Community Design Solutions

MIREHAVEN ARROYO B CONDITIONAL LETTER OF MAP REVISION

Prepared by
Community Design Solutions, LLC
9384 Valley View Drive NW
Suite 100
Albuquerque, New Mexico
87114

Prepared for
Kevin Patton
Pulte Group
7601 Jefferson St. NE Suite 320
Albuquerque, NM 87109

City of Albuquerque
Planning Department
Development Review Services
HYDROLOGY SECTION
APPROVED
DATE: 1/12/2026
BY:
HydroTrans # J07D002

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THE APPROVAL OF THESE PLANS/REPORTS SHALL EXPIRE TWO (2) YEARS AFTER THE APPROVAL DATE IF NO BUILDING PERMIT HAS BEEN PULLED ON THE DEVELOPMENT.

December 19, 2025
Project Number 242006

Community Design Solutions

CERTIFICATION

I, Cassy L. McClintock, do hereby certify that this report was duly prepared by me or under my direction and that I am a duly registered Professional Engineer under the laws of the state of New Mexico.

Cassy L. McClintock, P.E.
NMPE No. 29490

December 19, 2025
Date

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Community Design Solutions

SECTION 1. INTRODUCTION

PURPOSE

Community Design Solutions, LLC (CDS) was tasked to analyze the existing Federal Emergency Management Agency (FEMA) Zones A and AE floodplain associated with Mirehaven Arroyo B, spanning from the Atrisco Terrace Open Space (ATOS) to Ladera Dam 5s. The study area, outlined in red, is illustrated in Figure 1.

CDS conducted a comprehensive hydraulic analysis, in addition to the hydrologic analysis prepared in the High Mesa Trail Offsite Design Analysis Report (DAR), to support the Conditional Letter of Map Revision (CLOMR) for the proposed High Mesa Trail Subdivision. This included developing a U.S. Army Corps of Engineers Hydrologic Engineering Center's River Analysis System (HEC-RAS) model to reflect the subdivision's layout, offsite improvements, and updated hydrologic conditions under developed scenarios. This CLOMR affects two National Flood Insurance Program (NFIP) communities, Bernalillo County and City of Albuquerque.

To ensure accuracy in delineating inundation limits and estimating flood depths within the Mirehaven Arroyo B area, CDS utilized four hydraulic modeling tools:

1. HEC-HMS Version 4.13 – for hydrologic modeling.
2. HEC-RAS Version 6.6 (2D unsteady-state) – for detailed hydraulic simulation.
3. Autodesk Storm and Sanitary Analysis Version 2024.1 – for stormwater system evaluation.
4. ManningSolver Version 1.019 – for channel flow analysis.

Figure 4 provides an overview of the spatial application of these models, while Appendix C contains the detailed hydraulic model files used in the CLOMR.

