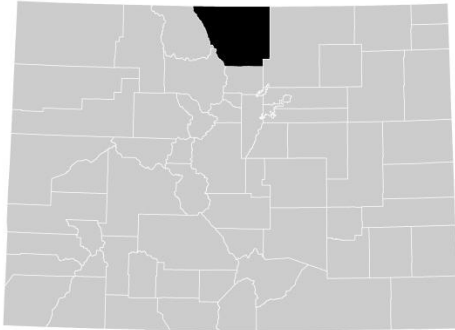


FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 3 OF 6



LARIMER COUNTY, COLORADO

AND INCORPORATED AREAS

| COMMUNITY NAME | COMMUNITY NUMBER |
|---|------------------|
| BERTHOUD, TOWN OF | 080296 |
| ESTES PARK, TOWN OF | 080193 |
| FORT COLLINS, CITY OF | 080102 |
| JOHNSTOWN, TOWN OF | 080250 |
| LARIMER COUNTY, UNINCORPORATED AREAS | 080101 |
| LOVELAND, CITY OF | 080103 |
| TIMNATH, TOWN OF | 080005 |
| WELLINGTON, TOWN OF | 080104 |
| WINDSOR, TOWN OF | 080264 |



FEMA

**REVISED
PRELIMINARY
12/20/2021**

REVISED:

FLOOD INSURANCE STUDY NUMBER

08069CV003F

Version Number 2.6.4.6

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Table 23: Floodway Data (Continued)

| FLOODING SOURCE | | FLOODWAY | | | 1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION | | | |
|-----------------|-----------------------|-----------------|-------------------------------------|--|--|------------------------------------|---------------------------------|--------------------|
| CROSS SECTION | DISTANCE ¹ | WIDTH (FEET) | SECTION AREA (SQUARE FEET) | MEAN VELOCITY (FEET PER SECOND) | REGULATORY (FEET NAVD) | WITHOUT FLOODWAY (FEET NAVD) | WITH FLOODWAY (FEET NAVD) | INCREASE (FEET) |
| TRIBUTARY BT-2 | | | | | | | | |
| A | 130 | 40 | 184 | 9.0 | 7,298.8 | 7,298.8 | 7,298.8 | 0.0 |
| B | 280 | 60 | 213 | 7.7 | 7,310.5 | 7,310.5 | 7,310.5 | 0.0 |
| C | 690 | 57 | 167 | 9.9 | 7,341.8 | 7,341.8 | 7,341.8 | 0.0 |

¹Feet above confluence with Big Thompson River

| | | |
|-----------------|--|--|
| TABLE 23 | FEDERAL EMERGENCY MANAGEMENT AGENCY | FLOODWAY DATA |
| | LARIMER COUNTY, CO AND INCORPORATED AREAS | |
| | | FLOODING SOURCE: TRIBUTARY BT-2 |

| FLOODING SOURCE | | FLOODWAY | | | 1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION | | | |
|-----------------|-----------------------|-----------------|-------------------------------------|--|--|------------------------------------|---------------------------------|--------------------|
| CROSS SECTION | DISTANCE ¹ | WIDTH (FEET) | SECTION AREA (SQUARE FEET) | MEAN VELOCITY (FEET PER SECOND) | REGULATORY (FEET NAVD) | WITHOUT FLOODWAY (FEET NAVD) | WITH FLOODWAY (FEET NAVD) | INCREASE (FEET) |
| TRIBUTARY BT-3 | | | | | | | | |
| A | 60 | 131 | 213 | 7.3 | 7,103.7 | 7,103.7 | 7,103.7 | 0.0 |
| B | 160 | 60 | 179 | 8.7 | 7,117.1 | 7,117.1 | 7,117.1 | 0.0 |
| C | 250 | 48 | 154 | 10.1 | 7,136.9 | 7,136.9 | 7,136.9 | 0.0 |

¹Feet above confluence with Big Thompson River

| | | |
|-----------------|--|--|
| TABLE 23 | FEDERAL EMERGENCY MANAGEMENT AGENCY | FLOODWAY DATA |
| | LARIMER COUNTY, CO AND INCORPORATED AREAS | |
| | | FLOODING SOURCE: TRIBUTARY BT-3 |

| FLOODING SOURCE | | FLOODWAY | | | 1-PERCENT ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION | | | |
|-----------------|-----------------------|-----------------|-------------------------------------|--|--|------------------------------------|---------------------------------|--------------------|
| CROSS SECTION | DISTANCE ¹ | WIDTH (FEET) | SECTION AREA (SQUARE FEET) | MEAN VELOCITY (FEET PER SECOND) | REGULATORY (FEET NAVD) | WITHOUT FLOODWAY (FEET NAVD) | WITH FLOODWAY (FEET NAVD) | INCREASE (FEET) |
| TRIBUTARY BT-4 | | | | | | | | |
| A | 140 | 33 | 62 | 8.1 | 7,013.8 | 7,013.8 | 7,013.8 | 0.0 |
| B | 220 | 21 | 54 | 9.3 | 7,039.2 | 7,039.2 | 7,039.2 | 0.0 |

¹Feet above confluence with Big Thompson River

| | | |
|-----------------|--|--|
| TABLE 23 | FEDERAL EMERGENCY MANAGEMENT AGENCY | FLOODWAY DATA |
| | LARIMER COUNTY, CO AND INCORPORATED AREAS | |
| | | FLOODING SOURCE: TRIBUTARY BT-4 |

| LOCATION | | FLOODWAY | | | 1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88) | | | |
|---------------|-----------------------|--------------|-------------------------|--------------------------|--|------------------|---------------|----------|
| CROSS SECTION | DISTANCE ¹ | WIDTH (FEET) | SECTION AREA (SQ. FEET) | MEAN VELOCITY (FEET/SEC) | REGULATORY | WITHOUT FLOODWAY | WITH FLOODWAY | INCREASE |
| A | 639 | 156 | 658 | 4.8 | 7,236.8 | 7,236.8 | 7,237.3 | 0.5 |
| B | 988 | 123 | 335 | 8.1 | 7,242.1 | 7,242.1 | 7,242.2 | 0.0 |
| C | 1,973 | 123 | 385 | 7.0 | 7,257.1 | 7,257.1 | 7,257.1 | 0.0 |
| D | 2,851 | 69 | 345 | 7.8 | 7,272.3 | 7,272.3 | 7,272.7 | 0.4 |
| E | 3,701 | 82 | 292 | 9.3 | 7,286.4 | 7,286.4 | 7,286.4 | 0.0 |
| F | 4,564 | 96 | 316 | 8.6 | 7,300.9 | 7,300.9 | 7,301.1 | 0.2 |
| G | 5,118 | 39 | 229 | 11.8 | 7,308.6 | 7,308.6 | 7,309.0 | 0.3 |
| H | 5,725 | 77 | 304 | 8.9 | 7,321.7 | 7,321.7 | 7,321.8 | 0.1 |
| I | 6,333 | 121 | 311 | 8.4 | 7,335.1 | 7,335.1 | 7,335.1 | 0.0 |
| J | 7,147 | 66 | 242 | 10.1 | 7,359.2 | 7,359.2 | 7,359.2 | 0.0 |
| K | 8,074 | 43 | 202 | 12.1 | 7,382.3 | 7,382.3 | 7,382.6 | 0.3 |

¹Feet above confluence with North Fork Big Thompson River

| | | |
|----------|--|------------------------------------|
| TABLE 23 | FEDERAL EMERGENCY MANAGEMENT AGENCY LARIMER COUNTY, CO AND INCORPORATED AREAS | FLOODWAY DATA |
| | | FLOODING SOURCE: WEST CREEK |

Table 24: Flood Hazard and Non-Encroachment Data for Selected Streams
[Not applicable to this Flood Risk Project]

6.4 Coastal Flood Hazard Mapping

This section is not applicable to this Flood Risk Project

Table 25: Summary of Coastal Transect Mapping Considerations
[Not applicable to this Flood Risk Project]

6.5 FIRM Revisions

This FIS Report and the FIRM are based on the most up-to-date information available to FEMA at the time of its publication; however, flood hazard conditions change over time. Communities or private parties may request flood map revisions at any time. Certain types of requests require submission of supporting data. FEMA may also initiate a revision. Revisions may take several forms, including Letters of Map Amendment (LOMAs), Letters of Map Revision Based on Fill (LOMR-Fs), Letters of Map Revision (LOMRs) (referred to collectively as Letters of Map Change (LOMCs)), Physical Map Revisions (PMRs), and FEMA-contracted restudies. These types of revisions are further described below. Some of these types of revisions do not result in the republishing of the FIS Report. To assure that any user is aware of all revisions, it is advisable to contact the community repository of flood-hazard data (shown in Table , “Map Repositories”).

6.5.1 Letters of Map Amendment

A LOMA is an official revision by letter to an effective NFIP map. A LOMA results from an administrative process that involves the review of scientific or technical data submitted by the owner or lessee of property who believes the property has incorrectly been included in a designated SFHA. A LOMA amends the currently effective FEMA map and establishes that a specific property is not located in a SFHA.

To obtain an application for a LOMA, visit www.fema.gov/floodplain-management/letter-map-amendment-loma and download the form “MT-1 Application Forms and Instructions for Conditional and Final Letters of Map Amendment and Letters of Map Revision Based on Fill”. Visit the “Flood Map-Related Fees” section to determine the cost, if any, of applying for a LOMA.

FEMA offers a tutorial on how to apply for a LOMA. The LOMA Tutorial Series can be accessed at www.fema.gov/online-tutorials.

For more information about how to apply for a LOMA, call the FEMA Map Information eXchange; toll free, at 1-877-FEMA MAP (1-877-336-2627).

6.5.2 Letters of Map Revision Based on Fill

A LOMR-F is an official revision by letter to an effective NFIP map. A LOMR-F states FEMA’s determination concerning whether a structure or parcel has been elevated on fill above the base flood elevation and is, therefore, excluded from the SFHA.

Information about obtaining an application for a LOMR-F can be obtained in the same manner as that for a LOMA, by visiting www.fema.gov/floodplain-management/letter-map-amendment-loma for the “MT-1 Application Forms and Instructions for Conditional and Final Letters of Map Amendment and Letters of Map Revision Based on Fill” or by calling the FEMA Map Information eXchange, toll free, at 1-877-FEMA MAP (1-877-336-2627). Fees for applying for a LOMR-F, if any, are listed in the “Flood Map-Related Fees” section.

A tutorial for LOMR-F is available at www.fema.gov/online-tutorials.

6.5.3 Letters of Map Revision

A LOMR is an official revision to the currently effective FEMA map. It is used to change flood zones, floodplain and floodway delineations, flood elevations and planimetric features. All requests for LOMRs should be made to FEMA through the chief executive officer of the community, since it is the community that must adopt any changes and revisions to the map. If the request for a LOMR is not submitted through the chief executive officer of the community, evidence must be submitted that the community has been notified of the request.

To obtain an application for a LOMR, visit www.fema.gov/national-flood-insurance-program-flood-hazard-mapping/mt-2-application-forms-and-instructions and download the form “MT-2 Application Forms and Instructions for Conditional Letters of Map Revision and Letters of Map Revision”. Visit the “Flood Map-Related Fees” section to determine the cost of applying for a LOMR. For more information about how to apply for a LOMR, call the FEMA Map Information eXchange; toll free, at 1-877-FEMA MAP (1-877-336-2627) to speak to a Map Specialist.

Previously issued mappable LOMCs (including LOMRs) that have been incorporated into the Larimer County FIRM are listed in Table 26. Please note that this table only includes LOMCs that have been issued on the FIRM panels updated by this map revision. For all other areas within this county, users should be aware that revisions to the FIS Report made by prior LOMRs may not be reflected herein and users will need to continue to use the previously issued LOMRs to obtain the most current data.

Table 26: Incorporated Letters of Map Change

| Case Number | Effective Date | Flooding Source | FIRM Panel(s) |
|--------------------------|----------------|-------------------------------|---|
| 09-08-0734P ¹ | 5/24/2010 | Lake Loveland | 08069C1189G |
| 11-08-0189P ¹ | 9/29/2011 | Big Thompson River | 08069C1113G |
| 12-08-0629P | 2/4/2013 | Coal Creek, Clark Inlet Canal | 08069C0759G |
| 12-08-0883P ¹ | 9/30/2013 | Dry Creek (North of Canal) | 08069C0977H |
| 13-08-1143P ¹ | 7/25/2014 | Spring Creek | 08069C0979J |
| 15-08-1293P | 3/28/2016 | Spring Creek | 08069C0983J |
| 17-08-0129P ¹ | 10/26/2017 | Cache La Poudre River | 08069C0976G |
| 16-08-1356P ¹ | 2/26/2018 | Spring Creek | 08069C0979J |
| 17-08-1354P ¹ | 2/21/2019 | Boxelder Creek | 08069C0788G 08069C0984J 08069C0992H |

| | | | |
|-------------|-----------|----------------------------|--|
| | | | 08069C1011G 08069C1013G 08069C1014G 08069C1202G |
| 19-08-0751P | 6/15/2020 | Dry Creek (South of Canal) | 08069C0977H 08069C0981H 08069C0983J |

¹ LOMR partially incorporated only on panels listed in FIRM Panel(s).

6.5.4 Physical Map Revisions

A Physical Map Revisions (PMR) is an official republication of a community’s NFIP map to effect changes to base flood elevations, floodplain boundary delineations, regulatory floodways and planimetric features. These changes typically occur as a result of structural works or improvements, annexations resulting in additional flood hazard areas or correction to base flood elevations or SFHAs.

The community’s chief executive officer must submit scientific and technical data to FEMA to support the request for a PMR. The data will be analyzed and the map will be revised if warranted. The community is provided with copies of the revised information and is afforded a review period. When the base flood elevations are changed, a 90-day appeal period is provided. A 6-month adoption period for formal approval of the revised map(s) is also provided.

For more information about the PMR process, please visit www.fema.gov and visit the “Flood Map Revision Processes” section.

6.5.5 Contracted Restudies

The NFIP provides for a periodic review and restudy of flood hazards within a given community. FEMA accomplishes this through a national watershed-based mapping needs assessment strategy, known as the Coordinated Needs Management Strategy (CNMS). The CNMS is used by FEMA to assign priorities and allocate funding for new flood hazard analyses used to update the FIS Report and FIRM. The goal of CNMS is to define the validity of the engineering study data within a mapped inventory. The CNMS is used to track the assessment process, document engineering gaps and their resolution, and aid in prioritization for using flood risk as a key factor for areas identified for flood map updates. Visit www.fema.gov to learn more about the CNMS or contact the FEMA Regional Office listed in Section 8 of this FIS Report.

6.5.6 Community Map History

The current FIRM presents flooding information for the entire geographic area of Larimer County. Previously, separate FIRMs, Flood Hazard Boundary Maps (FHBMs) and/or Flood Boundary and Floodway Maps (FBFMs) may have been prepared for the incorporated communities and the unincorporated areas in the county that had identified SFHAs. Current and historical data relating to the maps prepared for the project area are presented in Table 27, “Community Map History.” A description of each of the column headings and the source of the date is also listed below.

- *Community Name* includes communities falling within the geographic area shown on the FIRM, including those that fall on the boundary line, nonparticipating communities, and communities with maps that have been rescinded. Communities with No Special Flood Hazards are indicated by a footnote. If all maps (FHBM, FBFM, and FIRM) were rescinded for a community, it is not listed in this table unless SFHAs have been identified in this community.
- *Initial Identification Date (First NFIP Map Published)* is the date of the first NFIP map that identified flood hazards in the community. If the FHBM has been converted to a FIRM, the initial FHBM date is shown. If the community has never been mapped, the upcoming effective date or “pending” (for Preliminary FIS Reports) is shown. If the community is listed in Table 27 but not identified on the map, the community is treated as if it were unmapped.
- *Initial FHBM Effective Date* is the effective date of the first FHBM. This date may be the same date as the Initial NFIP Map Date.
- *FHBM Revision Date(s)* is the date(s) that the FHBM was revised, if applicable.
- *Initial FIRM Effective Date* is the date of the first effective FIRM for the community.
- *FIRM Revision Date(s)* is the date(s) the FIRM was revised, if applicable. This is the revised date that is shown on the FIRM panel, if applicable. As countywide studies are completed or revised, each community listed should have its FIRM dates updated accordingly to reflect the date of the countywide study. Once the FIRMs exist in countywide format, as PMRs of FIRM panels within the county are completed, the FIRM Revision Dates in the table for each community affected by the PMR are updated with the date of the PMR, even if the PMR did not revise all the panels within that community.

