

OCT 11 2022

Approved

REQUEST FOR AGENDA PLACEMENT FORM

Submission Deadline - Tuesday, 12:00 PM before Court Dates

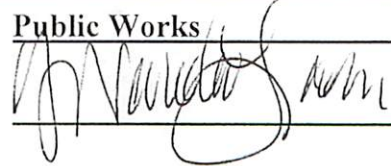
SUBMITTED BY: Jennifer VanderLaan

TODAY'S DATE: 10/04/22

DEPARTMENT:

Public Works

SIGNATURE OF DEPARTMENT HEAD:



REQUESTED AGENDA DATE:

October 11, 2022

SPECIFIC AGENDA WORDING:

Consideration of approval to send City of Alvarado Wastewater Treatment Plant Expansion project to Halff Engineering for review and recommendations.

PERSON(S) TO PRESENT ITEM: Jennifer VanderLaan

SUPPORT MATERIAL: (Must enclose supporting documentation)

TIME: 10 minutes

ACTION ITEM: X

WORKSHOP _____

(Anticipated number of minutes needed to discuss item)

CONSENT: _____

EXECUTIVE: _____

STAFF NOTICE:

COUNTY ATTORNEY: _____ **IT DEPARTMENT:** _____

AUDITOR: _____ **PURCHASING DEPARTMENT:** _____

PERSONNEL: _____ **PUBLIC WORKS:** X

BUDGET COORDINATOR: _____ **OTHER:** _____

*****This Section to be Completed by County Judge's Office*****

ASSIGNED AGENDA DATE: _____

REQUEST RECEIVED BY COUNTY JUDGE'S OFFICE _____

COURT MEMBER APPROVAL _____ Date _____



September 28, 2022
32083.023

Mr. Ralph McBroom, C.P.M.
Johnson County
Purchasing Agent
1102 E. Kilpatrick, Suite B
Cleburne, Texas 76031

RE: Professional Services for Review of the Alvarado WWTP Expansion Flood Study

Dear Mr. McBroom,

Johnson County has requested Halff Associates, Inc. (Halff) to provide professional engineering services for a review of the Alvarado Wastewater Treatment Plant (WWTP) Expansion Flood Study submitted by Freese and Nichols, Inc. to the County on September 26, 2022. This proposal includes the Project Description, Scope of Work, Deliverables, and Fees. The following exhibit is attached to the Proposal:

Exhibit A Scope of Work

Project Description

The Alvarado WWTP expansion is located along the north bank of North Fork Chambers Creek between County Road 401 and County Road 404 within the City of Alvarado. The effective FEMA mapping adjacent to the project area is Zone A and proposed fill associated with the project falls within an existing floodplain easement established by a 2002 study performed by Dannenbaum Engineering Corporation.

Deliverables

Halff will review and provide written comments to the County for consideration based on the Subdivision Rules and Regulations of Johnson County, state and federal regulations, calculations provided by the applicant, and engineering judgement. Halff requests the County provide any additional adopted ordinances or criteria that should be applied to this review.

Fees

Halff proposes to bill the County hourly for effort associated with the review with a total not to exceed fee of \$3,000. If the entire budget is not utilized for this review, it will not be billed. If additional effort is required to complete the review, Halff will communicate with the County for approval before exceeding this agreed amount.

We appreciate the opportunity to be of service to Johnson County. If you have any questions, please do not hesitate to call me at (817) 847-1422.

Sincerely,

HALFF ASSOCIATES, INC.

A handwritten signature in cursive script that reads "Scott A. Rushing".

Scott Rushing, P.E., CFM
Water Resources Team Leader



Exhibit 'A'
Proposed Scope of Work
Review of the Alvarado WWTP Expansion Flood Study

A. Review of Other Engineer's Work Products

Half Associates, Inc. shall serve as the ENGINEER to Johnson County who is the COUNTY.

The term "Other Engineer" means any person duly licensed as a professional engineer by the State of Texas and who is not affiliated with ENGINEER as a principal, staff employee or under subcontract involving the "WORK PRODUCT" that is the subject of review. Upon written request by COUNTY and acceptance in writing by ENGINEER, the ENGINEER shall review Drainage Reports and Construction Plans or similar material submitted by "Other Engineers" to COUNTY provided the materials submitted for review bear the "Other Engineer's" seal or suitable verification that such "Other Engineer" accepts full responsibility for the submittal.

