CLOMR REQUEST REPORT

FOR GENEIVAS ARROYO






Case No.: TBD

Community: City of Albuquerque,
Bernalillo County, NM

Community No.: 350001; 350002

MARCH 12, 2026

Prepared for:

SIMON CRE
SIMON COMMERCIAL REAL ESTATE

Prepared by:

Bohannan Huston

CONDITIONAL LETTER OF MAP REVISION (CLOMR)

REQUEST REPORT

FOR

GENEIVAS ARROYO

MARCH 12, 2026

Prepared for:

SIMONCRE GIBSON II, LLC

6900 E 2ND STREET

SCOTTSDALE, AZ 85251

Prepared by:

BOHANNAN HUSTON, INC.

7500 JEFFERSON STREET NE

ALBUQUERQUE, NM 87109

Prepared by:

3/12/2026

Grady Koenig, E.I. Date

Reviewed by:

VINCENT C. STEINER NEW MEXICO 24319 PROFESSIONAL ENGINEER

3/12/2026

Vincent Steiner, P.E., CFM Date

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

EXHIBITS

I. INTRODUCTION

This Conditional Letter of Map Revision (CLOMR) request is associated with the existing Special Flood Hazard Area (SFHA) for the Geneivas Arroyo to reflect proposed drainage improvements associated with the University of New Mexico (UNM) South Campus Commercial proposed development and to reflect existing upstream drainage improvements. The site is located in Albuquerque, New Mexico, east of I-25 and north of Gibson Boulevard SE. Figure 1 is a location map showing the proposed development. The UNM South Campus Commercial project proposes storm drain improvements to extend existing storm drains that outlet to the existing Geneivas Arroyo concrete channel (maintained by the City of Albuquerque [COA]) immediately downstream of University Boulevard, with the new storm drain outfall proposed downstream of an extension to Alumni Drive. The proposed storm drain outfall will discharge to a riprap lined reach of Geneivas Arroyo maintained by the Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA).

The project site is impacted by an effective Zone A SFHA associated with Geneivas Arroyo. The FEMA Flood Insurance Rate Map (FIRM) panels affected by this CLOMR request are provided as Exhibit 1 and include 35001C0334G, 35001C0342G, and 35001C0361G, effective September 26, 2008. All revisions are within the COA.

II. FEMA FORMS

The FEMA MT-2 Forms relevant for this CLOMR request are included as Appendix A.

Bohannan Huston
www.bhinc.com 800.877.5332

Approximate Limits of Floodplain/SHFA Revision
UNM South Commercial Project Site

N

0 1,250 2,500 5,000 Feet

1 in. = 2,500 ft.

Geneivas Arroyo CLOMR

Figure 1
Location Map

P:\20260033\SW\Reports\Preliminary & Draft\Figures\Source Files\20260033_UNMSouthCampus_Figures\20260033_UNMSouthCampus_Figures.aprx
Author: mcrooks

January 2026

III. SURVEYING AND MAPPING INFORMATION

A topographic field survey was performed by Bohannan Huston, Inc. (BHI) in August 2025 for the UNM South Commercial project site, including the subject reach of Geneivas Arroyo through the site. Topographic survey data prepared by BHI is at the North American Datum 1983 (NAD1983) horizontal datum, New Mexico Central Zone (3002) and the North American Vertical Datum of 1988 (NAVD88) vertical datum (GEOID18). CAD files are in AutoCAD Civil 3D DWG format and use a Modified State Plane (Ground) coordinate system, scaled about the origin (Northing=0, Easting=0) using a combined factor (ground to grid) of 0.99967505000. The projection used for the Hydrologic Engineering Center-River Analysis System (HEC-RAS) model is New Mexico State Plane Central – US Survey Foot.

The *Construction Plans for Geneiva's Arroyo, Buena Vista Drive S.E. to South Diversion Channel,* prepared by Boyle Engineering Corporation in 1991 (herein referred as 1991 as-builts), represent the current Geneivas Arroyo improvements along the subject reach and were used to determine existing storm drain infrastructure (pipe size, length, slope and elevations) between University Boulevard and Buena Vista Drive. The 1991 as-builts use the North American Datum of 1929 (NAVD29) and as-built elevations were converted to NAVD88 elevations for this analysis. The elevation conversion was based on the National Geodetic Survey (NGS) Coordinate Conversion and Transformation Tool (NCAT) and was verified by field survey of storm drain manhole rim elevations. The 1991 as-builts are included as Appendix B.

IV. ESA COMPLIANCE

As required for a CLOMR request, an investigation was conducted to ensure compliance with Sections 9 and 10 of the Endangered Species Act (ESA). The investigation was performed by Barr Engineering, and a memo documenting their findings is included as Appendix C.

V. HYDROLOGY

A. METHOD DESCRIPTION

The 100-year design discharges for Geneivas Arroyo provided on the *Construction Plans for Geneiva's Arroyo, Buena Vista Drive S.E. to South Diversion Channel* (1991 as-builts) were adopted for design of Geneivas Arroyo improvements and for this CLOMR request, through coordination with COA and AMAFCA. No discharges for Geneivas Arroyo are provided in the Flood Insurance Study (FIS) and no hydrologic analysis of Geneivas Arroyo was performed for this project. See Appendix B for the 1991 as-builts.

VI. HYDRAULICS

A. STORM DRAIN HYDRAULICS

1. ANALYSIS METHOD

To analyze the hydraulics of the existing storm drain, the Stormwater Studio (SWS) program (version 3.0.0.40) was used. The existing storm drain captures runoff from the residential area to the east of Buena Vista Drive. The existing storm drain extends far to the east of Buena Vista Drive but for the purposes of this CLOMR request, the upstream limits of the storm drain analysis is Buena Vista Drive, corresponding to the upstream end of the effective Zone A SFHA.

SWS was used to prepare two models: one for the existing storm drain between Buena Vista Drive and University Boulevard and another for the proposed condition with the storm drain extension from University Boulevard to the outfall downstream of Alumni Drive.

2. STORM DRAIN PROFILE

The existing storm drain sizes, inverts, and slopes were taken from the 1991 as-builts after the vertical adjustment to NAVD88. Adjusted manhole rim elevations were compared to field survey rim elevations to verify the vertical adjustment.

The proposed storm drain extension size and profile was designed to convey the 100-year discharge per the 1991 as-builts.

3. ROUGHNESS COEFFICIENT

The *COA Development Process Manual* [COA DPM] (2020) was referenced for Manning's n roughness coefficients. Table 6.16.26,"Values in Manning's 'n'", in Article 6-16 of the *COA DMP* (2020) includes recommended values for various material types. Table 1 summarizes the manning's n value associated with each material analyzed in the SWS models.

Table 1: Manning's n Roughness Coefficients for Storm Drain Hydraulic Analysis

Element	Manning's n
Concrete	0.013
Corrugated Metal Pipe	0.024

4. TAILWATER ELEVATION

The tailwater elevation for the existing storm drain outfall to the Geneivas Channel was determined using the water surface elevation (WSE) at the upstream cross-section of the existing HEC-RAS model. The tailwater elevation for the proposed storm drain outfall was determined using the WSE at the cross-section downstream of the pipe outlet from the proposed condition HEC-RAS model. HEC-RAS boundary conditions are discussed further in Section VI.B.4.

5. STRUCTURE LOSSES

Manholes were assumed to be half benched with HEC-22 equations used to calculate losses at structures. The junction box at the upstream end of the proposed storm drain was modeled as flat for the benching input and calculating the structure losses.

B. OPEN CHANNEL HYDRAULICS

1. METHOD DESCRIPTION

The United States Army Corps of Engineers (USACE) HEC-RAS version 6.6 was used to model the open channel reach of Geneivas Arroyo for existing and proposed conditions. For the existing condition model, from the existing storm drain outfall just downstream of University Boulevard, a concrete lined channel extends southwest to where the concrete channel transitions to riprap and eventually drains to a baffle chute at the downstream end of Geneivas Arroyo, where it enters the South Diversion Channel. The proposed condition model starts at the storm drain extension outfall and extends to the same downstream end as the existing condition model. HEC-RAS model information (cross-sections, limits of study, etc.) is provided on the Topographic Work Map (Exhibit 3) and is further described below.

2. PARAMETERS ESTIMATION

a) *Roughness Coefficient*

The *COA DPM* (2020) was utilized in developing Manning's n roughness coefficients for input to HEC-RAS. Table 6.16.26, "Values in Manning's 'n'", in Article 6-16 of the *COA DMP* (2020) includes recommended values for various material types. Manning's n values are based on investigation of the site and engineering judgment. The existing channel reach directly downstream of the concrete lined reach has experienced sedimentation and is represented as a grass lined channel with a lower Manning's n value. The remainder of the downstream reach is riprap lined, with less sedimentation. The Manning's n value for the proposed derrick stone was obtained from the *New Mexico*

Department of Transportation Drainage Design Manual (2018) Table 502-3: "Manning's n for Selected Linings and Flow Depths". Table 2 summarizes the Manning's n value associated with each material analyzed in the HEC-RAS models.

Table 2: Manning's n Roughness Coefficients for Open Channel Hydraulic Analysis

Element	Manning's n
Concrete	0.013
Grass Lined Channels	0.025
Arroyo Overbanks	0.045
Medium Weight Dumped Ripap	0.045
Derrick Stone	0.08

b) *Expansion and Contraction Coefficients*

Coefficients that pertain to the hydraulics of expansion and contraction were applied to cross sections in HEC-RAS. Using Table 3-3 "Subcritical Flow Contraction and Expansion Coefficients" from the HEC-RAS guidance documents, the typical values of 0.3 and 0.1 for gradual transitions were used at all cross sections for the expansion and contraction coefficients respectively. An abrupt change occurs at the baffle chute at the downstream cross section, and the coefficients were increased to 0.5 for expansion and 0.3 for contraction.

3. CROSS SECTION DESCRIPTION

HEC-RAS cross sections were cut approximately every 50 feet using the survey terrain from the storm drain pipe outfall just west of University Boulevard, to the top of the baffle chute just upstream of the confluence with the South Diversion Channel. The channel geometry consists of two sections: one being a concrete lined trapezoidal channel having 2 feet horizontal to 1-foot vertical (2H:1V) side slopes and a bottom width of 11 feet; the other being a riprap lined trapezoidal channel with 2 feet horizontal to 1-foot vertical (2H:1V) side slopes and a bottom that varies from approximately 61 feet to 13 feet. Cross sections were oriented perpendicular to the direction of flow.

The proposed conditions model begins immediately downstream of the proposed storm drain outlet structure. The proposed concrete-lined outlet structure and derrick stone lining immediately downstream of the new storm drain outfall was incorporated into the model using cross sections immediately upstream and downstream of the channel lining material change.

4. BOUNDARY CONDITIONS

The downstream boundary condition for the HEC-RAS model (for both existing and proposed conditions) is defined as a "Known WSE" determined using a weir calculation to model flow spilling over the top of the baffle chute. The known WSE is 5,045 feet at the baffle chute for the 100-year storm event. The weir calculation has been included in Appendix D for reference.

The existing condition upstream boundary condition was defined as normal depth. The existing channel slope, provided by the 1991 as-builts, was applied to the normal depth slope input in HEC-RAS. The resultant normal depth elevation was applied to the tailwater elevation for the storm drain model described above.

In the proposed conditions model, the upstream boundary is located along the most downstream storm drain pipe segment. A normal depth boundary condition was applied to represent storm drain pipe flow as it approaches the outfall, using the proposed pipe slope.

5. MODELING CONSIDERATIONS

a) *Hydraulic Jump and Drop Analysis*

In existing conditions, a hydraulic jump occurs in the vicinity of the transition between the concrete lining and riprap-lined channel. This existing channel reach appears stable.

In proposed conditions, a hydraulic jump will occur in the vicinity of the transition of concrete to derrick stone channel lining, where the channel slope decreases, the roughness increases, and the channel cross section expands. This jump will be contained in the derrick stone-lined portion of the channel based on design analyses prepared under separate cover. The proposed outfall includes concrete lining and derrick stone lining designed to protect the channel at the hydraulic jump.

b) *Ineffective Flow Areas*

The proposed model includes ineffective flow areas directly downstream of the storm drain outlet at an angle of 1 foot horizontal to 3 feet longitudinally.

c) *Supercritical Flows*

The existing concrete-lined channel, which will be removed as part of the proposed project, is anticipated to experience supercritical flow and is designed to endure those flow conditions. In proposed conditions, supercritical flow is anticipated at the storm drain outlet structure and the proposed concrete and derrick stone lining is designed to accommodate them. For the purpose of determining WSEs and floodplain limits, the HEC-RAS modeling was run as subcritical to be conservative.

C. RESULTS

1. STORM DRAIN HYDRAULIC ANALYSIS RESULTS

SWS output data is provided as Appendix E. All effective SFHA upstream of the proposed storm drain outfall would be removed because the 100-year discharge is conveyed in the storm drain. The Topographic Work Map reflecting these results is provided as Exhibit 3.

2. HEC-RAS RESULTS

HEC-RAS model data and results is provided as Appendix E. A Topographic Work Map reflecting proposed condition inundation limits based on the HEC-RAS model is provided as Exhibit 3.

3. COMPARISON OF RESULTS

The proposed design conveys the runoff in a storm drain for an additional length reducing the open channel distance compared to the existing infrastructure. The proposed inundation limits are limited to a shorter compared to existing conditions and significantly shorter reach as compared to the FEMA SFHA.

VII. EROSION, SEDIMENT TRANSPORT, AND GEOMORPHIC ANALYSIS

Scour and erosion calculations were not required for design and analysis of the subject Geneivas Arroyo improvements. The existing Geneivas Arroyo channel that is to remain was constructed in approximately 1991, is riprap-lined, and is in stable condition. Proposed channel lining consists of concrete and derrick stone (which has a larger rock size than the existing riprap) to protect against erosion and scour potential.

Sediment transport and geomorphology was not analyzed for this study. The drainage area is fully developed, and all existing upstream stormwater infrastructure is concrete-lined producing minimal sediment yield. No additional sediment transport is assumed to occur with the existing storm drains remaining as is.

VIII. DRAFT FIS DATA

1. ANNOTATED FLOOD INSURANCE RATE MAPS

This CLOMR would affect multiple panels: 35001C0334G, 35001C0342G, and 35001C0361G. Annotated FIRMs are included as Exhibit 2.

IX. CONCLUSION

A CLOMR is sought based on the analysis of existing storm drain improvements and the proposed storm drain improvements described herein to reduce the Zone A SFHA footprint. The proposed storm drain has been designed in accordance with applicable AMAFCA and COA codes and standards. A LOMR will be requested from FEMA after construction is complete. Proposed UNM South Commercial site development would be outside the revised FEMA SFHA after the LOMR is effective.

APPENDIX A – MT-2 FORMS

1. MT-2 Form 1 – Overview & Concurrence From
2. MT-2 Form 2 – Riverine Hydrology and Hydraulics Form
3. MT-2 Form 3 – Riverine Structures From (with supplemental section A and B)

DEPARTMENT OF HOMELAND SECURITY
Federal Emergency Management Agency

OVERVIEW & CONCURRENCE FORM

OMB Control Number: 1660-0016
Expiration: 1/31/2024

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless it displays a valid OMB control number. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington, DC 20472 , Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.
PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).
ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.
DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a (NFIP) Flood Insurance Rate Maps (FIRM).

A. REQUESTED RESPONSE FROM DHS-FEMA

This request is for a (check one):

☒ CLOMR: A letter from DHS-FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60, 65 & 72). All CLOMRs require documentation of compliance with the Endangered Species Act. Refer to the Instructions for details.

☐ LOMR: A letter from DHS-FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See 44 CFR Ch. 1, Parts 60, 65 & 72).

B. OVERVIEW

1. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
350002	City of Albuquerque	NM	35001C	0334G	9/26/2008
350002 350001	City of Albuquerque Bernalillio County	NM	35001C	0342G	9/26/2008
350002 350001	City of Albuquerque Bernalillio County	NM	35001C	0361G	9/26/2008

2. a. Flooding Source: Geneivas Channel

b. Types of Flooding: ☒ Riverine ☐ Coastal ☐ Shallow Flooding (e.g., Zones AO and AH) ☐ Alluvial Fan ☐ Lakes ☐ Other (Attach Description)

3. Project Name/Identifier: UNM South Commercial

4. FEMA zone designations (choices: A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

a. Effective: A

b. Revised: A

5. Basis for Request and Type of Revision:

a. The basis for this revision request is (check all that apply)

☒ Physical Change	☐ Improved Methodology/Data	☐ Regulatory Floodway Revision	☐ Base Map Changes
☐ Coastal Analysis	☒ Hydraulic Analysis	☐ Hydrologic Analysis	☐ Corrections
☐ Weir-Dam Changes	☐ Levee Certification	☐ Alluvial Fan Analysis	☐ Natural Changes
☐ New Topographic Data	☐ Other (Attach Description)		

Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

b. The area of revision encompasses the following structures (check all that apply)

Structures: ☒ Channelization	☐ Levee/Floodwall	☒ Bridge/Culvert	
☐ Dam	☒ Fill	☐ Other (Attach Description)	

6. ☒ Documentation of ESA compliance is submitted (required to initiate CLOMR review). Please refer to the instructions for more information.

C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☐ Yes Fee amount: $ _____

☐ No, Attach Explanation

- **Please see the DHS-FEMA Web site at http://www.fema.gov/forms-documents-and-software/flood-map-related-fees for Fee Amounts and Exemptions.**

D. SIGNATURES

1. REQUESTOR'S SIGNATURE

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: TBD	Company:	
Mailing Address:	Daytime Telephone:	Fax No.:
	E-mail Address:	
	Date:	

Signature of Requestor (required):

2. COMMUNITY CONCURRENCE

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirements for when fill is placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. For Conditional LOMR requests, the applicant has documented Endangered Species Act (ESA) compliance to FEMA prior to FEMA's review of the Conditional LOMR application. For LOMR requests, I acknowledge that compliance with Sections 9 and 10 of the ESA has been achieved independently of FEMA's process. For actions authorized, funded, or being carried out by Federal or State agencies, documentation from the agency showing its compliance with Section 7(a)(2) of the ESA will be submitted. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title:

Mailing Address:	Community Name:	
	Daytime Telephone:	Fax No.:
	E-mail Address:	
Community Official's Signature (required):	Date:	

3. CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting information as per NFIP regulations paragraph 65.2(b) and as described in the MT-2 Forms Instructions. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: Vincent Steiner	License No.: NM 24319	Expiration Date: 12/31/2027
Company Name: Bohannan Huston	Mailing Address: 7500 Jefferson St. NE, Albuquerque, NM 87109	
Telephone No.: 505-798-7862 Fax No.:		
E-mail Address: vsteiner@bhinc.com		
Signature:		Date:

Ensure the forms that are appropriate to your revision request are included in your submittal.

Form Name and (Number)	Required if …
☒ Riverine Hydrology and Hydraulics Form (Form 2)	New or revised discharges or water-surface elevations
☒ Riverine Structures Form (Form 3)	Channel is modified, addition/revision of bridge/culverts, addition/revision of levee/floodwall, addition/revision of dam
☐ Coastal Analysis Form (Form 4)	New or revised coastal elevations
☐ Coastal Structures Form (Form 5)	Addition/revision of coastal structure
☐ Alluvial Fan Flooding Form (Form 6)	Flood control measures on alluvial fans

Seal (Optional)

DEPARTMENT OF HOMELAND SECURITY

Federal Emergency Management Agency

RIVERINE HYDROLOGY & HYDRAULICS FORM (FORM 2)

OMB Control Number: 1660-0016
Expiration: 1/31/2024

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 3.5 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless it displays a valid OMB control number. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington, DC 20472 , Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.
PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).
ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.
DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a (NFIP) Flood Insurance Rate Maps (FIRM).

Flooding Source: Geneivas Channel

Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply):

☒ Not revised (skip to section B) ☐ No existing analysis ☐ Improved data
☐ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	Effective/FIS (cfs)	Revised (cfs)

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Precipitation/Runoff Model → Specify Model: _____ Duration: _____ Rainfall Amount: _____

☐ Statistical Analysis of Gage Records

☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters), and documentation to support the new analysis.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review. 4. HEC-RAS File Description**:

5. Impacts of Sediment Transport on Hydrology

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☐ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation.

B. HYDRAULICS

1. Reach to be Revised

Description	Cross Section	Water-Surface Elevation (ft.)	
		Effective	Proposed/Revised
Downstream Limit*			5042.32
Upstream Limit*			5042.32

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used: Stormwater Studio, HEC-RAS Version 6.6

☒ Steady State ☐ Unsteady State ☒ One-Dimensional ☐ Two-Dimentional

3. Pre-Submittal Review of Hydraulic Models*

DHS-FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4. HEC-RAS File Description**:

Models Submitted	Natural Run		Floodway Run		Datum
Duplicate Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
	N/A	N/A	N/A	N/A	N/A
Corrected Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
				5042.32	N/A
Existing or Pre-Project Conditions Model	File Name:	Plan Name:	File Name:	Plan Name:	
				5042.32	N/A
Revised or Post-Project Conditions Model	File Name:	Plan Name:	File Name:	Plan Name:	
	N/A	N/A	N/A	N/A	N/A
Other - (attach description)	File Name:	Plan Name:	File Name:	Plan Name:	
	N/A	N/A	N/A	N/A	N/A

* For details, refer to the corresponding section of the instructions.
**See instructions for information about modeling other then HEC-RAS. ☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Topographic Information: ☐ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Source: Survey | Date: 9/5/2025

Vertical Datum: NADV 88 | Spatial Projection: NM83-CF

Accuracy: Supports 1-foot contour interval

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM**, at the same scale as the original, annotated to show the boundaries of the revised 1%-and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%-and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

1. For LOMR/CLOMR requests, do Base Flood Elevations (BFEs) or Special Flood Hazard Areas (SFHAs) increase compared to the effective BFEs? ☐ Yes ☒ No

   If Yes, please attach **proof of property owner notification**. Examples of property owner notifications can be found in the MT-2 Form 2 Instructions.

2. For CLOMR requests, if either of the following is true, please submit **evidence of compliance with Section 65.12 of the NFIP regulations**:

   - The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot compared to pre-project conditions.
   - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.

3. Does the request involve the placement or proposed placement of fill? ☒ Yes ☐ No

   If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(A)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

4. Does the request involve the placement or proposed placement of fill? ☒ Yes ☐ No

   If Yes, attach **evidence of regulatory floodway revision notification**. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.

5. For CLOMR requests, please submit documentation to FEMA and the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA). For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA. Please see the MT-2 instructions for more detail.

DEPARTMENT OF HOMELAND SECURITY

Federal Emergency Management Agency

RIVERINE STRUCTURES FORM (FORM 3)

OMB Control Number: 1660-0016
Expiration: 1/31/2024

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 3.5 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless it displays a valid OMB control number. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington, DC 20472 , Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a (NFIP) Flood Insurance Rate Maps (FIRM).

Flooding Source: Geneivas Channel

Note: Fill out one form for each flooding source studied

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization:	complete Section B
Bridge/Culvert:	complete Section C
Dam:	complete Section D
Levee/Floodwall:	complete Section E
Sediment Transport:	complete Section F (if required)

Description Of Modeled Structure

1. Name of Structure: Existing Geneivas Arroyo Riprap Channel

   Type (check one): ☒ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: From Baffle Chute to Storm Drain Outfall

   Downstream Limit/Cross Section: Baffle Chute/0

   Upstream Limit/Cross Section: Storm Drain Outfall/378

2. Name of Structure: Storm Drain Extension from University Blvd.

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: Storm Drain Extension from University Blvd.

   Downstream Limit/Cross Section: Storm Drain Outfall/378

   Upstream Limit/Cross Section: Existing Storm Drain Outfall/1226

3. Name of Structure: _____

   Type (check one): ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: _____

   Downstream Limit/Cross Section: _____

   Upstream Limit/Cross Section: _____

NOTE: FOR MORE STRUCTURES, ATTACH ADDITIONAL PAGES AS NEEDED.

B. CHANNELIZATION

Flooding Source: Geneivas Channel

Name of Structure: Existing Geneivas Arroyo Riprap Channel

1. Hydraulic Considerations

The channel was designated to carry 605 (cfs) and/or the 100 - year flood

The design elevation in the channel is based on (check one):

☒ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☒ Inlet to channel ☐ Outlet to channel ☐ At Drop Structures ☐ At Transitions

☐ Other locations (specify): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections ☒ Energy dissipater

☐ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Weir

☐ Other (Describe): _____

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Geneivas Channel

Name of Structure: Geneivas Arroyo Storm Drain

1. This revision reflects (check one):

☒ Bridge/Culvert not modeled in the FIS

☐ Modified Bridge/Culvert previously modeled in the FIS

☐ Revised analysis of Bridge/Culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): SWS

If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

☒ Dimensions (height, width, span, radius, length)
☐ Shape (culverts only)
☒ Material
☐ Beveling and Rounding
☐ Wink Wall Angle
☐ Skew Angle
☐ Distance between Cross Sections
☐ Erosion Protection
☐ Low Chord Elevations - Upstream and Downstream
☐ Top of Road Elevations - Upstream and Downstream
☒ Structure Invert Elevations - Upstream and Downstream
☐ Stream Invert Elevations - Upstream and Downstream
☐ Cross-Section Locations

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

D. DAM/BASIN

Flooding Source: _____

Name of Structure: _____

1. This request is for (check one): ☐ Existing Dam/Basin ☐ New Dam/Basin ☐ Modification of existing Dam/Basin

2. The Dam/Basin was designed by (check one): ☐ Federal Agency ☐ State Agency ☐ Private Organization

   ☐ Local Government Agency Name of the Agency or Organization: _____

3. The Dam was permitted as (check one): ☐ Federal Dam ☐ State Dam

   Provide the permit or identification number (ID) for the dam and the appropriate permitting agency or organization

   Permit or ID number _____ Permitting Agency or Organization _____

   a. ☐ Local Government Dam ☐ Private Dam

   Provided related drawings, specification and supporting design information.

4. Does the project involve revised hydrology? ☐ Yes ☐ No

   If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2).

   Was the dam/basin designed using critical duration storm? (must account for the maximum volume of runoff)

   ☐ Yes, provide supporting documentation with your completed Form 2.