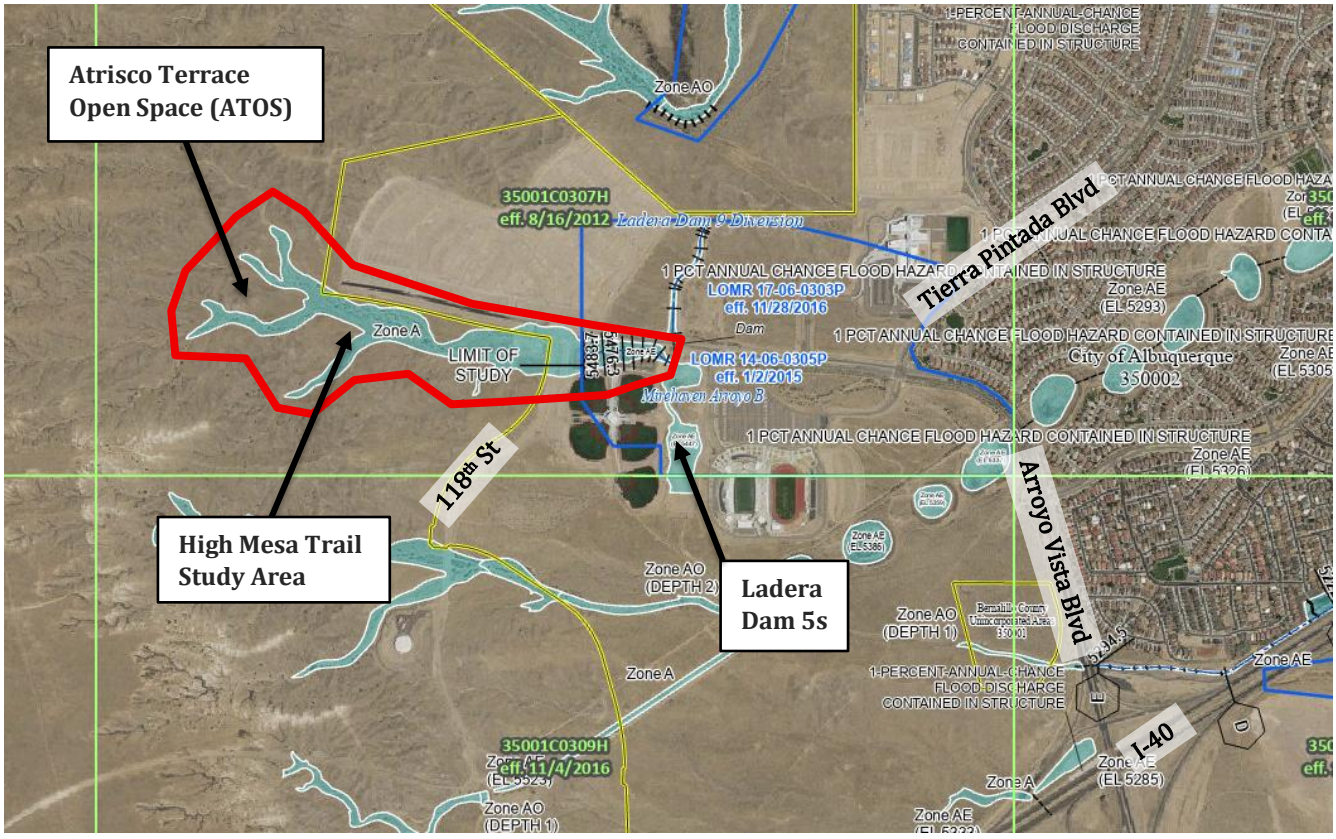


FIGURE 1: PROJECT VICINITY MAP

SECTION 2. DESIGN ANALYSIS

HYDROLOGY

Refer to the High Mesa Trail Offsite DAR for detailed information on existing and proposed hydrologic conditions affecting the offsite drainage areas.

HYDRAULICS

Refer to the High Mesa Trail Offsite DAR for details on existing and proposed hydraulic conditions related to the offsite design. The report includes Manning's calculations for the channels, the West and East Ponds, and the riprap plunge pools. See Section 3 for additional hydraulic analysis for the proposed floodplains in this CLOMR.

SECTION 3. FLOODPLAINS

EXISTING

EXISTING FEMA FLOODPLAINS

A detailed Letter of Map Revision (LOMR), was conducted on the AE floodplain in November 2016, extending downstream from 118th Street to Ladera Dam 5s. According to the Flood Insurance Rate Maps (FIRMs) published by the FEMA, Panel 35001C0307H, revised on August 16, 2012, the High Mesa Trail Subdivision is located within the center of a Zone A floodplain. This flood zone is associated with the Mirehaven Arroyo B. The current Letter of Map Revision (LOMR) is LOMR 17-06-0303P-350002 and referenced FIRM panel are included in Appendix B for further review.