B. Time of Performance

1. The review is anticipated to be completed within ten (10) business days of delivery to the ENGINEER and notice to proceed by the COUNTY.
2. If any individual task is expected to require more than ten (10) business days of delivery to the ENGINEER, due to complexity, regulatory requirements, or external review constraints, a mutually agreed upon schedule will be developed by the COUNTY and the ENGINEER.

C. Basic Services

All engineering work shall be reviewed for compliance with current drainage criteria in the Subdivision Rules and Regulations of Johnson County along with compliance with State and Federal regulations.

1. At the request of the COUNTY the ENGINEER will attend up to 2 meetings with the developer or COUNTY. If necessary, up to 1 meeting may be in person at the request of the COUNTY.
2. Discuss with the County, if necessary, any special problems or concerns relative to the proposed development.
3. Determine location of project and collect data on site and downstream conditions through aerial imagery and COUNTY drainage information.
4. Determine if the proposed development is in a FEMA-designated floodplain area.
5. Check to determine if drainage area maps provided in the plans and/or report accurately reflect the correct drainage areas.
6. Check to determine if drainage calculations which support the proposed improvements are provided in the plans and/or report.



7. Review analysis provided by the "Other Engineer" to determine if the proposed development will produce runoff discharges which will impact the downstream system, and recommend if additional off-site improvements (or additional on-site detention) are required to minimize the downstream impacts.
8. Comment on any areas of non-compliance of the plans with the COUNTY's drainage criteria and Section 404 permitting criteria (impacts to jurisdictional waters, wetlands, or other environmentally sensitive areas).
9. Verify that the latest FEMA-designated floodplain limits, panel number and map number are shown on the drainage area map and plat, or have been modified by FEMA-approved flooding report prepared by the "Other Engineer".
10. Comment on any potential maintenance or operation problems.
11. Provide value engineering comments, as needed.
12. Determine if the plans include an adequate erosion control plan to meet County, State and Federal requirements.
13. Review and check hydrology and hydraulic studies for open channels (when required by the COUNTY)
14. Submit review comments (via e-mail) and 'red lined' plans to the COUNTY, and discuss with the COUNTY and/or the "Other Engineer" the review comments, if necessary. Include any County comments in the letter. All review comments submitted to County staff will be submitted by ENGINEER's designated point of contact or secondary point of contact.
15. Provide one (1) follow-up review and provide comments as required. After all comments have been resolved, provide final recommendation letter that the drainage issues have been addressed and for the County to release the drainage plans and/or report.

D. Items Not included in this Scope of Services

1. The ENGINEER cannot comment on the professional competence, integrity, honesty, ethics or other personal characteristics of the "Other Engineer".
2. The ENGINEER cannot comment on the accuracy of all plan dimensions furnished.
3. The ENGINEER cannot comment on the validity of dedications, acknowledgements and certifications included in the plan and/or report submittals.
4. The ENGINEER cannot comment on the completeness, accuracy, precision and interpretation of the topographic field survey data provided by the "Other Engineer".
5. The ENGINEER cannot confirm that construction of the proposed drainage improvements is performed in accordance with the reviewed report and/or plans.
6. The ENGINEER cannot assure that compliance with specific regulations as planned is feasible and field confirmation it is built as planned.
7. The ENGINEER cannot comment on operational and maintenance problems which are not detectable from the drawings.



- 8. The ENGINEER cannot comment on detailed drainage onto private land if off-site grading and improvements are not shown on the plans.
- 9. The ENGINEER cannot comment on permits or special arrangements for physical features not shown on the topographic plans.

E. Items to be furnished by the "Other Engineer"

The "Other Engineer" will furnish copies of all associated on-site and off-site drainage background information including record plans and studies for review with the initial study.

The "Other Engineer" shall address all comments either by plan revision or by written explanation. Disputed comments will be addressed in writing. Failure to address comments will be cause for additional reviews and possible additional compensation.

AGREED AND ACCEPTED

Scott Rushing, P.E., CFM
Water Resources Team Leader

9/28/2022
Date

Johnson County Agent
Roger Harmon
Printed Name

10/11/22
Date

TECHNICAL MEMORANDUM



Innovative approaches
Practical results
Outstanding service

2711 N. Haskell Ave., Suite 3300 + Dallas, Texas 75204 + 214-217-2200 + FAX 817-735-7491

www.freese.com

TO: Jennifer Vanderlaan – Johnson County
CC: Michael Dwiggin – City of Alvarado
FROM: Caroline Short, PE, CFM
SUBJECT: Alvarado WWTP Expansion Flood Study
DATE: 9/13/2022
PROJECT: AVR21572