   ☐ No, provide a written explanation and justification for not using the critical duration storm.

5. Does the submittal include debris/sediment yield analysis? ☐ Yes ☐ No

   If Yes, then fill out Section F (Sediment Transport). If No, then attach your explanation for why debris/sediment analysis was not considered?

6. Does the Base Flood Elevation behind the dam/basin or downstream of the dam/basin change? ☐ Yes ☐ No

   If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2) and complete the table below.

	Stillwater Elevation Behind the Dam/Basin	
FREQUENCY (% annual chance)	FIS	REVISED
10-year (10%)		
50-year (2%)		
100-year (1%)		
500-year (0.2%)		
Normal Pool Elevation		

7. Please attach a copy of the formal Operation and Maintenance Plan

E. LEVEE/FLOODWALL

1. System Elements

   a. This Levee/Floodwall analysis is based on (check one): ☐ Upgrading of an existing levee/floodwall system ☐ A newly constructed levee/floodwall system ☐ Reanalysis of an existing levee/floodwall system

   b. Levee elements and locations are (check one):

   ☐ Earthen embankment, dike, berm, etc Stationed _____ to _____

   ☐ Structured floodwall Stationed _____ to _____

   ☐ Other (describe): _____ Stationed _____ to _____

E. LEVEE/FLOODWALL (CONTINUED)

c. Structural Type (check one): ☐ Monolithic cast-in place reinforced concrete ☐ Reinforced concrete masonry block ☐ Sheet piling ☐ Other (describe): _____

d. Has this levee/floodwall system been certified by a Federal agency to provide protection from the base flood?

☐ Yes ☐ No

If Yes, by which agency? _____

e. Attach certified drawings containing the following information (indicate drawing sheet numbers):

1. Plan of the levee embankment and floodwall structures. Sheet Numbers: _____
2. A profile of the levee/floodwall system showing the Base Flood Elevation (BFE), levee and/or wall crest and foundation, and closure locations for the total levee system. Sheet Numbers: _____
3. A profile of the levee/floodwall system showing the Base Flood Elevation (BFE), levee and/or wall crest and foundation, and closure locations for the total levee system. Sheet Numbers: _____
4. A layout detail for the embankment protection measures. Sheet Numbers: _____
5. Location, layout, and size and shape of the levee embankment features, foundation treatment, Floodwall structure, closure structures, and pump stations. Sheet Numbers: _____

2. Freeboard

a. The minimum freeboard provided above the BFE is:

_____

Riverine

3.0 feet or more at the downstream end and throughout	☐ Yes	☐ No
3.5 feet or more at the upstream end	☐ Yes	☐ No
4.0 feet within 100 feet upstream of all structures and/or constrictions	☐ Yes	☐ No

Coastal

1.0 foot above the height of the one percent wave associated with the 1%-annual-chance stillwater surge elevation or maximum wave runup (whichever is greater).	☐ Yes	☐ No
2.0 feet above the 1%-annual-chance stillwater surge elevation	☐ Yes	☐ No

Please note, occasionally exceptions are made to the minimum freeboard requirement. If an exception is requested, attach documentation addressing Paragraph 65.10(b)(1)(ii) of the NFIP Regulations.

If No is answered to any of the above, please attach an explanation.

b. Is there an indication from historical records that ice-jamming can affect the BFE? ☐ Yes ☐ No

3. Closures

a. Openings through the levee system (check one): ☐ Exists ☐ Does not exist

If opening exists, list all closures:

Channel Station	Left or Right Bank	Opening Type	Highest Elevation for Opening Invert	Type of Closure Device

(Extend table on an added sheet as needed and reference)

Note: Geotechnical and geologic data

In addition to the required detailed analysis reports, data obtained during field and laboratory investigations and used in the design analysis for the following system features should be submitted in a tabulated summary form. (Reference U.S. Army Corps of Engineers [USACE] EM-1110-2-1906 Form 2086.)

E. LEVEE/FLOODWALL (CONTINUED)

4. Embarkment Protection

a. The maximum levee slope land side is: _____

b. The maximum levee slope flood side is: _____

c. The range of velocities along the levee during the base flood is: _____ (min) to _____ (max)

d. Embankment material is protected by (describe what kind): _____

e. Riprap Design Parameters (check one): ☐ Velocity ☐ Tractive Stress
Attach referrences

Reach	Sideslope	Flow Depth	Velocity	Curve or Straight	Stone Riprap			Depth of Toedown
					D_{100}	D_{50}	Thickness	
Sta _____ to _____								
Sta _____ to _____								
Sta _____ to _____								
Sta _____ to _____								
Sta _____ to _____								
Sta _____ to _____								

(Extend table on an added sheet as needed and reference each entry)

f. Is a bedding/filter analysis and design attached? ☐ Yes ☐ No

g. Describe the analysis used for other kinds of protection used (include copies of the design analysis):

Attach engineering analysis to support construction plans.

5. Embarkment and Foundation Stability

a. Identify locations and describe the basis for selection of critical location for analysis:

☐ Overall height: STA:_____ , height _____ ft.

☐ Limiting foundation soil strength:

Strength ϕ = _____ degrees, c = _____ psf

Slope: SS = _____ (h) to _____ (v)

(Repeat as needed on an added sheet for additional locations)

b. Specify the embankment stability analysis methodology used (e.g., circular arc, sliding block, infinite slope, etc.):

c. Summary of stability analysis results: _____

E. LEVEE/FLOODWALL (CONTINUED)

5. Embarkment and Foundation Stability (continued)

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction		1.3
II	Sudden drawdown		1.0
III	Critical flood stage		1.4
IV	Steady seepage at flood stage		1.4
VI	Earthquake (Case I)		1.0

(Reference: USACE EM-1110-2-1913 Table 6-1)

d. Was a seepage analysis for the embankment performed? ☐ Yes ☐ No
If Yes, describe methodology used:

e. Was a seepage analysis for the embankment performed? ☐ Yes ☐ No

f. Were uplift pressures at the embankment landside toe checked? ☐ Yes ☐ No

g. Were seepage exit gradients checked for piping potential? ☐ Yes ☐ No

h. The duration of the base flood hydrograph against the embankment is _____ hours.

Attach engineering analysis to support construction plans.

6. Floodwall and Foundation Stability

a. Describe analysis submittal based on Code (check one): ☐ UBC (1988) ☐ Other (specify): _____

b. Stability analysis submitted provides for: ☐ Overturning ☐ Sliding ☐ If not, explain: _____

c. Loading included in the analyses were: ☐ Lateral earth @ P_A = _____ psf; P_p = _____ psf

☐ Surcharge-Slope @ _____, ☐ surface _____ psf

☐ Wind @ P_w = _____ psf

☐ Seepage (Uplift); _____ ☐ Earthquake @ P_{eq} = _____ %g

☐ 1%-annual-chance significant wave height: _____ ft.

☐ 1%-annual-chance significant wave period: _____ sec.

d. Summary of Stability Analysis Results: Factors of Safety.
Itemize for each range in site layout dimension and loading condition limitation for each respective reach.

Loading Condition	Criteria (Min)		Sta	To	Sta	To
	Overturn	Sliding	Overturn	Sliding	Overturn	Sliding
Dead & Wind	1.5	1.5				
Dead & Soil	1.5	1.5				
Dead, Soil, Flood, & Impact	1.5	1.5				
Dead, Soil, & Seismic	1.3	1.3				

(Ref: FEMA 114 Sept 1986; USACE EM 1110-2-2502)
Note: (Extend table on an added sheet as needed and reference)

E. LEVEE/FLOODWALL (CONTINUED)

e. Foundation bearing strength for each soil type:

Bearing Pressure	Sustained Load (psf)	Short Term Load (psf)
Computed design maximum		
Maximum allowable		

f. Foundation scour protection ☐ is, ☐ is not provided. If provided, attach explanation and supporting documentation:

Attach engineering analysis to support construction plans.

7. Settlement

a. Has anticipated potential settlement been determined and incorporated into the specified construction elevations to maintain the established freeboard margin?

b. The computed settlement range is _____ ft. to _____ ft.

c. Settlement of the levee crest is determined to be primarily from : ☐ Foundation consolidation

☐ Embankment compression ☐ Other (Describe): _____

d. Differential settlement of floodwalls ☐ has ☐ has not been accommodated in the structural design and construction

Attach engineering analysis to support construction plans.

8. Interior Drainage

a. Specify size of each interior watershed:

Drainage to pressure conduit: _____ acres

Drainage to ponding area: _____ acres

b. Relationship Established:

Ponding elevation vs. storage ☐ Yes ☐ No

Ponding elevation vs. gravity flow ☐ Yes ☐ No

Differential head vs. gravity flow ☐ Yes ☐ No

c. The river flow duration curve is enclosed: ☐ Yes ☐ No

d. Specify the discharge capacity of the head pressure conduit: _____ cfs

e. Which flooding conditions were analyzed?

Gravity flow (Interior Watershed) ☐ Yes ☐ No

Common storm (River Watershed) ☐ Yes ☐ No

Historical ponding probability ☐ Yes ☐ No

Coastal wave overtopping ☐ Yes ☐ No

If No for any of the above, attach explanation.

f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection.
☐ Yes ☐ No If No, attach explanation.

g. The rate of seepage through the levee system for the base flood is : _____ cfs

h. The length of levee system used to drive this seepage rate in item g: _____ ft.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage (continued)

i. Will pumping plants be used for interior drainage? ☐ Yes ☐ No

If Yes, include the number of pumping plants: _____ For each pumping plant, list:

	Plant #1	Plant #2
The number of pumps		
The ponding storage capacity		
The maximum pumping rate		
The maximum pumping head		
The pumping starting elevation		
The pumping stopping elevation		
Is the discharge facility protected?		
Is there a flood warning plan?		
How much time is available between warning and flooding?		

Will the operation be automatic? ☐ Yes ☐ No

If the pumps are electric; are there backup power sources? ☐ Yes ☐ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)
Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

9. Other Design Criteria

a. The following items have been addressed as stated:

Liquefaction ☐ is ☐ is not a problem

Hydrocompaction ☐ is ☐ is not a problem

Heave differential movement due to soils of high shrink/swell ☐ is ☐ is not a problem

b. For each of these problems, state the basic facts and corrective action taken:

Attach supporting documentation

c. If the levee/floodwall is new or enlarged, will the structure adversely impact flood levels and/or flow velocities floodside of the structure? ☐ Yes ☐ No

d. Sediment Transport Considerations:

Was sediment transport considered? ☐ Yes ☐ No

If Yes, then fill out Section F (Sediment Transport). If No, then attach your explanation for why sediment transport was not considered.

10. Operational Plan and Criteria

a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No

b. Does the operation plan incorporate all the provisions for closure devices as required in Paragraph 65.10(c)(1) of the NFIP regulations? ☐ Yes ☐ No

c. Does the operation plan incorporate all the provisions for interior drainage as required in Paragraph 65.10(c)(2) of the NFIP regulations? ☐ Yes ☐ No

If the answer is No to any of the above, please attach supporting documentation.

E. LEVEE/FLOODWALL (CONTINUED)

11. Maintenance Plan

Please attach a copy of the fomal maintenance plan for the levee/floodwall

12. Operational and Maintenance Plan

Please attach a copy of the formal Operations and Maintenance Plan for the levee/floodwall.

CERTIFICATION OF THE LEVEE DOCUMENTATION

This certification is to be signed and sealed by a licensed registered professional engineer authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting information as per NFIP regulations paragraph 65.10(e) and as described in the MT-2 Forms Instructions. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: _____ License No.: _____ Expiration Date: _____

Company Name: Telephone No.: _____ Fax No.: _____

Signature: _____ Date: _____ E-mail Address: _____

CERTIFICATION OF THE LEVEE DOCUMENTATION

Flooding Source: _____

Name of Structure: _____

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the Base Flood Elevation (BFE); and/or based on the stream morphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including scour and deposition) to affect the BFEs, then provide the following information along with the supporting documentation:

Sediment load associated with the base flood discharge: Volume _____ acres-feet

Debris load associated with the base flood discharge: Volume _____ acres-feet

Sediment transport rate _____ (percent concentration by volume)

Method used to estimate sediment transport: _____

Most sediment transport formulas are intended for a range of hydraulic conditions and sediment sizes; attach a detailed explanation for using the selected method.

Method used to estimate scour and/or deposition: _____

Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport: _____

Please note that bulked flows are used to evaluate the performance of a structure during the base flood; however, FEMA does not map BFEs based on bulked flows.

If a sediment analysis has not been performed, an explanation as to why sediment transport (including scour and deposition) will not affect the BFEs or structures must be provided.

APPENDIX B – HYDROLOGIC REFERENCES

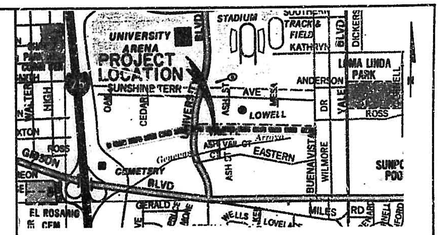
1. Excerpts from Construction Plans for Geneiva's Arroyo Improvements
   (Boyle Engineering, 1991)

CITY OF ALBUQUERQUE

CONSTRUCTION PLANS
FOR

GENEIVA'S ARROYO IMPROVEMENTS

BUENA VISTA DRIVE S.E.
TO
SOUTH DIVERSION CHANNEL



VICINITY MAP
NOT TO SCALE

GENERAL NOTES:

1. TOPOGRAPHIC ORTHOPHOTO MAPS USED IN THE CONSTRUCTION PLANS WERE DEVELOPED FROM AERIAL PHOTOGRAPHS TAKEN ON MARCH 2, 1990.
2. TWO WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT LINE LOCATION SERVICE, 260-1990, FOR LOCATION OF EXISTING UTILITIES.
3. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL OBSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER OR SURVEYOR SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.
4. RIGHTS OF WAY ARE SHOWN IN THESE PLANS. CONTRACTOR SHALL NOT ENTER PRIVATE PROPERTY WITHOUT WRITTEN VERIFIABLE PERMISSION FROM EACH OWNER.
5. ALL WORK DETAILED ON THESE PLANS TO BE PERFORMED UNDER CONTRACT SHALL, EXCEPT AS OTHERWISE STATED OR PROVIDED FOR HEREON, BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 1986 (INCLUDING AMENDMENTS 1, 2 & 3) (REFERENCED TO HEREIN AS THE "STANDARD SPECIFICATIONS").
6. TWO (2) WORKING DAYS PRIOR TO ANY EXCAVATION, THE CONTRACTOR SHALL OBTAIN A BARRICADING PERMIT THROUGH CONSTRUCTION COORDINATION AT 768-2552. REFER TO SECTION 19, STANDARD SPECIFICATIONS.
7. RESEED ALL DISTURBED AREAS IN ACCORDANCE WITH SUPPLEMENTAL TECHNICAL SPECIFICATION SECTION 1011.

△8. LEAN FILL CONSTRUCTION IS AT THE CONTRACTORS OPTION WITH AUTHORIZATION BY THE ENGINEER.

THE FOLLOWING NOTES APPLY WHEN CHECKED:

- ☒ ALL UTILITIES AND UTILITY SERVICE LINES SHALL BE INSTALLED PRIOR TO PAVING.
- ☒ BACKFILL COMPACTION SHALL BE ACCORDING TO SPECIFIED STREET USE.
- ☒ TACK COAT REQUIREMENTS SHALL BE DETERMINED BY THE CITY ENGINEER.
- ☐ SIDEWALKS AND WHEELCHAIR RAMPS WITHIN THE CURB RETURNS SHALL BE CONSTRUCTED WHEREVER A NEW CURB RETURN IS CONSTRUCTED.
- ☐ IF CURB IS DEPRESSED FOR A DRIVEPAD, THE DRIVEPAD SHALL BE CONSTRUCTED PRIOR TO ACCEPTANCE OF CURB AND GUTTER.
- ☒ ALL STORM DRAINAGE FACILITIES SHALL BE COMPLETED PRIOR TO FINAL ACCEPTANCE.
- ☐ THE REQUESTOR OR DEVELOPER SHALL BE RESPONSIBLE FOR REPAIR OR REPLACEMENT OF ALL CURB AND GUTTER OR SIDEWALK DAMAGED AFTER APPROVAL BY THE CITY ENGINEER OF WORK COMPLETED BY THE CONTRACTOR.

INDEX

APPROVAL OF AS BUILT DRAWINGS
CHIEF CONSTRUCTION ENGINEER
DATE 6/5/92

RECORD DRAWING
THIS IS A RECORD DRAWING OF THE FACILITIES SHOWN HEREON IN THE TITLE BLOCK BELOW AND WAS EITHER PREPARED IN PART OR IN THE BASIS OF INFORMATION SUPPLIED AND PROVIDED BY VENDORS, THE ENGINEER/ARCHITECT AND OTHER (S) WILL NOT BE LIABLE FOR ANY ERROR (S) OR OMISSION (S) WHICH MAY HAVE BEEN INCORPORATED INTO THIS DRAWING. ACTUAL CONDITIONS WILL VARY SOMEWHAT FROM THE CONDITIONS SHOWN HEREON AND AT SOME LOCATIONS THE VARIANCE MAY BE LARGE. IF THE PRECISE LOCATION OF ANY FACILITY IS REQUIRED, THE FACILITY SHOULD BE FIELD LOCATED IN THE PRESENCE OF AN EMPLOYEE OF THE DISTRICT OR THE OWNER (S) OF THE UTILITIES INVOLVED.

C of A PWD Maps & Records
1 2 3 4 5 6 7 8 9 10 11 12
26 3904.9001 92

△ 2-22-91 ADDENDUM No. 3 LWG

REV.	SHEETS	CITY ENGINEER	DATE	USER DEPT.	DATE	USER DEPT.	DATE

WILLIAM M. JONES NEW MEXICO 4115 REGISTERED PROFESSIONAL ENGINEER 1/9/91
Revised 4/22/91 WMJ

BOYLE ENGINEERING CORPORATION

APPROVED FOR CONSTRUCTION
CITY ENGINEER DATE 1-11-91

PROJECT NUMBER: 3904

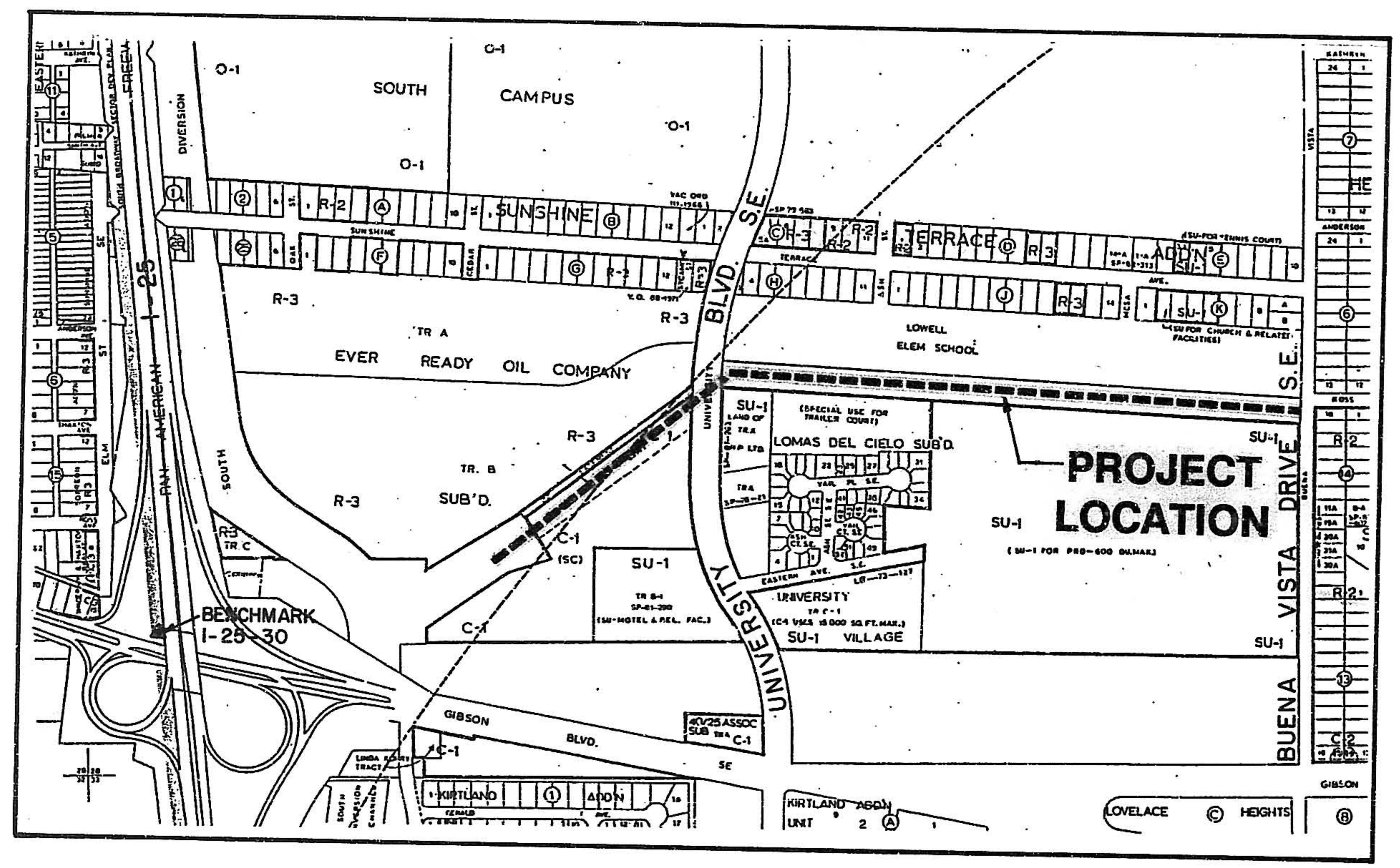
SHEET 1 OF 36

Excerpts From Construction Plans for Geneiva's Arroyo Improvements
Boyle Engineering
1991

ALBUQUERQUE, NEW MEXICO

LEGEND

Symbol	Description
℄ — — —	CENTERLINE
——— ℘ ———	PROPERTY LINE
— — — —	EXISTING GROUND CONTOUR
————	PROPOSED GROUND CONTOUR
— — SD — —	EXISTING STORM DRAIN
——SD——	PROPOSED STORM DRAIN
——RW——	RIGHT OF WAY
—o—x—x—o—	CHAINLINK FENCE
	SLOPE INDICATOR
— — S — —	EXISTING SEWER LINE
——S——	NEW SEWER LINE
— — W — —	EXISTING WATER LINE
——W——	NEW WATER LINE
— — ○ — —	EXISTING SEWER MANHOLE
——●——	NEW SEWER MANHOLE
— — OPL — —	EXISTING OVERHEAD POWER LINE
— — G — —	EXISTING GAS LINE
——■——	NEW STORM DRAIN INLET



LOCATION MAP L-15-Z

N.T.S.

AS BUILT INFORMATION

BENCH MARKS

NMSHC Brass Tablet, Stamped "Sta. I-25-30", Set in top of a concrete post projecting 0.2 ft. above ground at the northwest corner of the overpass of Gibson Ave. S.E., of the southbound lane of I-25. Elevation = 5038.51.

SURVEY INFORMATION

NO.	FIELD NOTES	BY	DATE

MICRO-FILM INFORMATION

ENGINEER'S SEAL — WILLIAM M. JONES, NEW MEXICO, REGISTERED PROFESSIONAL ENGINEER — 1/10/91

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	

DESIGNED BY / DATE
DRAWN BY / DATE
CHECKED BY / DATE

RECORD DRAWINGS

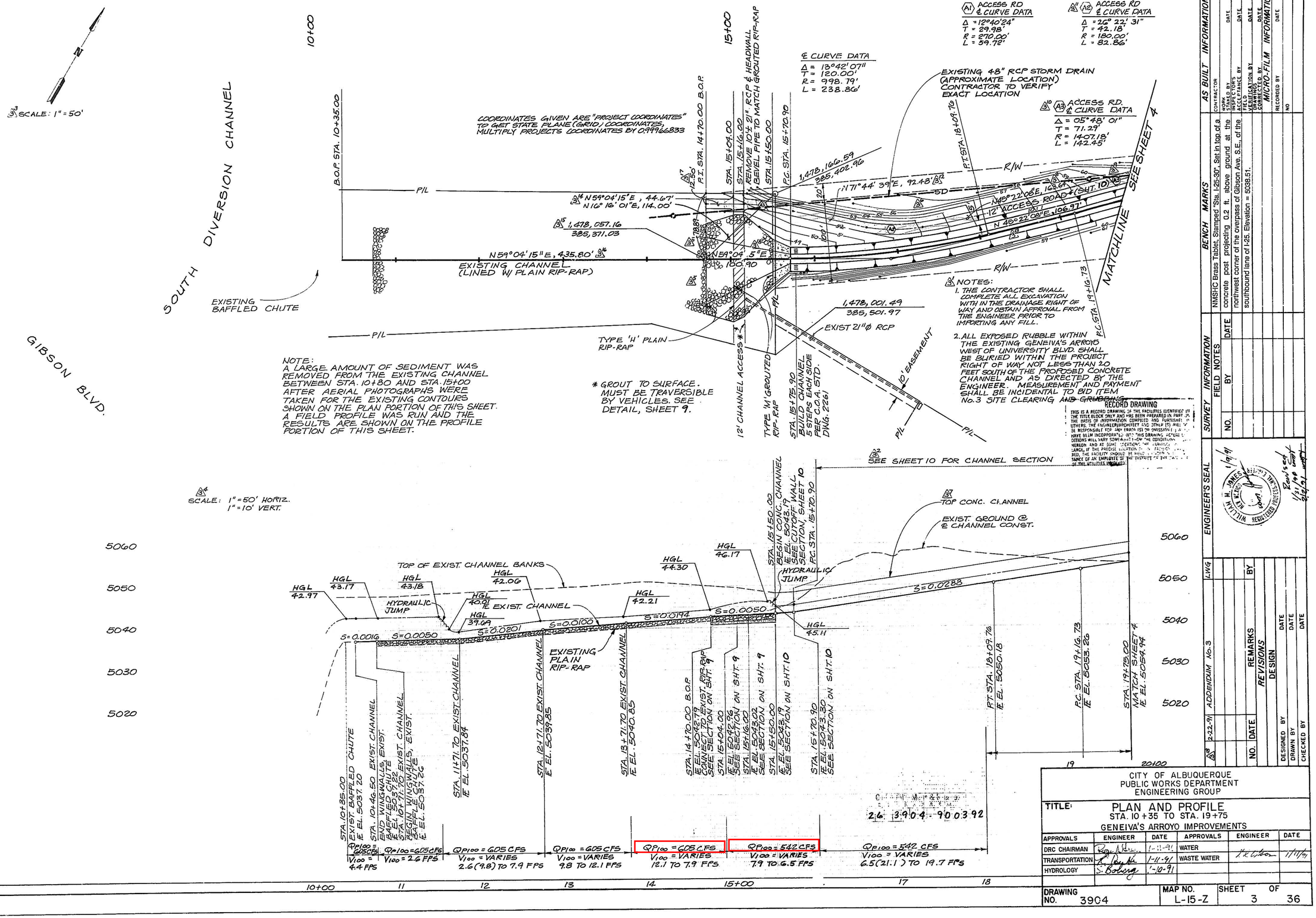
THIS IS A RECORD DRAWING OF THE FACILITIES IDENTIFIED IN THE TITLE BLOCK ONLY AND HAS BEEN PREPARED IN PART ON THE BASIS OF INFORMATION COMPILED AND FURNISHED BY OTHERS. THE ENGINEER/ARCHITECT AND OTHER(S) WILL NOT BE RESPONSIBLE FOR ANY ERROR(S) OR OMISSION(S) WHICH HAVE BEEN INCORPORATED INTO THIS DRAWING. ACTUAL CONDITIONS WILL VARY SOMEWHAT FROM THE CONDITIONS SHOWN HEREON AND AT SOME LOCATIONS THE VARIANCE MAY BE LARGE. IF THE PRECISE LOCATION OF ANY FACILITY IS REQUIRED, THE FACILITY SHOULD BE FIELD LOCATED IN THE PRESENCE OF AN EMPLOYEE OF THE DISTRICT OR THE OWNER OF THE UTILITIES INVOLVED.

