessary for this update.
4. Update the prior existing condition hydraulic analysis with updated hydrologic flows to compute updated/new existing condition hydrologic results for the 2-, 10-, 25-, 50-, 100-, and 500-year frequency events. This task also assumes model adjustments to uncross profiles and ensure model containment.
5. Update the existing condition floodplain mapping, including depth and water surface grids, to ensure alignment with LiDAR modeling updates. Additionally, ensure smooth tie-ins and cross-section alignments at confluences.

b. Internal QA/QC:

1. Conduct internal QA/QC of the updated existing condition hydraulic results prior to submission to Williamson County for review. Two milestone reviews are anticipated for existing condition hydraulic updates.
 - Cross-Section Adjustments – Review of 2024 LiDAR adjusted cross-section alignments relative to the prior cross-section alignments.

- Updated Existing Conditions Hydraulics and Mapping – Review of updated hydraulic models, updated mapping, updated depth and water surface grids, and reporting.
- 2. Submit hydraulic data and internal review checklist for county review. It is anticipated that these two (2) hydraulic milestone reviews include one initial review and one backcheck to clear comments. It also assumes two (2) virtual coordination meetings to efficiently coordinate QC comments and resolution.
- 3. Reconcile County comments or reach a mutual agreement regarding comment resolution and re-submittal of final hydrologic deliverables.

DELIVERABLES:

1. Bulleted summary of existing condition hydraulic and mapping changes
2. Internal QA/QC forms
3. Reconciled external QA/QC forms
4. Updated existing condition hydraulic memorandum and dataset submittal (hydraulic modeling notebook, reporting support, hydraulic models, supporting GIS files – centerlines, cross-sections, n-values, floodplains, water surface elevation grids, and depth grids)

5. INDEPENDENT QA/QC

This effort includes independent technical review of hydrologic, hydraulic and mapping production for AECOM and Doucet submittals. Technical reviews will follow the technical guidelines and QA/QC documents for the program. It is assumed that this effort will not exceed 197 areas of model updates between the two teams.

- a. Coordinate QC Meetings (8 virtual meetings assumed):
 1. A set of eight (8) meetings will be conducted for AECOM and Doucet to advance work order tasks and coordinate QC comments and resolution.
- b. Independent Technical Review
 1. Conduct fifty-four (54) independent reviews of consultant hydrology, hydraulics, and mapping. The anticipated reviews include a review of the three (3) hydrologic milestones and three (3) hydraulic and mapping milestones per team. Submittals are assumed to be one (1) hydrologic review and eight (8) batch hydraulic and mapping reviews per team. It is anticipated that these milestone reviews include an initial review and one backcheck to clear comments. A set of fifty-four (54) reviews will be conducted for AECOM and Doucet submittals.

DELIVERABLES:

1. TPM: Independent QA/QC forms for eighteen (18) independent reviews of consultant hydrology, hydraulics, and mapping.

6. DOCUMENTATION

This effort includes preparation of an addendum memorandum for the prior Atlas 14 Floodplain Study report. The memorandum shall provide a thorough explanation of all updated procedures, assumptions, special considerations, comparisons, checkpoints, independent QA/QC, and planning results. Specific tasks include:

a. Documentation (Study Area):

1. Prepare an existing condition addendum memorandum documenting the updated existing condition study approach, data collection, hydrologic analysis, hydraulic analysis, and modeling results.
2. Prepare supporting digital information including computation spreadsheets, hydrologic models, hydraulic models, and supporting geospatial data. A digital copy of the memorandum will also be provided.

DELIVERABLES:

1. Draft existing condition addendum memorandum submittal describing the methods, assumptions, and results of the study area including supporting information, models, and GIS datasets.
2. Final existing condition addendum memorandum with reconciled independent QA/QC comments.

PROJECT ASSUMPTIONS

General Project Assumptions

1. The Outreach Consultant will be responsible for all administrative tasks related to stakeholder and public outreach, such as scheduling, advertisement, recording/documentation, meeting minutes, reproduction, and other duties as needed.
2. It was determined that 14 locations in the Salado watershed, 35 locations in the Berry Creek watershed and no more than 197 additional locations identified by other study area teams (developments and quarries) require updates to reflect terrain changes. If additional locations are identified, a change order will be required for existing condition modeling and mapping updates in those areas.
3. No wholistic existing condition modeling updates will be conducted such as broad updates of the existing condition land use layer, roughness coefficients, hydrologic routing, or adjustments to the Atlas 14 rainfall totals.
4. Natural LiDAR deviations due to vegetative cover, seasonal permanent pool fluctuations, channel erosion, base flow, etc. will not warrant modeling or mapping updates.
5. It is assumed that new developments planned or constructed after the 2024 LiDAR collection date (requiring manual development of DEMs based on construction plans) will not be included.
6. It is assumed that LiDAR updates are not necessary for areas outside of Williamson County.
7. Work to be completed within this scope of work is for areas Outside of Municipality within the above listed watershed extents. Effort for Lidar updates in municipalities to be completed in a separate scope of work.