FREESE AND NICHOLS, INC.
TEXAS REGISTERED
ENGINEERING FIRM
F-2144

1. BACKGROUND

Freese and Nichols is supporting The City of Alvarado in the design and development of the Alvarado Wastewater Treatment Plant (WWTP) Expansion. This expansion is located in the City of Alvarado, on the north bank of the North Fork Chambers Creek. The FEMA Flood Insurance Rate Map (FIRM) denotes the area as a Zone A, indicating there is no defined base flood elevation (BFE). A study was previously completed by Dannenbaum Engineering Corporation (DEC) in 2002 that analyzed the initial development of the WWTP. FNI obtained a copy of this report from the City of Alvarado, but no associated models or other digital files could be located. As a result of this previous study, a floodplain easement was dedicated to the County around the perimeter of the existing WWTP site at an elevation of 685.55 ft. The floodplain easement is shown in **Exhibit 2**. The proposed expansion involves fill with this floodplain easement, therefore FNI performed a flood study to show that the expansion of the WWTP site does not cause an adverse impact to the floodplain on adjacent properties. The site and its proposed expansion are shown in **Exhibits 1 and 2**.

2. HYDROLOGY

The DEC study included several hydrologic analyses to determine peak discharges along the creek adjacent to the site. Calculations were performed using the USGS SCS method for both existing and future land use conditions as well as through use of the USGS Statewide Rural Regional Regression Method as a check. The previous study used the discharges resulting from the SCS method calculations for future land use conditions as the basis of the flood elevations. FNI reviewed the methodology described in the report and believe the hydrologic results of the previous study to be adequate for the current study and were used in subsequent analysis.

3. HYDRAULIC ANALYSIS

A steady state 1D HEC-RAS (v5.0.7) model was created to evaluate the hydraulics of the creek adjacent to the WWTP site to compare to the 2002 study results. The model extends upstream to CR 404 and downstream to CR 401, as shown in the attached **Exhibit 1**. The model created during the previous study was not available; therefore, a new model was created with new cross sections drawn to intersect the WWTP site. Both existing conditions and proposed conditions analyses were completed.



For the existing conditions model, cross sections were cut from LiDAR created with two Texas Natural Resources Information System (TNRIS) datasets, one from 2019 and one from 2013. Manning’s N values were set to 0.08 for the overbanks and 0.04 in the channel to match the methodology of the previous study.

Initially, normal depth was considered for the downstream boundary condition of the model, but this was deemed to result in flood elevations that were too low. It is expected that the bridge at CR 401 or the railroad bridge will cause additional backwater. To account for this situation, the boundary condition was set to known water surface with an elevation of 685 ft which matches the approximate elevation of the railroad bridge estimated from LiDAR. This resulted in flood elevations at the site very similar to the previous study.

A proposed conditions model was created by duplicating the existing conditions and making adjustments to reflect the proposed site. The proposed project involves grading and fill to expand the footprint of the site. To reflect this the cross sections were updated based on the proposed grading plan. The above grade sequencing batch reactors were reflected as blocked obstructions at cross sections 1754 and 1579. The roughness values were revised to 0.013 across the site to reflect the paved concrete conditions. The models were executed, and the results were compared to evaluate the impact of the proposed project.

4. RESULTS

The table below displays the cross sections and the change in WSE from existing to proposed conditions. These resulting flood elevations are similar to those of the DEC study and floodplain easement and demonstrate either no rise or a minimal rise in the 100-year water surface elevation (WSE) for proposed conditions. The minor increase in WSE shown in the table below occurs on City property, and no other rise occurs on adjacent properties. The majority of the proposed site is elevated above the calculated elevations with only a portion of the service road onsite within the floodplain. No onsite structures will be impacted by the rise in WSE. The existing and proposed floodplains and their relation to adjacent properties is shown in **Exhibit 2**.