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

TITLE: **LOCATION MAP & LEGEND**
GENEIVA'S ARROYO IMPROVEMENTS

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRC CHAIRMAN	[signature]	1-11-91	WATER	[signature]	1-11-91
TRANSPORTATION	[signature]	1-11-91	WASTE WATER		
HYDROLOGY	S. Boberg	1-10-91			

PROJECT NO.	MAP NO.	SHEET	OF
3904	L-15-Z	2	36



A1 ACCESS RD ℄ CURVE DATA
Δ = 12°40'24"
T = 29.98'
R = 270.00'
L = 59.72'

A2 ACCESS RD ℄ CURVE DATA
Δ = 26°22'31"
T = 42.18'
R = 180.00'
L = 82.86'

℄ CURVE DATA
Δ = 13°42'07"
T = 120.00'
R = 998.79'
L = 238.86'

A3 ACCESS RD. ℄ CURVE DATA
Δ = 05°48'01"
T = 71.29
R = 1407.18'
L = 142.45'

COORDINATES GIVEN ARE "PROJECT COORDINATES" TO GET STATE PLANE (GRID) COORDINATES, MULTIPLY PROJECTS COORDINATES BY 0.99966833

NOTE:
A LARGE AMOUNT OF SEDIMENT WAS REMOVED FROM THE EXISTING CHANNEL BETWEEN STA. 10+80 AND STA. 15+00 AFTER AERIAL PHOTOGRAPHS WERE TAKEN FOR THE EXISTING CONTOURS SHOWN ON THE PLAN PORTION OF THIS SHEET. A FIELD PROFILE WAS RUN AND THE RESULTS ARE SHOWN ON THE PROFILE PORTION OF THIS SHEET.

* GROUT TO SURFACE. MUST BE TRAVERSIBLE BY VEHICLES. SEE DETAIL, SHEET 9.

NOTES:

1. THE CONTRACTOR SHALL COMPLETE ALL EXCAVATION WITH IN THE DRAINAGE RIGHT OF WAY AND OBTAIN APPROVAL FROM THE ENGINEER PRIOR TO IMPORTING ANY FILL.
2. ALL EXPOSED RUBBLE WITHIN THE EXISTING GENEIVA'S ARROYO WEST OF UNIVERSITY BLVD. SHALL BE BURIED WITHIN THE PROJECT RIGHT OF WAY NOT LESS THAN 20 FEET SOUTH OF THE PROPOSED CONCRETE CHANNEL AND AS DIRECTED BY THE ENGINEER. MEASUREMENT AND PAYMENT SHALL BE INCIDENTAL TO BID ITEM No.3 SITE CLEARING ~~AND GRUBBING~~

RECORD DRAWING

THIS IS A RECORD DRAWING OF THE FACILITIES IDENTIFIED IN THE TITLE BLOCK ONLY AND HAS BEEN PREPARED IN PART ON THE BASIS OF INFORMATION COMPILED AND FURNISHED BY OTHERS. THE ENGINEER/ARCHITECT AND OTHER (S) WILL NOT BE RESPONSIBLE FOR ANY ERROR (S) OR OMISSION (S) WHICH HAVE BEEN INCORPORATED INTO THIS DRAWING. ACTUAL CONDITIONS WILL VARY SOMEWHAT FROM THE CONDITIONS [illegible] HEREON AND AT SOME LOCATIONS THE VARIANCE [illegible] LARGE. IF THE PRECISE LOCATION [illegible] FACILITY [illegible] RED, THE FACILITY SHOULD BE FIELD [illegible] SENCE OF AN EMPLOYEE OF THE DISTRICT OF THE [illegible] OF THE UTILITIES INVOLVED.

ENGINEER'S SEAL

WILLIAM M. JONES
1/9/91
Revised 1/31/90 [illegible]
2/2/91 [illegible]

SURVEY INFORMATION		
FIELD NOTES		
NO.	BY	DATE

BENCH MARKS

NMSHC Brass Tablet, Stamped "Sta. I-25-30", Set in top of a concrete post projecting 0.2 ft. above ground at the northwest corner of the overpass of Gibson Ave. S.E., of the southbound lane of I-25. Elevation = 5038.51.

AS BUILT INFORMATION

CONTRACTOR	
WORK STAKED BY	DATE
INSPECTOR'S ACCEPTANCE BY	DATE
FIELD VERIFICATION BY	DATE
DRAWINGS CORRECTED BY	DATE

MICRO-FILM INFORMATION

RECORDED BY	DATE
NO	

NO.	DATE	REMARKS	BY
3	2-22-91	ADDENDUM No.3	LWG

REVISIONS

DESIGN	DATE
DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	DATE

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

TITLE:
PLAN AND PROFILE
STA. 10+35 TO STA. 19+75
GENEIVA'S ARROYO IMPROVEMENTS

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRC CHAIRMAN	Roger A. Green	1-11-91	WATER		
TRANSPORTATION	R. [illegible]	1-11-91	WASTE WATER	T. K. Gibson	1/11/91
HYDROLOGY	S. Boling	1-10-91			

DRAWING NO. 3904
MAP NO. L-15-Z
SHEET 3 OF 36


CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP
TITLE: PLAN AND PROFILE
STA. 19+75 TO STA. 34+00
GENEIVA'S ARROYO IMPROVEMENTS
DRAWING NO. 3904
MAP NO. L-15-Z
SHEET 4 OF 36
APPROVALS ENGINEER DATE
DRC CHAIRMAN
TRANSPORTATION 1-10-91
HYDROLOGY 1-10-91
WATER
WASTE WATER
AS BUILT INFORMATION
MICRO-FILM INFORMATION
BENCH MARKS
NMSHC Brass Tablet, Stamped "Sta. I-25-30", Set in top of a concrete post projecting 0.2 ft. above ground at the northwest corner of the overpass of Gibson Ave. S.E., of the southbound lane of I-25. Elevation = 5038.51.
SURVEY INFORMATION
FIELD NOTES
ENGINEER'S SEAL
REVISIONS
4-3-91 CHANGE ORDER #1, ADD'L MANHOLE & STORM DRAIN
1-22-91 ADDENDUM No. 3
RECORD DRAWING
SEE SHEET 3
SEE SHEET 5
MATCHLINE
UNIVERSITY BLVD.
15' ACCESS RD. (SHT. 10)
TEMPORARY CONSTRUCTION EASEMENT
NEW 42"Ø RCP @ S=0.0040 SEE SHEET 6
REMOVE & DISPOSE OF APPROX. 484 L.F. EXIST. 24"Ø RCP & CONC. HEADWALL
NOTE: F. & I. DENOTES TO FURNISH & INSTALL.
COORDINATES GIVEN ARE "PROJECT COORDINATES" TO GET STATE PLANE (GRID) COORDINATES, MULTIPLY PROJECT COORDINATES BY 0.99966833.
BERM TYPICAL
COMPACT TO 90% OF MAXIMUM AS DETERMINED BY ASTM-D1557
COMPACT ALL FILL IN TEMPORARY CONSTRUCTION EASEMENT FROM UNIVERSITY BLVD. TO BUENA VISTA DRIVE TO 95% OF MAXIMUM AS DETERMINED BY ASTM D1557.
NOTE: 'T' TYPE MANHOLES AT STA. 26+79.17, 28+19.95 & 32+69.11 SHALL BE F. & I. WITH NEENAH TYPE R-2560-E CATCH BASIN FRAME & BEEHIVE GRATE OR EQUIVALENT WITH PROVISION TO BOLT BEEHIVE GRATE IN PLACE.
F. & I. 445.80 L.F. 60"Ø CLASS IV RCP
409.93 L.F. 64"Ø CLASS IV RCP
130.89 L.F. 54"Ø CLASS IV RCP
SCALE: 1"=50' HORIZ. 1"=10' VERT.
SEE SHT. 10 FOR CHANNEL SECTION
NOTES:
1. THE CONTRACTOR SHALL COMPLETE ALL EXCAVATION WITHIN THE DRAINAGE RIGHT OF WAY AND OBTAIN APPROVAL FROM THE ENGINEER PRIOR TO IMPORTING ANY FILL.
2. ALL EXPOSED RUBBLE WITHIN THE EXISTING GENEIVA'S ARROYO WEST OF UNIVERSITY BLVD. SHALL BE BURIED WITHIN THE PROJECT RIGHT OF WAY NOT LESS THAN 2.0 FEET SOUTH OF THE PROPOSED CONCRETE CHANNEL AND AS DIRECTED BY THE ENGINEER. MEASUREMENT AND PAYMENT SHALL BE INCIDENTAL TO BID ITEM No. 3 SITE CLEARING AND GRUBBING.
NOTES:
1. F & I DENOTES TO FURNISH AND INSTALL.
2. DEPTH OF TRENCHING SHALL BE MEASURED FROM FINISHED GROUND TO INVERT OF PIPE.
3. ALL EXPOSED RUBBLE IN THE EXISTING GENEIVA'S ARROYO WITHIN THE TEMPORARY CONSTRUCTION EASEMENT SHALL BE REMOVED AND BURIED IN THE EXISTING GENEIVA'S ARROYO WITHIN THE PROJECT RIGHT OF WAY MORE THAN 2.0 FEET FROM ANY STORM DRAIN PIPE AND AS DIRECTED BY THE ENGINEER. MEASUREMENT AND PAYMENT SHALL BE INCIDENTAL TO BID ITEM No. 3 SITE CLEARING AND GRUBBING.
4. THE CONTRACTOR SHALL COMPLETE ALL EXCAVATION WITHIN THE PROJECT LIMITS AND OBTAIN APPROVAL FROM THE ENGINEER PRIOR TO IMPORTING ANY FILL.
EXIST. GROUND @ ℄ PIPE
FINISHED GROUND AT ℄ PIPE
TOP OF CONCRETE CHANNEL
EXIST. GROUND AT ℄ CHANNEL CONST.
HYDRAULIC JUMP
S=0.0288
S=0.0084
S=0.0188
S=0.0354
Q100 = 542 CFS V100 = VARIES 19.7 TO 17.9 FPS
Q100 = 542 CFS V100 = VARIES 17.9 TO 17.5 FPS
Q100 = 542 CFS V100 = VARIES 17.5 TO 10.8 FPS
Q100 = 331 CFS V100 = VARIES 10.7 TO 7.9 FPS
Q100 = 331 V100 = VARIES 17.1 TO 18.2 FPS
Q100 = 321 CFS V100 = VARIES 18.2 TO 16.7 FPS
Q100 = 310 CFS V100 = VARIES 16.7 TO 19.3 FPS
Q100 = 288 CFS V100 = VARIES 19.3 TO 23.9 FPS
Q100 = 284 CFS V100 = 23.9 FPS
MATCH PROFILE SHT. 5
20+00 21 22 23 24 25+00 26 27 28 29 30 31 32

SEE SHEET 4
MATCHLINE
35+00
40+00
45+00
54 L.F. 24"φ RCP @ 1%
R/W
TEMPORARY CONSTRUCTION EASEMENT
S 86°40'48"E, 1191.15'
15' ACCESS RD. (SHT. 10)
TYPICAL 20' LONG BERM SEE SHEET 4 FOR SECTION.
LEAVE 10'x10' AREA AROUND POWER POLE UNDISTURBED
SEE SHEET 8 FOR GRADING PLAN THIS AREA.
TYPICAL BERM SEE DETAIL
SEE SHEETS 7 & 8 FOR GRADING PLAN
STA. 36+ F. & I. 1-DOUBLE 'D' INLET PER C.O.A. STD. DWG. 2206 W/ 5' CONC. PAD AROUND PERIMETER. CORNER EL.=5103.00 GRATE EL.=5102.33 INV. EL.=5098.79
STA. 37+10.37 F. & I. TYPE 'T' M.H. INV. EL.=5100.52 RIM EL.=5109.00
STA. 37+66.47 F. & I. 1-54"x24" WYE Δ=61°49'
COMPACT ALL FILL IN TEMPORARY CONSTRUCTION EASEMENT FROM UNIVERSITY EAST TO BUENA VISTA DRIVE TO 95% OF MAX. AS DETERMINED BY ASTM D1557.
STA. 41+62.78 F. & I. TYPE 'T' M.H. INV. EL.=5114.36 RIM EL.=5122.93
STA. 42+09.33 F. & I. 1-54"x24" WYE Δ=64°01'
℄ ACCESS RD. CURVE DATA Δ=11°48'46" T=15.13' R=146.23' L=30.15'
P.C. STA. 44+66.27
P.T. STA. 44+96.25
STA. 45+26.13 F. & I. 54"φ (34"x53" ELLIPTICAL) R.P. WYE 45° INV. EL.=5130.10
STA. 45+85.00 F. & I. 54"x54" 45° WYE & CONC. PLUG STUBOUT W/ INV. EL.=5133.72
BUENA VISTA DRIVE
ROSS AVE.
SCALE: 1"=50'
N
FUTURE 54"φ S.D.
STA. 46+03.66 F&I TYPE 'E' M.H., 8' DIA
STA. 46+26.66 E.O.P. REHAB. EXIST. JUNCTION BOX
1,478,637.88 388,293.50
CONSTRUCT 150' CMU WALL 2' HIGH, SEE SHEET 12.
EXIST. 48"φ S.D.
CONSTRUCT 12' DRIVEPAD PER C.O.A. STD. DWG 2425 & 12' PIPE GATE PER C.O.A. STD. DWG 2251
ABANDON 85 L.F.± EXIST. 48"φ RCP IN PLACE, PLUG BOTH ENDS WITH CONCRETE.
REHAB. EXIST. JUNCTION BOX F. & I. TYPE 'E' M.H. 8' DIA. SEE SHEET 14.
F. & I. 2-DBL 'C' INLETS SEE DETAILS, SHT. 14.
REMOVE & DISPOSE EXIST. CONC. BASIN & 54" RCP
F. & I. 118 L.F. 34"x53" ELLIPTICAL (H-E) RCP SEE SHT. 14 FOR DETAILS
EXIST. DROP INLET INV. EL.=5123.04
F. & I. 4-54"x8' RCP W/ 3° BEVELED BELLS
℄ CURVE DATA Δ=11°48'38" T=16.06' R=155.24' L=32.00'
LINE B SEE SHEET 14.
1,478,518.05 388,292.42
ABANDON IN PLACE EXISTING JUNCTION BOX & 56 L.F. 54" RCP
STA. 45+16.13 F. & I. TYPE 'T' M.H. INV. EL.=5129.49 RIM. EL.=5140.38
EXIST. 12"φ RCP EXIST. 8" SAS
REMOVE 20 L.F. 24"φ CMP
EXIST. DROP INLET INV. EL.=5105.32
EXIST. 40 L.F. 24"φ CMP, S=0.0535
EXIST. 40 L.F. 24"φ CMP, S=0.0845
STA. 35+95.00 F. & I. 1-54"x24" WYE, Δ=45° INV. EL.=5097.00 INV. EL. 24"=5098.25
STA. 38+13±, 78' RT. CONNECT 24"φ RCP TO EXIST. 24"φ CMP INV. EL.=5104.25 F. & I. 90 L.F. 24"φ RCP @ S=0.0084
STA. 42+48±, 66' RT. CONNECT NEW 24"φ RCP TO EXIST. 24"φ CMP INV. EL.=5119.66 F. & I. 76 L.F. 24"φ RCP @ S=0.0271
COMPACT TO 90% OF MAXIMUM AS DETERMINED BY ASTM-D1557
BERM TYPICAL
BERMS & ACCESS ROAD TO BE CONSTRUCTED UNDER 0301.01 "GRADING AREAS NOT TO BE PAVED, WITH LESS THAN 2' EXCAVATION."
NOTE: 'T' TYPE MANHOLES AT STA. 37+10.37, 41+62.78 & 45+16.13 SHALL BE F. & I. WITH NEENAH TYPE R-2560-E CATCH BASIN FRAME & BEEHIVE GRATE OR EQUIVALENT WITH PROVISION TO BOLT BEEHIVE GRATE IN PLACE.
COORDINATES GIVEN ARE "PROJECT COORDINATES" TO GET STATE PLANE (GRID) COORDINATES, MULTIPLY PROJECT COORDINATES BY 0.99966833.
310.37 L.F. 54"φ CLASS IV RCP
452.41 L.F. 54"φ CLASS IV RCP
353.35 L.F. 54"φ CLASS IV RCP
107.53 L.F. 54"φ CLASS IV RCP
SCALE: 1"=50' HORIZ. 1"=10' VERT.
MATCH PROFILE SHEET 4
FINISHED GROUND AT ℄ PIPE
EXIST. GROUND AT ℄ PIPE
2' MINIMUM COVER
HGL 105.55
HGL 105.47
HGL 117.33
HGL 119.26
HGL 119.24
HGL 132.78
HGL 133.34
HGL 132.60
HGL 140.16
S=0.0306
S=0.0428
S=0.0614
EXISTING 8" SAS INV. EL.=34.99
STA. 44+00 FIN. GRADE EL=5131.50
NOTES:
1. F & I DENOTES TO FURNISH AND INSTALL.
2. DEPTH OF TRENCHING SHALL BE MEASURED FROM FINISHED GROUND TO INVERT OF PIPE.
3. ALL EXPOSED RUBBLE IN THE EXISTING GENEIVA'S ARROYO WITHIN THE TEMPORARY CONSTRUCTION EASEMENT SHALL BE REMOVED MORE THAN 20 FEET FROM ANY STORM DRAIN PIPE AND BURIED IN THE EXISTING GENEIVA'S ARROYO WITHIN THE PROJECT RIGHT OF WAY MORE THAN 20 FEET FROM ANY STORM DRAIN PIPE AND AS DIRECTED BY THE ENGINEER. MEASUREMENT AND PAYMENT SHALL BE INCIDENTAL TO BID ITEM NO. 3 SITE CLEARING AND GRUBBING.
4. THE CONTRACTOR SHALL COMPLETE ALL EXCAVATION WITHIN THE PROJECT LIMITS AND OBTAIN APPROVAL FROM THE ENGINEER
STA. 34+00.00 INV. EL.=5091.03 GRADE CHANGE
STA. 35+95.00 F. & I. 1-54"x24" WYE, Δ=45° INV. EL.=5097.00 INV. EL. 24"=5098.25
STA. 37+10.37 F. & I. TYPE 'T' M.H. INV. EL.=5100.52 RIM EL.=5109.00
STA. 37+66.47 F. & I. 1-54"x24" WYE, Δ=61°49' INV. EL.=5102.24 INV. EL.=5103.49 (SE)
STA. 41+62.78, GRADE CHANGE F. & I. TYPE 'T' M.H. INV. EL.=5114.36 RIM EL.=5122.93
STA. 42+09.33 F. & I. 1-54"x24" WYE, Δ=64°01' INV. EL.=5116.35 INV. EL.=5117.60 (SE)
STA. 45+16.13, GRADE CHANGE F. & I. TYPE 'T' M.H. INV. EL.=5129.49 RIM EL.=5140.38
STA. 45+26.13 F. & I. 54"φ x (34"x53" ELLIPTICAL) WYE, Δ=45° INV. EL.=5130.10 INV. EL.=5130.93 (SE)
STA. 45+85.00 F. & I. 1-54"x54" WYE, Δ=45° INV. EL.=5133.72
STA. 46+26.66 E.O.P. F. & I. 1-TYPE 'E' 6' DIA M.H. INV. EL.=5136.28 (W) INV. EL.=5137.07 (E) INV. EL.=5141.53 (NE) RIM EL.=5146.78
5130 5120 5110 5100 5090 5080 5070
5150 5140 5130 5120 5110 5100 5090
Qp100 = 284 CFS V100 = 22.2 FPS
Qp100 = 279 CFS V100 = VARIES 22.2 TO 25.0 FPS
Qp100 = 274 CFS V100 = VARIES 25.0 TO 22.0 FPS
Qp100 = 205 CFS V100 = VARIES 22.0 TO 13.6 FPS
34 35+00 36 37 38 39 40+00 41 42 43 44 45+00 46
C of A PWD Maps & Records
26 3904 900592
AS BUILT INFORMATION
CONTRACTOR
WORK STARTED BY DATE
INSPECTOR'S ACCEPTANCE BY DATE
FIELD VERIFICATION BY DATE
DRAWINGS CORRECTED BY DATE
MICRO-FILM INFORMATION
RECORDED BY DATE
NO.
BENCH MARKS
NMSHC Brass Tablet, Stamped "Sta. I-25-30". Set in top of a concrete post projecting 0.2 ft. above ground at the northwest corner of the overpass of Gibson Ave. S.E., of the southbound lane of I-25. Elevation = 5038.51.
SURVEY INFORMATION
FIELD NOTES
NO. BY DATE
ENGINEER'S SEAL
WILLIAM M. JONES
NEW MEXICO
REGISTERED PROF. ENGINEER
1/9/91
REVISIONS
2-22-91 ADDENDUM No. 3 LWG
NO. DATE REMARKS BY DATE
DESIGN
DESIGNED BY
DRAWN BY
CHECKED BY
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP
TITLE: PLAN AND PROFILE
STA. 34+00 TO STA. 46+26.66
GENEIVA'S ARROYO IMPROVEMENTS
APPROVALS ENGINEER DATE APPROVALS ENGINEER DATE
DRC CHAIRMAN
TRANSPORTATION 1-11-91
WATER
WASTE WATER
HYDROLOGY S. Boberg 1-10-91
DRAWING NO. 3904
MAP NO. L-15-Z
SHEET 5 OF 36

APPENDIX C – ENDANGERED SPECIES ACT MEMO

1. Commercial UNM South Campus Development CLOMR Endangered Species Act Compliance Evaluation and Biological Survey Memorandum
   (Barr, 2026)

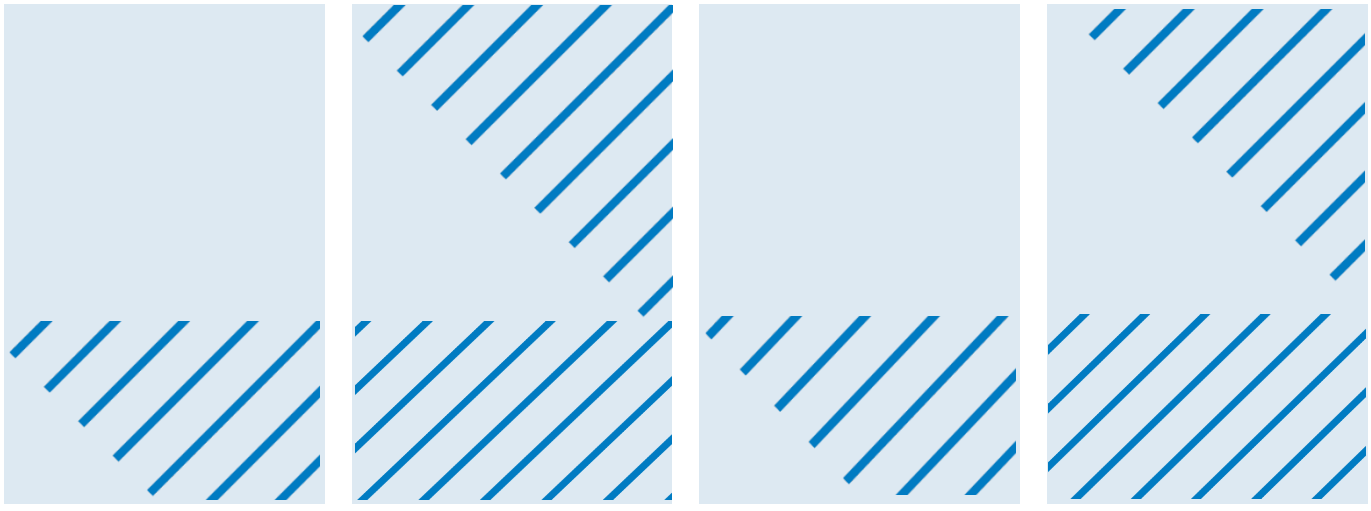
Commercial UNM South Campus Development CLOMR

Endangered Species Act Compliance Evaluation and Biological Survey Memorandum

January 2026

320 Osuna Road NE, Suite G-4
Albuquerque, NM 87107
505.954.1570

barr.com



Contents

Attachments

1 Introduction

1.1 Background

The University of New Mexico proposes to develop vacant 41-acre property in southeastern Albuquerque, Bernalillo County, New Mexico. The development would construct a variety of commercial facilties and retail storefronts and install a pipe to safely convey stormwater beneath an existing channel.