Project Exclusions

1. Support and attendance of public meetings
2. Field survey and field reconnaissance
3. Manual development of DEMs
4. Update of gage analysis, historical simulations, or comparisons to any other newly available datasets beyond the comparisons in the prior existing condition analysis
5. Flood risk mitigation analysis
6. Grant application development

ATTACHMENT C
WORK SCHEDULE
FOR Atlas 14 Floodplain Mapping
Work Authorization No. 4 - Supplemental Work Authorization No. 3
Study Area LiDAR Update of Unincorporated Areas
in the Salado Basin plus Berry Creek Hydraulics
& Limited County-wide Technical Program Management Tasks

TASK	DURATION (working days)	START	END
<i>Notice to Proceed</i>	1	30-May-25	
1. PROJECT MANAGEMENT	131	30-May-25	30-Nov-25
2. DATA COLLECTION	30	30-May-25	11-Jul-25
3. HYDROLOGIC ANALYSIS	90	11-Jul-25	14-Oct-25
4. HYDRAULIC ANALYSIS & MAPPING	90	11-Jul-25	14-Oct-25
5. INDEPENDENT QA/QC	131	30-May-25	30-Nov-25
6. DOCUMENTATION	43	1-Oct-25	30-Nov-25

ATTACHMENT D
WILLIAMSON COUNTY ATLAS 14 FLOODPLAIN MAPPING UPDATE
 Work Authorization No. 4 - Supplemental Work Authorization No. 3 Study Area Analysis
 Labor and Expense Detail: Halff Associates, Inc.

LABOR TASK <i>Hourly Rate:</i>	Technical Advisor \$357.00	Senior Engineer \$270.00	Project Engineer \$199.00	Junior Engineer \$133.00	Engineer-In- Training \$120.00	Quality Manager \$235.00	GIS Operator \$122.00	GIS Technician \$97.00	RPLS Task Leader \$224.00	Survey Tech \$112.00	2 - Person Survey Crew \$179.00	Admin / Clerical \$82.00	TOTAL HOURS	TOTAL LABOR	TOTAL EXPENSE	TOTAL
1. PROJECT MANAGEMENT																
a. Monthly Progress Report, Invoices, and Billings		8	12									16	36	\$5,860		\$5,860
b. Project Coordination & Administration			16										16	\$3,184		\$3,184
c. Stakeholder Meetings (virtual stakeholder meetings)	2	4	4				12						22	\$4,103		\$4,103
d. Progress/Coordination Meetings	4	12	12		14		14						56	\$10,444		\$10,444
TASK TOTAL:	6	24	44	0	14	0	26	0	0	0	0	16	130	\$23,591	\$0	\$23,591
2. DATA COLLECTION																
a. Terrain Development and Analysis (county-wide)	2	4	18			8	20	40					92	\$13,576		\$13,576
b. Terrain Comparison			16			8	20	80					124	\$15,264		\$15,264
c. Field Reconnaissance			4		30								34	\$4,396		\$4,396
TASK TOTAL:	2	4	38	0	30	16	40	120	0	0	0	0	250	\$33,236	\$0	\$33,236
3. HYDROLOGIC ANALYSIS																
a. Update Prior Existing Condition Hydrologic Analysis		16	40		60								116	\$19,480		\$19,480
c. Internal QC/QC		4				16							20	\$4,840		\$4,840
TASK TOTAL:	0	20	40	0	60	16	0	0	0	0	0	0	136	\$24,320	\$0	\$24,320
4. HYDRAULIC ANALYSIS & MAPPING																
a. Update Prior Existing Condition Hydraulic Analysis	8	50	140	300	840			170					1,508	\$201,459		\$201,459
b. Internal QA/QC		8	40	60		84		40					232	\$41,720		\$41,720
TASK TOTAL:	8	58	180	360	840	84	0	210	0	0	0	0	1,740	\$243,179	\$0	\$243,179
5. INDEPENDENT QA/QC																
a. QC Coordination Meetings	8	8	12			12							40	\$10,304		\$10,304
b. Independent Technical Review	12	32	140	140	20	140		100					584	\$104,404		\$104,404
TASK TOTAL:	20	40	152	140	20	152	0	100	0	0	0	0	624	\$114,708	\$0	\$114,708
6. DOCUMENTATION																
a. Documentation		8	16		28	4							56	\$9,701		\$9,701
b. Digital Deliverables			8			2	8	40					58	\$6,918		\$6,918
TASK TOTAL:	0	8	24	0	28	6	8	40	0	0	0	0	114	\$16,619	\$0	\$16,619
TOTAL HOURS:	36	154	478	500	992	274	74	470	0	0	0	16	2,995			
TOTAL LABOR COST:	\$12,852	\$41,637	\$95,202	\$66,553	\$119,040	\$64,390	\$9,077	\$45,590	\$0	\$0	\$0	\$1,312		\$455,652	\$0	\$455,652

HALFF ASSOCIATES, INC. TOTAL COST: \$455,652