FIGURE 2: EXISTING FEMA FLOODPLAINS

PROPOSED

According to the FEMA FIRM, the area extending from the ATOS to just upstream of the Albuquerque Regional Sports Complex is designated as a Zone A floodplain. This transitions into a Zone AE floodplain with established Base Flood Elevations (BFEs) that connect to the Ladera Dam 5s (Detention Basin 5s on LOMR 17-06-0303P-350002).
The primary objectives of this study are as follows:

1. Redefine the floodplain boundary of the Zone A area located upstream of the High Mesa Trail Subdivision within the ATOS and reclassify it as Zone AO.
2. Remove the Zone A floodplain designation from the High Mesa Trail Subdivision property and establish a BFE for the proposed West Pond.
3. Eliminate the Zone AE floodplain downstream of the High Mesa Trail Subdivision, tying it into the existing Zone AE floodplain located directly upstream of the Ladera Dam 5s.

Refer to Figure 3 for the proposed site plan illustrating the facilities described in the High Mesa Trail Offsite Design Analysis Report (DAR). The preliminary construction plans for the proposed High Mesa Trail Subdivision Offsite Channel and Ponds are provided in Appendix D. Refer to Figure 4 that illustrates the different hydraulic software used for the proposed improvements in this CLOMR analysis.

To support remapping Zone A within the ATOS, CDS applied hydrologic data from the High Mesa Trail Offsite DAR to generate inflow hydrographs. These hydrographs, representing runoff from offsite basins, were used as boundary conditions in the HEC-RAS 2D hydraulic model to define inundation limits within the open space. Table 1 summarizes the inflow discharges incorporated into the model, while Figure 5 illustrates the locations of hydrograph inputs. The maximum modeled water depth on the eastern side of the ATOS, upstream of the West Pond and proposed channel improvements, is approximately 2.1 feet. The corresponding inundation map, showing maximum water surface depths, is presented in Figure 5.

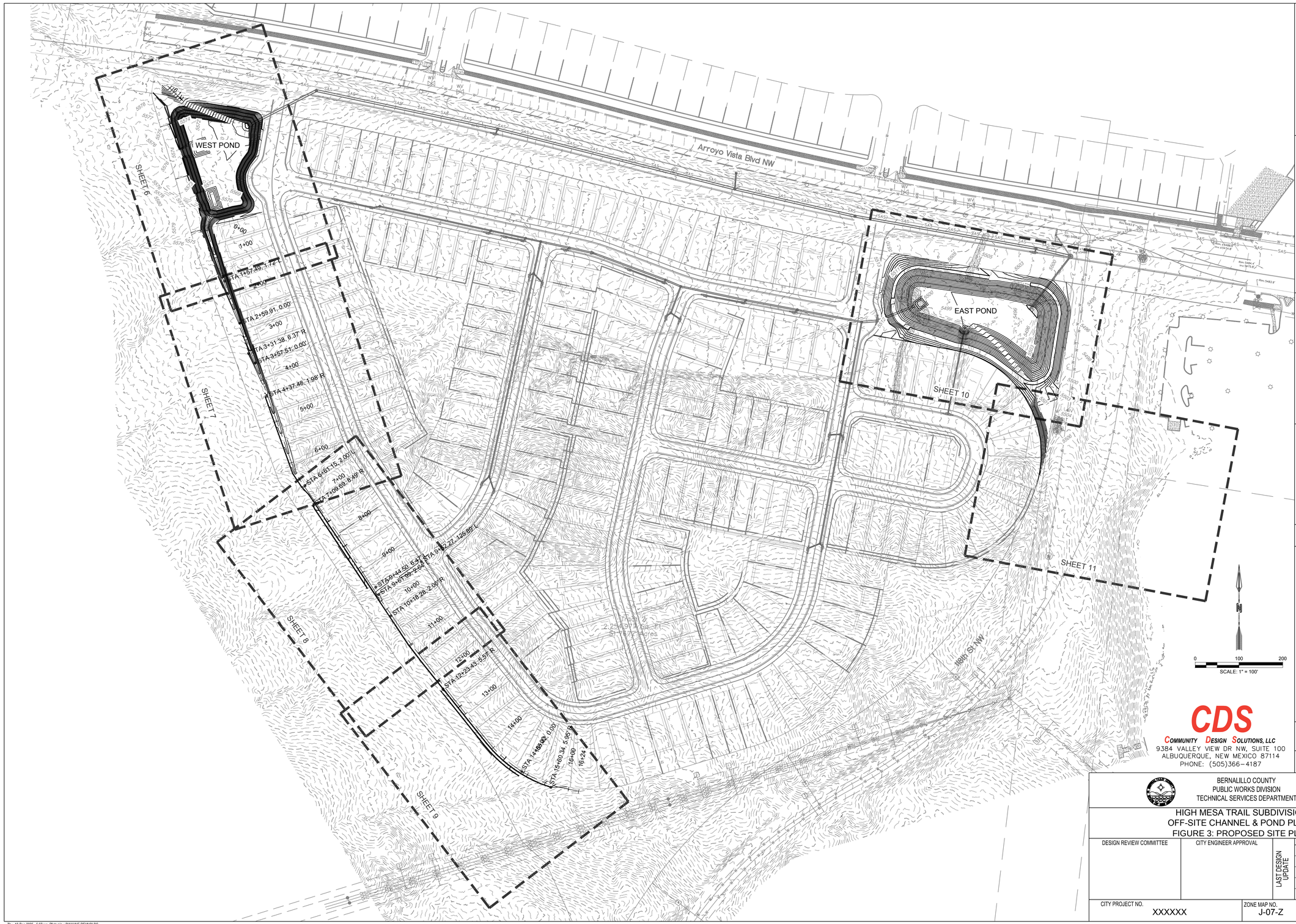
TABLE 1: INFLOW HYDROGRAPHS INTO HEC-RAS MODEL