Barr Engineering Co. (Barr) was contracted to provide a desktop review and pedestrian biological resources survey of the proposed development area. The purpose was to document the potential for effects on species listed under the Endangered Species Act (ESA), the Migratory Bird Treaty Act (MBTA), and the Bald and Golden Eagle Protection Act (BGEPA), and to identify any impacts to state-protected species.

1.2 Location

The project area is just north of Gibson Boulevard and east of Interstate 25 in southeast Albuquerque (see maps in Attachment A). It appears on the Albuquerque West, New Mexico, US Geological Survey 7.5-minute quadrangle map.

1.3 Project Description

Development would include grading and construction of buildings. A stormwater pipe would be installed via trenching to convey stormwater and urban nuisance flows from the existing upstream pipe outlet to downstream stormwater management facilities, replacing the existing concrete channel.

1.4 Environmental Setting

The project area is in an undeveloped urban lot surrounded by transportation, stormwater management, commercial, and recreational land uses in the southeast quadrant of Albuquerque.

The project area is in the Arizona and New Mexico Plateau Level III Ecoregion and the Albuquerque Basin Level IV Ecoregion (Griffith et al. 2006). This ecoregion is characterized by filled basins, escarpments, and a few areas of volcanic rocks and lava-capped mesas. Vegetation is a mix of sand scrub and desert grassland communities The elevation of the project area ranges from approximately 5,030 to 5,100 feet above mean sea level.

Two soil mapping units were identified by the Natural Resources Conservation Service (NRCS 2025) in the project area. They are cut-and-fill lands and Wink fine sandy loam, with 0 to 5 percent slopes. Cut-and-fill lands are approximately 95 percent of the project area. The Wink fine sandy loam unit is about 5 percent of the project area, near the proposed access road/entrance.

The Geneiva's Arroyo, an ephemeral waterway, is along the southern project area boundary and is the subject of a proposed conditional letter of map revision (CLOMR) request. Stormwater flows in the project area are controlled and channelized in this arroyo. They originate from underground upstream inputs. In the project area, the arroyo is concrete-lined along most of its length. Where the concrete section meets the unlined channel, erosion has created a small dip where flows pond.

The project area is just upstream from the Geneiva's Arroyo confluence with the South Diversion Channel (SDC), the primary stormwater management and flood control feature for this portion of the city. It is in a Zone A Federal Emergency Management Agency (FEMA)-designated special flood hazard area (Attachment B). Zone A areas are those areas without base flood elevations, but which have a 1 percent annual chance of flooding. The proponent is pursuing a design-based CLOMR approval.

The climate in Albuquerque is arid to semi-arid. Albuquerque International Airport climate data indicate the average annual maximum temperatures range between nearly 92 degrees Fahrenheit (°F) in summer and 47°F in winter, and average minimum temperatures range from about 65°F in summer to 23°F in winter. The average annual precipitation is about 8.7 inches. (Western Regional Climate Center 2025). Most precipitation occurs during July, August, and September.

2 Methods

Barr reviewed publicly available desktop sources such as the US Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) tool, New Mexico Crucial Habitat and the New Mexico Department of Game and Fish (NMDGF) Bison-M database, and the New Mexico Energy Mineral and Natural Resources Department (EMNRD) Forestry Division list of endangered plants to identify the potential for federally listed or otherwise protected species to be present.

Pedestrian biological resources surveys were conducted on October 9, 2025. The surveys were conducted during seasonally warm and dry conditions, but within 48 hours of a local precipitation event. The entire project area (identified by Bohannan Huston, the project engineer) was surveyed. Dominant species of plants were identified, and animals or their sign observed were noted. Resources such as animals or their signs that were observed were recorded with a hand-held global positioning system (GPS)-enabled device and photographed (Resources Map, Attachment A).

3 Findings

3.1 Protected Species

3.1.1 Federally Listed and Otherwise Protected Species

Federally listed species and critical habitat information were obtained from the USFWS IPAC tool (USFWS 2025), along with an unofficial species list (Attachment B). Critical habitat relative to the project area was mapped (Attachment A).

Five USFWS-listed, proposed, or candidate species appear on the Bernalillo County IPaC report for the project location. Two of these—the endangered New Mexico meadow jumping mouse (*Zapus hudsonius luteus*) and the threatened, yellow-billed cuckoo (*Coccyzus americanus*)—require riparian woodland or riparian meadow habitats that are not in or near the project area.

The experimental non-essential population of Mexican wolf (*Canis lupus baileyi*) is wide-ranging but typically associated with expansive, undeveloped, and forested federally managed lands and does not occur in urban areas. The proposed threatened monarch butterfly (*Danaus plexippus*) requires meadows or other large patches of milkweed for reproduction and wildflowers for food. These are not available in the project area, which supports a few milkweed plants along the arroyo.

The proposed endangered Suckley's cuckoo bumble bee (*Bombus suckleyi*) depends on populations of host bee species, which in turn depend on pollen sources not available in the project area.

No designated or proposed critical habitat is in or adjacent to the project area. Development of the property and issuance of a CLOMR are expected to result in *no effect* on federally listed species.

Bald and Golden Eagle Protection Act

The BGEPA (16 U.S.C. 668-668d), enacted in 1940 and amended several times, prohibits the take (including harm or harassment) of eagles, nests, or eggs without a permit. The IPaC report indicates no eagles are known to frequent the project area. Bald eagles (*Haliaeetus leucocephalus*) are known to roost along the portions of Rio Grande. These areas are generally outside of the Albuquerque metro area. No bald or golden eagle nesting or likely roosting habitat is in the project area. The proposed development and map revision would not result in a take of either bald or golden eagles.

Migratory Bird Treaty Act

Under the MBTA (16 U.S.C. § 703-712) and Executive Order 13186, federal agencies are directed to consider impacts on migratory birds from land management and planning activities.

It is unlawful to take an occupied nest of a species protected under the MBTA without a permit. Impacts on migratory birds are typically avoided by removing project area vegetation outside the breeding season (generally between September and March). If that is not feasible, a preconstruction survey is conducted to identify occupied nests and prevent accidental take. If an occupied nest must be taken, a USFWS permit is required before removal is allowed.

Trees, shrubs, mammal burrows, culvert structures, or cacti provide potential nest sites for migratory birds. One unoccupied nest was observed during the survey. Nests could be established during future seasons. Preconstruction nest surveys should be completed to confirm MBTA compliance if clearing and excavation are scheduled during the area nesting season (March 15–September 15).

3.1.2 State-Listed Species

The NMDGF Biota Information System of New Mexico was accessed to acquire a list of state-protected species for Bernalillo County (NMDGF 2025). New Mexico endangered plants were identified by accessing the New Mexico EMNRD New Mexico State Forestry Division list of state-endangered plants (EMNRD 2025). State-protected species (Attachment B) were eliminated from further evaluation because they occur in rivers, riparian woodlands or meadows, wetlands or seeps, expansive grasslands, mountains, cliffs, prairies, forests, wetlands, piñon-juniper woodlands, beaches and sandbars, or open waters. None of these habitats occurs in or adjacent to the project area.

3.2 Vegetation and Wildlife

Vegetation

The project area is previously disturbed and surrounded by commercial developments and transportation networks. It supports disturbed Sand Scrub and Desert Grassland vegetation communities (Dick-Peddie 1993). The arroyo channel is concrete-lined for most of its flow path within the project area. It is generally not vegetated or somewhat vegetated. Partially vegetated soils along the banks support native shrubs and forbs. Within vegetated areas, the dominant plant species present are four-wing saltbush (*Atriplex*

canescens), broom dalea *(Psorothamnus scoparius)*, *s*and dropseed grass (*Sporobolus cryptandrus*), and false buffalograss (*Munroa squarrosa*).

Other common species present include sand sage (*Artemisia filifolia*), cholla (*Cylindropuntia imbricata*), snakeweed (*Gutierrezia sarothrae*), and yucca (*Yucca glauca*).

Siberian elm (*Ulmus pumila*), salt cedar (*Tamarix chinensis*), and tree of heaven (*Ailanthus altissima*), all Class C New Mexico noxious weed species, are scattered throughout the property. No treatment or mitigation is recommended for Class C species, which are widespread and naturalized throughout the state.

Proposed project activities may disturb approximately 40 acres of partially vegetated soils. Barr recommends revegetating currently vegetated soils that remain open after construction using native, certified weed-free species. Equipment used in construction should be cleaned prior to arrival and when leaving the construction site to ensure it is free of noxious weed seeds.

Wildlife

Species or their signs observed during the survey of the project area included house finch (*Haemorhous mexicanus*), white-crowned sparrow (*Zonotrichia leucophrys*), curve-billed thrasher (*Toxostoma curvirostre*), rock squirrel (*Otospermophilus variegatus*), and fence lizards (*Sceloporus* sp.).

The project would result in minor permanent and temporary impacts on low-quality urban wildlife habitats. Any deep, narrow excavated trenches left open overnight have the potential to trap small mammals and reptiles. Small animals are likely to be disturbed by construction and will likely avoid the area until it is complete. Post-construction revegetation and landscaping would replace some habitat functions for small mammals, reptiles, and birds.

4 Conclusions

No federal or state-listed or otherwise protected species in Bernalillo County were observed during the surveys. No designated or proposed critical habitat occurs in or near the project area, which is located 1 mile from the nearest critical habitat designation (Rio Grande silvery minnow [*Hybognathus amarus*]). The project is expected to have *no effect* on USFWS-listed species. The project has no potential for "take" (to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or to attempt to engage in any such conduct) of listed species.

Barr recommends that the proponent implement the following measures to reduce impacts on biological resources:

- Limit clearing and grading for the development to months outside the migratory bird nesting season for the Albuquerque area (March 15–September 15) or provide preconstruction nest surveys. If occupied nests of applicable species are to be taken, a permit must be obtained prior to construction.
- Implement sediment and erosion controls appropriate for the disturbance during construction and limit construction in the arroyo to no- or low-flow conditions.
- Limit equipment refueling, storage, and maintenance activities to areas outside the floodplain.

- Clean heavy equipment used in the project area before project onset and inspect daily for leaks. Leaking equipment must not be used in or near any watercourse.

- Backfill any trenching immediately or provide ramps to avoid trapping small animals.

5 References

Dick-Peddie, W. A. 1993. New Mexico vegetation: past, present, and future, with contributions by W. H. Moir and R. Spellenberg. Published by the University of New Mexico Press, Albuquerque, New Mexico.

Federal Emergency Management Agency. 2025. Flood Hazard Maps for Bernalillo County, New Mexico, Unincorporated Areas (multiple maps), Effective 2008. Available online at: https://www.arcgis.com/apps/webappviewer.

Griffith, G.E., J.M. Omernik, M.M. McGraw, G.Z. Jacobi, C.M. Canavan, T.S. Schrader, D. Mercer, R. Hill, and B.C. Moran. 2006. Ecoregions of New Mexico (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (Map scale 1:1,400,000). Available online at: https://www.epa.gov/eco-research/level-iii-and-iv-ecoregions-state.

New Mexico Department of Game and Fish (NMDGF). 2025. Biota Information System of New Mexico (BISON-M). http://bison-m.org/. Accessed November 2025.

New Mexico Energy, Minerals, and Natural Resources Department, Forestry Division. 2025. List of New Mexico Endangered Plants. Available online at: http://www.emnrd.state.nm.us/SFD.

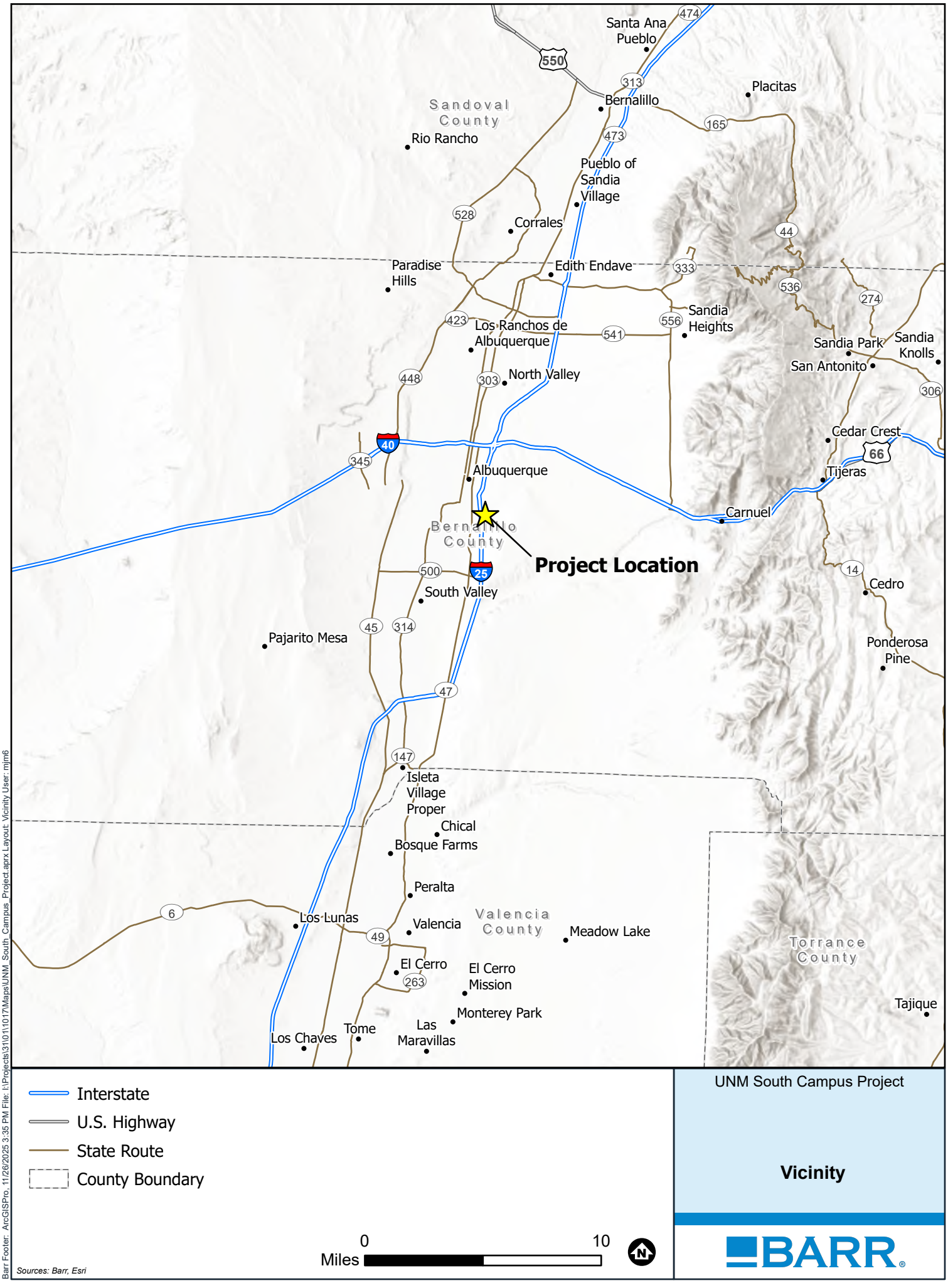
U.S. Department of Agriculture Natural Resources Conservation Service Web Soil Survey. 2025. Available online at: http://soildatamart.nrcs.usda.gov. Accessed November 2025.

USFWS. 2025. IPaC-Information, Planning, and Consultation. Listed and sensitive species in Hidalgo County, New Mexico. [Website] US Fish and Wildlife Service Environmental Conservation Online System. Available online at: http://ecos.fws.gov/ipac/. Accessed December 2025.

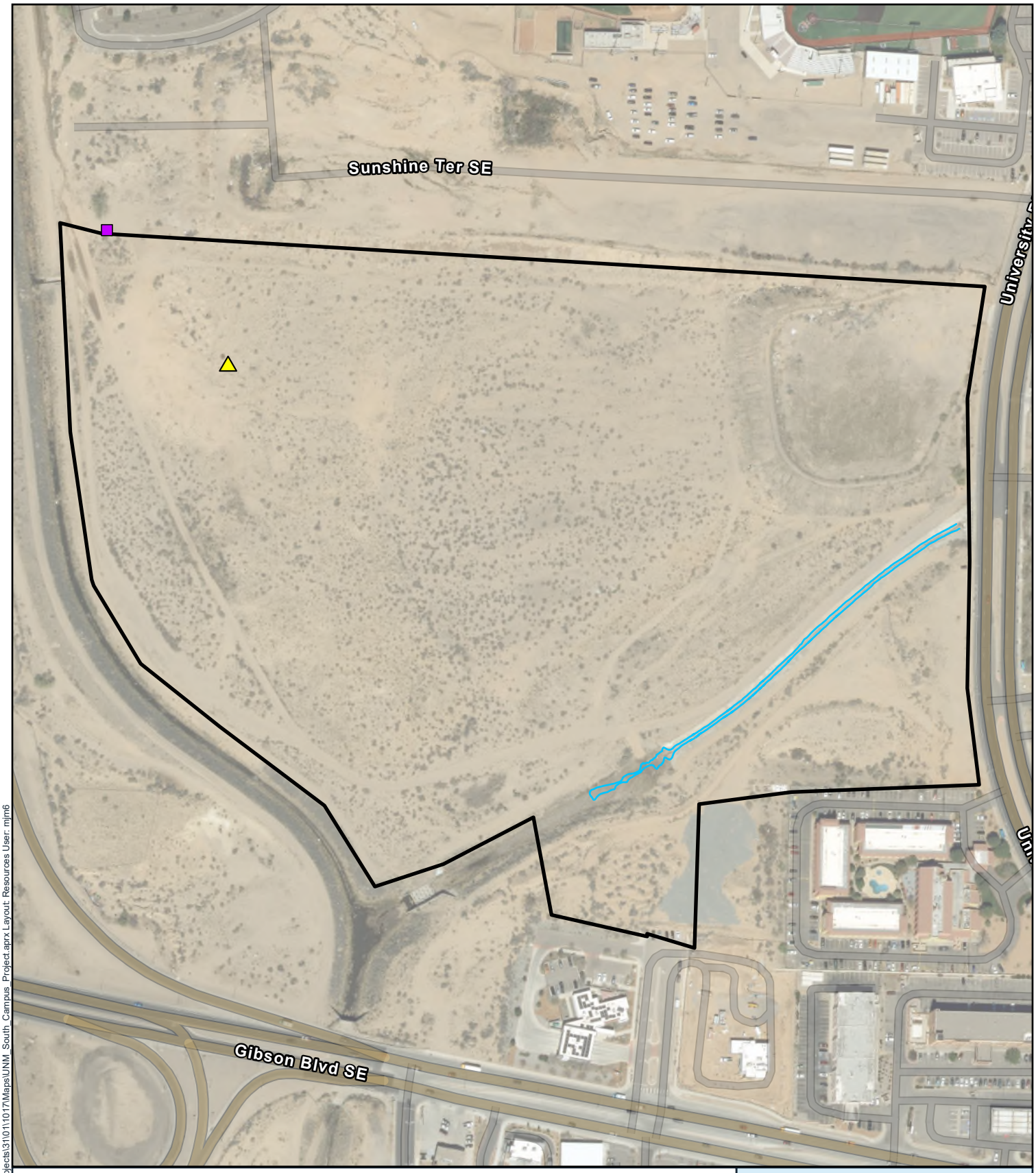
Western Regional Climate Center. New Mexico Climate Summaries. State University, New Mexico. Period of Record 1914-2005. Monthly Climate Summary. Available at: https://wrcc.dri.edu/summary.

Attachment A

Maps



Barr Footer: ArcGISPro, 11/26/2025 3:35 PM File: I:\Projects\31\01\1017\Maps\UNM_South_Campus_Project.aprx Layout: Vicinity User: mjm6



Project Area

Ephemeral Stream

Bird Nest

Burrow

0 500

Feet

Sources: Barr, Esri

UNM South Campus Project

Resources

BARR

Barr Footer: ArcGISPro, 11/26/2025 3:46 PM File: I:\Projects\31\01\017\Maps\UNM_South_Campus_Project.aprx Layout: Resources User: mjm6

Project Area

Critical Habitat

Rio Grande Silvery Minnow (Endangered)

0 0.5 1

Miles

Sources: Barr, USFWS, Esri

UNM South Campus Project

Critical Habitat

BARR

Attachment B

Photographs and Supporting Information

National Flood Hazard Layer FIRMette

FEMA

106°38'26"W 35°4'N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

106°37'48"W 35°3'30"N

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 12/11/2025 at 9:10 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

IPaC U.S. Fish & Wildlife Service

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Bernalillo County, New Mexico

Local office

New Mexico Ecological Services Field Office

(505) 346-2525
(505) 346-2542

2105 Osuna Road Ne
Albuquerque, NM 87113-1001

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

---

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Mexican Wolf Canis lupus baileyi No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/3916	EXPN
New Mexico Meadow Jumping Mouse Zapus hudsonius luteus Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/7965	Endangered

Birds

NAME	STATUS
Yellow-billed Cuckoo Coccyzus americanus There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/3911	Threatened

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/9743	Proposed Threatened
Suckley's Cuckoo Bumble Bee Bombus suckleyi No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/10885	Proposed Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act [2] and the Migratory Bird Treaty Act (MBTA) [1]. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their nests, should follow appropriate regulations and implement required avoidance and minimization measures, as described in the various links on this page.

The data in this location indicates that no eagles have been observed in this area. This does not mean eagles are not present in your project area, especially if the area is difficult to survey. Please review the 'Steps to Take When No Results Are Returned' section of the Supplemental Information on Migratory Birds and Eagles document to determine if your project is in a poorly surveyed area. If it is, you may need to rely on other resources to determine if eagles may be present (e.g. your local FWS field office, state surveys, your own surveys).

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

Bald and Golden Eagle information is not available at this time

Bald & Golden Eagles FAQs

What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are an eagle (Bald and Golden Eagle Protection Act requirements may apply).

Proper interpretation and use of your eagle report

On the graphs provided, please look carefully at the survey effort (indicated by the black vertical line) and for the existence of the "no data" indicator (a red horizontal line). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort line or no data line (red horizontal) means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list and associated information help you know what to look for to confirm presence and helps guide you in knowing when to implement avoidance and minimization measures to eliminate or reduce potential impacts from your project activities or get the appropriate permits should presence be confirmed.

How do I know if eagles are breeding, wintering, or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating, or resident), you may query your location using the RAIL Tool and view the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If an eagle on your IPaC migratory bird species list has a breeding season associated with it (indicated by yellow vertical bars on the phenology graph in your “IPaC PROBABILITY OF PRESENCE SUMMARY” at the top of your results list), there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

Interpreting the Probability of Presence Graphs

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. A taller bar indicates a higher probability of species presence. The survey effort can be used to establish a level of confidence in the presence score.

How is the probability of presence score calculated? The calculation is done in three steps:
The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season ()
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort ()
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data ()
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

Migratory birds

The Migratory Bird Treaty Act (MBTA) [1] prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (FWS).

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

Migratory bird information is not available at this time

Migratory Bird FAQs

Tell me more about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Avoidance & Minimization Measures for Birds describes measures that can help avoid and minimize impacts to all birds at any location year-round. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is one of the most effective ways to minimize impacts. To see when birds are most likely to occur and breed in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location, such as those listed under the Endangered Species Act or the Bald and Golden Eagle Protection Act and those species marked as “Vulnerable”. See the FAQ “What are the levels of concern for migratory birds?” for more information on the levels of concern covered in the IPaC migratory bird species list.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) with which your project intersects. These species have been identified as warranting special attention because they are BCC species in that area, an eagle (Bald and Golden Eagle Protection Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, and to verify survey effort when no results present, please visit the Rapid Avian Information Locator (RAIL) Tool.

Why are subspecies showing up on my list?

Subspecies profiles are included on the list of species present in your project area because observations in the AKN for **the species** are being detected. If the species are present, that means that the subspecies may also be present. If a subspecies shows up on your list, you may need to rely on other resources to determine if that subspecies may be present (e.g. your local FWS field office, state surveys, your own surveys).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating, or resident), you may query your location using the RAIL Tool and view the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your IPaC migratory bird species list has a breeding season associated with it (indicated by yellow vertical bars on the phenology graph in your “IPaC PROBABILITY OF PRESENCE SUMMARY” at the top of your results list), there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Bald and Golden Eagle Protection Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially BCC species. For more information on avoidance and minimization measures you can implement to help avoid and minimize migratory bird impacts, please see the FAQ “Tell me more about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds”.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Proper interpretation and use of your migratory bird report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please look carefully at the survey effort (indicated by the black vertical line) and for the existence of the "no data" indicator (a red horizontal line). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list does not represent all birds present in your project area. It is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list and associated information help you know what to look for to confirm presence and helps guide implementation of avoidance and minimization measures to eliminate or reduce potential impacts from your project activities, should presence be confirmed. To learn more about avoidance and minimization measures, visit the FAQ "Tell me about avoidance and minimization measures I can implement to avoid or minimize impacts to migratory birds".

Interpreting the Probability of Presence Graphs

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. A taller bar indicates a higher probability of species presence. The survey effort can be used to establish a level of confidence in the presence score.