The initial effective date for the Larimer County FIRMs in countywide format was 12/19/2006.

Table 27: Community Map History

| Community Name | Initial Identification Date | Initial FHBM Effective Date | FHBM Revision Date(s) | Initial FIRM Effective Date | FIRM Revision Date(s) |
|--------------------------------------|-----------------------------|-----------------------------|-----------------------|-----------------------------|--|
| Berthoud, Town of ¹ | 12/19/2006 | N/A | N/A | 12/19/2006 | 1/15/2021, 2/6/2013 |
| Estes Park, Town of | 9/19/1975 | 9/19/1975 | N/A | 1/17/1979 | 1/15/2021, 12/19/2006, 5/4/1987 |
| Fort Collins, City of | 6/28/1974 | 6/28/1974 | N/A | 7/16/1979 | 5/2/2012, 6/17/2008, 12/19/2006, 3/18/1996, 2/15/1984 |
| Johnstown, Town of ¹ | 12/19/2006 | N/A | N/A | 12/19/2006 | 1/15/2021 |
| Larimer County, Unincorporated Areas | 12/27/1974 | 12/27/1974 | 3/11/1977 | 4/2/1979 | 1/15/2021, 2/6/2013, 5/2/2012, 6/17/2008, 12/19/2006, 3/23/1999, 7/17/1997, 3/18/1996, 11/17/1993, 3/4/1987, 3/18/1986 |
| Loveland, City of | 3/1/1974 | 3/1/1974 | 12/17/1976 | 9/1/1978 | 1/15/2021, 2/6/2013, 12/19/2006, 3/23/1999, 1/18/1984 |
| Timnath, Town of ¹ | 12/19/2006 | N/A | N/A | 12/19/2006 | N/A |
| Wellington, Town of | 3/22/1974 | 3/22/1974 | 1/17/1975 | 2/15/1979 | 12/19/2006, 10/20/1998, 12/3/1993 |
| Windsor, Town of | 9/27/1991 | 9/27/1991 | N/A | 9/27/1991 | 1/20/2016 |

¹ This community did not have a FIRM prior to the first countywide FIRM for Flood County

SECTION 7.0 – CONTRACTED STUDIES AND COMMUNITY COORDINATION

7.1 Contracted Studies

Table 28 provides a summary of the contracted studies, by flooding source, that are included in this FIS Report.

Table 28: Summary of Contracted Studies Included in this FIS Report

| Flooding Source | FIS Report Dated | Contractor | Number | Work Completed Date | Affected Communities |
|---|------------------|---|-----------------------|---------------------|--|
| Big Thompson River, Black Canyon Creek, Fall River, North Fork Big Thompson River, West Creek, and Zone A, AE Tributaries | TBD | AECOM; Colorado Hazard Mapping Program (CHAMP) | 2016-1452 | July 2020 | Estes Park, Town of; Loveland, City of; Larimer County Unincorporated Areas |
| Little Thompson River and Zone A, AE Tributaries | 1/15/2021 | AECOM; Colorado Hazard Mapping Program (CHAMP) | 2016-1452 | February 2017 | Berthoud, Town of; Johnstown, Town of; Larimer County, Unincorporated Areas |
| Big Thompson River and Zone A, AE Tributaries | 2/6/2013 | Simons, Li & Associates, Inc., Resource Consultants, Inc. | EMW-83-C-1167 | April 1985 | Estes Park, Town of; Loveland, City of; Larimer County, Unincorporated Areas |
| Big Thompson River, Dry Creek | 2/6/2013 | Anderson Consulting Engineers, Inc. | N/A | March 2005 | Loveland, City of |
| Cache La Poudre River, Boxelder Creek, and Zone A, AE Tributaries | TBD | AECOM; Colorado Hazard Mapping Program (CHAMP) | 2016-1452 | July 2020 | Fort Collins, City of; Larimer County Unincorporated Areas; Windsor, Town of |
| Cache La Poudre River | 2/6/2013 | US Department of the Army Corps of Engineers (USACE), Omaha District; Simons, Li & Associates, Inc.; Ayres Associates | EMW-86-C-2262, H-4017 | October 2005 | Fort Collins, City of; Larimer County, Unincorporated Areas |

Table 28: Summary of Contracted Studies Included in this FIS Report

| Flooding Source | FIS Report Dated | Contractor | Number | Work Completed Date | Affected Communities |
|---|------------------|-------------------------------------|-------------|---------------------|---|
| Cooper Slough | 2/6/2013 | Anderson Consulting Engineers, Inc. | EMW-90-C313 | 2005 | Fort Collins, City of; Larimer County, Unincorporated Areas |
| Dry Creek | 2/6/2013 | Gingery Associates, Inc. | N/A | June 2008 | Fort Collins, City of; Larimer County, Unincorporated Areas |
| Spring Creek, Shields Street Overflow, Spring Canyon Park Diversion | 2/6/2013 | Anderson Consulting Engineers, Inc. | N/A | May 2012 | Fort Collins, City of; Larimer County, Unincorporated Areas |

7.2 Community Meetings

The dates of the community meetings held for this Flood Risk Project and previous Flood Risk Projects are shown in Table 29. These meetings may have previously been referred to by a variety of names (Community Coordination Officer (CCO), Scoping, Discovery, etc.), but all meetings represent opportunities for FEMA, community officials, study contractors, and other invited guests to discuss the planning for and results of the project.

Table 29: Community Meetings

| Community | FIS Report Dated | Date of Meeting | Meeting Type | Attended By |
|--------------------------------------|------------------|-----------------|--------------|--|
| Berthoud, Town of | TBD | 7/9/2015 | Scoping | FEMA, the community, the study contractor, and the Department of Natural Resources (DNR) |
| | | 4/12/2019 | CCO Meeting | FEMA, the community, and the study contractor |
| Estes Park, Town of | TBD | N/A | N/A | N/A |
| Fort Collins, City of | TBD | N/A | N/A | N/A |
| Johnstown, Town of | TBD | 7/9/2015 | Scoping | FEMA, the community, the study contractor, and the Department of Natural Resources (DNR) |
| | | 4/12/2019 | CCO Meeting | FEMA, the community, and the study contractor |
| Larimer County, Unincorporated Areas | TBD | 7/9/2015 | Scoping | FEMA, the community, the study contractor, and the Department of Natural Resources (DNR) |
| | | 4/12/2019 | CCO Meeting | FEMA, the community, and the study contractor |

Table 29: Community Meetings

| Community | FIS Report Dated | Date of Meeting | Meeting Type | Attended By |
|---------------------|------------------|-----------------|-------------------|---|
| Loveland, City of | TBD | N/A | N/A | N/A |
| Timnath, Town of | TBD | N/A | N/A | N/A |
| Wellington, Town of | TBD | 11/5/2005 | Final CCO Meeting | FEMA, the community, and the study contractor |
| Windsor, Town of | TBD | N/A | N/A | N/A |

SECTION 8.0 – ADDITIONAL INFORMATION

Information concerning the pertinent data used in the preparation of this FIS Report can be obtained by submitting an order with any required payment to the FEMA Engineering Library. For more information on this process, see www.fema.gov.

The additional data that was used for this project includes the FIS Report and FIRM that were previously prepared for Larimer County (FEMA 2006).

Table 30 is a list of the locations where FIRMs for Larimer County can be viewed. Please note that the maps at these locations are for reference only and are not for distribution. Also, please note that only the maps for the community listed in the table are available at that particular repository. A user may need to visit another repository to view maps from an adjacent community.

Table 30: Map Repositories

| Community | Address | City | State | Zip Code |
|---|--|--------------|-------|----------|
| Berthoud, Town of | Town Hall 807 Mountain Avenue | Berthoud | CO | 80513 |
| Estes Park, Town of | Town Hall 170 MacGregor Avenue | Estes Park | CO | 80517 |
| Fort Collins, City of | Stormwater Utilities Department 700 Wood Street | Fort Collins | CO | 80521 |
| Johnstown, Town of | Town Hall 450 South Parish Avenue | Johnstown | CO | 80534 |
| Larimer County, Unincorporated Areas | Larimer County Courthouse Offices Building 200 West Oak Street Suite 3000 | Fort Collins | CO | 80521 |
| Loveland, City of | Public Works Department 2525 West 1 st Street | Loveland | CO | 80537 |
| Timnath, Town of | TSD Inc 748 Whalers Way | Fort Collins | CO | 80525 |
| Wellington, Town of | Town Hall 3735 Cleveland Avenue | Wellington | CO | 80549 |
| Windsor, Town of | Town Hall 301 Walnut Street | Windsor | CO | 80550 |

The National Flood Hazard Layer (NFHL) dataset is a compilation of effective FIRM Databases and LOMCs. Together they create a GIS data layer for a State or Territory. The NFHL is updated as studies become effective and extracts are made available to

the public monthly. NFHL data can be viewed or ordered from the website shown in Table 31.

Table 31 contains useful contact information regarding the FIS Report, the FIRM, and other relevant flood hazard and GIS data. In addition, information about the State NFIP Coordinator and GIS Coordinator is shown in this table. At the request of FEMA, each Governor has designated an agency of State or territorial government to coordinate that State's or territory's NFIP activities. These agencies often assist communities in developing and adopting necessary floodplain management measures. State GIS Coordinators are knowledgeable about the availability and location of State and local GIS data in their state.

Table 31: Additional Information

| FEMA and the NFIP | |
|---|--|
| FEMA and FEMA Engineering Library website | www.fema.gov/national-flood-insurance-program-flood-hazard-mapping/engineering-library |
| NFIP website | www.fema.gov/national-flood-insurance-program |
| NFHL Dataset | msc.fema.gov |
| FEMA Region VIII | Denver Federal Center, Building 710 P.O. Box 25267 Denver, CO 80255-0267 (303) 235-4812 |
| Other Federal Agencies | |
| USGS website | www.usgs.gov |
| Hydraulic Engineering Center website | www.hec.usace.army.mil |
| State Agencies and Organizations | |
| State NFIP Coordinator | Doug Mahan CWCB Community Assistance Program Coordinator 1313 Sherman Street, Suite 721 Denver, CO 80203 (303) 866-3441 x3221 doug.mahan@state.co.us |
| State GIS Coordinator | Jon Gottsegen Statewide GIS Coordinator 601 E. 18 th Ave Denver, CO 80203 Phone: (303) 764-7712 jon.gottsegen@state.co.us |

SECTION 9.0 – BIBLIOGRAPHY AND REFERENCES

Table 32 includes sources used in the preparation of and cited in this FIS Report as well as additional studies that have been conducted in the study area.

Table 32: Bibliography and References

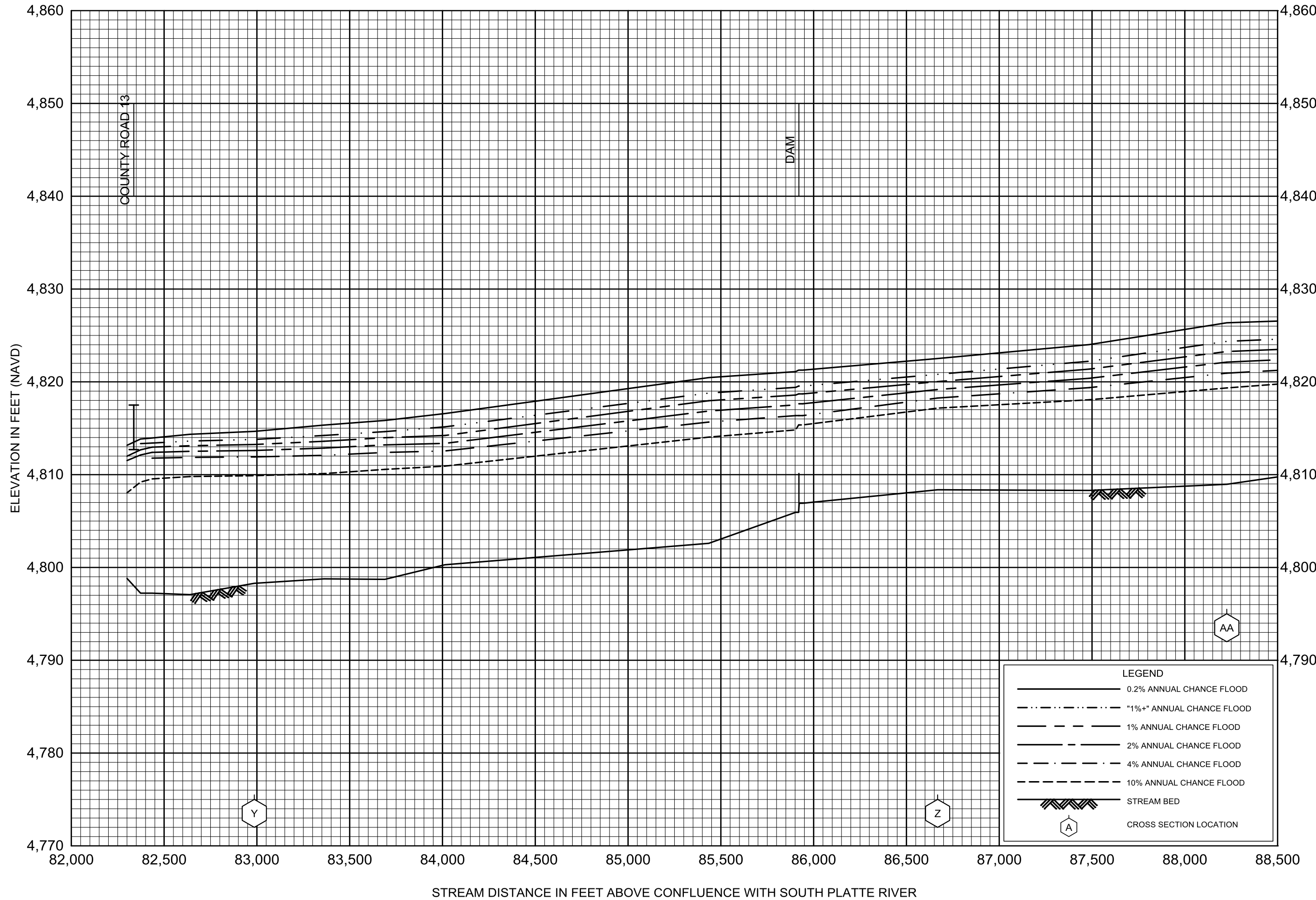
| Citation in this FIS | Publisher/ Issuer | Publication Title, "Article," Volume, Number, etc. | Author/Editor | Place of Publication | Publication Date/ Date of Issuance | Link |
|----------------------|--|---|---------------|----------------------|------------------------------------|---|
| AECOM, 2016 | AECOM | <i>Alternate methods for calculating the 1-percent-plus flood discharge.</i> | | Denver, CO | February 2016 | Colorado Water Conservation Board |
| ARIX 1984 | ARIX Engineering | <i>Topographic Maps</i> | | | May 1984 | |
| Ayres 2004 | Ayres Associates, Inc. | <i>Topographic Mapping for Dry Creek from North College Avenue to East Vine Drive</i> | | | 2004 | |
| CH2M Hill, 2015 | CDOT | <i>Little Thompson River Hydrologic Analysis Phase 2: Little Thompson River above Big Thompson River.</i> | | Denver, CO | June 2015 | http://cwcb.state.co.us/water-management/flood/pages/2013floodresponse.aspx |
| CSU 1997 | Colorado State University, Fort Collins Flood 1997 | <i>Assessing the July 28, 1977 Extreme Event that hit Fort Collins and Colorado State University</i> | | | November 6, 1997 | |
| CWCB 2016 | Colorado Water Conservation Board | <i>Big Thompson CO CHAMP Survey TSDN</i> | | Denver, CO | March 2, 2016 | |
| CWCB 2016a | Colorado Water Conservation Board | <i>Big Thompson CO CHAMP Hydrology TSDN</i> | | Denver, CO | March 31, 2017 | |
| CWCB 2017 | Colorado Water Conservation Board | <i>Big Thompson CO CHAMP Hydraulics TSDN</i> | | Denver, CO | March 21, 2017 | |
| CWCB 2018 | Colorado Water Conservation Board | <i>Big Thompson CO CHAMP Floodplain Mapping TSDN</i> | | Denver, CO | February 28, 2018 | |