Boundary Name	Tributary Name	Time of Peak	Time of Peak (hrs)	Peak Discharge (cfs)
OS.5a	Mirehaven Arroyo B Tributary 1	6:10am	6.17	60.3
Junction 4	Mirehaven Arroyo B Tributary 2	7:58am	7.97	220.4
OS.5b1	Mirehaven Arroyo B Tributary 3	6:10am	6.17	70.4
Junction 7	Mirehaven Arroyo B Tributary 4	6:12am	6.2	130.9
Inspiration Channel E	Mirehaven Arroyo B Tributary 5	6:10am	6.17	62.1

CDS developed stage-storage tables to model flow routing through the proposed West Pond, designed to attenuate peak inflows entering the Arroyo Vista storm drain system, which is subject to downstream capacity constraints. The peak water surface elevation in the West Pond, calculated using HEC-HMS, will serve as the BFE for updating the floodplain mapping. A summary of the computed water surface elevations is provided in Table 2, while the detailed stage-storage table for the West Pond can be found in Appendix B of the High Mesa Trail Offsite DAR.

TABLE 2: WATER SURFACE ELEVATIONS IN WEST POND

Pond	Drainage Area (sq. mi)	Peak Inflow (cfs)	Pond Invert (ft)	Water Surface Elevation (ft)	Peak Storage (Ac-Ft)
West	8.4	355.1	5554.00	5572.00	9.22



CDS
COMMUNITY DESIGN SOLUTIONS, LLC
9384 VALLEY VIEW DR NW, SUITE 100
ALBUQUERQUE, NEW MEXICO 87114
PHONE: (505)366-4187

ENGINEER'S SEAL

100% NOT FOR CONSTRUCTION

SURVEY INFORMATION

FIELD NOTES

NO.	BY	DATE

BENCH MARKS

AS-BUILT INFORMATION

	DATE
CONTRACTOR	
STAKED BY	
INSPECTORS	
ACCEPTANCE BY	
VERIFICATION BY	
DOCUMENTS	
DRAWING BY	

MICRO-FILM INFORMATION

	DATE
RECORDED BY	
NO.	