How is the probability of presence score calculated? The calculation is done in three steps:

The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season ()
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort ()
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data ()
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

Facilities

Wildlife refuges and fish hatcheries

Refuge and fish hatchery information is not available at this time

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

RIVERINE
R4SB3Jx

A full description for each wetland code can be found at the National Wetlands Inventory website

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Federal or State Threatened/Endangered Species

Bernalillo

Taxonomic Group	# Species	Taxonomic Group	# Species
Birds	15	Lepidoptera; moths and butterflies	1
Fish	1	Mammals	2

TOTAL SPECIES: 19

Common Name	Scientific Name	NMGF	US FWS	Critical Habitat	SGCN	Photo
Spotted Bat	Euderma maculatum	T			Y	View
New Mexico Jumping Mouse	Zapus hudsonius luteus	E	E	Y	Y	View
Yellow-billed Cuckoo (western pop)	Coccyzus americanus occidentalis		T	Y	Y	View
Broad-billed Hummingbird	Cynanthus latirostris	T			Y	View
White-eared Hummingbird	Basilinna leucotis	T				View
Least Tern	Sternula antillarum	E			Y	View
Neotropic Cormorant	Phalacrocorax brasilianus	T			Y	View
Brown Pelican	Pelecanus occidentalis	E				View
Bald Eagle	Haliaeetus leucocephalus	T			Y	View
Common Black Hawk	Buteogallus anthracinus	T			Y	View
Mexican Spotted Owl	Strix occidentalis lucida		T	Y	Y	View
Aplomado Falcon	Falco femoralis	E	E		Y	View
Peregrine Falcon	Falco peregrinus	T			Y	View
Southwestern Willow Flycatcher	Empidonax traillii extimus	E	E	Y	Y	View
Bell's Vireo	Vireo bellii	T			Y	View
Gray Vireo	Vireo vicinior	T			Y	View
Baird's Sparrow	Centronyx bairdii	T			Y	View
Rio Grande Silvery Minnow	Hybognathus amarus	E	E	Y	Y	View
Monarch	Danaus plexippus		P			View

NEW MEXICO STATE ENDANGERED PLANT SPECIES (19.21.2.8 NMAC)

Detailed information and images of many of these and other rare plants can be found at the New Mexico Rare Plants website (https://nmrareplants.unm.edu/). Also, click on botanical name in table to get detailed information for each species from New Mexico Rare Plants Website.

Botanical Name	Common Name	New Mexico Counties
Agalinis calycina	Leoncita false-foxglove	Chaves
Aliciella formosa	Aztec gilia	San Juan
Allium gooddingii	Goodding's onion	San Juan, McKinley, Catron, Lincoln
Amsonia tharpii	Tharp's bluestar	Eddy
Argemone pinnatisecta	Sacramento prickly poppy	Otero
Astragalus humillimus	Mancos milkvetch	San Juan
Castilleja ornata	Swale paintbrush	Hidalgo
Castilleja tomentosa	Tomentose paintbrush	Hidalgo
Cirsium vinaceum	Sacramento Mountains thistle	Otero
Cirsium wrightii	Wright's marsh thistle	Chaves, Guadalupe, Otero, Sierra, Socorro
Cleome multicaulis (Peritoma multicaulis)	slender spiderflower	Grant, Hidalgo
Coryphantha robustispina ssp. scheeri	Scheer's pincushion cactus	Chavez, Eddy
Cylindropuntia viridiflora	Santa Fe cholla	Santa Fe
Cymopterus spellenbergii	Spellenberg's springparsley	Rio Arriba, Taos
Cypripedium parviflorum var. pubescens	golden lady's slipper	San Juan, Grant, San Miguel
Echinocereus fendleri var. kuenzleri	Kuenzler's hedgehog cactus	Chavez, Eddy, Lincoln, Otero
Erigeron hessii	Hess' fleabane	Catron
Erigeron rhizomatus	Zuni fleabane	Catron, McKinley, San Juan
Eriogonum gypsophilum	gypsum wild buckwheat	Eddy

Escobaria duncanii	Duncan's pincushion cactus	Sierra
Escobaria organensis	Organ Mountain pincushion cactus	Doña Ana
Escobaria sneedii var. leei	Lee's pincushion cactus	Eddy
Escobaria sneedii var. sneedii	Sneed's pincushion cactus	Doña Ana
Escobaria villardii	Villard's pincushion cactus	Doña Ana, Otero
Hedeoma todsenii	Todsen's pennyroyal	Otero, Sierra
Helianthus paradoxus	Pecos sunflower	Cibola, Valencia, Socorro, Guadalupe, Chavez
Hexalectris colemanii	Coleman’s coralroot	Hidalgo
Hexalectris nitida	shining coralroot	Eddy, Otero
Hexalectris arizonica	crested coralroot	Sierra, Otero, Hidalgo
Ipomopsis sancti-spiritus	Holy Ghost ipomopsis	San Miguel
Lepidospartum burgessii	gypsum scalebroom	Otero
Lilium philadelphicum	wood lily	Otero, Los Alamos, Sandoval, San Miguel, Santa Fe
Linum allredii	Allred’s flax	Eddy
Opuntia arenaria	sand prickly pear	Doña Ana, Luna, Socorro
Pediocactus knowltonii	Knowlton's cactus	San Juan
Pediomelum pentaphyllum	Chihuahua scurfpea	Hidalgo
Peniocereus greggii	night-blooming cereus	Doña Ana, Grant, Hidalgo, Luna
Penstemon metcalfei	Metcalfe’s beardtongue	Sierra
Polygala rimulicola var. mescalerorum	San Andres milkwort	Doña Ana
Puccinellia parishii	Parish's alkali grass	Catron, Cibola, Grant, Hidalgo, McKinley, Sandoval, San Juan
Sclerocactus cloverae	Clover’s cactus	Rio Arriba, San Juan, Sandoval

Sclerocactus mesae-verdae	Mesa Verde cactus	San Juan
Scophularia macrantha	Mimbres figwort	Grant, Luna
Spiranthes magnicamporum	lady tresses orchid	Bernalillo, Santa Fe, Guadalupe, Rio Arriba
Townsendia gypsophila	gypsum Townsend's aster	Sandoval

Photograph 1 Geneiva's Arroyo channel facing downstream (westward) from the buried pipe outlet

Photograph 2 Geneiva's Arroyo facing eastward (upstream) from the downstream project area terminus

Photograph 3 Overview of the project area, looking to the southwest from the northeast corner

Photograph 4 Unoccupied nest in a cholla in the project area

Photograph 5 Inactive burrow in the project area

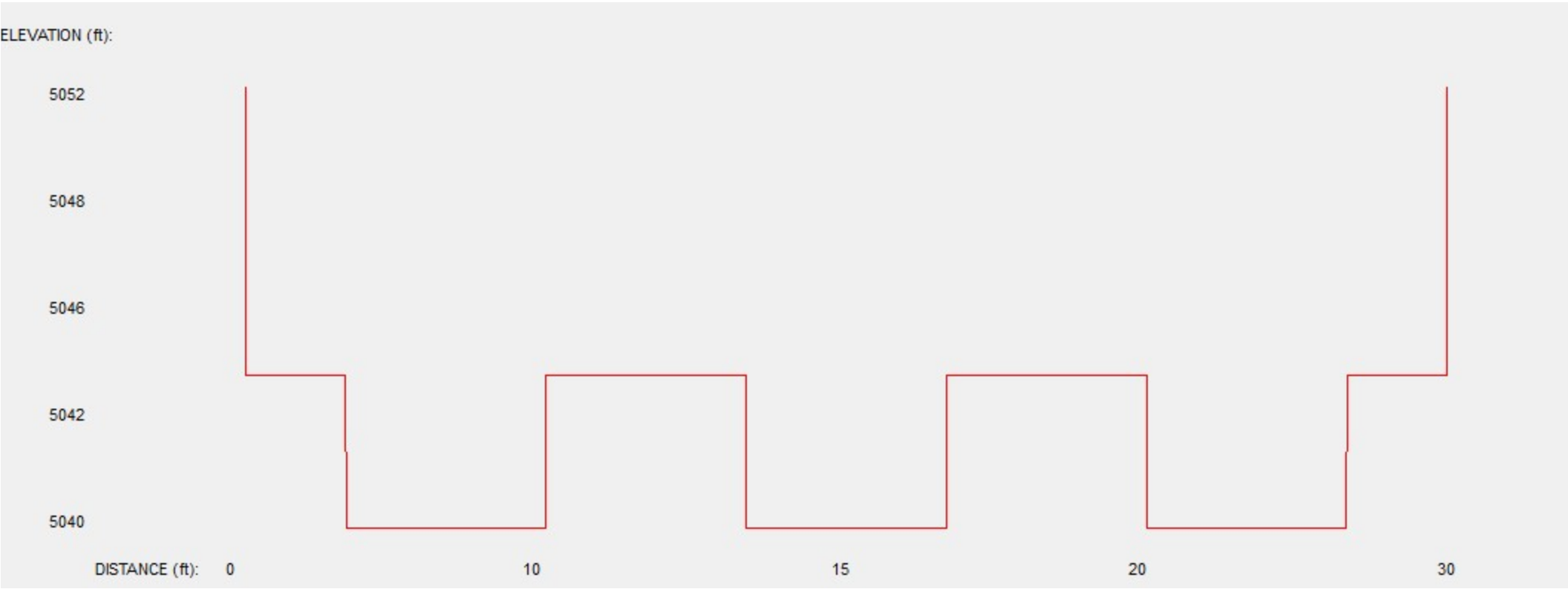
APPENDIX D – HYDRAULIC RESULTS

1. Baffle Chute Weir Results

WEIR COEFFICIENT = 3.320 X-SECTION DISTANCE = 0.250

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1.0	0.0	5051.5	7.0	12.5	5044.0	13.0	27.5	5040.0
2.0	0.0	5044.0	8.0	12.5	5040.0	14.0	27.5	5044.0
3.0	2.5	5044.0	9.0	17.5	5040.0	15.0	30.0	5044.0
4.0	2.5	5040.0	10.0	17.5	5044.0	16.0	30.0	5051.5
5.0	7.5	5040.0	11.0	22.5	5044.0			
6.0	7.5	5044.0	12.0	22.5	5040.0			

WSEL FT.	DEPTH INC FT.	FLOW AREA SQ.FT.	FLOW RATE (CFS)	FLOW VEL (FPS)	TOPWID PLUS OBSTRUCTIONS
5040.250	0.250	3.743	6.213	1.660	29.924
5040.500	0.500	7.487	17.575	2.347	29.928
5040.750	0.750	11.232	32.290	2.875	29.931
5041.000	1.000	14.978	49.718	3.320	29.935
5041.250	1.250	18.724	69.489	3.711	29.939
5041.500	1.500	22.472	91.354	4.065	29.943
5041.750	1.750	26.220	115.129	4.391	29.946
5042.000	2.000	29.970	140.674	4.694	29.950
5042.250	2.250	33.720	167.873	4.978	29.954
5042.500	2.500	37.472	196.632	5.247	29.958
5042.750	2.750	41.224	226.872	5.503	29.961
5043.000	3.000	44.978	258.525	5.748	29.965
5043.250	3.250	48.732	291.531	5.982	29.969
5043.500	3.500	52.487	325.837	6.208	29.973
5043.750	3.750	56.243	361.396	6.426	29.976
5044.000	4.000	60.000	398.167	6.636	29.980
5044.250	4.250	67.495	442.332	6.554	29.981
5044.500	4.500	74.990	492.773	6.571	29.981
5044.750	4.750	82.486	547.666	6.640	29.982
5045.000	5.000	89.981	606.340	6.739	29.983
5045.250	5.250	97.477	668.397	6.857	29.983
5045.500	5.500	104.973	733.564	6.988	29.984
5045.750	5.750	112.469	801.633	7.128	29.985
5046.000	6.000	119.965	872.441	7.272	29.985
5046.250	6.250	127.462	945.853	7.421	29.986
5046.500	6.500	134.958	1021.754	7.571	29.987
5046.750	6.750	142.455	1100.047	7.722	29.987
5047.000	7.000	149.952	1180.646	7.873	29.988
5047.250	7.250	157.449	1263.475	8.025	29.989
5047.500	7.500	164.946	1348.466	8.175	29.989
5047.750	7.750	172.444	1435.557	8.325	29.990
5048.000	8.000	179.941	1524.691	8.473	29.991
5048.250	8.250	187.439	1615.819	8.621	29.991
5048.500	8.500	194.937	1708.892	8.766	29.992
5048.750	8.750	202.435	1803.866	8.911	29.993
5049.000	9.000	209.933	1900.700	9.054	29.993
5049.250	9.250	217.432	1999.357	9.195	29.994
5049.500	9.500	224.930	2099.801	9.335	29.995
5049.750	9.750	232.429	2201.997	9.474	29.995
5050.000	10.000	239.928	2305.916	9.611	29.996
5050.250	10.250	247.427	2411.526	9.746	29.997
5050.500	10.500	254.926	2518.800	9.881	29.997
5050.750	10.750	262.426	2627.710	10.013	29.998
5051.000	11.000	269.925	2738.232	10.144	29.999
5051.250	11.250	277.425	2850.341	10.274	29.999
5051.500	11.500	284.925	2964.013	10.403	30.000


ELEVATION (ft):
5052
5048
5046
5042
5040
DISTANCE (ft):
0
10
15
20
30

APPENDIX E – STORM DRAIN HYDRAULIC RESULTS

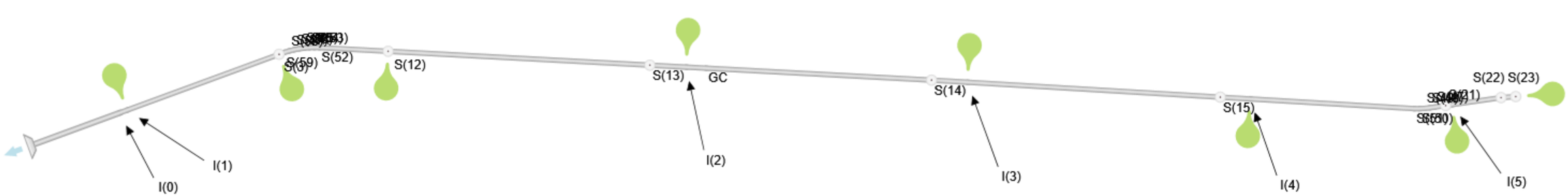
1. Existing Conditions Storm Drain Hydraulic Results
2. Proposed Conditions Storm Drain Hydraulic Results

Plan View

Stormwater Studio 2025 v 3.0.0.39

Project Name: EXISTING SD

09-11-2025

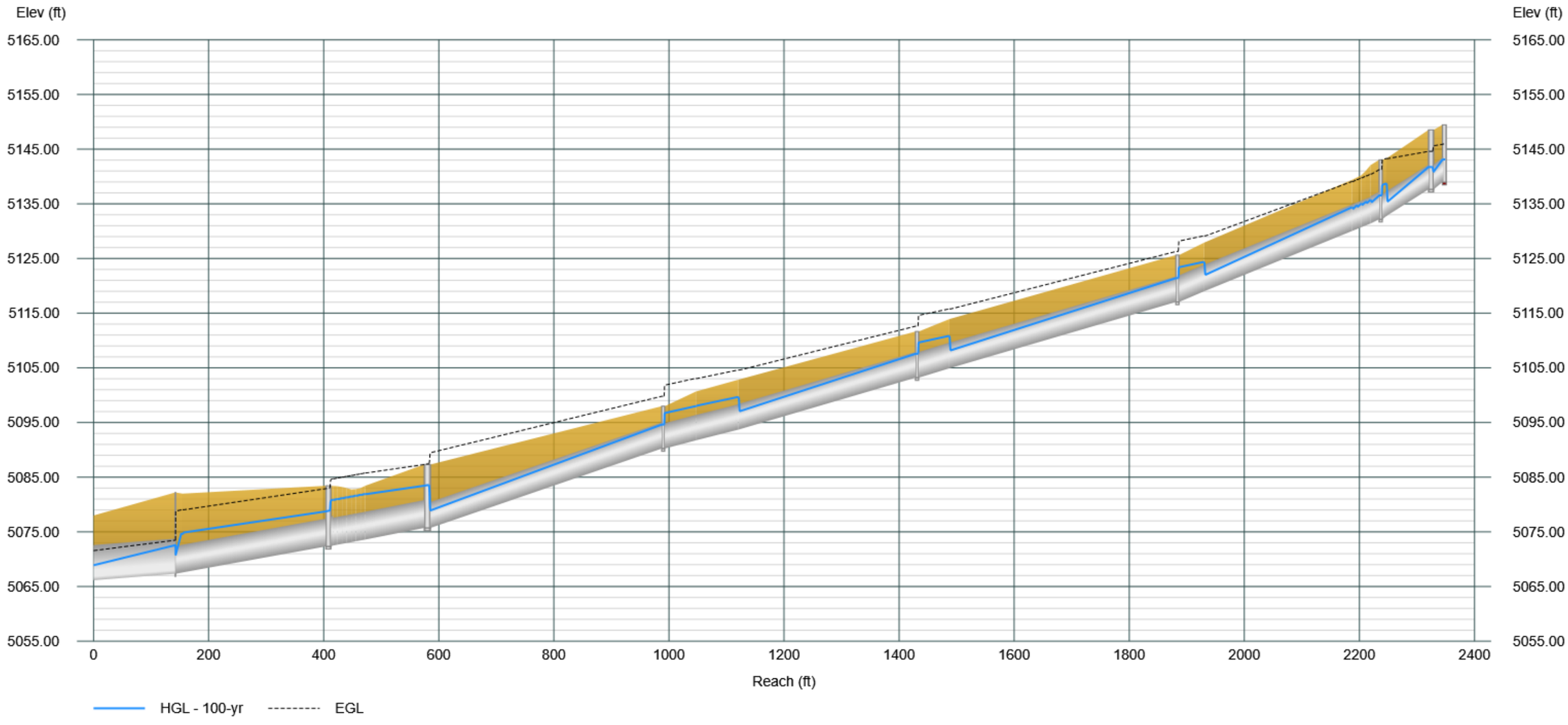


Profile View

Stormwater Studio 2026 v 3.0.0.40

Project Name: EXISTING SD

01-08-2026



Energy Grade Line Calculations

Project Name: EXISTING SD

Stormwater Studio 2026 v 3.0.0.40

01-08-2026

Line No	Line Size	Q	Downstream							Length	Upstream							Pipe		Junction		
			Invert Elev	Depth	Area	HGL Elev	Vel	Vel Head	EGL Elev		Invert Elev	Depth	Area	HGL Elev	Vel	Vel Head	EGL Elev	n Value	Enrgy Loss	HGLa Elev	EGLa Elev	Enrgy Loss
	(in)	(cfs)	(ft)	(ft)	(sqft)	(ft)	(ft/s)	(ft)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft)	(ft/s)	(ft)	(ft)		(ft)	(ft)	(ft)	(ft)
1	77x114a	331.00	5066.15	2.74[1]	25.22	5068.90	13.12	2.68	5071.57	142.25	5067.34	5.23	43.44	5072.57	7.62	0.90	5073.47	0.024	1.901	5072.58	5073.48	0.00
2	60	331.00	5067.34	3.49‡	14.62	5070.83	22.65	7.97	5078.80	12.50	5067.58	5.00	19.63	5074.63	16.86	4.42	5079.05	0.013	0.247	5074.63	5079.05	0.00
3	60	321.00	5067.58	5.00	19.63	5074.89	16.35	4.16	5079.05	253.29	5072.34	5.00	19.63	5078.74	16.35	4.16	5082.90	0.013	3.848	5078.87	5083.02	0.12
4	60	310.00	5072.34	5.00	19.63	5080.70	15.79	3.88	5084.57	8.00	5072.50	5.00	19.63	5080.81	15.79	3.88	5084.69	0.013	0.113	5080.85	5084.73	0.04
5	60	310.00	5072.50	5.00	19.63	5080.85	15.79	3.88	5084.73	8.00	5072.66	5.00	19.63	5080.97	15.79	3.88	5084.84	0.013	0.113	5081.00	5084.88	0.04
6	60	310.00	5072.66	5.00	19.63	5081.00	15.79	3.88	5084.88	8.00	5072.82	5.00	19.63	5081.12	15.79	3.88	5084.99	0.013	0.113	5081.16	5085.03	0.04
7	60	310.00	5072.82	5.00	19.63	5081.16	15.79	3.88	5085.03	8.00	5072.97	5.00	19.63	5081.27	15.79	3.88	5085.15	0.013	0.113	5081.31	5085.19	0.04
8	60	310.00	5072.97	5.00	19.63	5081.31	15.79	3.88	5085.19	8.00	5073.13	5.00	19.63	5081.43	15.79	3.88	5085.30	0.013	0.113	5081.46	5085.34	0.04
9	60	310.00	5073.13	5.00	19.63	5081.46	15.79	3.88	5085.34	8.00	5073.29	5.00	19.63	5081.58	15.79	3.88	5085.45	0.013	0.113	5081.62	5085.49	0.04
10	60	310.00	5073.29	5.00	19.63	5081.62	15.79	3.88	5085.49	8.00	5073.44	5.00	19.63	5081.73	15.79	3.88	5085.61	0.013	0.113	5081.77	5085.65	0.04
11	60	310.00	5073.44	5.00	19.63	5081.77	15.79	3.88	5085.65	8.00	5073.60	5.00	19.63	5081.89	15.79	3.88	5085.76	0.013	0.113	5081.91	5085.79	0.03
12	60	310.00	5073.60	5.00	19.63	5081.91	15.79	3.88	5085.79	108.01	5075.72	5.00	19.63	5083.44	15.79	3.88	5087.32	0.013	1.530	5083.56	5087.44	0.12
13	54	288.00	5075.72	3.20‡	12.08	5078.92	23.84	8.83	5089.48	409.93	5090.24	4.37[2]	15.77	5094.61	18.26	5.18	5099.79	0.013	10.317	5094.61	5099.79	0.00
14	54	288.00	5090.24	4.50	15.90	5096.73	18.11	5.10	5101.83	56.79	5091.74	4.50	15.90	5097.95	18.11	5.10	5103.05	0.013	1.218	5097.95	5103.05	0.00
15	54	284.00	5091.74	4.50	15.90	5098.10	17.86	4.96	5103.05	74.10	5093.71	4.50	15.90	5099.64	17.86	4.96	5104.60	0.013	1.545	5099.64	5104.60	0.00
16	54	284.00	5093.71	3.37‡	12.76	5097.08	22.25	7.70	5104.60	310.37	5103.20	4.37[2]	15.77	5107.57	18.01	5.04	5112.61	0.013	8.013	5107.57	5112.61	0.00
17	54	284.00	5103.20	4.50	15.90	5109.64	17.86	4.96	5114.60	56.10	5104.92	4.50	15.90	5110.81	17.86	4.96	5115.77	0.013	1.170	5110.81	5115.77	0.00
18	54	279.00	5104.92	3.29‡	12.45	5108.21	22.41	7.81	5115.77	396.31	5117.04	4.35[2]	15.75	5121.40	17.72	4.88	5126.28	0.013	10.508	5121.40	5126.28	0.00
19	54	279.00	5117.04	4.50	15.90	5123.41	17.55	4.79	5128.19	46.55	5119.01	4.50	15.90	5124.35	17.54	4.78	5129.13	0.013	0.938	5124.35	5129.13	0.00
20	54	274.00	5119.01	3.02‡	11.35	5122.03	24.15	9.06	5129.13	256.94	5130.04	4.34[2]	15.73	5134.38	17.42	4.72	5139.10	0.013	9.964	5134.38	5139.10	0.00
21	54	274.00	5130.04	4.08‡	15.15	5134.11	18.08	5.08	5139.10	8.00	5130.38	4.34[2]	15.73	5134.72	17.42	4.72	5139.44	0.013	0.344	5134.72	5139.44	0.00
22	54	274.00	5130.38	4.11‡	15.24	5134.49	17.98	5.03	5139.44	8.00	5130.72	4.34[2]	15.73	5135.06	17.42	4.72	5139.78	0.013	0.340	5135.06	5139.78	0.00

Notes: Return Period = 100-yrs. [1] Critical depth. [2] Critical depth. ‡ Supercritical. r = rectangular e = elliptical a = arch

Project File: 20260033Existing SD with Adjustment.sws

Energy Grade Line Calculations

Project Name: EXISTING SD

Stormwater Studio 2026 v 3.0.0.40

01-08-2026

Line No	Line Size	Q	Downstream							Length	Upstream							Pipe		Junction		
			Invert Elev	Depth	Area	HGL Elev	Vel	Vel Head	EGL Elev		Invert Elev	Depth	Area	HGL Elev	Vel	Vel Head	EGL Elev	n Value	Enrgy Loss	HGLa Elev	EGLa Elev	Enrgy Loss
	(in)	(cfs)	(ft)	(ft)	(sqft)	(ft)	(ft/s)	(ft)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft)	(ft/s)	(ft)	(ft)		(ft)	(ft)	(ft)	(ft)
23	54	274.00	5130.72	4.11‡	15.24	5134.83	17.98	5.03	5139.78	8.00	5131.06	4.34²	15.73	5135.40	17.42	4.72	5140.12	0.013	0.339	5135.40	5140.12	0.00
24	54	274.00	5131.06	4.11‡	15.24	5135.17	17.98	5.03	5140.12	8.00	5131.40	4.34²	15.73	5135.74	17.42	4.72	5140.46	0.013	0.340	5135.74	5140.46	0.00
25	54	274.00	5131.40	3.91‡	14.67	5135.31	18.68	5.42	5140.46	17.85	5132.17	4.34²	15.73	5136.51	17.42	4.72	5141.23	0.013	0.770	5136.51	5141.23	0.00
26	54	274.00	5132.17	4.50	15.90	5138.46	17.23	4.62	5143.08	10.00	5132.79	4.50	15.90	5138.66	17.23	4.61	5143.27	0.013	0.194	5138.66	5143.28	0.00
27	54	205.00	5132.79	2.64‡	9.70	5135.43	21.14	6.95	5143.28	77.53	5137.66	4.07²	15.14	5141.73	13.54	2.85	5144.58	0.013	1.308	5141.73	5144.58	0.00
28	54	205.00	5137.66	3.24‡	12.25	5140.90	16.74	4.36	5145.62	23.00	5138.96	4.08	15.15	5143.04	13.53	2.85	5145.88	0.013	0.266	5143.13	5145.98	0.09

Notes: Return Period = 100-yrs. ² Critical depth. ‡ Supercritical.