| Citation in this FIS | Publisher/ Issuer | Publication Title, "Article," Volume, Number, etc. | Author/Editor | Place of Publication | Publication Date/ Date of Issuance | Link |
|----------------------|-------------------------------------|--|---------------|----------------------|------------------------------------|---|
| EPI 1988 | Engineering Professionals, Inc. | <i>Spring Creek Master Drainageway Plan</i> | | | March 1988 | |
| FEMA 1996 | Federal Emergency Management Agency | <i>Flood Insurance Study, City of Fort Collins, Colorado.</i> | | Washington, D.C. | March 1996 | |
| FEMA 1999 | Federal Emergency Management Agency | <i>Flood Insurance Study, City of Loveland, Colorado.</i> | | Washington, D.C. | March 1999 | |
| FEMA 1998 | Federal Emergency Management Agency | <i>Flood Insurance Study, Town of Wellington, Colorado.</i> | | Washington, D.C. | October 1998 | |
| FEMA 1987 | Federal Emergency Management Agency | <i>Flood Insurance Study, Town of Estes Park, Colorado.</i> | | Washington, D.C. | May 4, 1987 | |
| FEMA 2006 | Federal Emergency Management Agency | <i>Flood Insurance Study, Larimer County, Colorado.</i> | | Washington, D.C. | December 2006 | FEMA Flood Map Service Center msc.fema.gov |
| FEMA 2014 | Federal Emergency Management Agency | <i>Memorandum from Roger Jones, Public Assistance Branch Director DR 4145, Ryan Pietramali, Risk Analysis Branch Chief, and Portia Ross, EHP Advisor DR 4145</i> | | | November 2014 | |

| Citation in this FIS | Publisher/ Issuer | Publication Title, "Article," Volume, Number, etc. | Author/Editor | Place of Publication | Publication Date/ Date of Issuance | Link |
|----------------------|--|---|---------------|----------------------|-------------------------------------|---|
| FEMA 2015 | Federal Emergency Management Agency | <i>Memorandum from Tom Bush, Public Assistance Branch Chief, and Ryan Pietramali, Risk Analysis Branch Chief.</i> | | | July 2015 | |
| Gingery 1976 | Gingery Associates, Inc. | <i>Special Flood Plain Information Report, Big Thompson River and Tributaries, Larimer County, Colorado</i> | | | December 1976 | |
| Gingery 1980 | Gingery Associates, Inc. | <i>Major Drainageway Planning</i> | | | April 1980 | |
| Greenhorne | Greenhorne & O'Mara, Inc | <i>Spring Creek Topographic Mapping in Fort Collins</i> | | | | |
| Hogan/ Olhausen 1977 | Hogan/Olhausen, Inc. | <i>Topographic Maps of Buckhorn Creek and Redstone Creek</i> | | | October 1977 | |
| Jacobs 2014 | CDOT | <i>Hydrologic Evaluation of the Big Thompson Watershed, Post September 2013 Flood Event.</i> | | | August 2014 | http://cwcb.state.co.us/watermanagement/flood/pages/2013floodresponse.aspx |
| Jacobs 2015 | CDOT | <i>Lower Big Thompson Watershed Phase 2 Hydrologic Evaluation, Post September 2013 Flood Event.</i> | | | July 2015 | http://cwcb.state.co.us/watermanagement/flood/pages/2013floodresponse.aspx |
| Kucera 1981 | Kucera & Associates, Photogrammetric Consultants | <i>Topographic Maps of Big Thompson River and Tributaries</i> | | | September 1976, June 1979, May 1981 | |

| Citation in this FIS | Publisher/ Issuer | Publication Title, "Article," Volume, Number, etc. | Author/Editor | Place of Publication | Publication Date/ Date of Issuance | Link |
|----------------------|--|--|---------------|----------------------|------------------------------------|------|
| Kucera 1976 | Kucera & Associates, Photogrammetric Consultants | <i>Big Thompson River Topographic Mapping</i> | | | August 1976 | |
| M & I 1971 | M & I Consulting Engineers | <i>Estes Park Aerial Topographic Mapping</i> | | | December 1971 | |
| M & I 1971 | M & I Consulting Engineers | <i>Topographic Maps of Fish Creek and Fall River at Estes Park, Colorado</i> | | | December 1971 | |
| M & I 1977 | M & I Consulting Engineers | <i>Topographic Maps of Boxelder Creek at Wellington, Colorado</i> | | | September 1977 | |
| M & I 1978 and 1979 | M & I Consulting Engineers | <i>Topographic Maps of Boxelder Creek at Wellington, Colorado</i> | | | September 1977 | |
| Merrick 1999 | Merrick & Company | <i>Topographic Mapping for the Dry Creek Basin</i> | | | 1999 | |
| Nelson | Nelson, Healy, Patterson & Quirk | <i>Spring Creek Topographic Maps in Fort Collins</i> | | | | |
| Scharf 1986 | Scharf and Associates | <i>Spring Creek Topographic Mapping in Fort Collins</i> | | | March 1986 | |
| Simons | Simons, Li & Associates, Inc. | <i>Cache La Poudre Topographic Mapping</i> | | | | |
| Simons 1981 | Simons, Li & Associates, Inc. | <i>Cooper Slough, Boxelder Creek Master Drainageway Planning Study, City of Fort Collins, Larimer County, Colorado</i> | | | August 1981 | |

| Citation in this FIS | Publisher/Issuer | Publication Title, "Article," Volume, Number, etc. | Author/Editor | Place of Publication | Publication Date/Date of Issuance | Link |
|----------------------|---|--|-----------------------------|----------------------|-----------------------------------|---|
| URS 2007 | URS Corporation | <i>Dry Creek Physical Map Revision, PMR Report, Volumes I through V</i> | | | March 6, 2007 | |
| URS 1971 | URS, Inc | <i>Topographic Maps of Cache La Poudre River at Fort Collins, Colorado</i> | | | 1971 | |
| USDA 1971 | U.S. Department of Agriculture, Soil Conservation Service | <i>Watershed Work Plan. Boxelder Creek Watershed</i> | | | February 1971 | |
| USACE 1973 | U.S. Department of the Army, Corps of Engineers, Omaha District | <i>Flood Plain Information Report, Cache La Poudre River, Volume I, Larimer County, Colorado</i> | | Omaha, Nebraska | October 1973 | |
| USACE 1971 | U.S. Department of the Army, Corps of Engineers | <i>Flood Plain Information Report, Big Thompson River, Loveland, Colorado</i> | | | December 1971 | |
| USACE 1973 | U.S. Department of the Army, Corps of Engineers | <i>HEC-2 Water-Surface Profiles. Generalized Computer Program</i> | | Davis, California | October 1973 | |
| USGS 1948 | U.S. Department of Interior, Geological Survey | <i>Floods in Colorado</i> | R. Follansbee and L. Sawyer | | 1948 | |
| USGS 2016 | U.S. Department of Interior, Geological Survey | <i>USGS Water Data for the Nation.</i> | | Washington, D.C. | 2016 | http://waterdata.usgs.gov/nwis |