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	

DESIGNED BY	CDS	DATE 10/21/2025
CHECKED BY	CDS	DATE 10/21/2025
DRAWN BY	CDS	DATE 10/21/2025

BERNALILLO COUNTY
PUBLIC WORKS DIVISION
TECHNICAL SERVICES DEPARTMENT

HIGH MESA TRAIL SUBDIVISION
OFF-SITE CHANNEL & POND PLANS
FIGURE 3: PROPOSED SITE PLAN

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	LAST DESIGN UPDATE	MO./DAY/YR.	MO./DAY/YR.

CITY PROJECT NO.	ZONE MAP NO.	SHEET	OF
XXXXXX	J-07-Z		

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AS-BUILT INFORMATION

CONTRACTOR — DATE
SURVEYED BY
INSPECTORS
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		REVISIONS	CDS
			CDS

DESIGNED BY CDS — DATE 10/21/2025
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CDS
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9384 VALLEY VIEW DR NW, SUITE 100
ALBUQUERQUE, NEW MEXICO 87114
PHONE: (505)366-4187

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FIGURE 4: HYDRAULIC ANALYSIS OVERVIEW

DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	LAST DESIGN UPDATE	MO./DAY/YR.	MO./DAY/YR.

CITY PROJECT NO.	ZONE MAP NO.	SHEET	OF
XXXXXX	J-07-Z		

Thu, 18-Dec-2025 - 5:07 pm. Plotted by: DWAYNE.REYNOLDS
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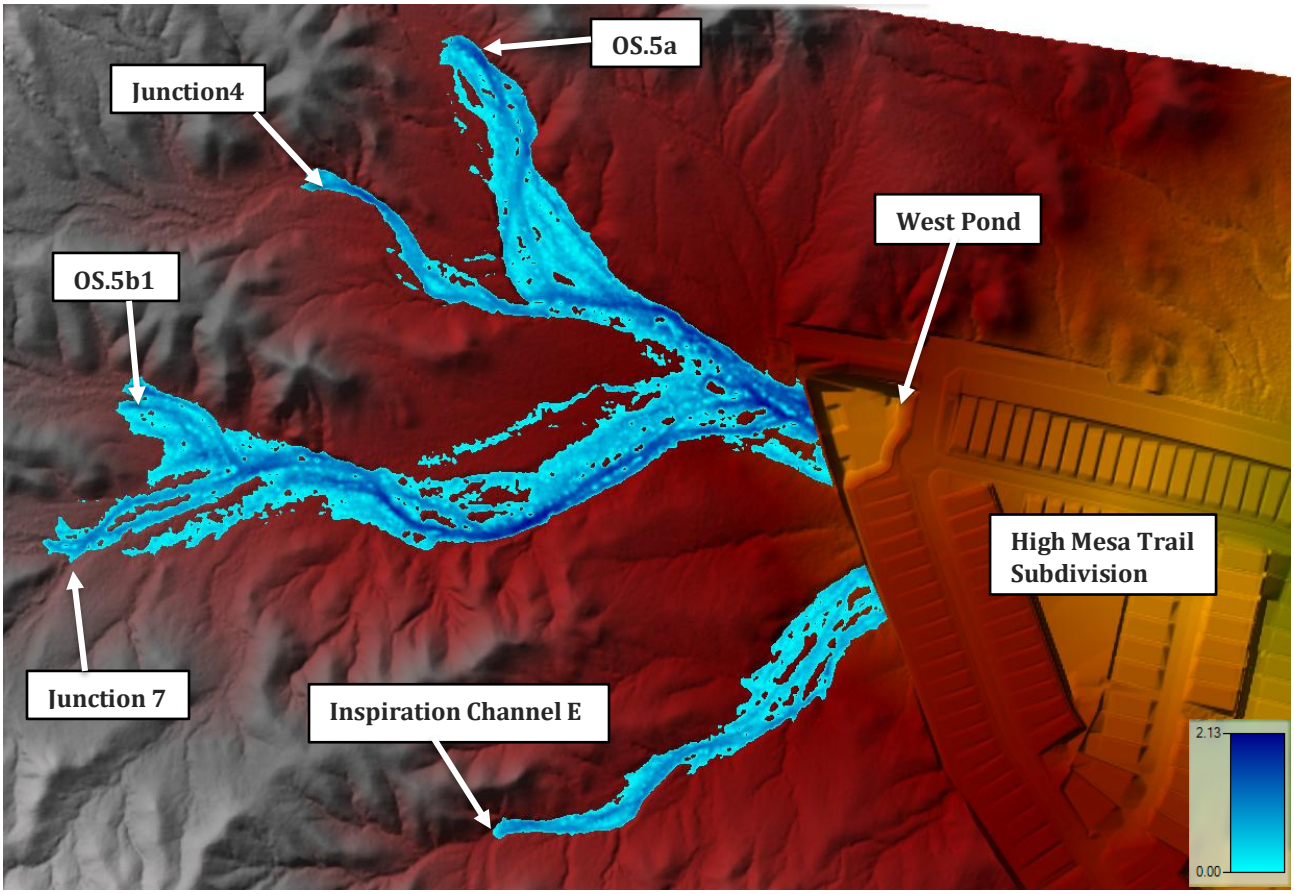