Structure Report

Stormwater Studio 2026 v 3.0.0.40

Project Name: EXISTING SD

01-08-2026

Line No.	Inlet ID	Line ID	Junct Type	Grnd/Rim Elev Up (ft)	Invert Up (ft)	Bench-ing	Flow Rate (cfs)	Known Q (cfs)	HGL Junct (ft)	Minor Loss (ft)	HGL Up (ft)	Vel Up (ft/s)
1	I(0)	P(49)	MH	5082.20	5067.34	Impr	331.00	0.00	5072.75	0.00	5072.57	7.62
2	I(1)	P(50)	None	5082.00	5067.58	....	331.00	10.00	5074.63	....	5074.63	16.86
3	S(3)	P(2)	MH	5083.43	5072.34	Half	321.00	11.00	5079.57	0.12	5078.74	16.35
4	S(59)	P(3)	None	5083.40	5072.50	....	310.00	0.00	5080.85	....	5080.81	15.79
5	S(58)	P(4)	None	5083.35	5072.66	....	310.00	0.00	5081.00	....	5080.97	15.79
6	S(57)	P(5)	None	5083.20	5072.82	....	310.00	0.00	5081.16	....	5081.12	15.79
7	S(56)	P(6)	None	5083.00	5072.97	....	310.00	0.00	5081.31	....	5081.27	15.79
8	S(55)	P(7)	None	5082.75	5073.13	....	310.00	0.00	5081.46	....	5081.43	15.79
9	S(54)	P(8)	None	5082.82	5073.29	....	310.00	0.00	5081.62	....	5081.58	15.79
10	S(53)	P(9)	None	5083.00	5073.44	....	310.00	0.00	5081.77	....	5081.73	15.79
11	S(52)	P(10)	None	5083.43	5073.60	....	310.00	0.00	5081.91	....	5081.89	15.79
12	S(12)	P(11)	MH	5087.32	5075.72	Half	310.00	22.00	5084.22	0.12	5083.44	15.79
13	S(13)	P(12)	MH	5097.98	5090.24	Impr	288.00	0.00	5094.61	0.00	5094.61	18.26
14	I(2)	P(45)	None	5100.67	5091.74	....	288.00	4.00	5097.95	....	5097.95	18.11
15	GC	New	None	5102.84	5093.71	....	284.00	0.00	5099.64	....	5099.64	17.86
16	S(14)	P(13)	MH	5111.65	5103.20	Impr	284.00	0.00	5107.57	0.00	5107.57	18.01
17	I(3)	P(46)	None	5113.92	5104.92	....	284.00	5.00	5110.81	....	5110.81	17.86
18	S(15)	P(14)	MH	5125.62	5117.04	Impr	279.00	0.00	5121.40	0.00	5121.40	17.72
19	I(4)	P(47)	None	5127.91	5119.01	....	279.00	5.00	5124.35	....	5124.35	17.54
20	S(51)	P(15)	None	5139.39	5130.04	....	274.00	0.00	5134.38	....	5134.38	17.42
21	S(50)	P(16)	None	5139.80	5130.38	....	274.00	0.00	5134.72	....	5134.72	17.42
22	S(49)	P(17)	None	5140.23	5130.72	....	274.00	0.00	5135.06	....	5135.06	17.42
23	S(48)	P(18)	None	5141.06	5131.06	....	274.00	0.00	5135.40	....	5135.40	17.42
24	S(47)	P(19)	None	5142.07	5131.40	....	274.00	0.00	5135.74	....	5135.74	17.42
25	S(21)	P(20)	MH	5143.04	5132.17	Impr	274.00	0.00	5136.51	0.00	5136.51	17.42
26	I(5)	P(48)	None	5143.30	5132.79	....	274.00	69.00	5138.66	....	5138.66	17.23
27	S(22)	P(21)	MH	5148.53	5137.66	Half	205.00	0.00	5141.73	0.00	5141.73	13.54
28	S(23)	P(22)	MH	5149.44	5138.96	Half	205.00	205.00	5143.66	0.09	5143.04	13.53

Notes: IDF File = SampleIDF.idf, Return Period = 100-yrs. r = rectangular e = elliptical a = arch

Plan View

Stormwater Studio 2026 v 3.0.0.40

Project Name: 20260033Entire System

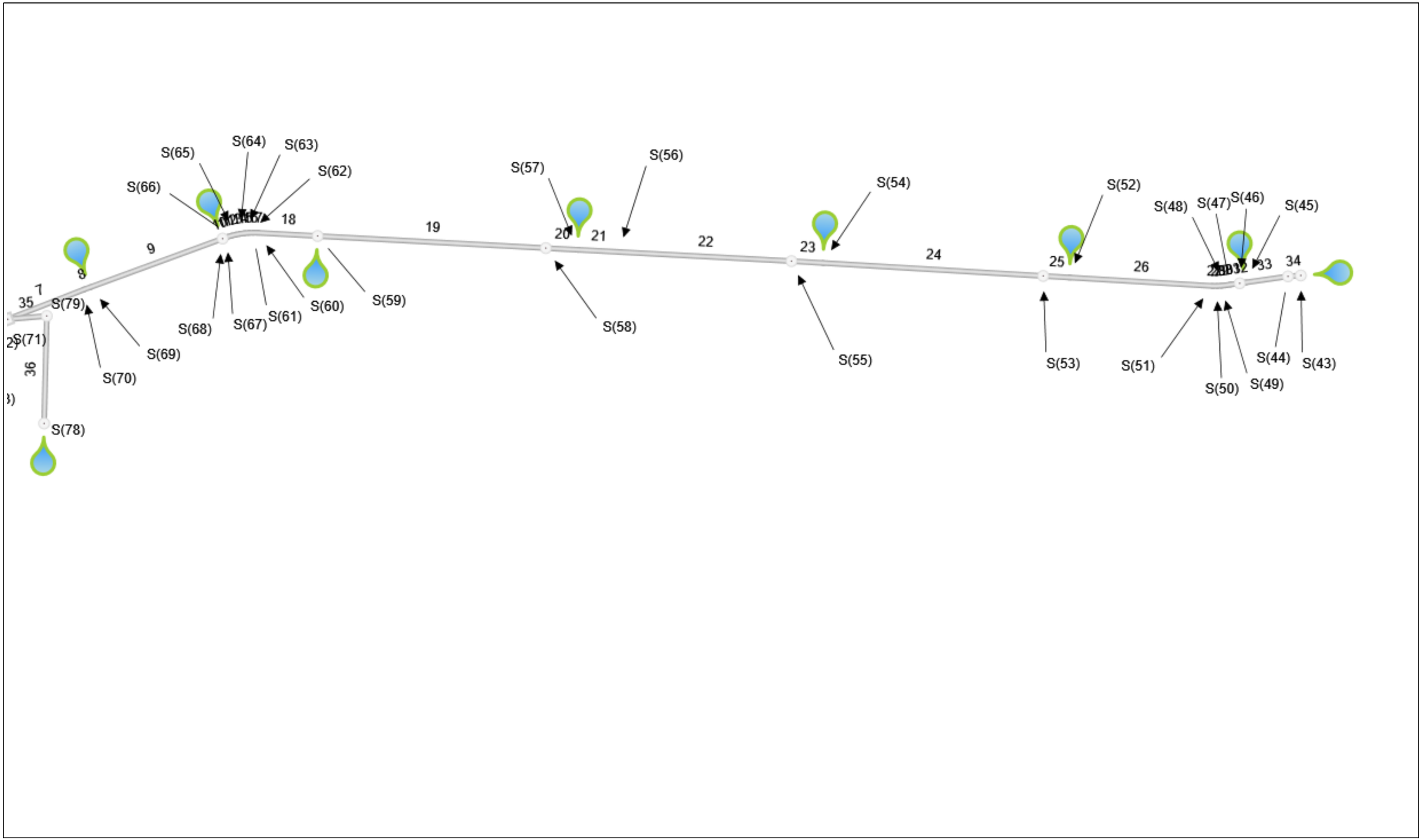
01-08-2026

Plan View

Stormwater Studio 2026 v 3.0.0.40

Project Name: 20260033Entire System

01-06-2026

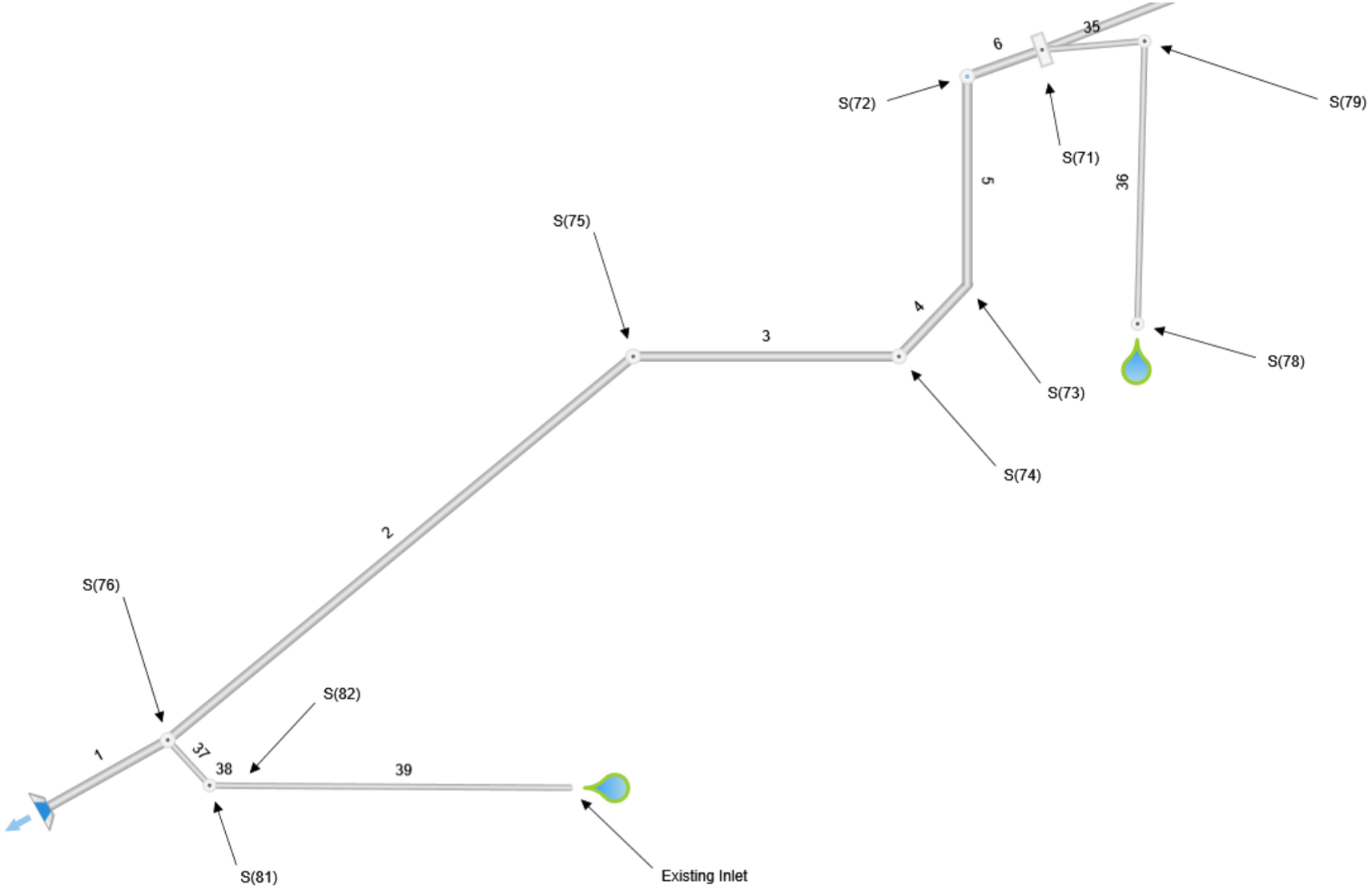


Plan View

Stormwater Studio 2026 v 3.0.0.40

Project Name: 20260033Entire System

01-06-2026

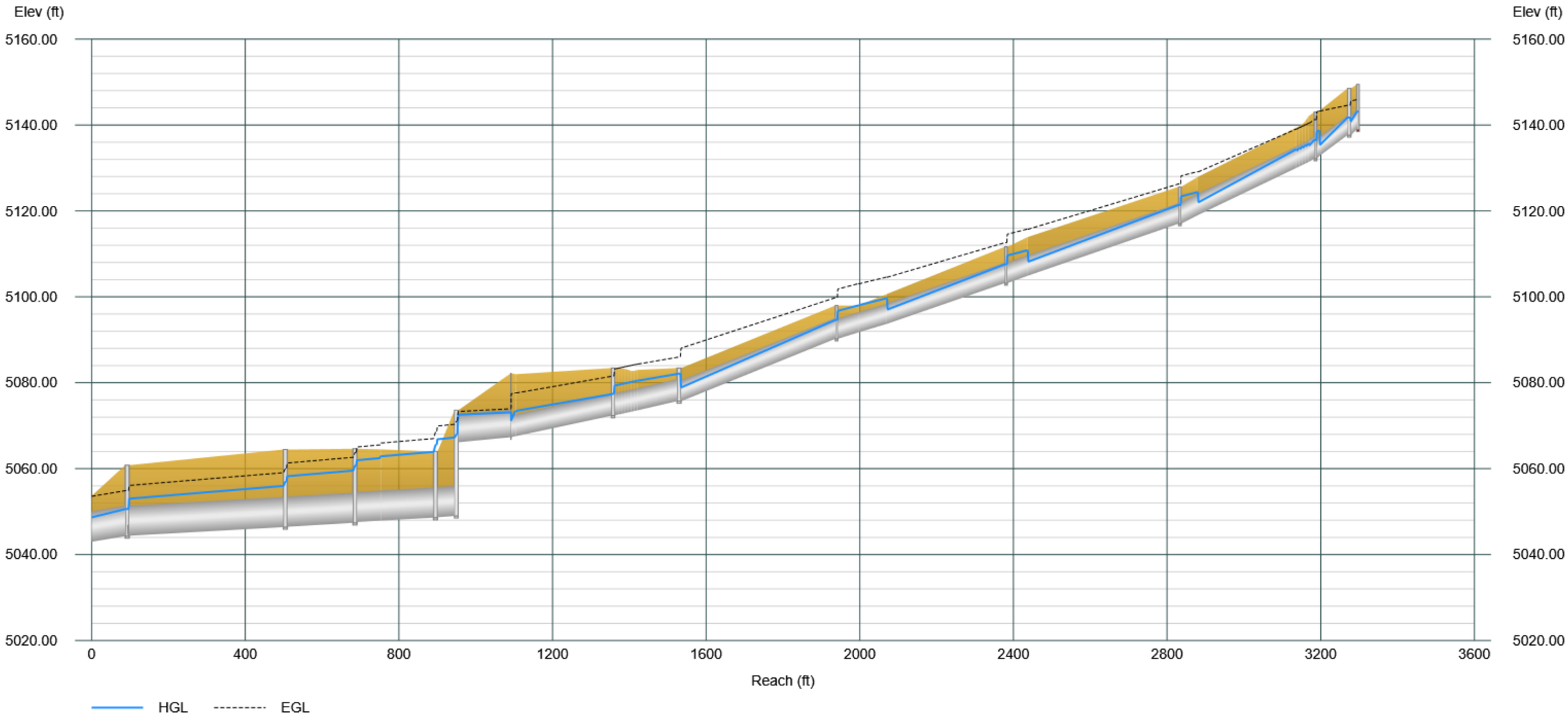


Profile View

Stormwater Studio 2026 v 3.0.0.41

Project Name: 20260033Entire System

03-10-2026

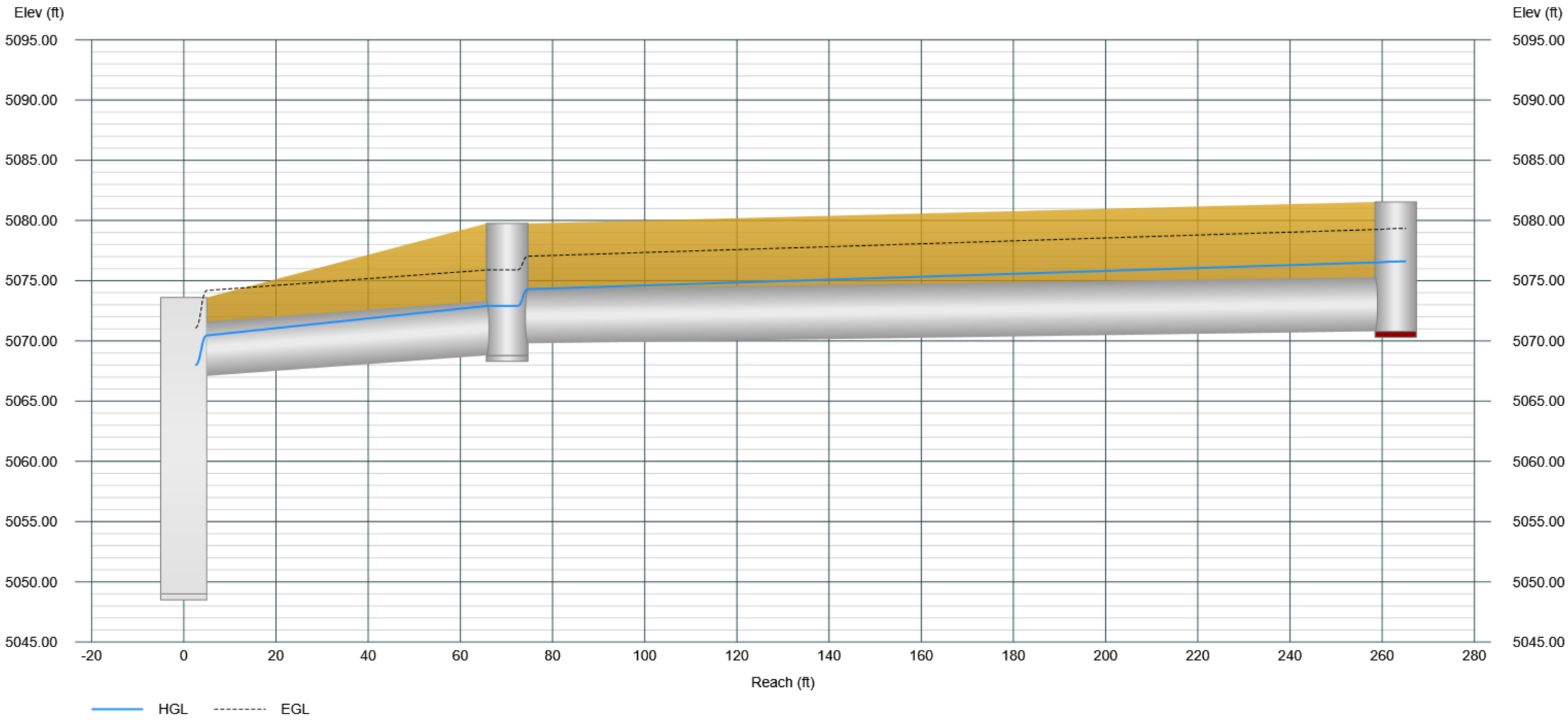


Profile View

Stormwater Studio 2026 v 3.0.0.41

Project Name: 20260033Entire System

03-10-2026

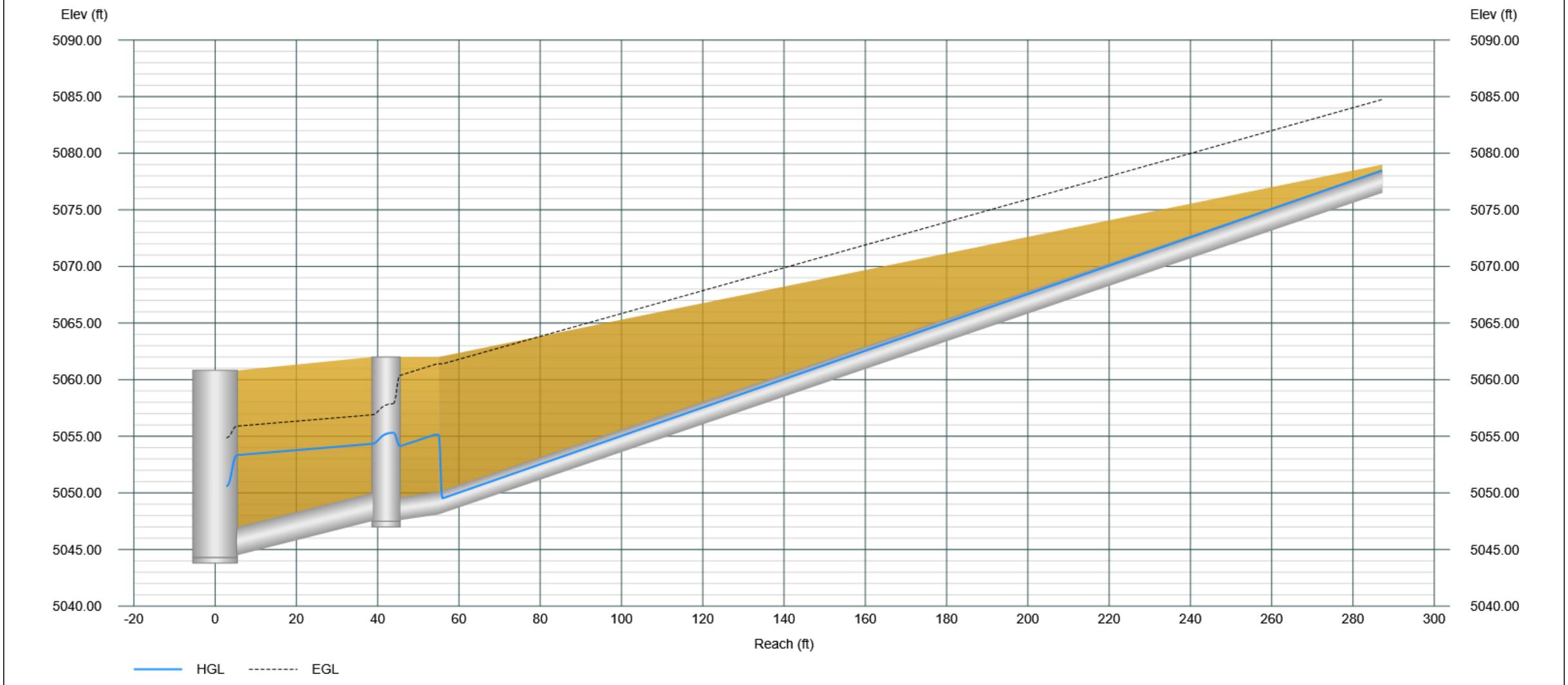


Profile View

Stormwater Studio 2026 v 3.0.0.41

Project Name: 20260033Entire System

03-10-2026



Energy Grade Line Calculations

Project Name: 20260033Entire System

Stormwater Studio 2026 v 3.0.0.41

03-10-2026

Line No	Line Size	Q	Downstream							Length	Upstream							Pipe		Junction		
			Invert Elev	Depth	Area	HGL Elev	Vel	Vel Head	EGL Elev		Invert Elev	Depth	Area	HGL Elev	Vel	Vel Head	EGL Elev	n Value	Enrgy Loss	HGLa Elev	EGLa Elev	Enrgy Loss
	(in)	(cfs)	(ft)	(ft)	(sqft)	(ft)	(ft/s)	(ft)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft)	(ft/s)	(ft)	(ft)		(ft)	(ft)	(ft)	(ft)
1	84	605.00	5043.00	5.67‡	33.40	5048.67	18.11	5.10	5053.58	92.73	5044.30	6.29²	36.45	5050.59	16.60	4.28	5054.88	0.013	1.300	5050.59	5054.88	0.00
2	84	542.00	5044.40	7.00³	38.48	5053.02	14.09	3.08	5056.11	411.48	5046.40	7.00	38.48	5055.99	14.08	3.08	5059.07	0.013	2.961	5057.02	5060.10	1.03
3	84	542.00	5046.50	7.00³	38.48	5058.25	14.09	3.08	5061.33	181.37	5047.40	7.00	38.48	5059.56	14.08	3.08	5062.64	0.013	1.306	5060.74	5063.82	1.18
4	84	542.00	5047.60	7.00³	38.48	5061.97	14.09	3.08	5065.06	67.41	5047.92	7.00	38.48	5062.46	14.08	3.08	5065.54	0.013	0.485	5062.90	5065.99	0.44
5	84	542.00	5047.92	7.00³	38.48	5062.90	14.09	3.08	5065.99	142.23	5048.60	7.00	38.48	5063.93	14.08	3.08	5067.01	0.013	1.024	5065.62	5068.71	1.69
6	84	542.00	5048.70	7.00³	38.48	5066.85	14.09	3.08	5069.94	54.18	5049.00	7.00	38.48	5067.25	14.08	3.08	5070.33	0.013	0.390	5068.00	5071.08	0.75
7	77x114e	331.00	5066.15	6.42³	47.88	5072.57	6.91	0.74	5073.31	142.25	5067.34	5.78	45.29	5073.12	7.31	0.83	5073.95	0.025	0.632	5073.12	5073.96	0.01
8	60	331.00	5067.34	3.96‡	16.67	5071.30	19.85	6.13	5077.43	12.50	5067.58	5.00	19.63	5073.22	16.86	4.42	5077.64	0.013	0.208	5073.22	5077.64	0.00
9	60	321.00	5067.58	5.00	19.63	5073.49	16.35	4.16	5077.64	253.29	5072.34	5.00	19.63	5077.34	16.35	4.16	5081.50	0.013	3.851	5077.46	5081.62	0.12
10	60	310.00	5072.34	5.00	19.63	5079.29	15.79	3.88	5083.17	8.00	5072.50	5.00	19.63	5079.41	15.79	3.88	5083.29	0.013	0.113	5079.44	5083.31	0.03
11	60	310.00	5072.50	5.00	19.63	5079.44	15.79	3.88	5083.31	8.00	5072.66	5.00	19.63	5079.55	15.79	3.88	5083.43	0.013	0.113	5079.59	5083.46	0.04
12	60	310.00	5072.66	5.00	19.63	5079.59	15.79	3.88	5083.46	8.00	5072.82	5.00	19.63	5079.70	15.79	3.88	5083.58	0.013	0.113	5079.74	5083.62	0.04
13	60	310.00	5072.82	5.00	19.63	5079.74	15.79	3.88	5083.62	8.00	5072.97	5.00	19.63	5079.85	15.79	3.88	5083.73	0.013	0.113	5079.89	5083.77	0.04
14	60	310.00	5072.97	5.00	19.63	5079.89	15.79	3.88	5083.77	8.00	5073.13	5.00	19.63	5080.01	15.79	3.88	5083.88	0.013	0.113	5080.05	5083.92	0.04
15	60	310.00	5073.13	5.00	19.63	5080.05	15.79	3.88	5083.92	8.00	5073.29	5.00	19.63	5080.16	15.79	3.88	5084.04	0.013	0.113	5080.21	5084.08	0.05
16	60	310.00	5073.29	5.00	19.63	5080.21	15.79	3.88	5084.08	8.00	5073.44	5.00	19.63	5080.32	15.79	3.88	5084.20	0.013	0.113	5080.35	5084.22	0.02
17	60	310.00	5073.44	5.00	19.63	5080.35	15.79	3.88	5084.22	8.00	5073.60	5.00	19.63	5080.46	15.79	3.88	5084.34	0.013	0.113	5080.51	5084.38	0.05
18	60	310.00	5073.60	5.00	19.63	5080.51	15.79	3.88	5084.39	108.01	5075.72	5.00	19.63	5082.04	15.79	3.88	5085.92	0.013	1.530	5082.16	5086.03	0.12
19	54	288.00	5075.72	3.20‡	12.08	5078.92	23.84	8.83	5088.08	409.93	5090.24	4.37²	15.77	5094.61	18.26	5.18	5099.79	0.013	11.719	5094.61	5099.79	0.00
20	54	288.00	5090.24	4.50	15.90	5096.73	18.11	5.10	5101.83	56.79	5091.74	4.50	15.90	5097.95	18.11	5.10	5103.05	0.013	1.218	5097.95	5103.05	0.00
21	54	284.00	5091.74	4.50	15.90	5098.10	17.86	4.96	5103.05	74.10	5093.71	4.50	15.90	5099.64	17.86	4.96	5104.60	0.013	1.545	5099.64	5104.60	0.00
22	54	284.00	5093.71	3.37‡	12.76	5097.08	22.25	7.70	5104.60	310.37	5103.20	4.37²	15.77	5107.57	18.01	5.04	5112.61	0.013	8.009	5107.57	5112.61	0.00