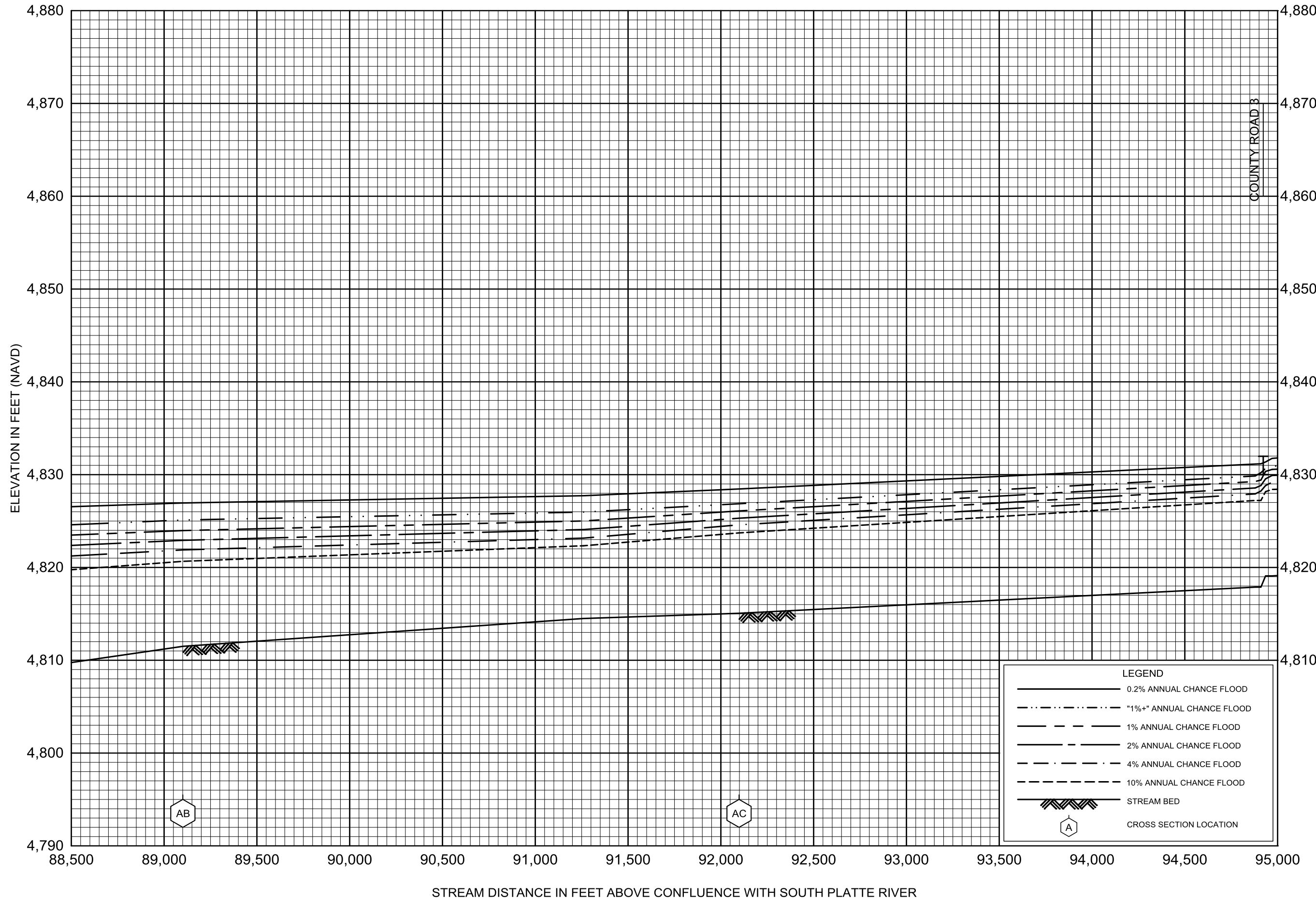


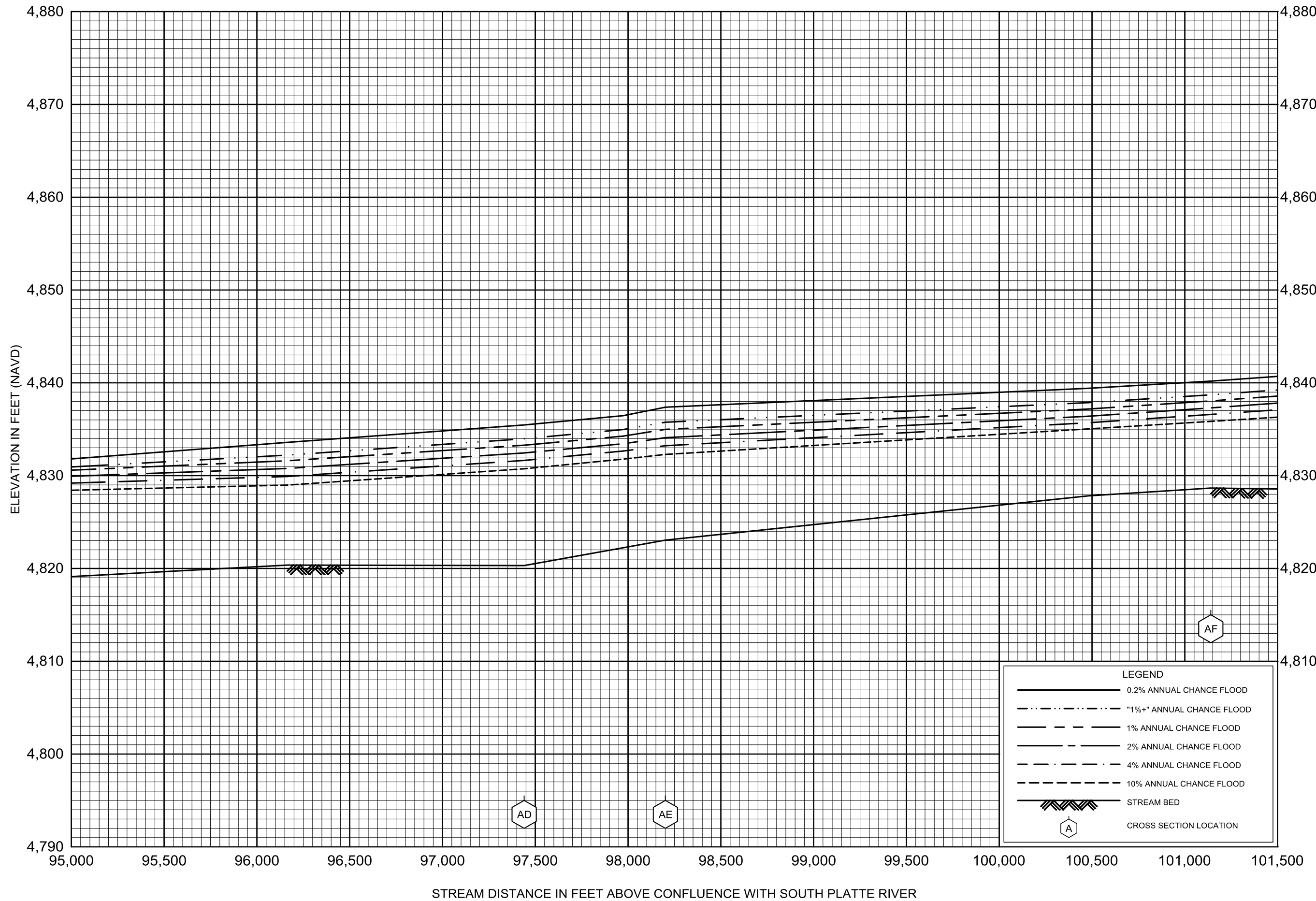
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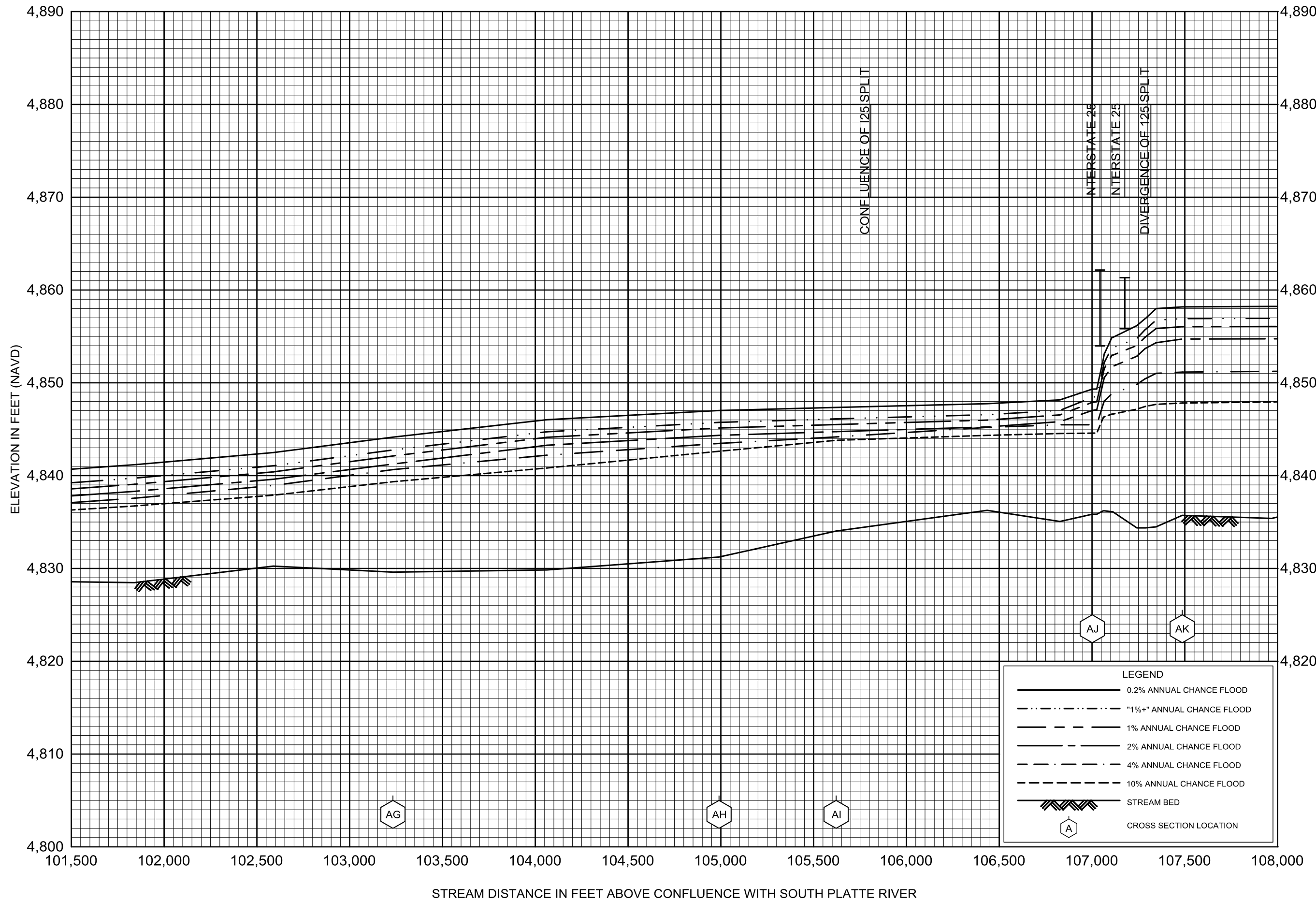
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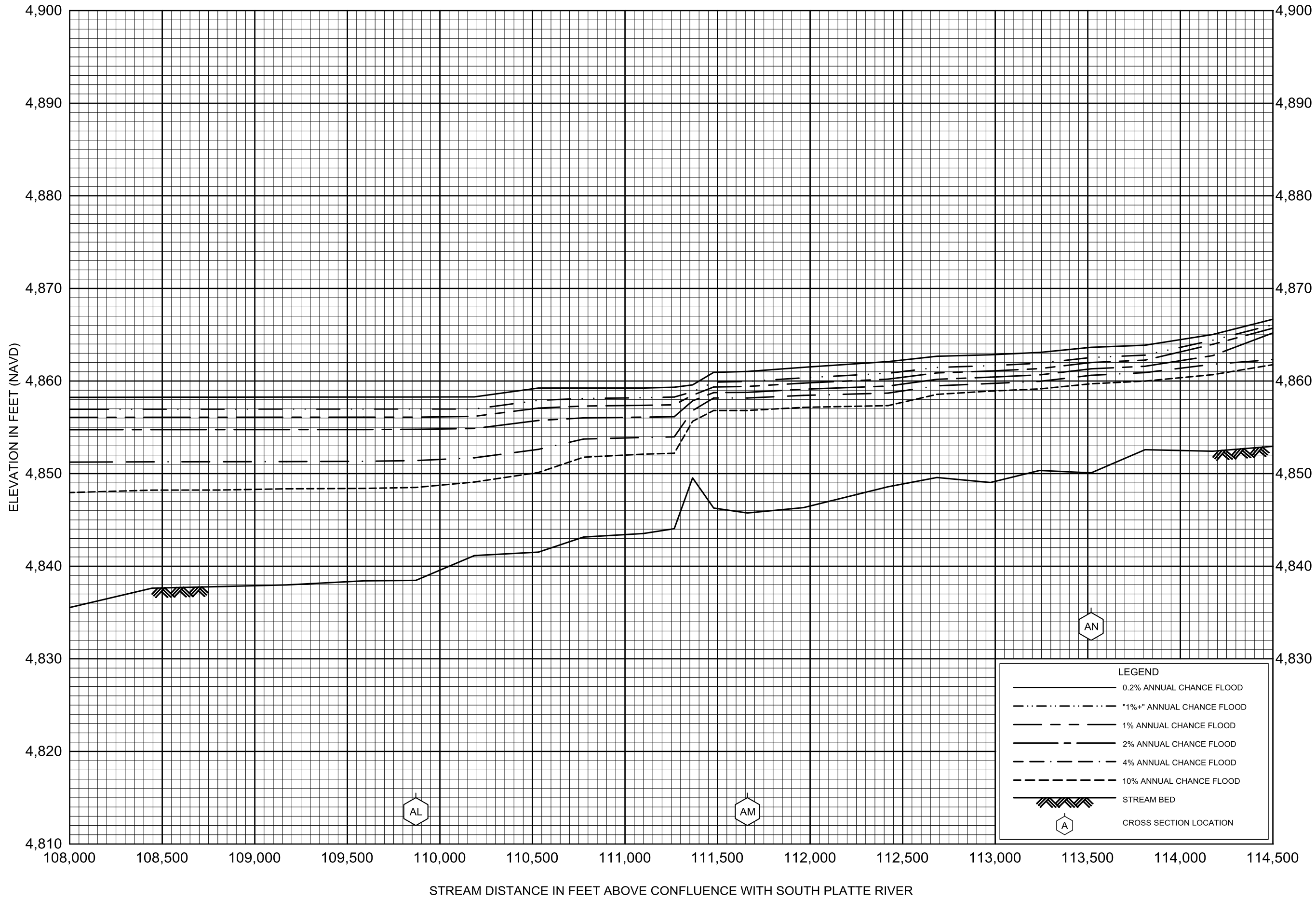
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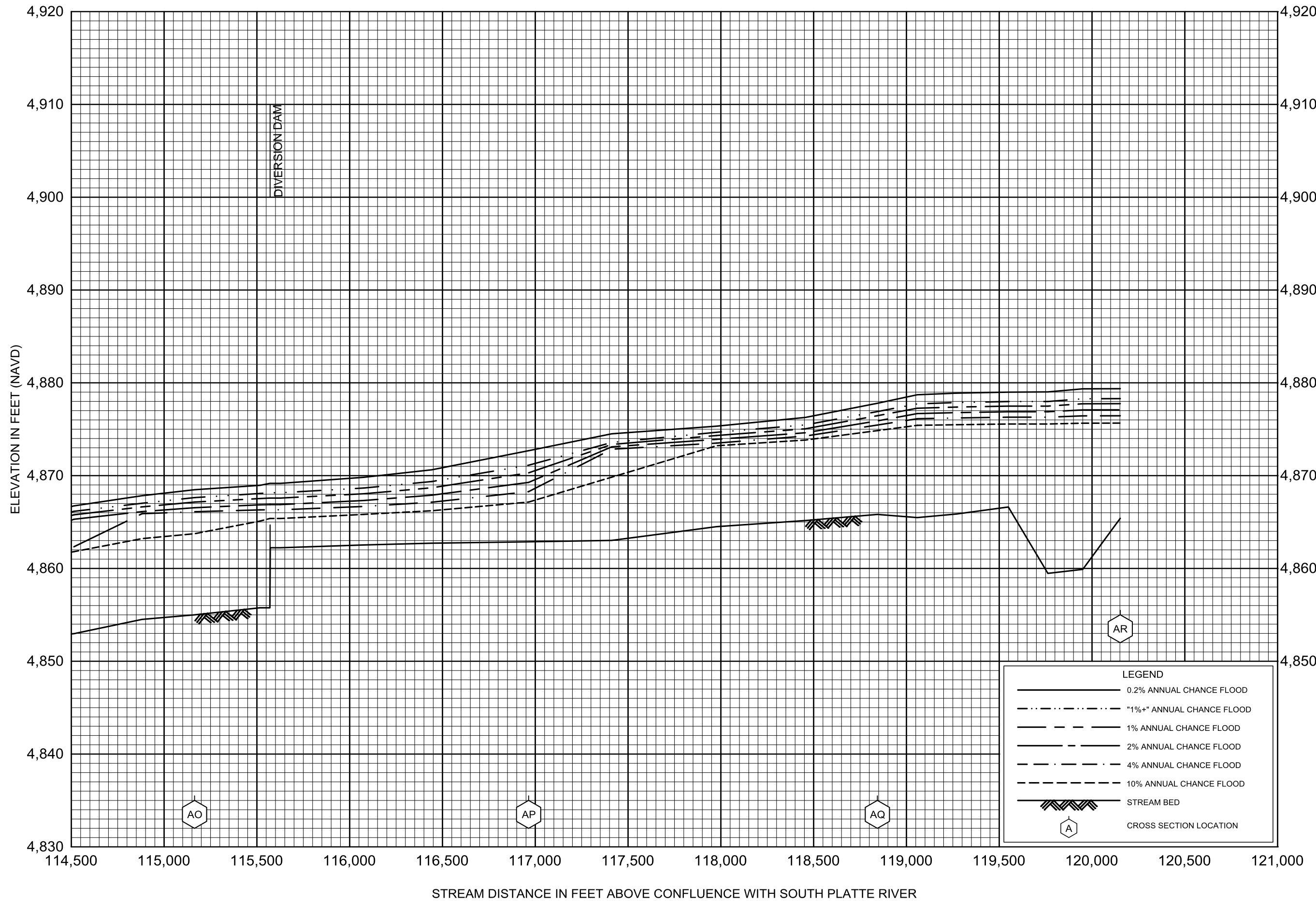


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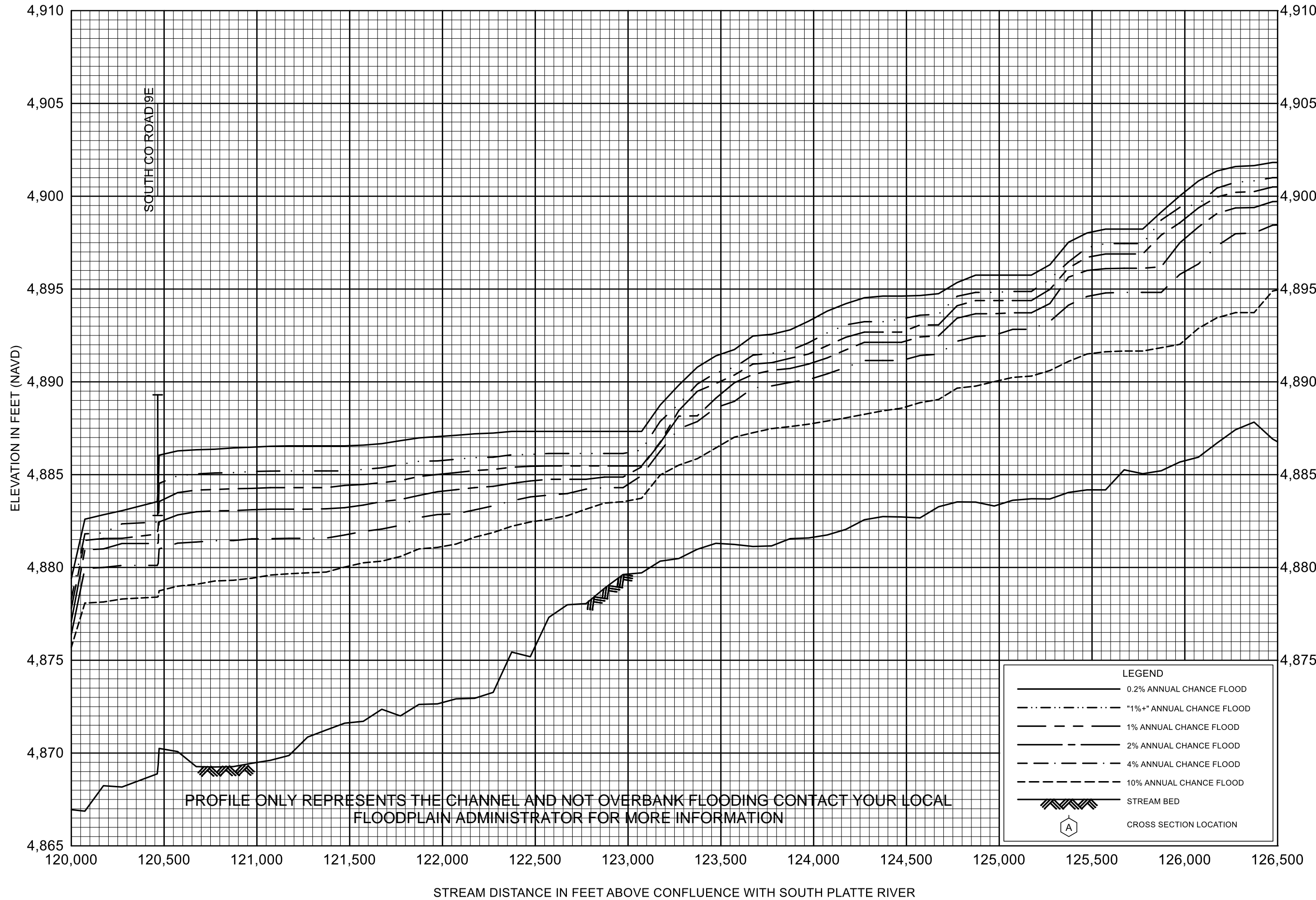
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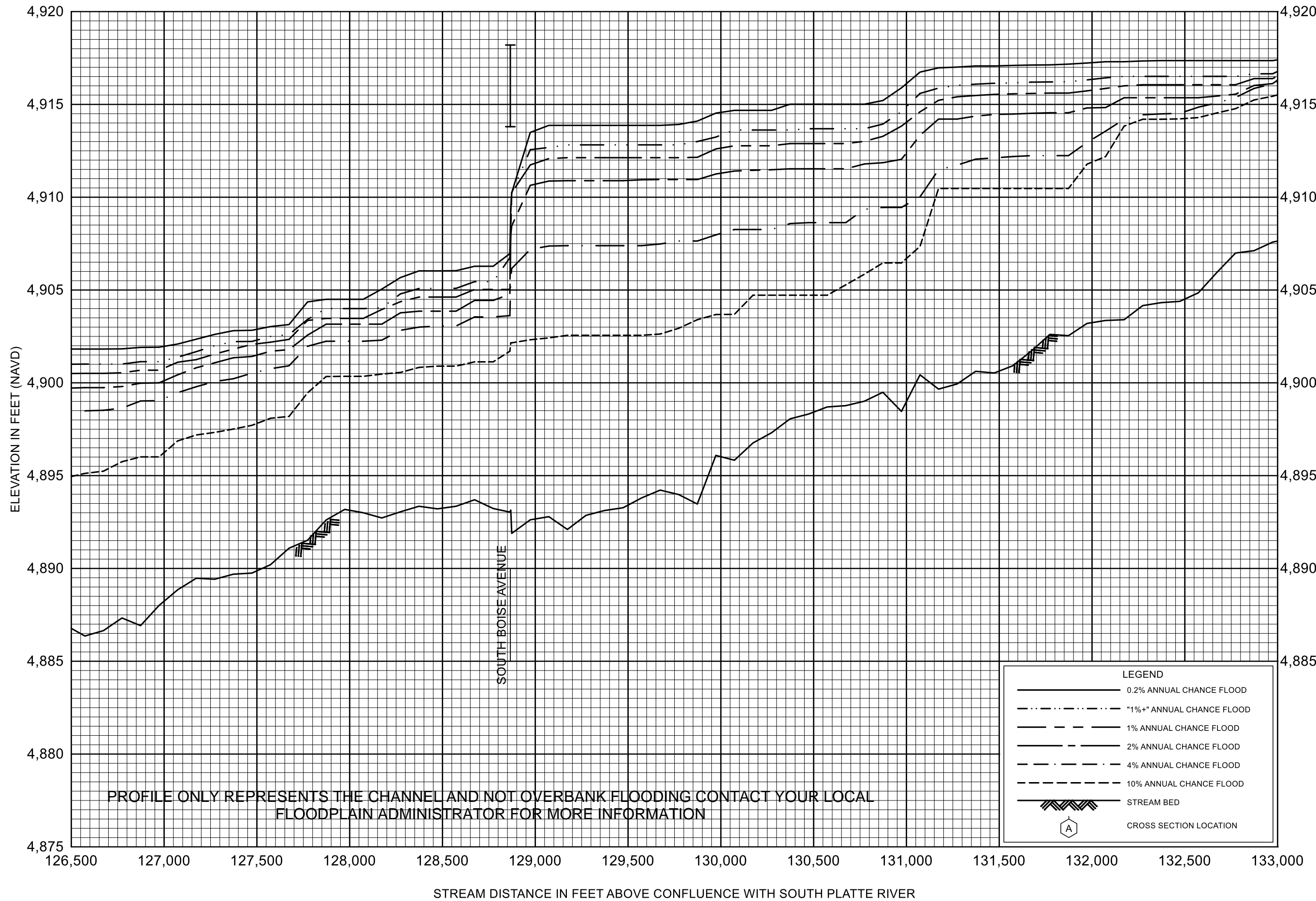