FIGURE 5: HEC-RAS MODEL INFLOW HYDROGRAPH LOCATIONS

CDS utilized Autodesk Storm and Sanitary Analysis Version 2024.1 to evaluate the storm drain outfall sections extending from the West Pond to the manhole within the Arroyo Vista. The West Pond outfall is designed to connect to this manhole, integrating with the broader storm drain system. The storm drain infrastructure within Arroyo Vista is being designed by Bohannan Huston, Inc. (BHI). Preliminary construction plans for the Arroyo Vista Improvements are included in Appendix D. Figure 6 illustrates the hydraulic grade line (HGL) in the West Pond outfall in Autodesk Storm and Sanitary Analysis. The HGL export for the West Pond outfall is included in Appendix C.

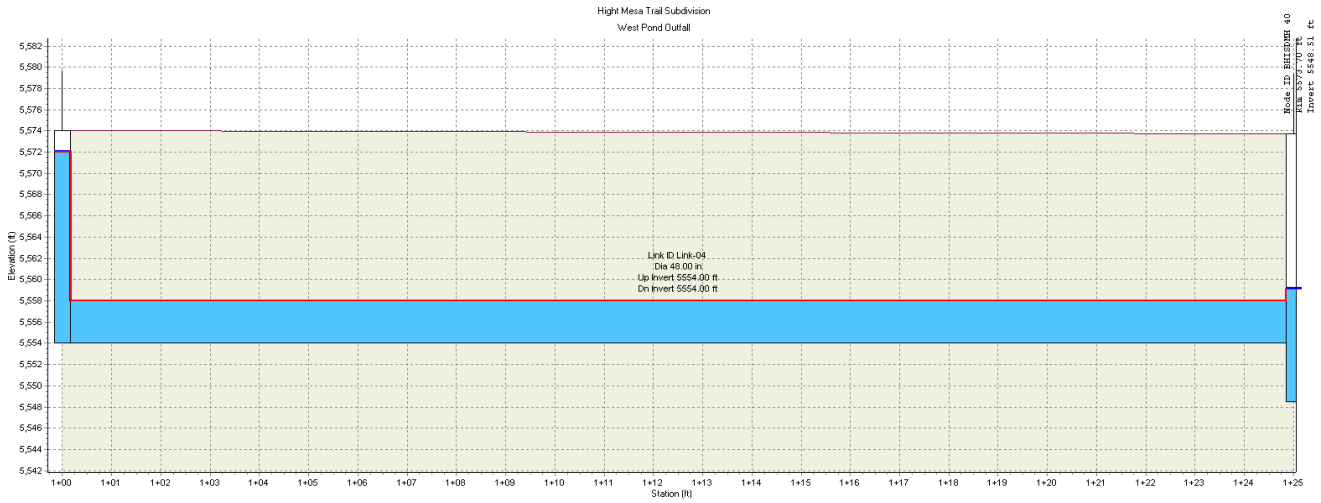

FIGURE 6: WEST POND OUTFALL HGL IN STORM AND SANITARY ANALYSIS

ManningSolver Version 1.019 was used for the channel calculations directly south of the West Pond that collects runoff from the tributary areas in the ATOS, "Basin OS.5b2-b" through "Basin OS.5b2-e". The locations of cross sections are shown in Figure 7. The calculation results are provided in the High Mesa Trail Offsite DAR Appendix C.