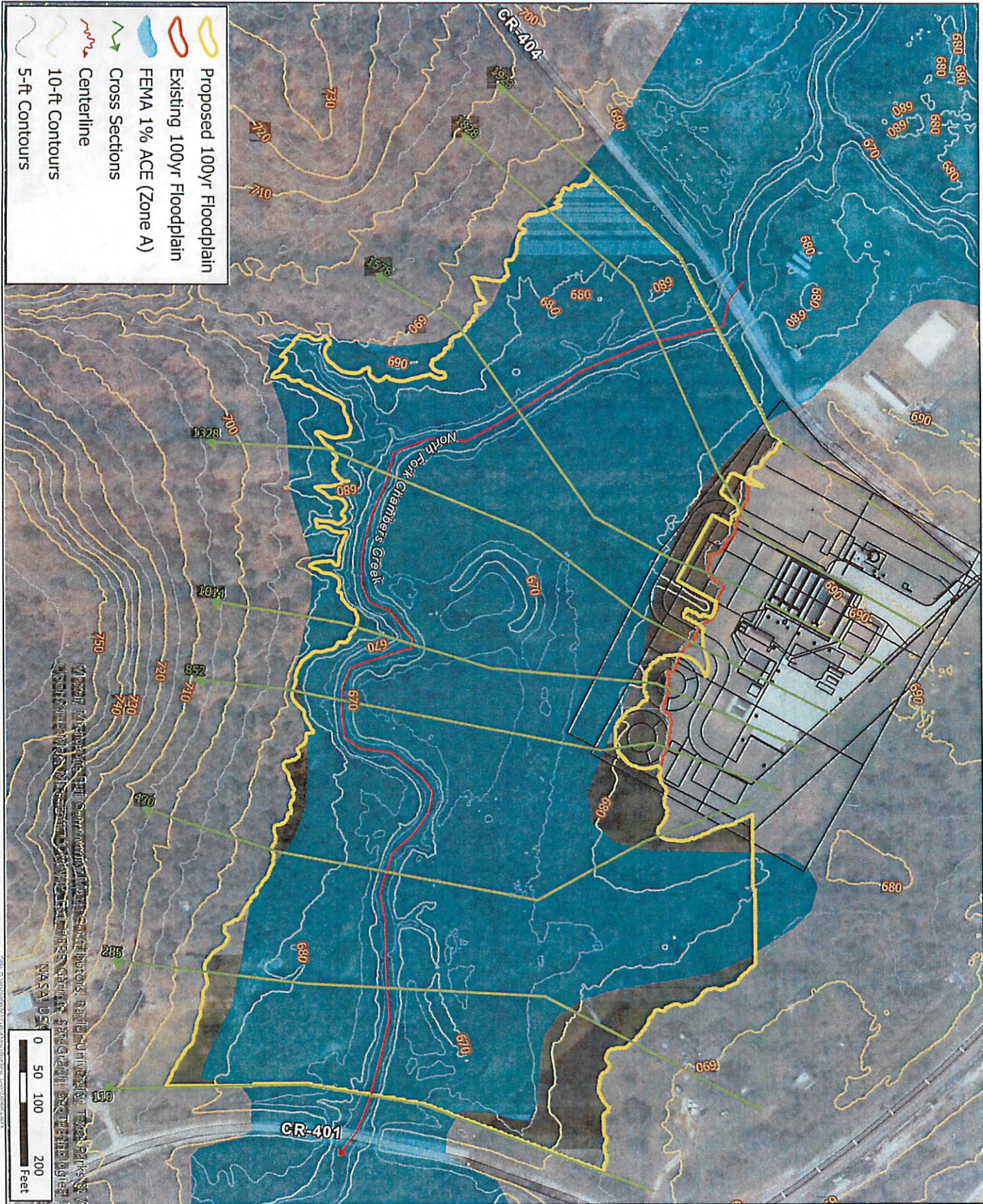
Table 1: Existing and Proposed Conditions Water Surface Elevations for the 100-yr Floodplain

Cross Section	Existing Conditions WSE (ft)	Proposed Conditions WSE (ft)	Δ WSE
1923	685.28	685.25	-0.03
1841	685.34	685.25	-0.09
1754	685.31	685.27	-0.04
1579	685.26	685.23	-0.03
1328	685.25	685.24	-0.01
1014	685.15	685.18	0.03
858	685.16	685.15	-0.01
470	685.05	685.05	0
285	685.02	685.02	0
110	685.00	685.00	0