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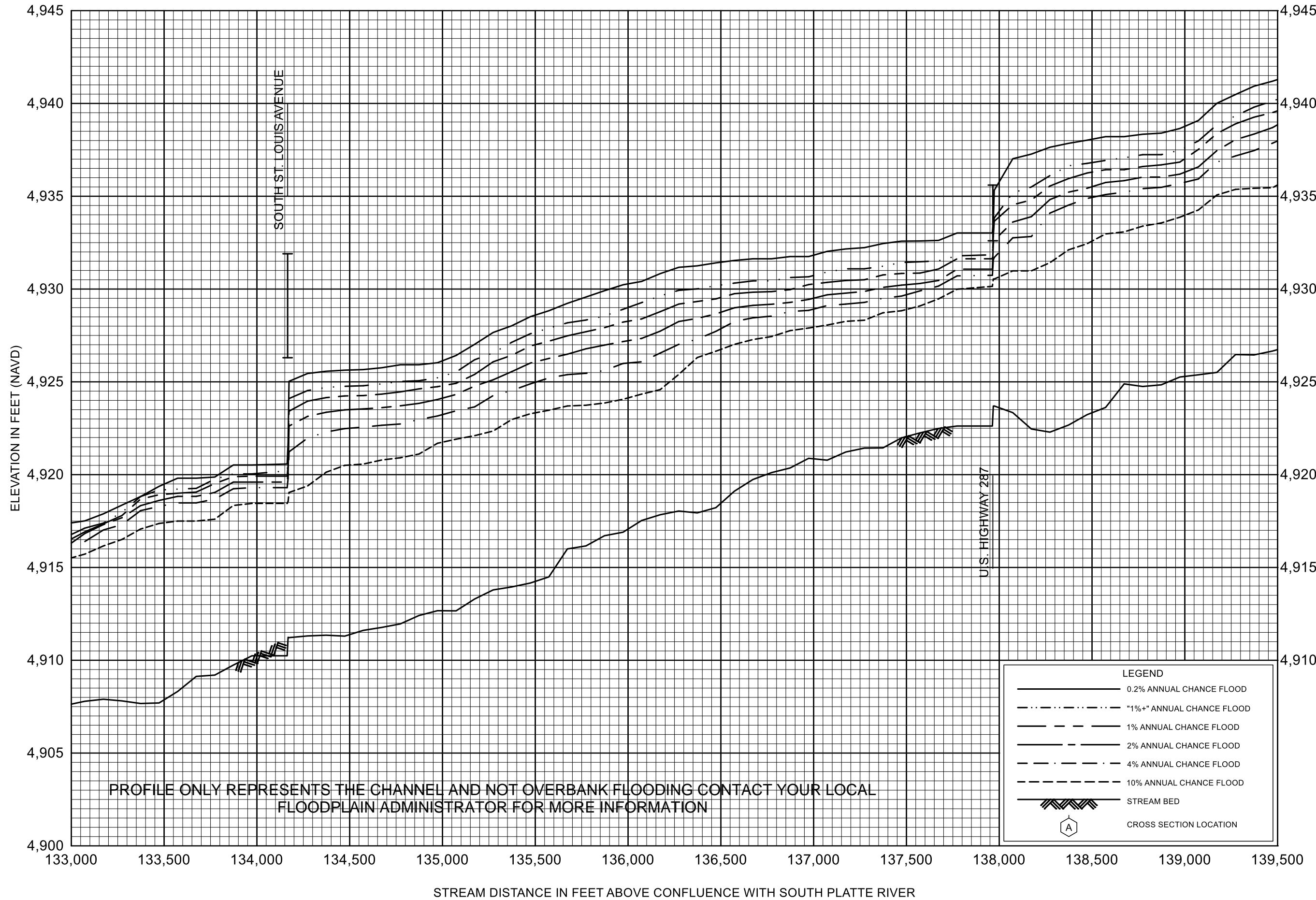
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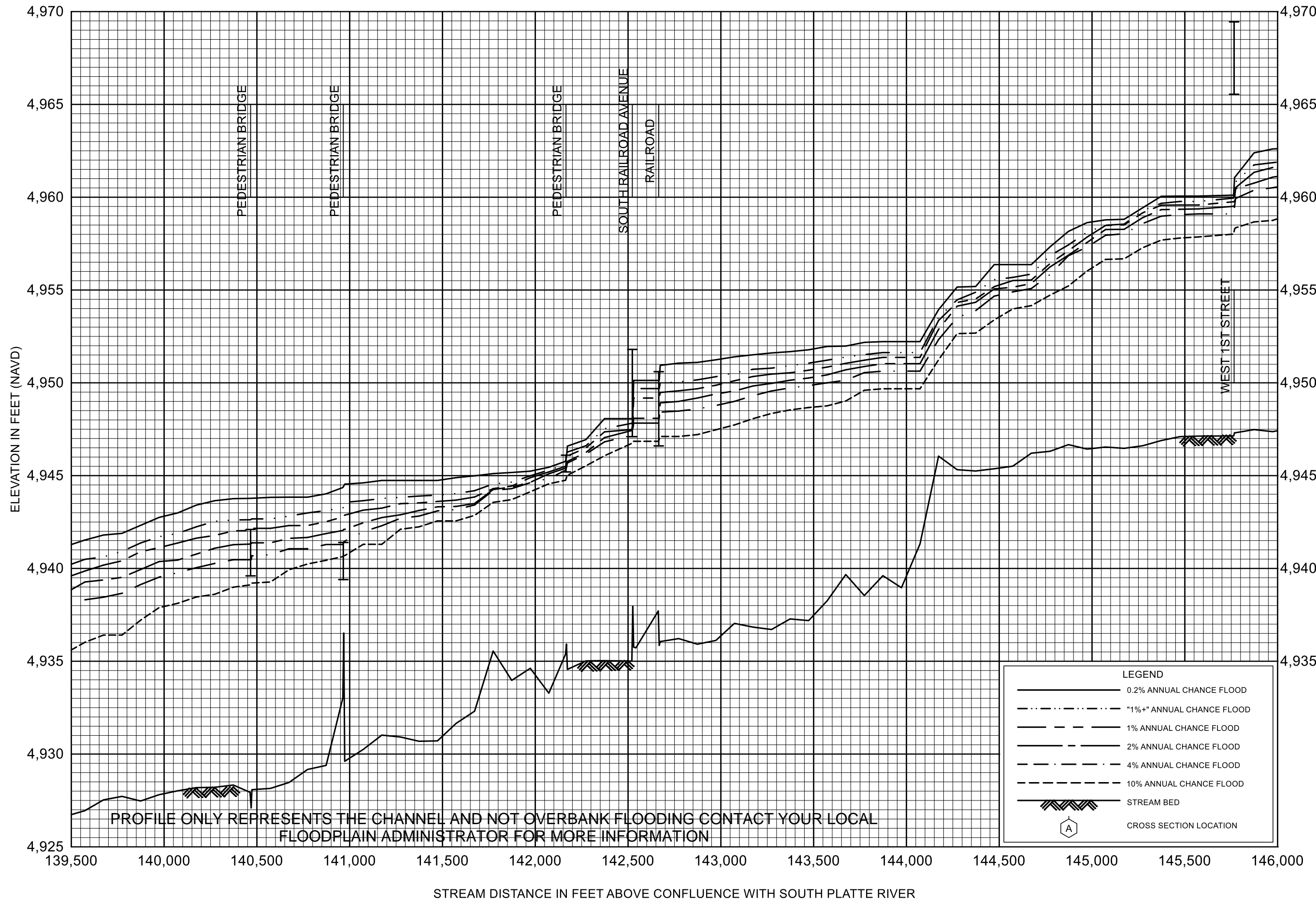