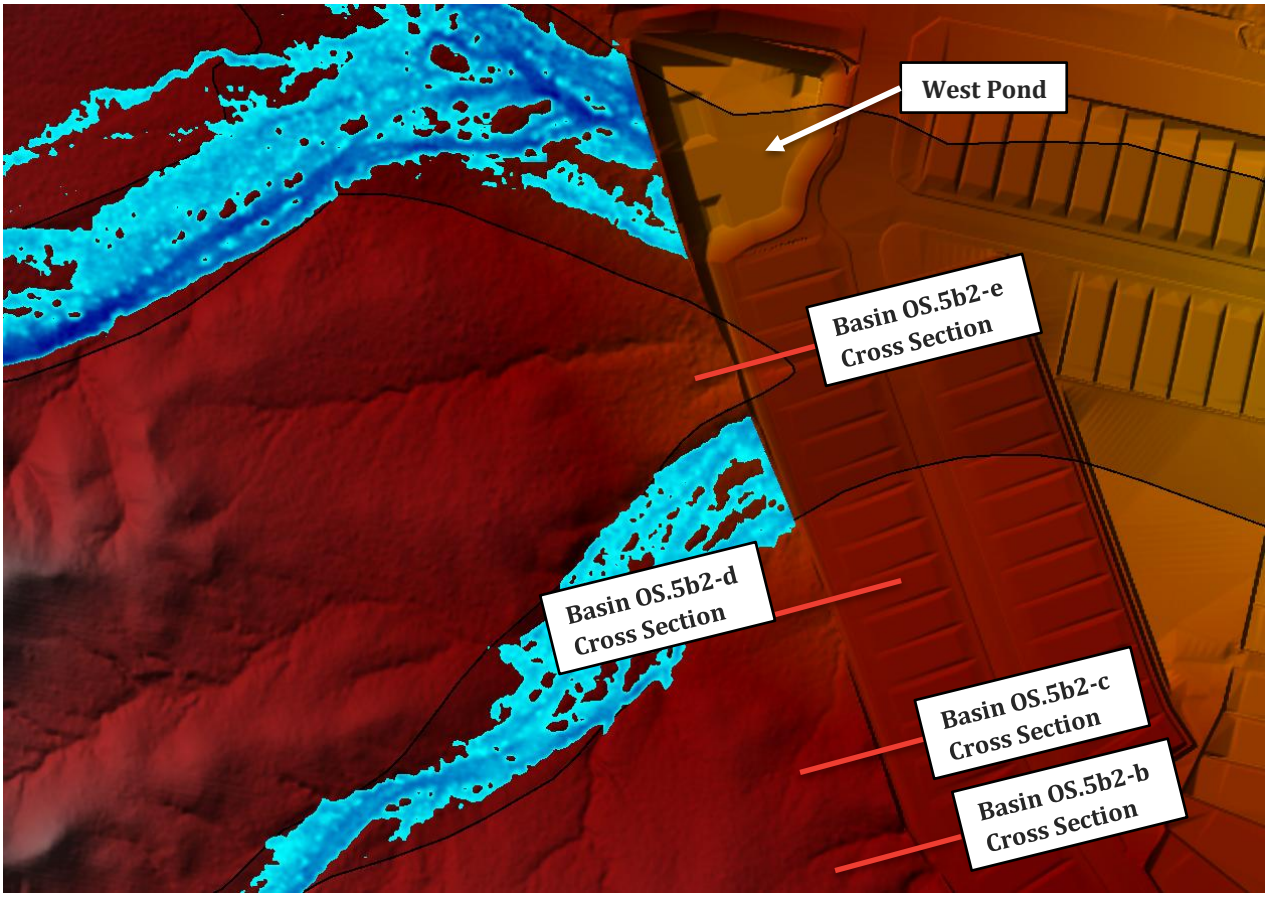

FIGURE 7: MANNING'S SOLVER CROSS SECTION LOCATIONS

The Mannings' calculations were completed to verify the channels' capacity at changes in slope and channel geometry. Refer to Table 3 as it summarizes the design discharges and water depths at the cross sections previously mentioned.

TABLE 3: SUMMARY OF CHANNEL CALCULATIONS

Cross Section Name	Discharge (cfs)	Water Depth (ft)
Basin OS.5b2-b	3.7	0.3
Basin OS.5b2-c	4.3	0.3
Basin OS.5b2-d	4.8	0.3
Basin OS.5b2-e	62.1	1.4

Since the modeled water depths at cross sections "Basin OS.5b2-b" through "Basin OS.5b2-d" were less than 1 foot, these sections were excluded from the proposed floodplain mapping. However, cross section "Basin OS.5b2-e" exhibited a water depth exceeding 1 foot and was therefore incorporated into the floodplain mapping, using the BFE calculated for the West Pond via HEC-HMS.

SECTION 4. CONCLUSION

CDS conducted a hydraulic analysis of the Mirehaven Arroyo B watershed, spanning from the ATOS to Ladera Dam 5s, in support of a CLOMR submission to FEMA. The primary objective of this study was to update the existing floodplain mapping for FEMA Zones A and AE to reflect proposed site developments, including the High Mesa Trail Subdivision and associated offsite drainage improvements.

Based on the hydrologic and hydraulic modeling performed for both the CLOMR and the High Mesa Trail Offsite DAR, the proposed improvements within the Mirehaven Arroyo B watershed will:

1. Convey the 100-year storm event without causing adverse impacts to upstream or downstream properties.