5. CONCLUSION

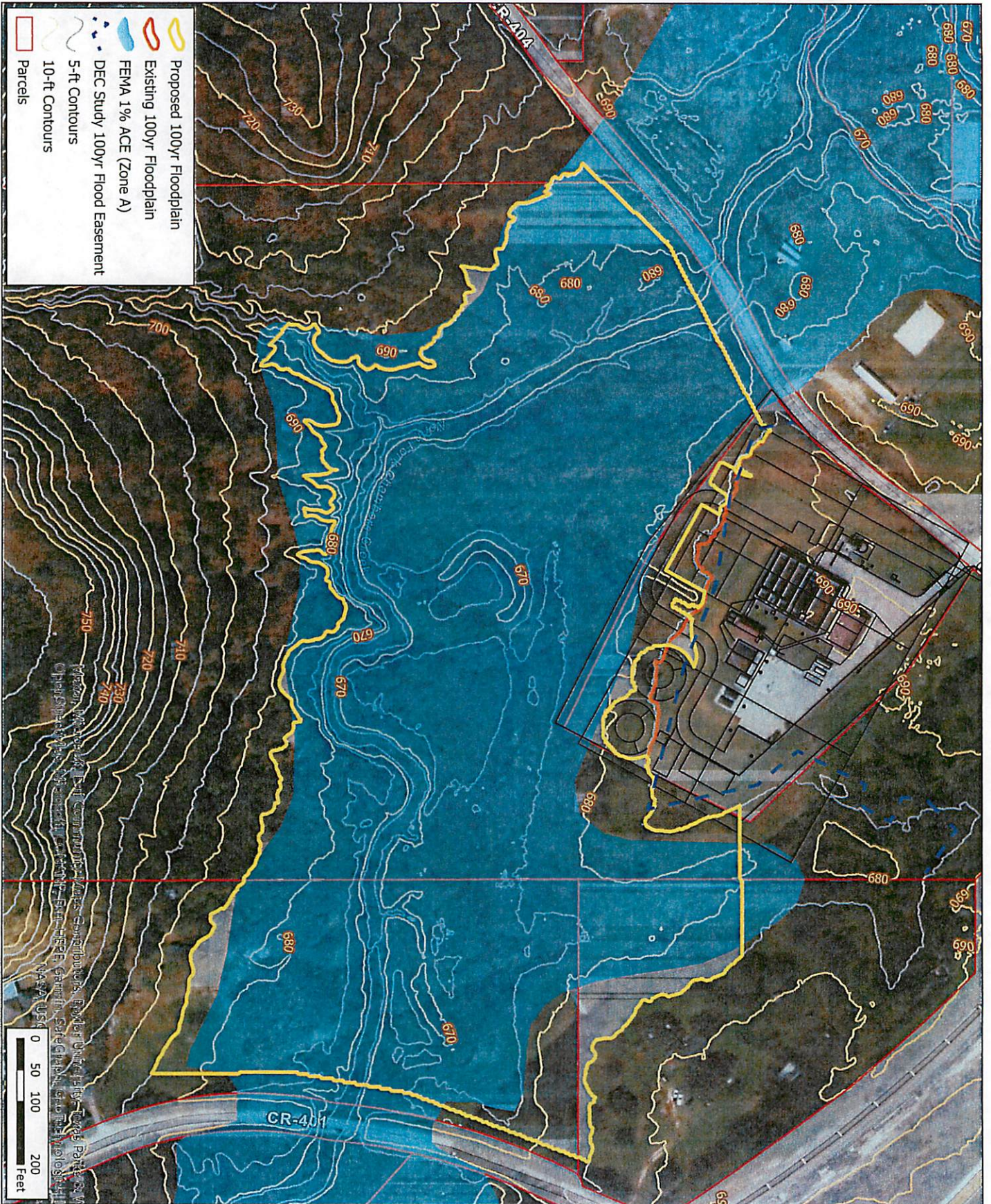
The hydraulic analysis demonstrates that the proposed expansion of the WWTP will result in a minimal rise to the 100-yr floodplain, which is fully contained within property owned by the City of Alvarado and therefore, does not adversely impact adjacent property. These results also indicate that the project is compliant with FEMA floodplain regulations as the rise is less than the limit of 1 ft. Based on these findings, FNI requests that the County approve of the proposed work within the dedicated floodplain easement.



Hydraulic Workmap

Alvarado WWTP Expansion

FN JOB NO	AVR21572	EXHIBIT 1
FILE	Exhibits	
DATE	9/12/2022	
SCALE	1:2,400	
DRAFTED	03880	



- ▭ Proposed 100yr Floodplain
- ▭ Existing 100yr Floodplain
- ▭ FEMA 1% ACE (Zone A)
- ▭ DEC Study 100yr Flood Easement
- ▭ 5-ft Contours
- ▭ 10-ft Contours
- ▭ Parcels

0 50 100 200
Feet

FREESE NICHOLS
801 Cherry Street, Suite 2800
Fort Worth, TX 76102
817-735-7300 | www.freese.com



Floodplain Comparison

Alvarado WWTP Expansion

FN JOB NO	AVR21572	EXHIBIT 2
FILE	Exhibits	
DATE	9/12/2022	
SCALE	1:2,400	
DRAFTED	03880	