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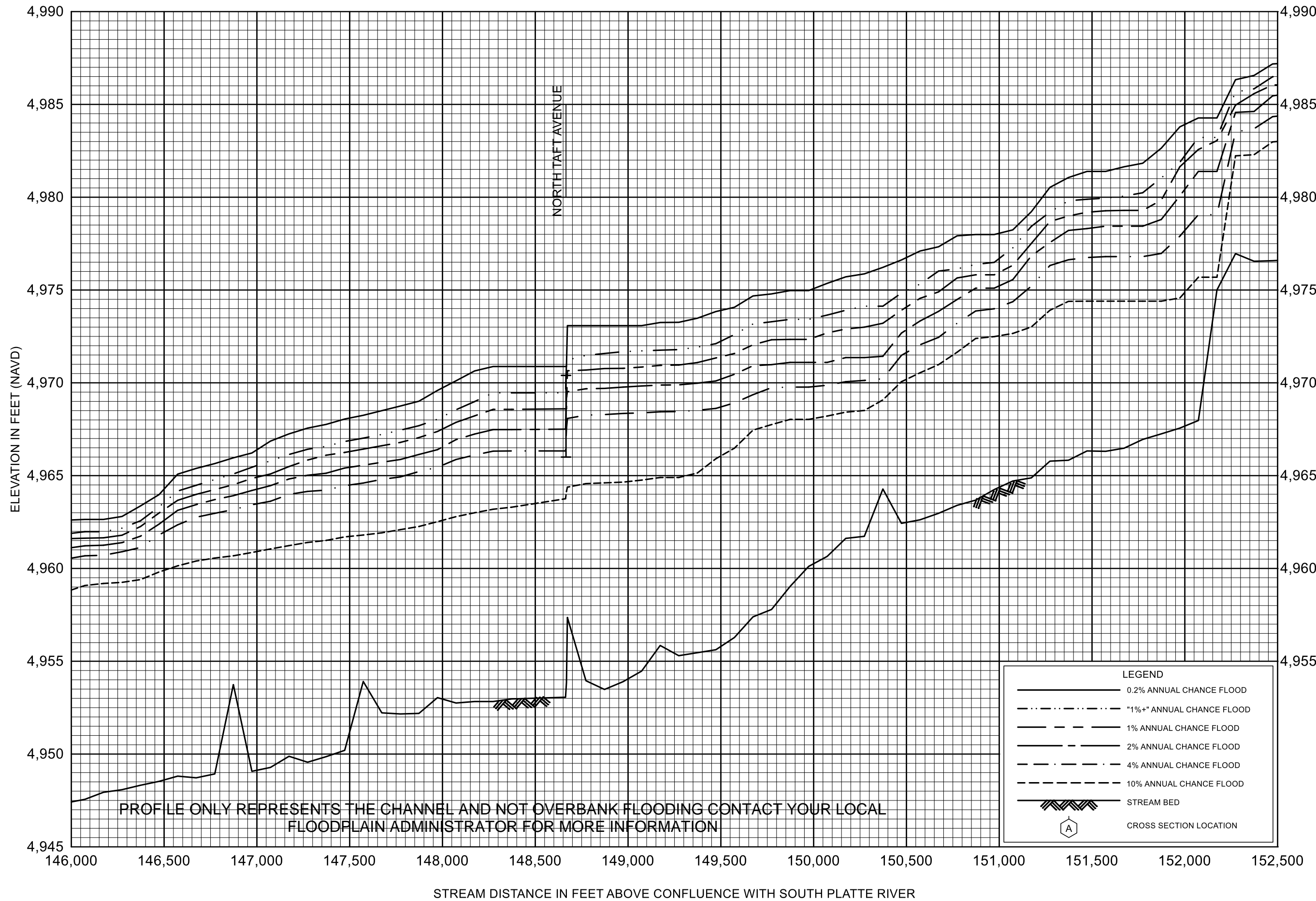
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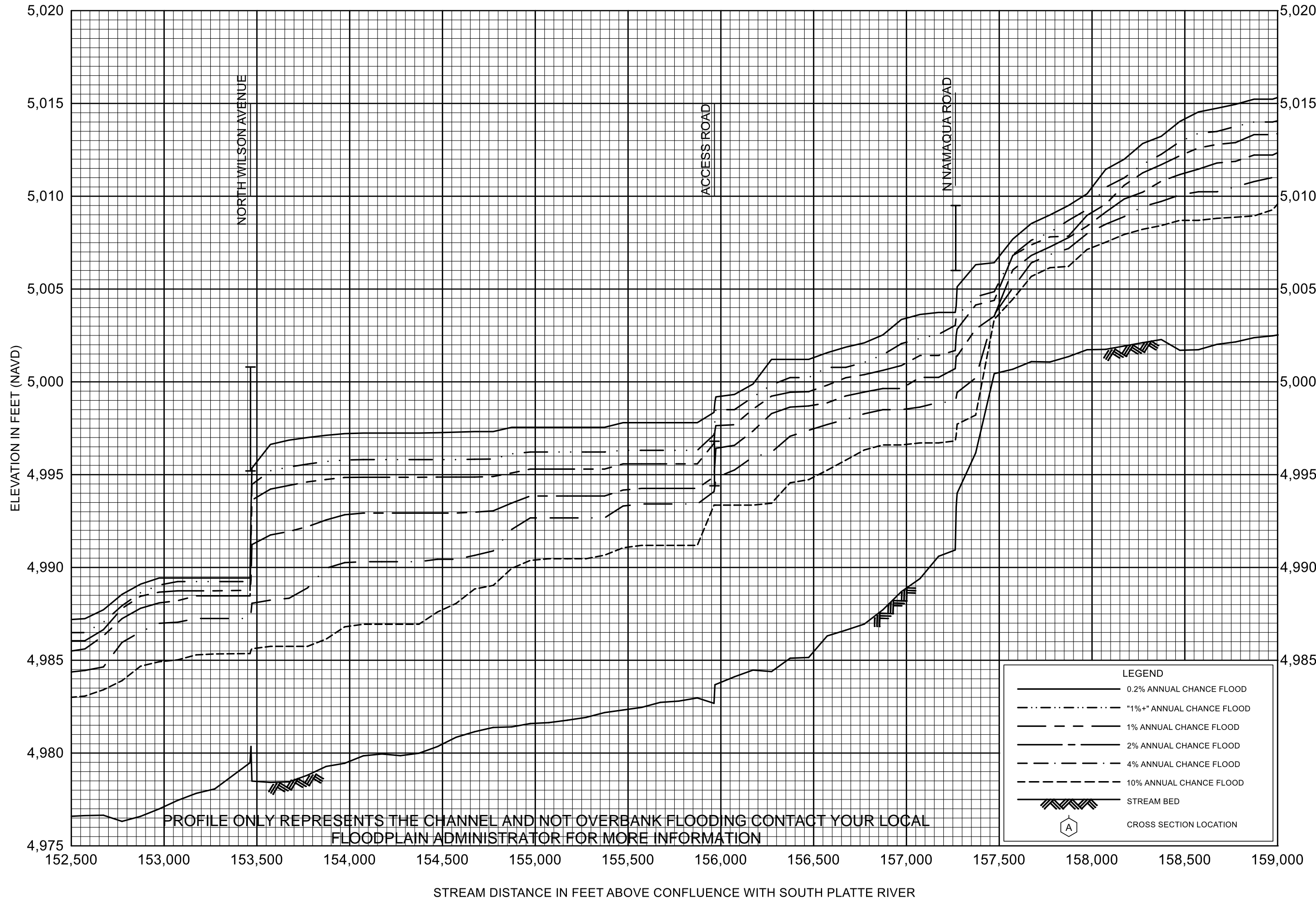
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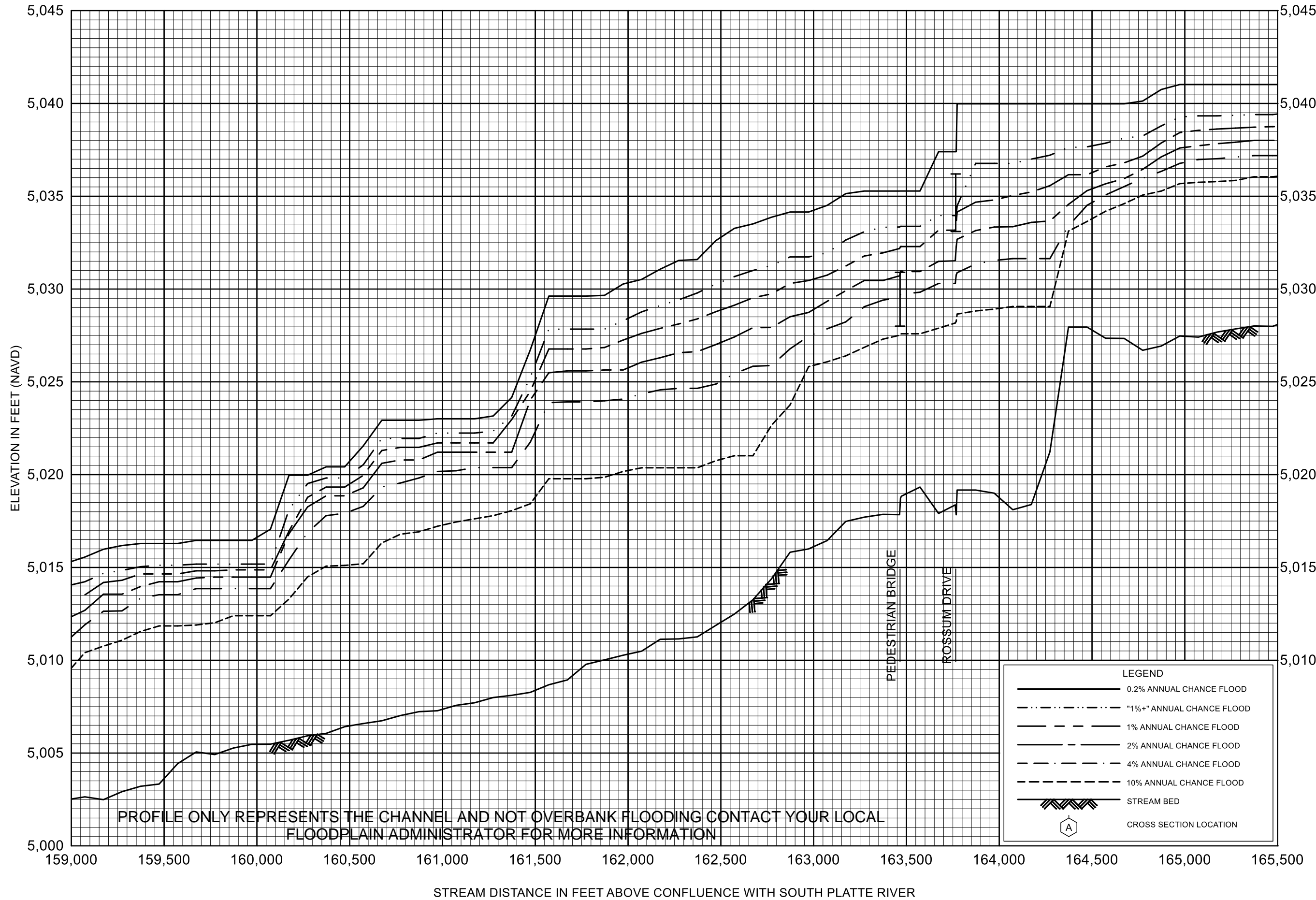


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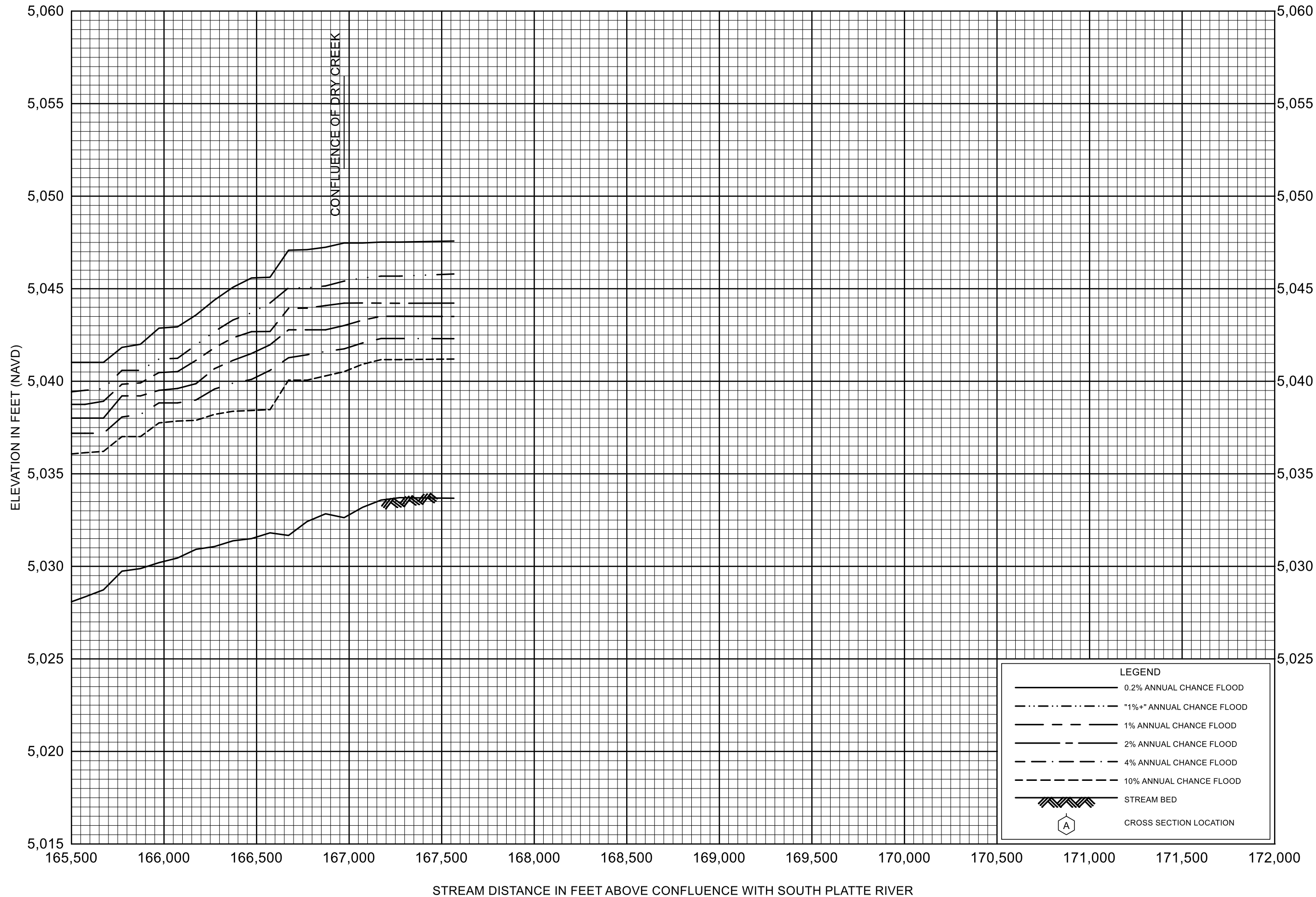