Notes: ² Critical depth. ³ Normal depth. ‡ Supercritical. r = rectangular e = elliptical a = arch

Energy Grade Line Calculations

Project Name: 20260033Entire System

Stormwater Studio 2026 v 3.0.0.41

03-10-2026

Line No	Line Size	Q	Downstream							Length	Upstream							Pipe		Junction		
			Invert Elev	Depth	Area	HGL Elev	Vel	Vel Head	EGL Elev		Invert Elev	Depth	Area	HGL Elev	Vel	Vel Head	EGL Elev	n Value	Enrgy Loss	HGLa Elev	EGLa Elev	Enrgy Loss
	(in)	(cfs)	(ft)	(ft)	(sqft)	(ft)	(ft/s)	(ft)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft)	(ft/s)	(ft)	(ft)		(ft)	(ft)	(ft)	(ft)
23	54	284.00	5103.20	4.50	15.90	5109.64	17.86	4.96	5114.59	56.10	5104.92	4.50	15.90	5110.81	17.86	4.96	5115.76	0.013	1.170	5110.81	5115.77	0.00
24	54	279.00	5104.92	3.29‡	12.45	5108.21	22.41	7.81	5115.77	396.31	5117.04	4.35²	15.75	5121.40	17.72	4.88	5126.27	0.013	10.508	5121.40	5126.27	0.00
25	54	279.00	5117.04	4.50	15.90	5123.40	17.55	4.79	5128.19	46.55	5119.01	4.50	15.90	5124.34	17.54	4.78	5129.13	0.013	0.938	5124.34	5129.13	0.00
26	54	274.00	5119.01	3.02‡	11.35	5122.03	24.15	9.06	5129.13	256.94	5130.04	4.34²	15.73	5134.38	17.42	4.72	5139.10	0.013	9.973	5134.38	5139.10	0.00
27	54	274.00	5130.04	4.08‡	15.15	5134.11	18.08	5.08	5139.10	8.00	5130.38	4.34²	15.73	5134.72	17.42	4.72	5139.44	0.013	0.344	5134.72	5139.44	0.00
28	54	274.00	5130.38	4.10‡	15.22	5134.48	18.00	5.04	5139.44	8.00	5130.72	4.34²	15.73	5135.06	17.42	4.72	5139.78	0.013	0.342	5135.06	5139.78	0.00
29	54	274.00	5130.72	4.07‡	15.14	5134.79	18.10	5.09	5139.78	8.00	5131.07	4.34²	15.73	5135.41	17.42	4.72	5140.13	0.013	0.348	5135.41	5140.13	0.00
30	54	274.00	5131.07	4.07‡	15.14	5135.14	18.10	5.09	5140.13	8.00	5131.41	4.34²	15.73	5135.75	17.42	4.72	5140.47	0.013	0.345	5135.75	5140.47	0.00
31	54	274.00	5131.41	3.91‡	14.67	5135.32	18.68	5.42	5140.47	17.85	5132.17	4.34²	15.73	5136.51	17.42	4.72	5141.23	0.013	0.761	5136.51	5141.23	0.00
32	54	274.00	5132.17	4.50	15.90	5138.46	17.23	4.62	5143.08	10.00	5132.79	4.50	15.90	5138.66	17.23	4.61	5143.27	0.013	0.194	5138.66	5143.27	0.00
33	54	205.00	5132.79	2.64‡	9.70	5135.43	21.14	6.95	5143.27	77.53	5137.66	4.07²	15.14	5141.73	13.54	2.85	5144.58	0.013	1.311	5141.73	5144.58	0.00
34	54	205.00	5137.66	3.24‡	12.25	5140.90	16.74	4.36	5145.62	23.00	5138.96	4.08	15.15	5143.04	13.53	2.85	5145.88	0.013	0.266	5143.13	5145.98	0.09
35	54	211.00	5067.10	3.36‡	12.72	5070.46	16.58	4.28	5074.19	70.16	5068.80	4.11²	15.24	5072.91	13.85	2.98	5075.89	0.013	1.700	5072.91	5075.89	0.00
36	54	211.00	5069.80	4.50³	15.90	5074.30	13.27	2.74	5077.04	192.76	5070.80	4.50	15.90	5076.52	13.27	2.74	5079.26	0.013	2.220	5076.60	5079.34	0.08
37	30	63.00	5044.50	2.50	4.91	5053.34	12.84	2.56	5055.90	42.07	5047.50	2.50	4.91	5054.33	12.83	2.56	5056.89	0.013	0.993	5055.32	5057.88	0.99
38	24	63.00	5047.60	2.00³	3.14	5054.13	20.06	6.25	5060.39	12.90	5048.10	2.00	3.14	5055.13	20.05	6.25	5061.39	0.013	1.001	5055.14	5061.40	0.01
39	24	63.00	5048.10	1.42‡	2.39	5049.52	26.40	10.83	5061.40	232.23	5076.50	1.99²	3.14	5078.49	20.06	6.26	5084.75	0.013	23.353	5078.49	5084.75	0.00

Notes: ² Critical depth. ³ Normal depth. ‡ Supercritical.

Structure Report

Stormwater Studio 2026 v 3.0.0.41

Project Name: 20260033Entire System

03-10-2026

Line No.	Inlet ID	Line ID	Junct Type	Grnd/Rim Elev Up (ft)	Invert Up (ft)	Bench-ing	Flow Rate (cfs)	Known Q (cfs)	HGL Junct (ft)	Minor Loss (ft)	HGL Up (ft)	Vel Up (ft/s)	Free-board (ft)
1	S(76)	P(78)	MH	5060.82	5044.30	Half	605.00	0.00	5050.59	0.00	5050.59	16.60	10.22
2	S(75)	P(77)	MH	5064.47	5046.40	Half	542.00	0.00	5056.60	1.03	5055.99	14.08	7.86
3	S(74)	P(76)	MH	5064.64	5047.40	Half	542.00	0.00	5060.17	1.18	5059.56	14.08	4.46
4	S(73)	P(75)	None	5064.50	5047.92	....	542.00	0.00	5062.90	....	5062.46	14.08	1.60
5	S(72)	P(74)	MH	5064.02	5048.60	Half	542.00	0.00	5064.55	1.69	5063.93	14.08	-0.52
6	S(71)	P(73)	MH	5073.61	5049.00	Flat	542.00	0.00	5067.86	0.75	5067.25	14.08	5.75
7	S(70)	P(72)	MH	5082.20	5067.34	Impr	331.00	0.00	5073.28	0.01	5073.12	7.31	8.92
8	S(69)	P(71)	None	5082.00	5067.58	....	331.00	10.00	5073.22	....	5073.22	16.86	8.78
9	S(68)	P(70)	MH	5083.43	5072.34	Half	321.00	11.00	5078.17	0.12	5077.34	16.35	5.26
10	S(67)	P(69)	None	5083.40	5072.50	....	310.00	0.00	5079.44	....	5079.41	15.79	3.96
11	S(66)	P(68)	None	5083.40	5072.66	....	310.00	0.00	5079.59	....	5079.55	15.79	3.81
12	S(65)	P(67)	None	5083.35	5072.82	....	310.00	0.00	5079.74	....	5079.70	15.79	3.61
13	S(64)	P(66)	None	5083.20	5072.97	....	310.00	0.00	5079.89	....	5079.85	15.79	3.31
14	S(63)	P(65)	None	5083.00	5073.13	....	310.00	0.00	5080.05	....	5080.01	15.79	2.96
15	S(62)	P(64)	None	5082.75	5073.29	....	310.00	0.00	5080.21	....	5080.16	15.79	2.54
16	S(61)	P(63)	None	5082.80	5073.44	....	310.00	0.00	5080.35	....	5080.32	15.79	2.46
17	S(60)	P(62)	None	5083.00	5073.60	....	310.00	0.00	5080.51	....	5080.46	15.79	2.49
18	S(59)	P(61)	MH	5083.43	5075.72	Half	310.00	22.00	5082.81	0.12	5082.04	15.79	0.62
19	S(58)	P(60)	MH	5097.98	5090.24	Impr	288.00	0.00	5094.61	0.00	5094.61	18.26	3.37
20	S(57)	P(59)	None	5097.98	5091.74	....	288.00	4.00	5097.95	....	5097.95	18.11	0.03
21	S(56)	P(58)	None	5100.67	5093.71	....	284.00	0.00	5099.64	....	5099.64	17.86	1.03
22	S(55)	P(57)	MH	5111.65	5103.20	Impr	284.00	0.00	5107.57	0.00	5107.57	18.01	4.08
23	S(54)	P(56)	None	5113.92	5104.92	....	284.00	5.00	5110.81	....	5110.81	17.86	3.11
24	S(53)	P(55)	MH	5125.62	5117.04	Impr	279.00	0.00	5121.40	0.00	5121.40	17.72	4.23
25	S(52)	P(54)	None	5127.91	5119.01	....	279.00	5.00	5124.34	....	5124.34	17.54	3.57
26	S(51)	P(53)	None	5139.39	5130.04	....	274.00	0.00	5134.38	....	5134.38	17.42	5.01
27	S(50)	P(52)	None	5139.80	5130.38	....	274.00	0.00	5134.72	....	5134.72	17.42	5.08
28	S(49)	P(51)	None	5140.23	5130.72	....	274.00	0.00	5135.06	....	5135.06	17.42	5.17
29	S(48)	P(50)	None	5141.06	5131.07	....	274.00	0.00	5135.41	....	5135.41	17.42	5.65
30	S(47)	P(49)	None	5142.07	5131.41	....	274.00	0.00	5135.75	....	5135.75	17.42	6.32
31	S(46)	P(48)	MH	5143.04	5132.17	Impr	274.00	0.00	5136.51	0.00	5136.51	17.42	6.53
32	S(45)	P(47)	None	5143.30	5132.79	....	274.00	69.00	5138.66	....	5138.66	17.23	4.64
33	S(44)	P(46)	MH	5148.53	5137.66	Half	205.00	0.00	5141.73	0.00	5141.73	13.54	6.80
34	S(43)	P(45)	MH	5149.44	5138.96	Half	205.00	205.00	5143.66	0.09	5143.04	13.53	5.78

Notes: r = rectangular e = elliptical a = arch

Structure Report

Stormwater Studio 2026 v 3.0.0.41

Project Name: 20260033Entire System

03-10-2026

Line No.	Inlet ID	Line ID	Junct Type	Grnd/Rim Elev Up (ft)	Invert Up (ft)	Bench-ing	Flow Rate (cfs)	Known Q (cfs)	HGL Junct (ft)	Minor Loss (ft)	HGL Up (ft)	Vel Up (ft/s)	Free-board (ft)
35	S(79)	P(84)	MH	5079.75	5068.80	Half	211.00	0.00	5072.91	0.00	5072.91	13.85	6.84
36	S(78)	P(82)	MH	5081.54	5070.80	Half	211.00	211.00	5077.07	0.08	5076.52	13.27	4.47
37	S(81)	P(86)	MH	5062.00	5047.50	Half	63.00	0.00	5054.85	0.99	5054.33	12.83	7.15
38	S(82)	P(85) (1)	None	5062.00	5048.10	....	63.00	0.00	5055.14	....	5055.13	20.05	6.86
39	Existing Inlet	P(85)	None	5079.00	5076.50	....	63.00	63.00	5078.49	....	5078.49	20.06	0.51

Notes:

APPENDIX F – DIGITAL FILES (ATTACHED AS SEPARATE FILES)

1. HEC-RAS Model
    - Existing Conditions Model (Plan: Existing_100-YR)
    - Proposed Conditions Model (Plan: Proposed_100-YR)
2. Stormwater Studio Model
    - Existing Conditions Model (20260033_Existing SD with Adjustments)
    - Proposed Conditions Model (20260033_Proposed Entire SD Model)

EXHIBIT 1 – EFFECTIVE FIRM PANELS

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The **projection** used in the preparation of this map was New Mexico State Plane Central Zone. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey, SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit their website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by Bernalillo County produced at a scale of 1:12,000 from photography dated 1999 or later.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for the Flood Insurance Study report may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and their website at http://www.msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

FEMA recommends that a Flood Insurance Policy be purchased for structures in areas where levees are shown as providing protection from the 1% annual chance flood. Flooding is not covered by standard property/fire/dwelling insurance policies nor is it covered by Homeowners Insurance, Renters Insurance, Condominium Owners Insurance, or Commercial Property Insurance. Contact your insurance agent and local floodplain administrator for further information. Visit http://www.fema.gov/pdf/fhm/frm_gsah.pdf for information on levees and the risk of flooding in areas shown as being protected by levees.

EXHIBIT 1
EFFECTIVE FIRM
Panel 1 of 3

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	1% annual chance floodplain boundary
	0.2% annual chance floodplain boundary
	Floodway boundary
	Zone D Boundary
	CBRS and OPA Boundary
	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513 (EL 987)	Base Flood Elevation line and value; elevation in feet* / Base Flood Elevation value where uniform within zone; elevation in feet*
A — A	Cross section line
23 — 23	Transect line
97° 07' 30", 32° 22' 30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
4276000mE	1000-meter Universal Transverse Mercator grid values, zone 13
600000 FT	5000-foot grid ticks: New Mexico State Plane coordinate system, Central zone (FIPSZONE 3002), Transverse Mercator
DX5510	Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5	River Mile

*Referenced to the North American Vertical Datum of 1988

MAP REPOSITORIES
Refer to Map Repositories list on Map Index.

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP PANEL

SEPTEMBER 20, 1996

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

April 2, 2002 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to add roads and road names, to reflect updated topographic information, and to incorporate previously issued Letters of Map Revision.

November 19, 2003 - to update corporate limits and to incorporate previously issued Letters of Map Revision.

September 26, 2008 - to update corporate limits, to change Special Flood Hazard Areas, to add roads and road names, to incorporate previously issued Letters of Map Revision, to reflect updated topographic information, to change Base Flood Elevations, to add Base Flood Elevations.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0334G

FIRM

FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY, NEW MEXICO AND INCORPORATED AREAS

PANEL 334 OF 825

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE, CITY OF	350002	0334	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
35001C0334G

MAP REVISED
SEPTEMBER 26, 2008

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The **projection** used in the preparation of this map was New Mexico State Plane, Central Zone. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey, SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit their website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by Bernalillo County produced at a scale of 1:12,000 from photography dated 1999 or later.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for the Flood Insurance Study report may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and their website at http://www.msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

FEMA recommends that a Flood Insurance Policy be purchased for structures in areas where levees are shown as providing protection from the 1% annual chance flood. Flooding is not covered by standard property/fire/dwelling insurance policies nor is it covered by Homeowners Insurance, Renters Insurance, Condominium Owners Insurance, or Commercial Property Insurance. Contact your insurance agent and local floodplain administrator for further information. Visit http://www.fema.gov/pdf/fhm/frm_gsah.pdf for information on levees and the risk of flooding in areas shown as being protected by levees.

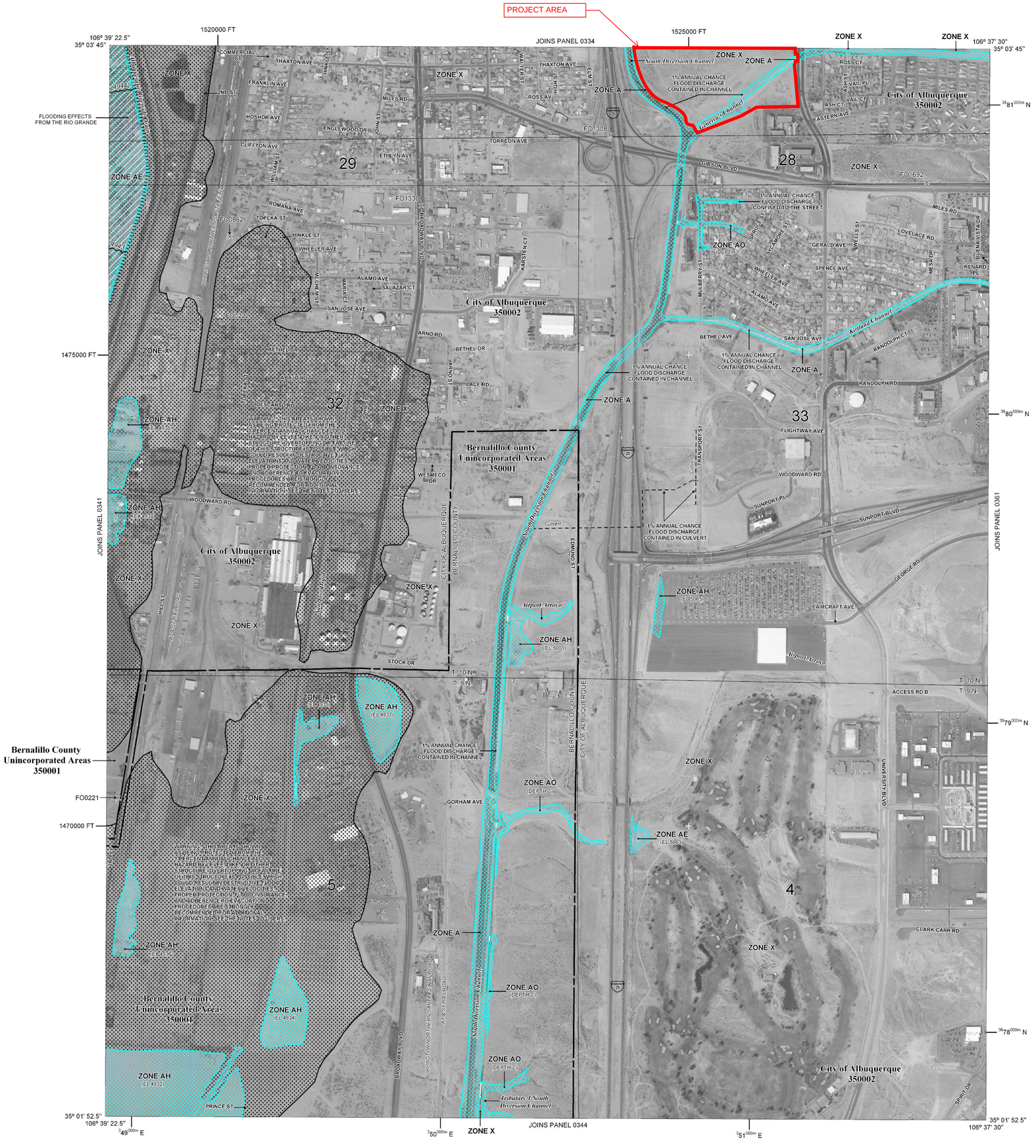


EXHIBIT 1
EFFECTIVE FIRM
Panel 2 of 3

LEGEND

▨	SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

▨ **FLOODWAY AREAS IN ZONE AE**

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

▨ **OTHER FLOOD AREAS**

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

☐ **OTHER AREAS**

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

▨ **COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**

▨ **OTHERWISE PROTECTED AREAS (OPAs)**

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

———	1% annual chance floodplain boundary
———	0.2% annual chance floodplain boundary
— — —	Floodway boundary
— — —	Zone D Boundary
•••••••••••••••	CBRS and OPA Boundary
▨	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
~~ 513 ~~~	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

Ⓐ——Ⓐ	Cross section line
㉓- - - - -㉓	Transect line
97° 07' 30", 32° 22' 30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
$^{42}76^{000m}$E	1000-meter Universal Transverse Mercator grid values, zone 13
600000 FT	5000-foot grid ticks: New Mexico State Plane coordinate system, Central zone (FIPSZONE 3002), Transverse Mercator
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
● M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index.

EFFECTIVE DATE OF COUNTYWIDE FLOOD
INSURANCE RATE MAP PANEL

SEPTEMBER 20, 1996

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

April 2, 2002 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to add roads and road names, to reflect updated topographic information, and to incorporate previously issued Letters of Map Revision.

November 19, 2003 - to update corporate limits and to incorporate previously issued Letters of Map Revision.

September 26, 2008 - to update corporate limits, to change Special Flood Hazard Areas, to add roads and road names, to incorporate previously issued Letters of Map Revision, to reflect updated topographic information, to change Base Flood Elevations, to add Base Flood Elevations.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0342G

FIRM
FLOOD INSURANCE RATE MAP
BERNALILLO COUNTY, NEW MEXICO
AND INCORPORATED AREAS

PANEL 342 OF 825

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE, CITY OF	350002	0342	G
BERNALILLO COUNTY UNINCORPORATED AREAS	350001	0342	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
35001C0342G

MAP REVISED
SEPTEMBER 26, 2008

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The **projection** used in the preparation of this map was New Mexico State Plane, Central Zone. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey, SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit their website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by Bernalillo County produced at a scale of 1:12,000 from photography dated 1999 or later.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for the Flood Insurance Study report may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

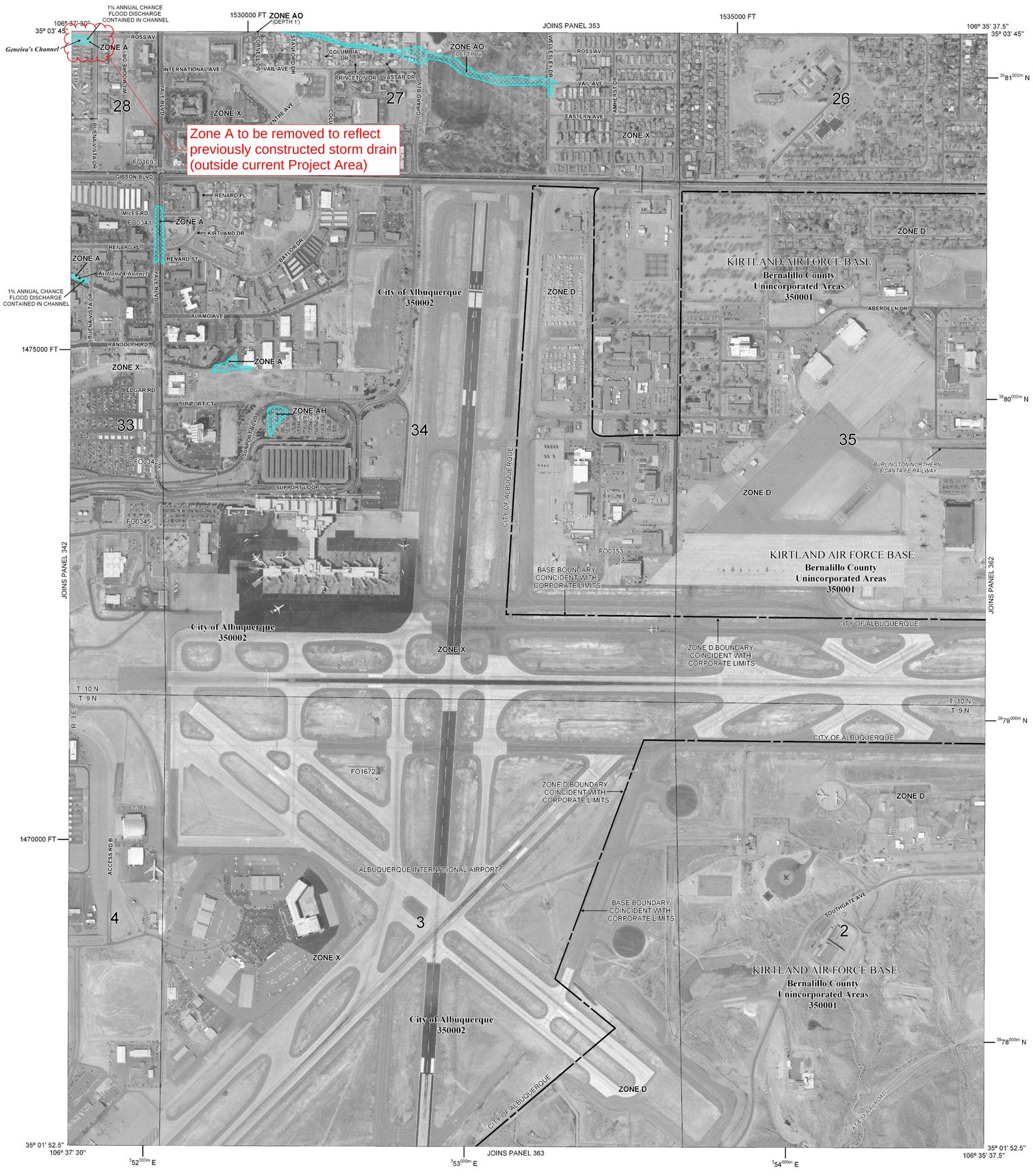
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and their website at http://www.msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

EXHIBIT 1
EFFECTIVE FIRM
Panel 3 of 3



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D Boundary
- CBRS and OPA Boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 (EL 987) — Base Flood Elevation line and value; elevation in feet* / Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 97° 07' 30", 32° 22' 30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4 276 000m E — 1000-meter Universal Transverse Mercator grid values, zone 13
- 600000 FT — 5000-foot grid ticks: New Mexico State Plane coordinate system, Central zone (FIPSZONE 3002), Transverse Mercator
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index.