2. Attenuate peak discharges through the West Pond and channel.
3. Support the removal and reclassification of existing FEMA Zone A and AE floodplains in accordance with FEMA's CLOMR criteria.
4. Enhance existing floodplain conditions along Mirehaven Arroyo B while establishing BFEs for the West Pond.

These results provide the technical basis for the CLOMR request and ensure that FEMA's mapping reflects both current and proposed hydrologic conditions within the watershed.

SECTION 5. REFERENCES

Bohannan Houston Inc., 2025. Arroyo Vista Improvements – Preliminary Construction Plans
Community Design Solutions, LLC, 2025. High Mesa Trail Offsite Design Analysis Report
Community Design Solutions, LLC, 2025. High Mesa Trail Subdivision Offsite Channel & Ponds – Preliminary Construction Plans
Federal Emergency Management Agency, 2012. Flood Insurance Rate Map (FIRM), Bernalillo County, New Mexico. Map Number: 35001C0307H
Federal Emergency Management Agency, 2016. Flood Insurance Study Volume 1 & 2, Bernalillo County, New Mexico. Map Number: 35001CV001D and 35001CV002D
Federal Emergency Management Agency, 2016. Flood Insurance Rate Map (FIRM) LOMR 17-06-0303P-350002, Bernalillo County, New Mexico. Map Number: 35001C0307H Revised to Reflect LOMR Effective: November 28, 2016.

APPENDIX A
FEMA FORMS

APPENDIX B
ASBUILTS AND PAST REPORTS

APPENDIX C
MODELS AND CALCULATIONS

APPENDIX D
MAPS

APPENDIX E
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APPENDIX F
PROPERTY OWNER NOTIFICATION