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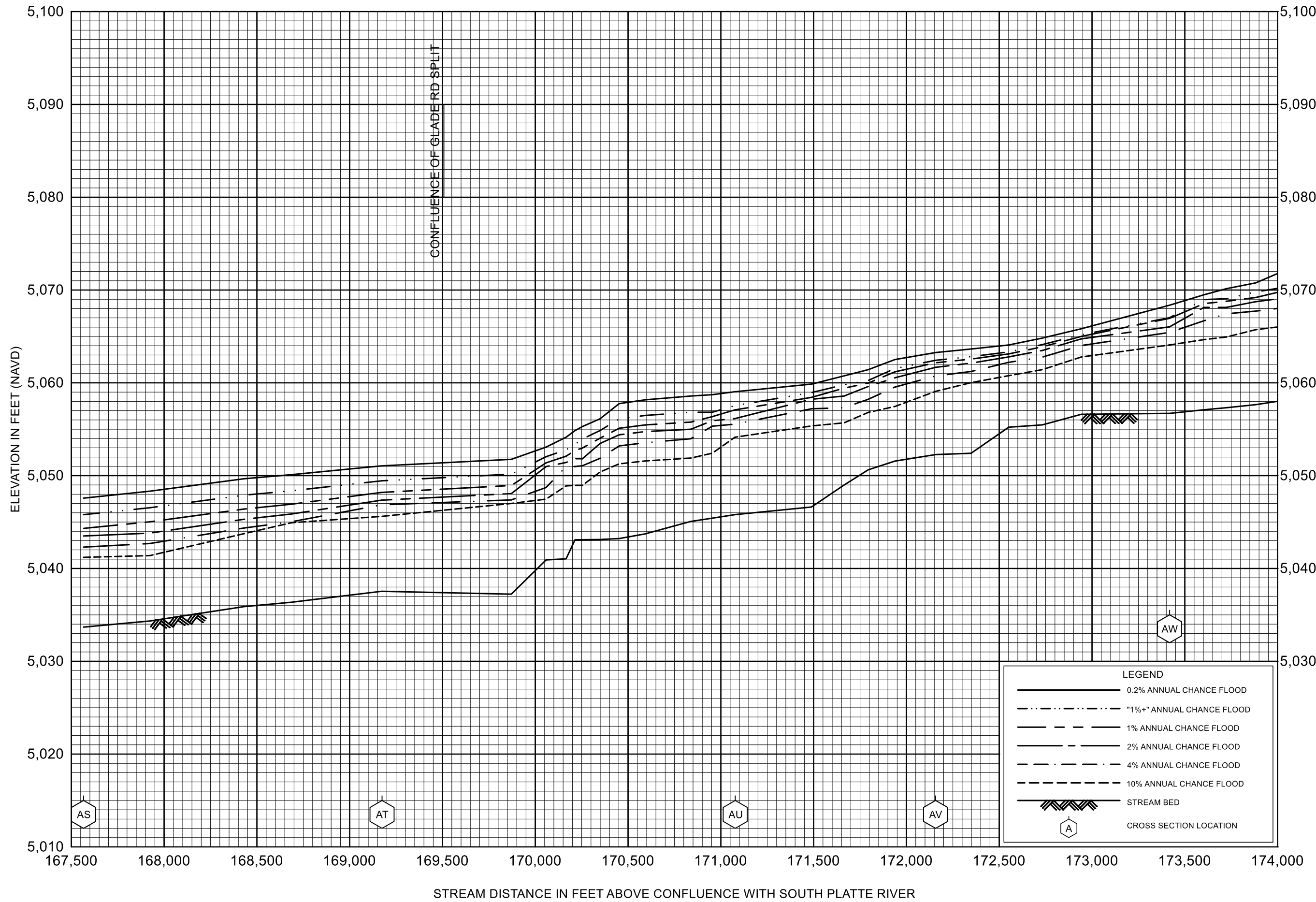
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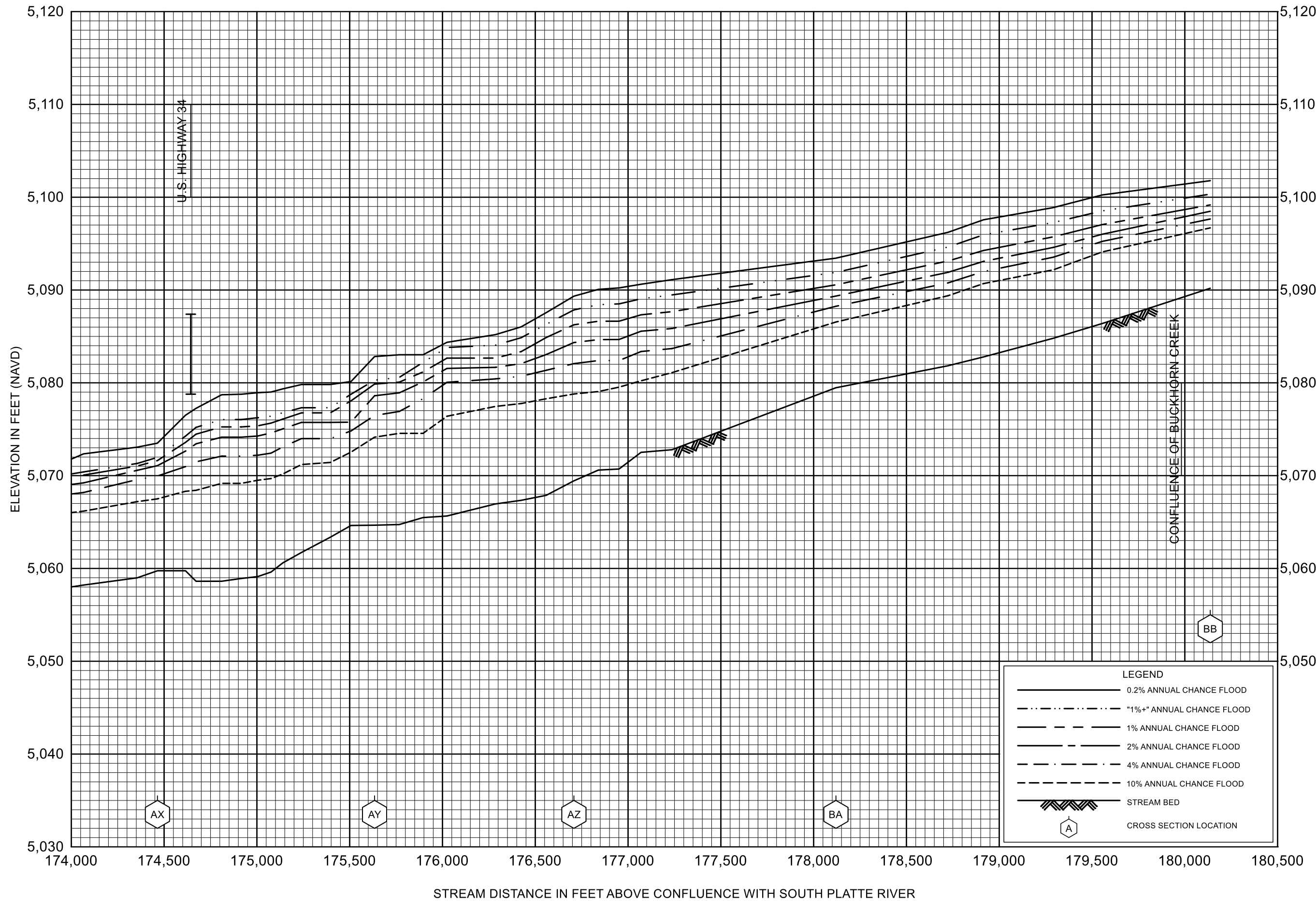
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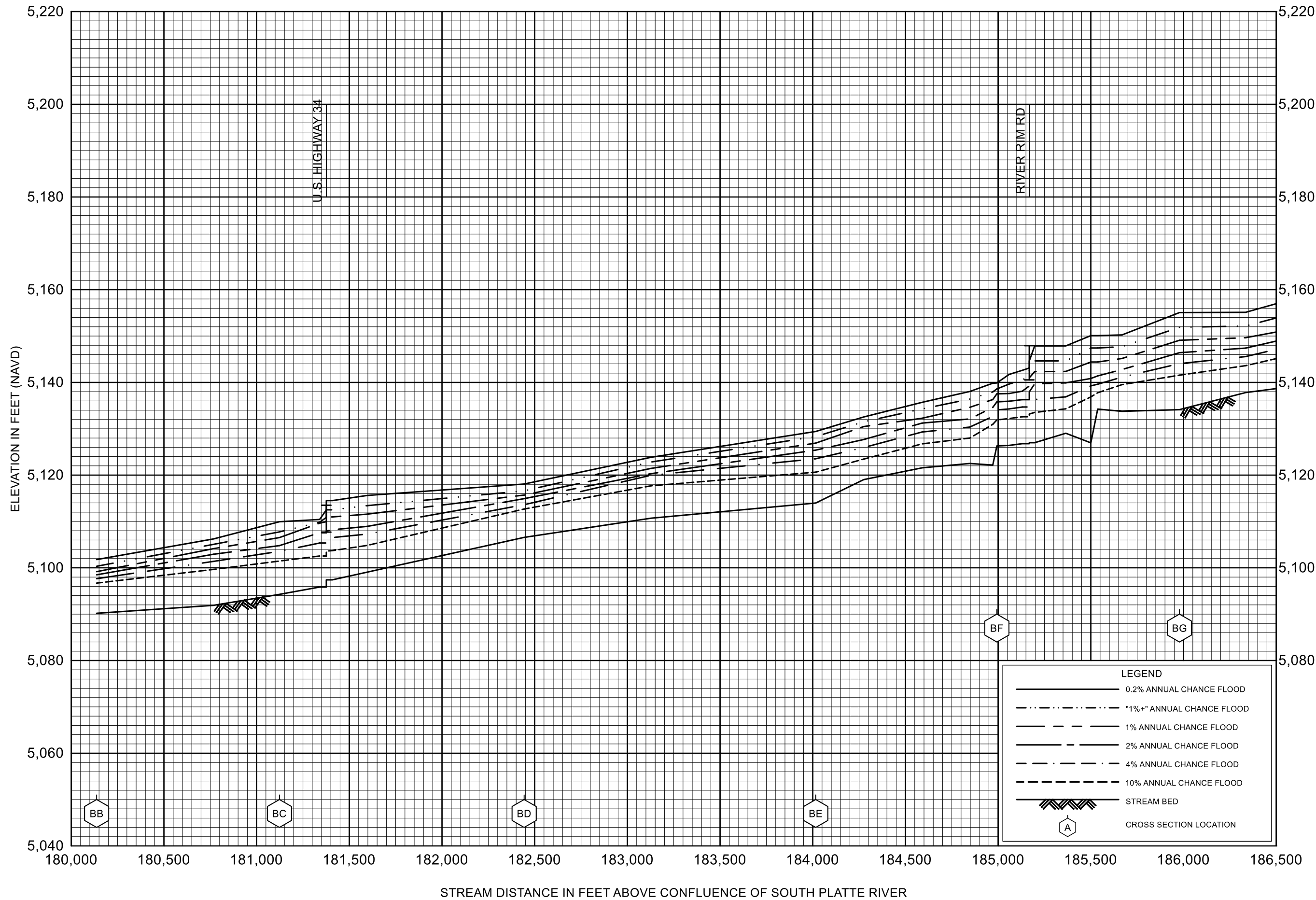
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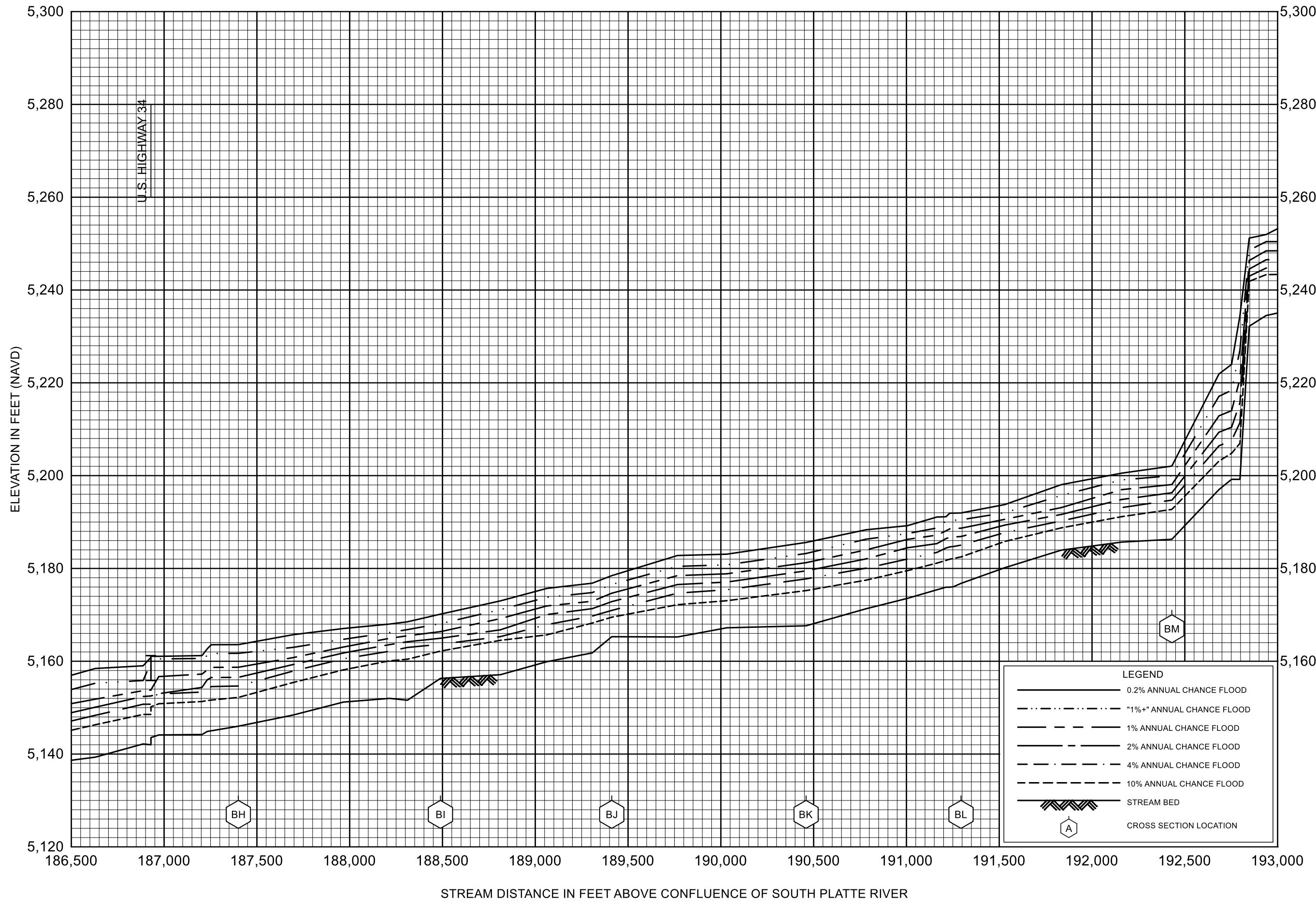
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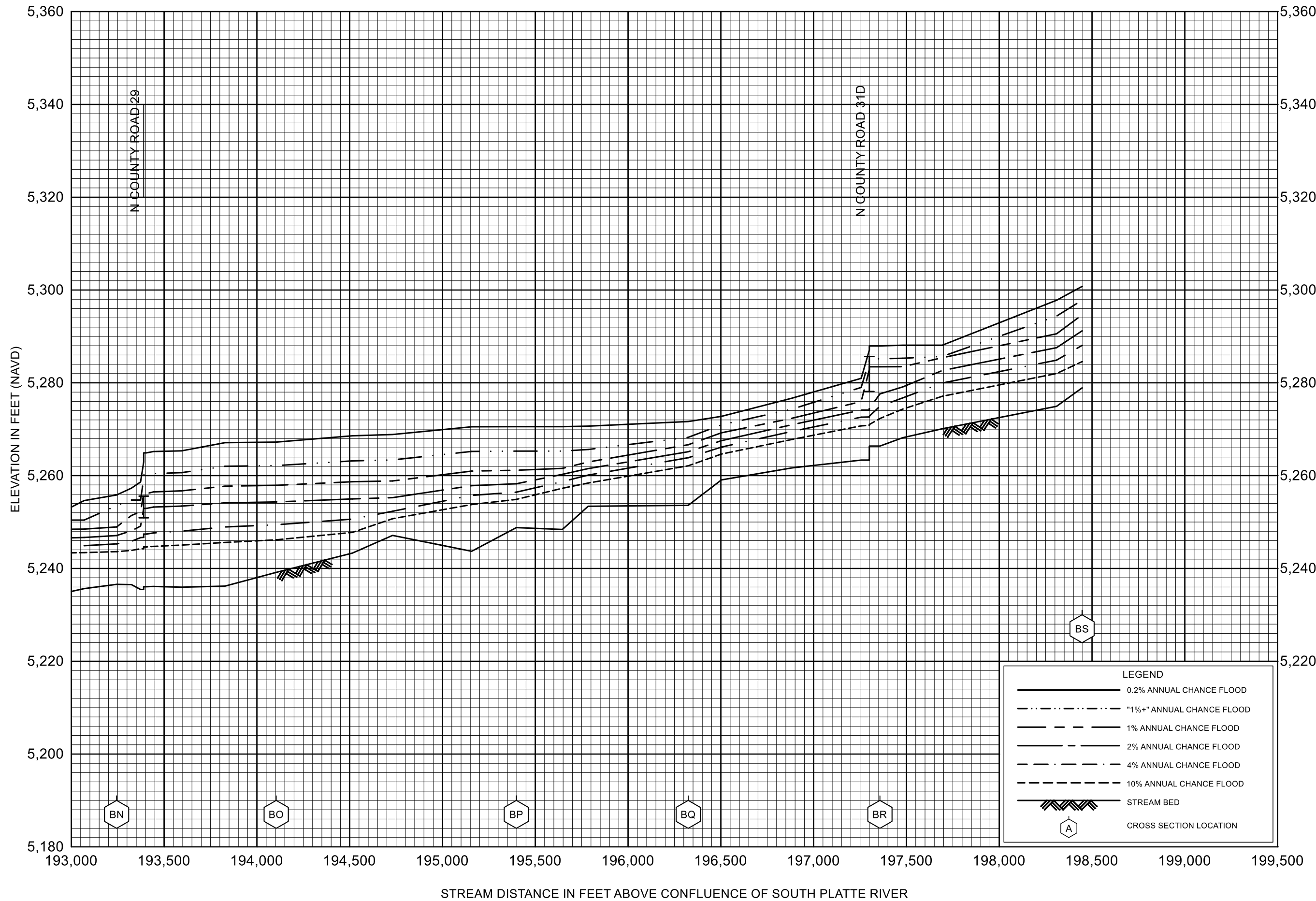