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP PANEL

SEPTEMBER 20, 1996

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

April 2, 2002 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to add roads and road names, to reflect updated topographic information, and to incorporate previously issued Letters of Map Revision.

November 19, 2003 - to update corporate limits and to incorporate previously issued Letters of Map Revision.

September 26, 2008 - to update corporate limits, to change Special Flood Hazard Areas, to add roads and road names, to incorporate previously issued Letters of Map Revision, to reflect updated topographic information, to change Base Flood Elevations, to add Base Flood Elevations.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0361G

FIRM

FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY, NEW MEXICO AND INCORPORATED AREAS

PANEL 361 OF 825

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE, CITY OF	350002	0361	G
BERNALILLO COUNTY UNINCORPORATED AREAS	350001	0361	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
35001C0361G

MAP REVISED
SEPTEMBER 26, 2008

Federal Emergency Management Agency

EXHIBIT 2 – ANNOTATED FIRM PANELS

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The **projection** used in the preparation of this map was New Mexico State Plane, Central Zone. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey, SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit their website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by Bernalillo County produced at a scale of 1:12,000 from photography dated 1999 or later.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for the Flood Insurance Study report may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

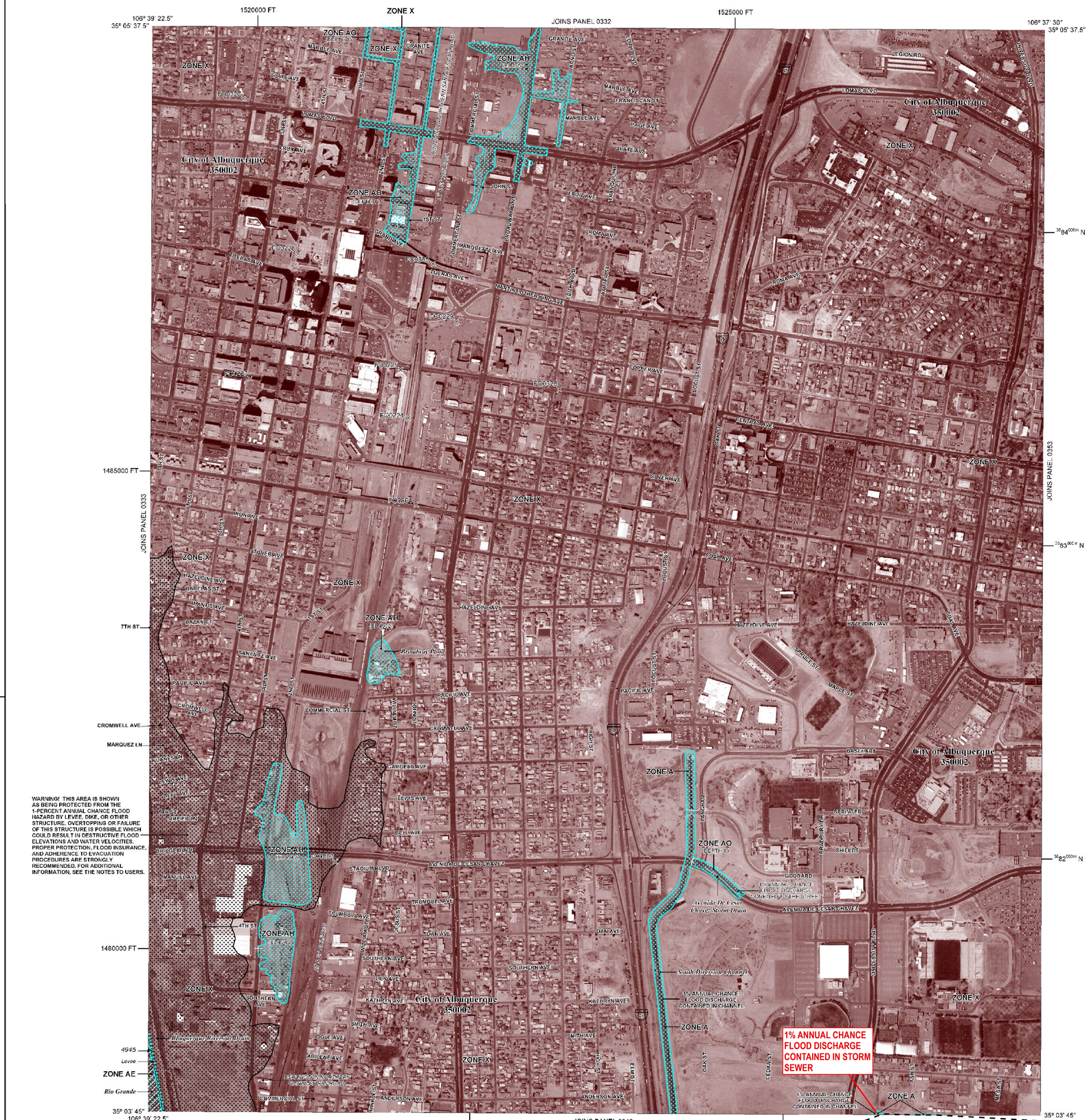
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and their website at http://www.msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

FEMA recommends that a Flood Insurance Policy be purchased for structures in areas where levees are shown as providing protection from the 1% annual chance flood. Flooding is not covered by standard property/fire/dwelling insurance policies nor is it covered by Homeowners Insurance, Renters Insurance, Condominium Owners Insurance, or Commercial Property Insurance. Contact your insurance agent and local floodplain administrator for further information. Visit http://www.fema.gov/pdf/fhm/frm_gsah.pdf for information on levees and the risk of flooding in areas shown as being protected by levees.

EXHIBIT 2
ANNOTATED FIRM
Panel 1 of 3



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D Boundary
- CBRS and OPA Boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 97° 07' 30", 32° 22' 30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4276000m E — 1000-meter Universal Transverse Mercator grid values, zone 13
- 500000 FT — 5000-foot grid ticks: New Mexico State Plane coordinate system, Central zone (FIPSZONE 3002), Transverse Mercator
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index.

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP PANEL

SEPTEMBER 20, 1996

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

April 2, 2002 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to add roads and road names, to reflect updated topographic information, and to incorporate previously issued Letters of Map Revision.

November 19, 2003 - to update corporate limits and to incorporate previously issued Letters of Map Revision.

September 26, 2008 - to update corporate limits, to change Special Flood Hazard Areas, to add roads and road names, to incorporate previously issued Letters of Map Revision, to reflect updated topographic information, to change Base Flood Elevations, to add Base Flood Elevations.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0334G

FIRM

FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY, NEW MEXICO AND INCORPORATED AREAS

PANEL 334 OF 825

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE, CITY OF	350002	0334	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
35001C0334G

MAP REVISED
SEPTEMBER 26, 2008

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The **projection** used in the preparation of this map was New Mexico State Plane, Central Zone. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey, SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit their website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by Bernalillo County produced at a scale of 1:12,000 from photography dated 1999 or later.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for the Flood Insurance Study report may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

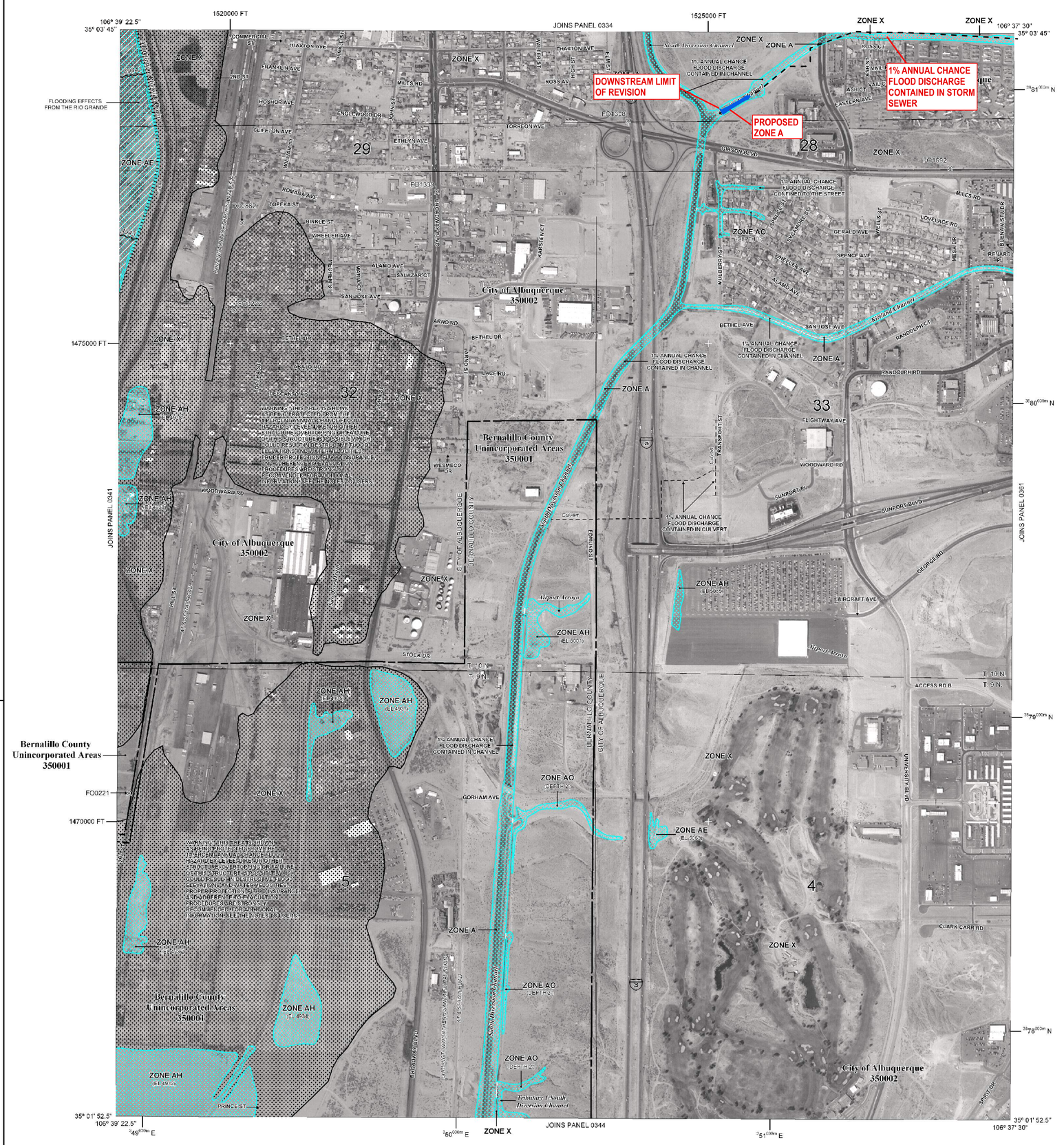
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and their website at http://www.msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

FEMA recommends that a Flood Insurance Policy be purchased for structures in areas where levees are shown as providing protection from the 1% annual chance flood. Flooding is not covered by standard property/fire/dwelling insurance policies nor is it covered by Homeowners Insurance, Renters Insurance, Condominium Owners Insurance, or Commercial Property Insurance. Contact your insurance agent and local floodplain administrator for further information. Visit http://www.fema.gov/pdf/fhm/frm_gsah.pdf for information on levees and the risk of flooding in areas shown as being protected by levees.

EXHIBIT 2
ANNOTATED FIRM
Panel 2 of 3



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D Boundary
- CBRS and OPA Boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- 97° 07' 30", 32° 22' 30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4275000m E — 1000-meter Universal Transverse Mercator grid values, zone 13
- 6000000 FT — 5000-foot grid ticks: New Mexico State Plane coordinate system, Central zone (FIPSZONE 3002), Transverse Mercator
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index.

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP PANEL

SEPTEMBER 20, 1996

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

April 2, 2002 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to add roads and road names, to reflect updated topographic information, and to incorporate previously issued Letters of Map Revision.

November 19, 2003 - to update corporate limits and to incorporate previously issued Letters of Map Revision.

September 26, 2008 - to update corporate limits to change Special Flood Hazard Areas, to add roads and road names, to incorporate previously issued Letters of Map Revision, to reflect updated topographic information, to change Base Flood Elevations, to add Base Flood Elevations.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NFIP

PANEL 0342G

FIRM

FLOOD INSURANCE RATE MAP

BERNALILLO COUNTY, NEW MEXICO AND INCORPORATED AREAS

PANEL 342 OF 825

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE, CITY OF	350002	0342	G
BERNALILLO COUNTY UNINCORPORATED AREAS	350001	0342	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
35001C0342G

MAP REVISED
SEPTEMBER 26, 2008

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The **projection** used in the preparation of this map was New Mexico State Plane, Central Zone. **The horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey, SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit their website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by Bernalillo County produced at a scale of 1:12,000 from photography dated 1999 or later.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for the Flood Insurance Study report may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

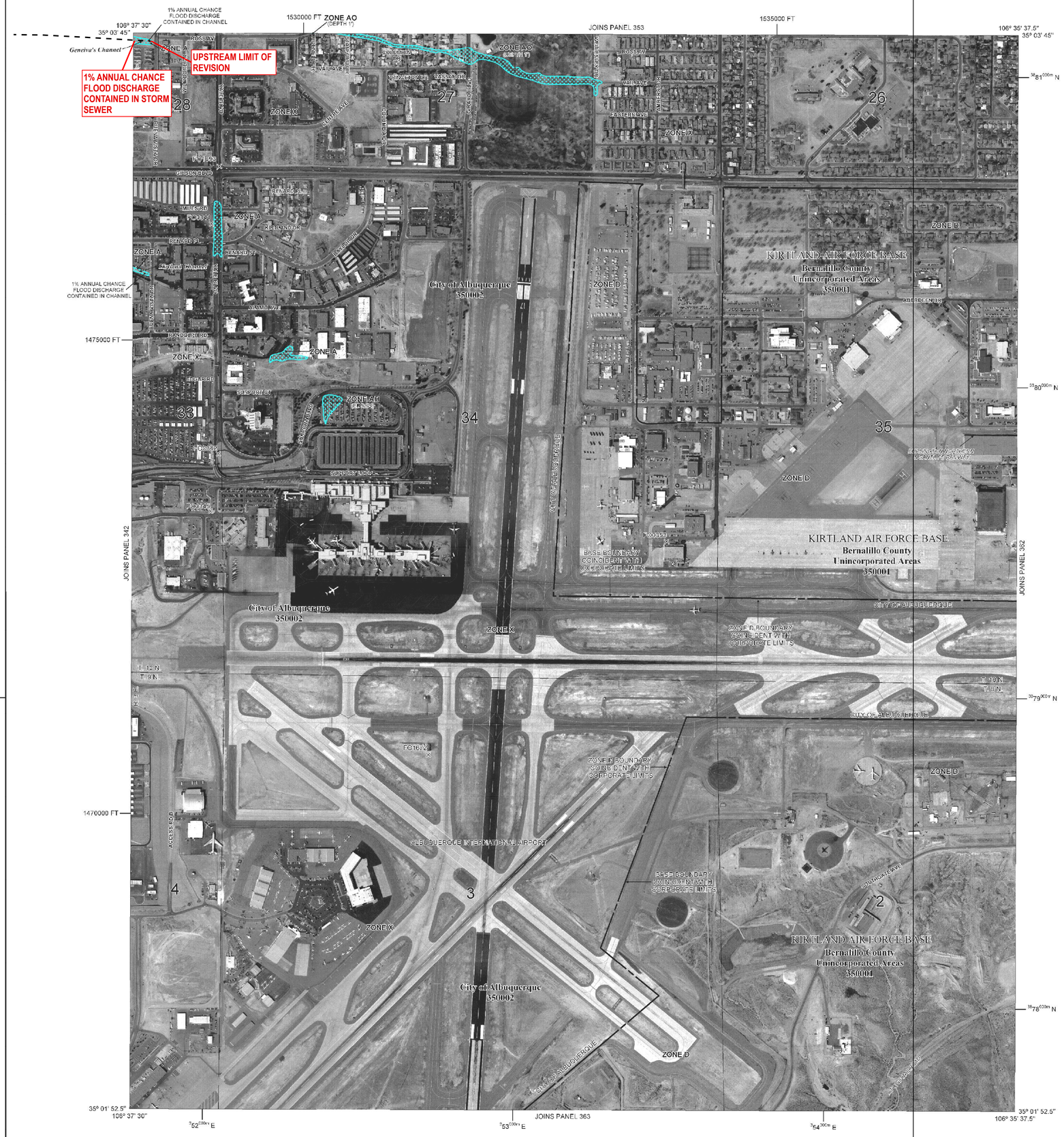
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and their website at http://www.msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

EXHIBIT 2
ANNOTATED FIRM
Panel 3 of 3



LEGEND

▨ SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

▨ FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

▨ OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

☐ OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

▨ COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

▨ OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

───	1% annual chance floodplain boundary
───	0.2% annual chance floodplain boundary
── ──	Floodway boundary
— — —	Zone D Boundary
•••••••••••••	CBRS and OPA Boundary
▨	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
~~ 513 ~~~	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

(A)———(A)	Cross section line
(23)- - - - -(23)	Transect line
97° 07' 30", 32° 22' 30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
$^{42}76^{000m}E$	1000-meter Universal Transverse Mercator grid values, zone 13
600000 FT	5000-foot grid ticks: New Mexico State Plane coordinate system, Central zone (FIPSZONE 3002), Transverse Mercator
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
● M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index.

EFFECTIVE DATE OF COUNTYWIDE FLOOD
INSURANCE RATE MAP PANEL

SEPTEMBER 20, 1996

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

April 2, 2002 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to add roads and road names, to reflect updated topographic information, and to incorporate previously issued Letters of Map Revision.

November 19, 2003 - to update corporate limits and to incorporate previously issued Letters of Map Revision.

September 26, 2008 - to update corporate limits, to change Special Flood Hazard Areas, to add roads and road names, to incorporate previously issued Letters of Map Revision, to reflect updated topographic information, to change Base Flood Elevations, to add Base Flood Elevations.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0361G

FIRM
FLOOD INSURANCE RATE MAP
BERNALILLO COUNTY, NEW MEXICO
AND INCORPORATED AREAS

PANEL 361 OF 825

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ALBUQUERQUE, CITY OF	350002	0361	G
BERNALILLO COUNTY UNINCORPORATED AREAS	350001	0361	G

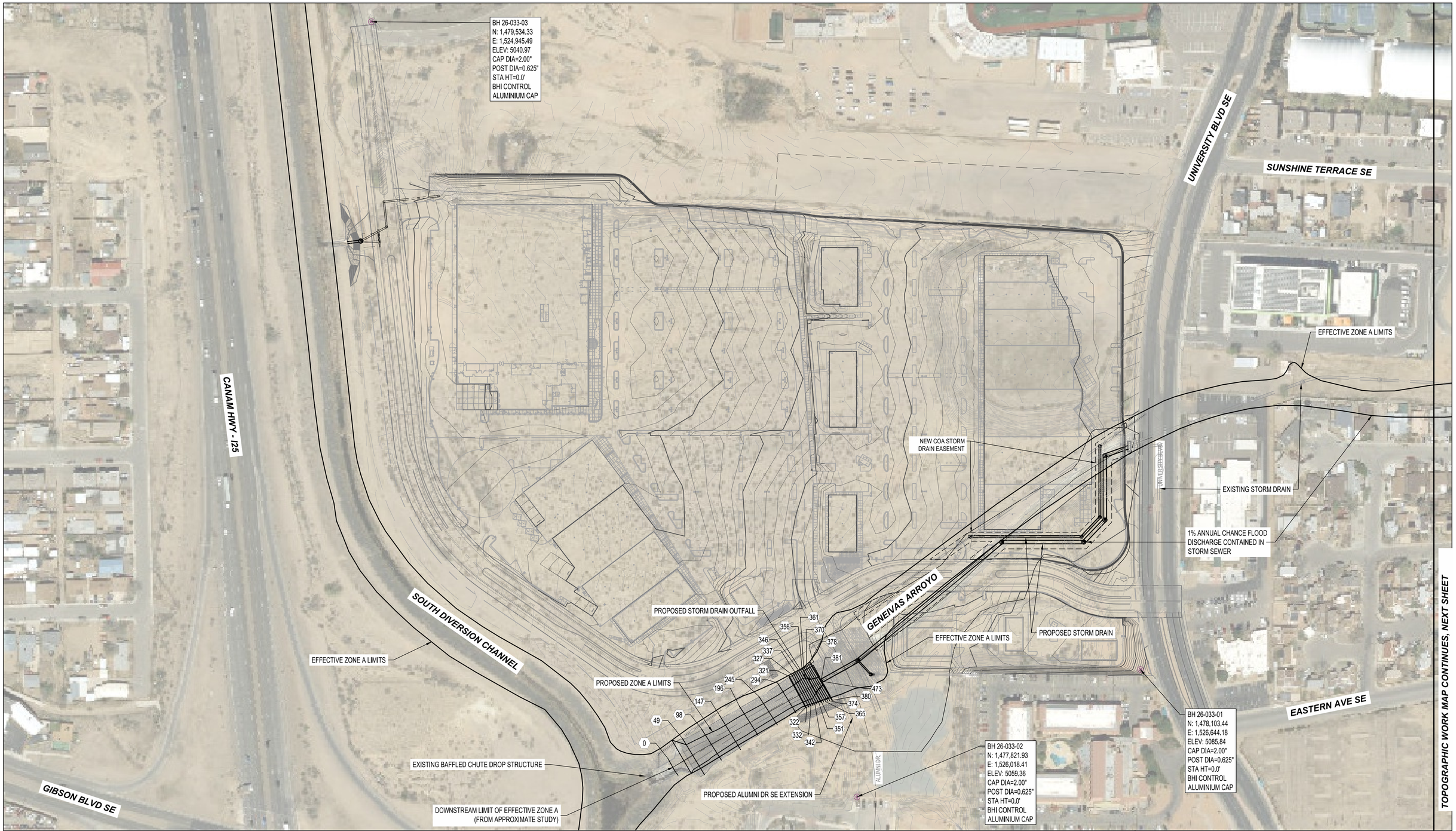
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
35001C0361G

MAP REVISED
SEPTEMBER 26, 2008

Federal Emergency Management Agency

EXHIBIT 3 – CERTIFIED TOPOGRAPHIC WORK MAPS



NOTES

1. VERTICAL DATUM: NAVD88
2. EFFECTIVE FLOODPLAIN LIMITS ARE SHOWN PER FIRM 35001C0342G, EFFECTIVE 9/26/2008, FIRM 35001C0334G, EFFECTIVE 9/26/2008, & FIRM 35001C0361G, EFFECTIVE 9/26/2008.
3. TOPOGRAPHY DATA ALONG THE GENEIVAS ARROYO IS FROM A FIELD SURVEY BY BOHANNAN HUSTON INC CONDUCTED IN SEPTEMBER 2025.
4. PARCEL AND EASEMENT INFORMATION IS PER SURVEY DATED 11/13/2025, PROVIDED BY BHI INC.
5. AERIAL IMAGERY IS FROM ESRI, DATED 12/30/2025.

LEGEND:

- HEC-RAS STREAMLINE / CENTERLINE
- HEC-RAS CROSS-SECTION
- EXISTING CONTOUR (1-FT) - INDEX
- EXISTING CONTOUR (1-FT) - INTERMEDIATE
- EFFECTIVE FEMA ZONE A SFHA
- PROPOSED FEMA ZONE A SFHA
- PARCEL LINES
- EASEMENT LINES
- SURVEY MONUMENT

N

100 50 0 100

1"=100'

Wed, 11-Mar-2026 - 6:57 pm, Plotted by: GKOENIG
\\A-ABQ-FS\Bl\ABQ-Projects\20260033\SW\Reports\Final\Exhibits\Working\Exhibit_3_22x34.dwg

Bohannan Huston
www.bhinc.com 800.877.5332

TOPOGRAPHIC WORK MAP
CLOMR

UNM SOUTH COMMERCIAL

DRAWN BY:	DATE:	
GIK	3/11/26	
CHECKED BY:	BHI PROJECT NO.	SHEET NO.
VCS	20260033	1 OF 2

NOTES

1. VERTICAL DATUM: NAVD88
2. EFFECTIVE FLOODPLAIN LIMITS ARE SHOWN PER FIRM 35001C0342G, EFFECTIVE 9/26/2008, FIRM 35001C0334G, EFFECTIVE 9/26/2008, & FIRM 35001C0361G, EFFECTIVE 9/26/2008.
3. TOPOGRAPHY DATA ALONG THE GENEIVAS ARROYO IS FROM A FIELD SURVEY BY BOHANNAN HUSTON INC CONDUCTED IN SEPTEMBER 2025.
4. PARCEL AND EASEMENT INFORMATION IS PER SURVEY DATED 11/13/2025, PROVIDED BY BHI INC.
5. AERIAL IMAGERY IS FROM ESRI, DATED 12/30/2025.

LEGEND:

- HEC-RAS STREAMLINE / CENTERLINE
- HEC-RAS CROSS-SECTION
- EXISTING CONTOUR (1-FT) - INDEX
- EXISTING CONTOUR (1-FT) - INTERMEDIATE
- EFFECTIVE FEMA ZONE A SFHA
- PROPOSED FEMA ZONE A SFHA
- PARCEL LINES
- APPROXIMATE EASEMENT LINES
- SURVEY MONUMENT

N

100 50 0 100

1"=100'

Wed, 11-Mar-2026 - 6:57 pm, Plotted by: GKOENIG
\\A-ABQ-FS2\BABQ-Projects\20260033\SW\Reports\Final\Exhibits\Working\Exhibit_3_22x34.dwg

Bohannan Huston
www.bhinc.com 800.877.5332

TOPOGRAPHIC WORK MAP CLOMR

UNM SOUTH COMMERCIAL

DRAWN BY:	DATE:	
HAJ	1/9/26	
CHECKED BY:	BHI PROJECT NO.	SHEET NO.
VCS	20260033	2 OF 2