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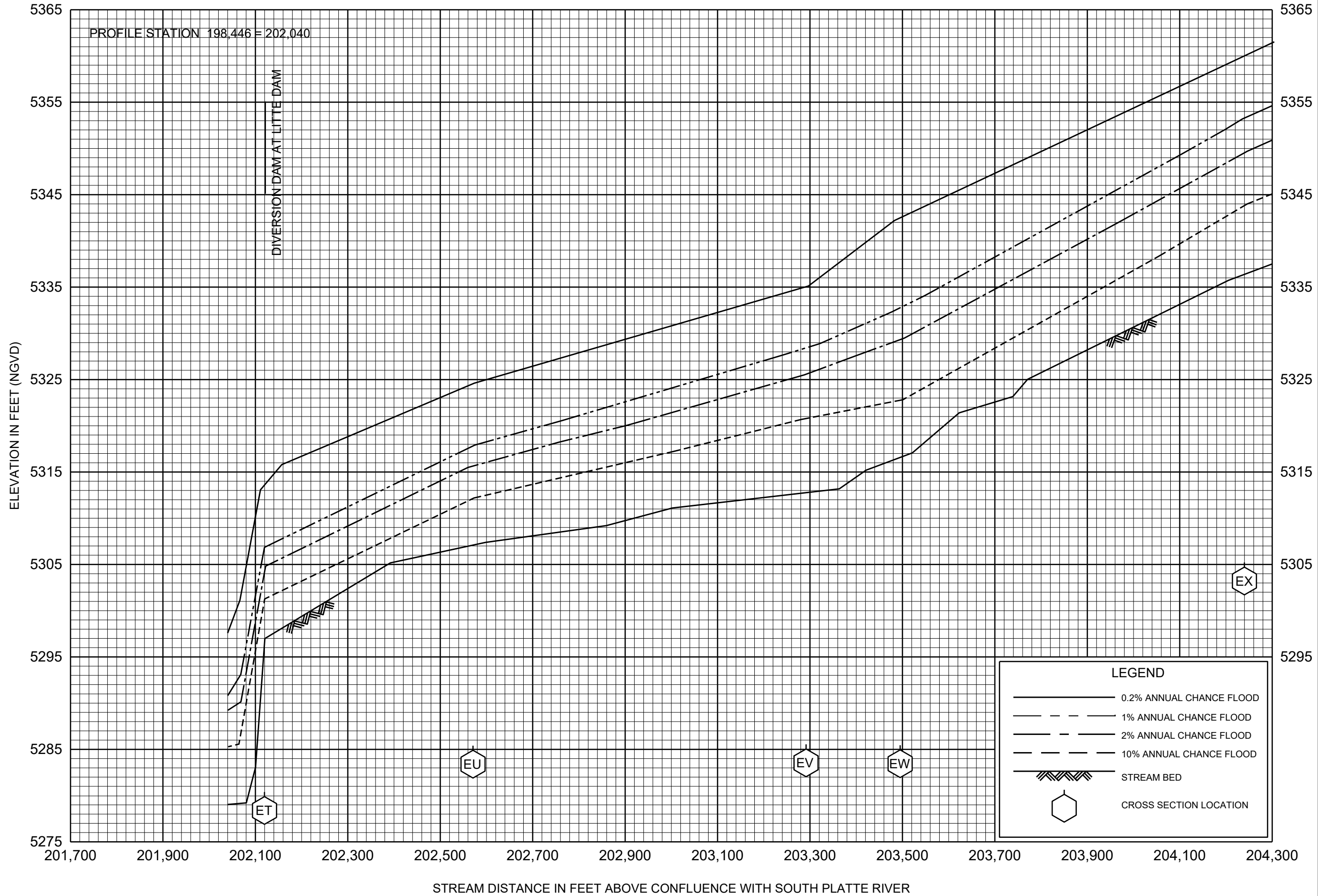
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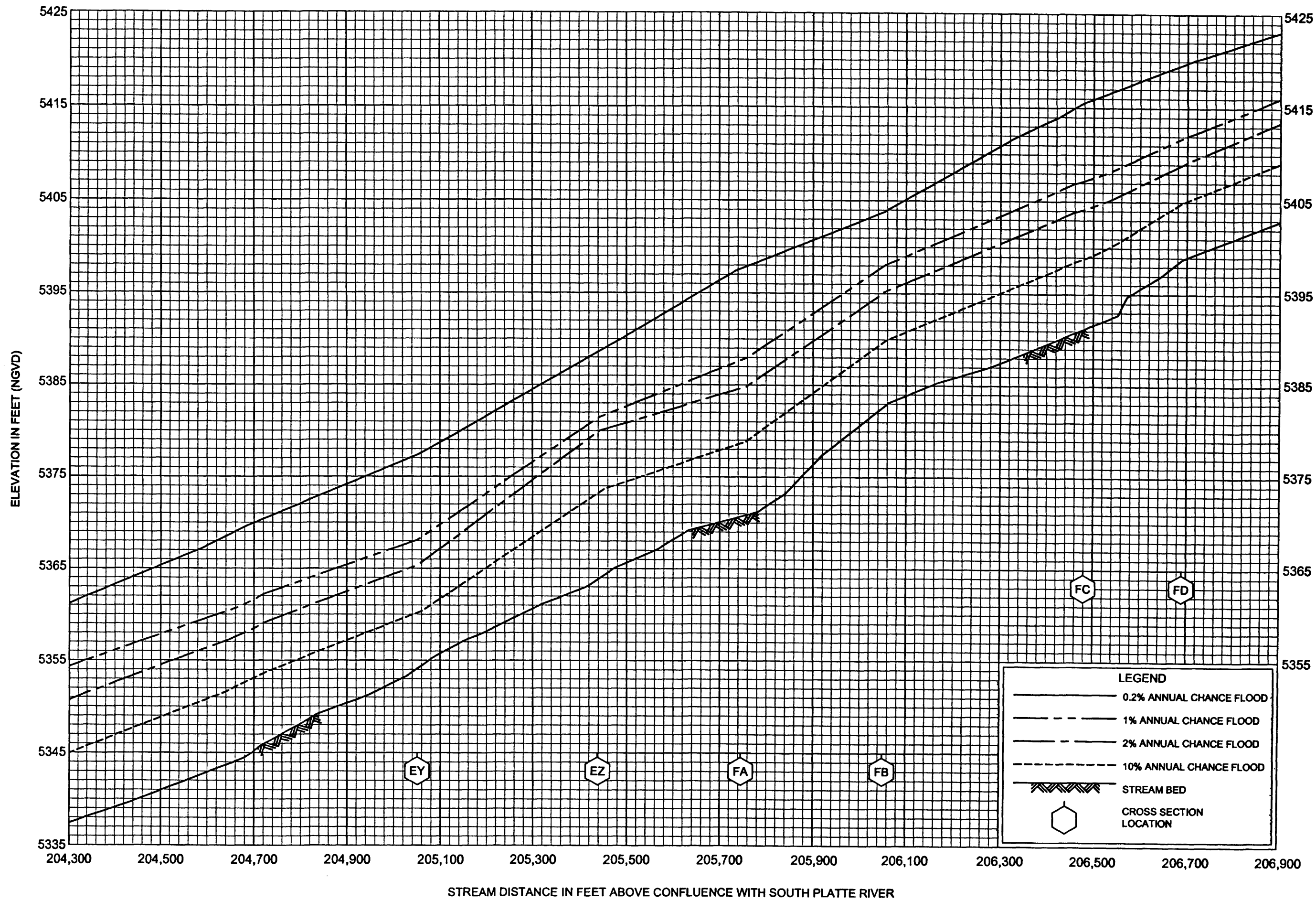
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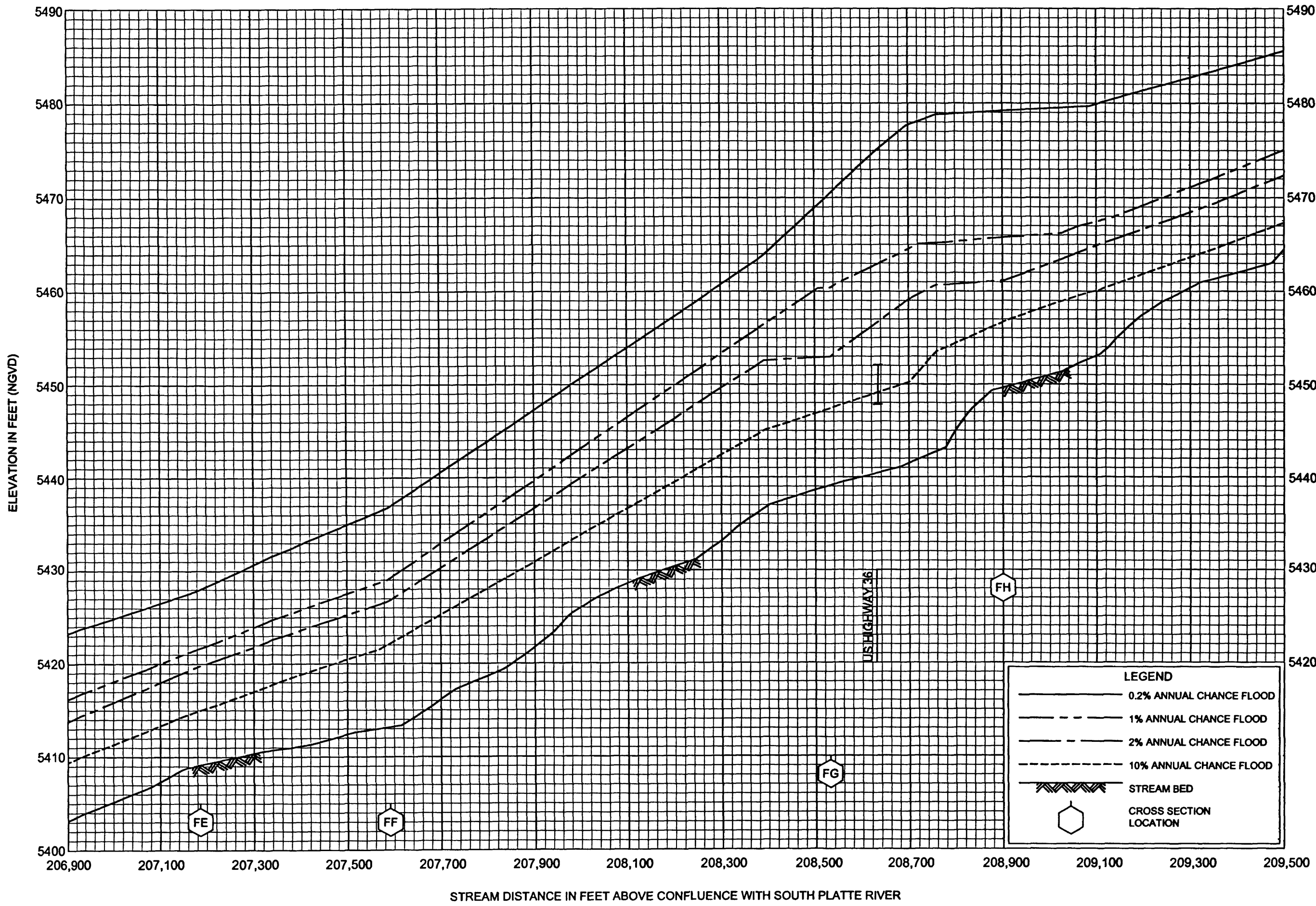
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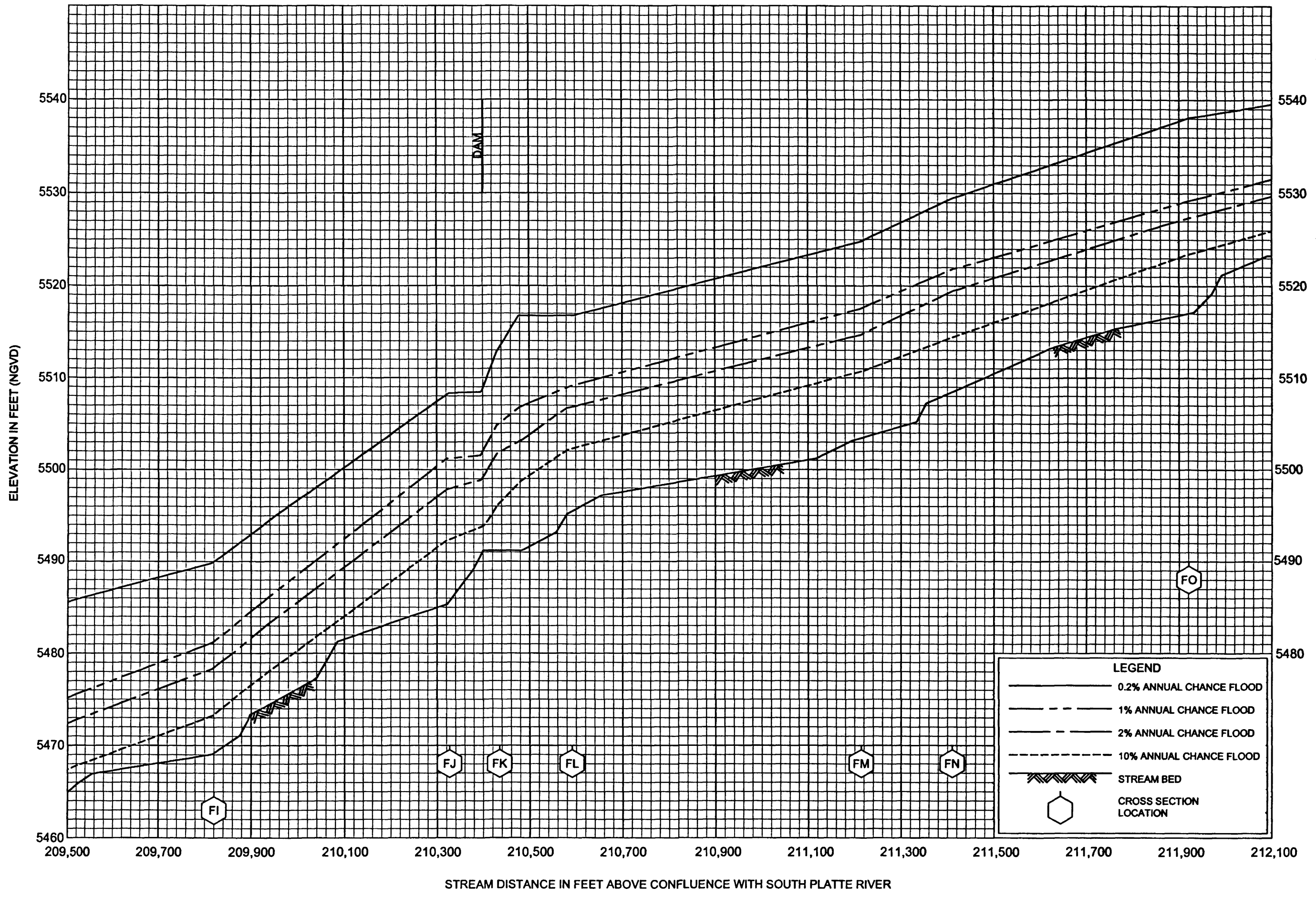
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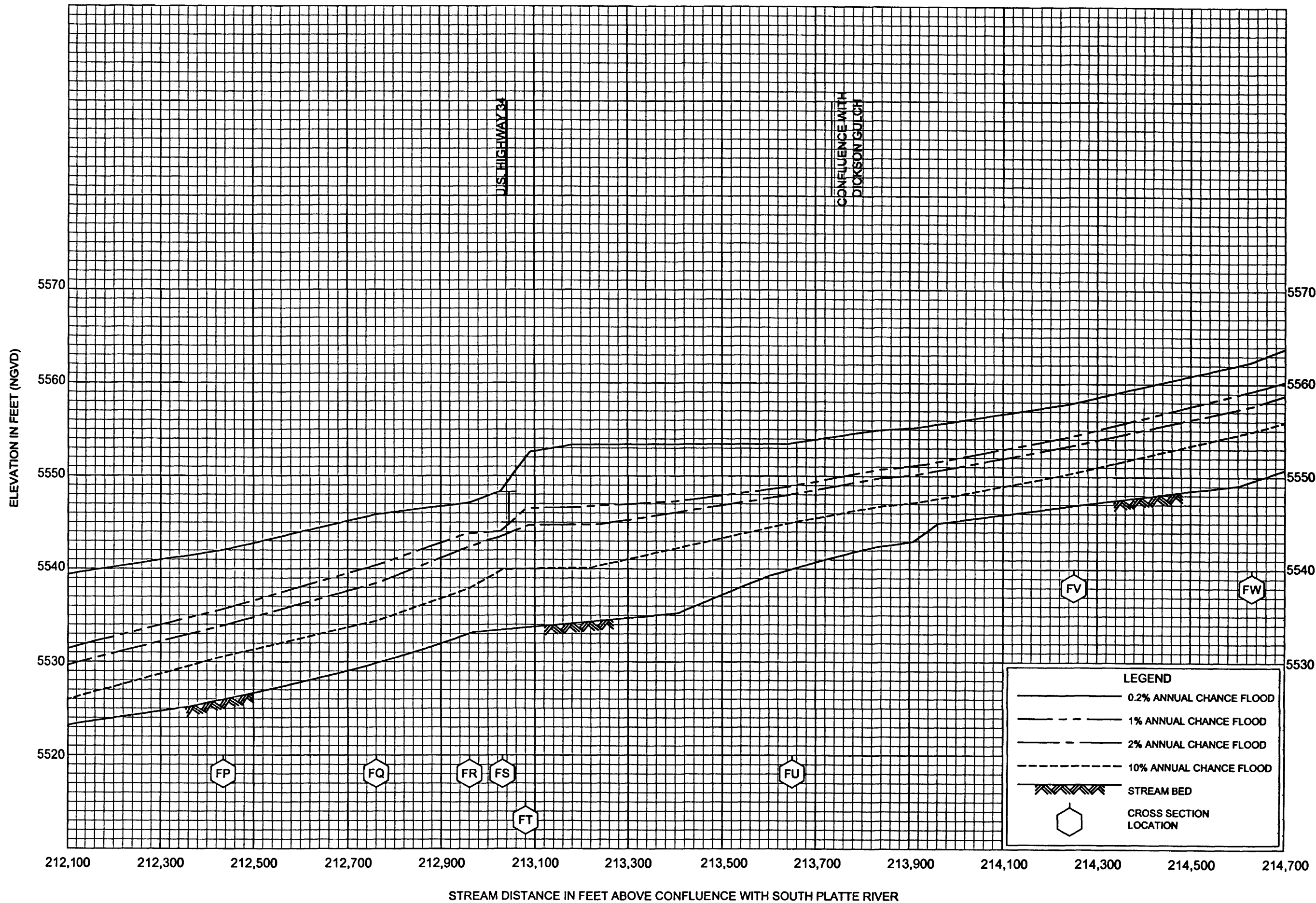
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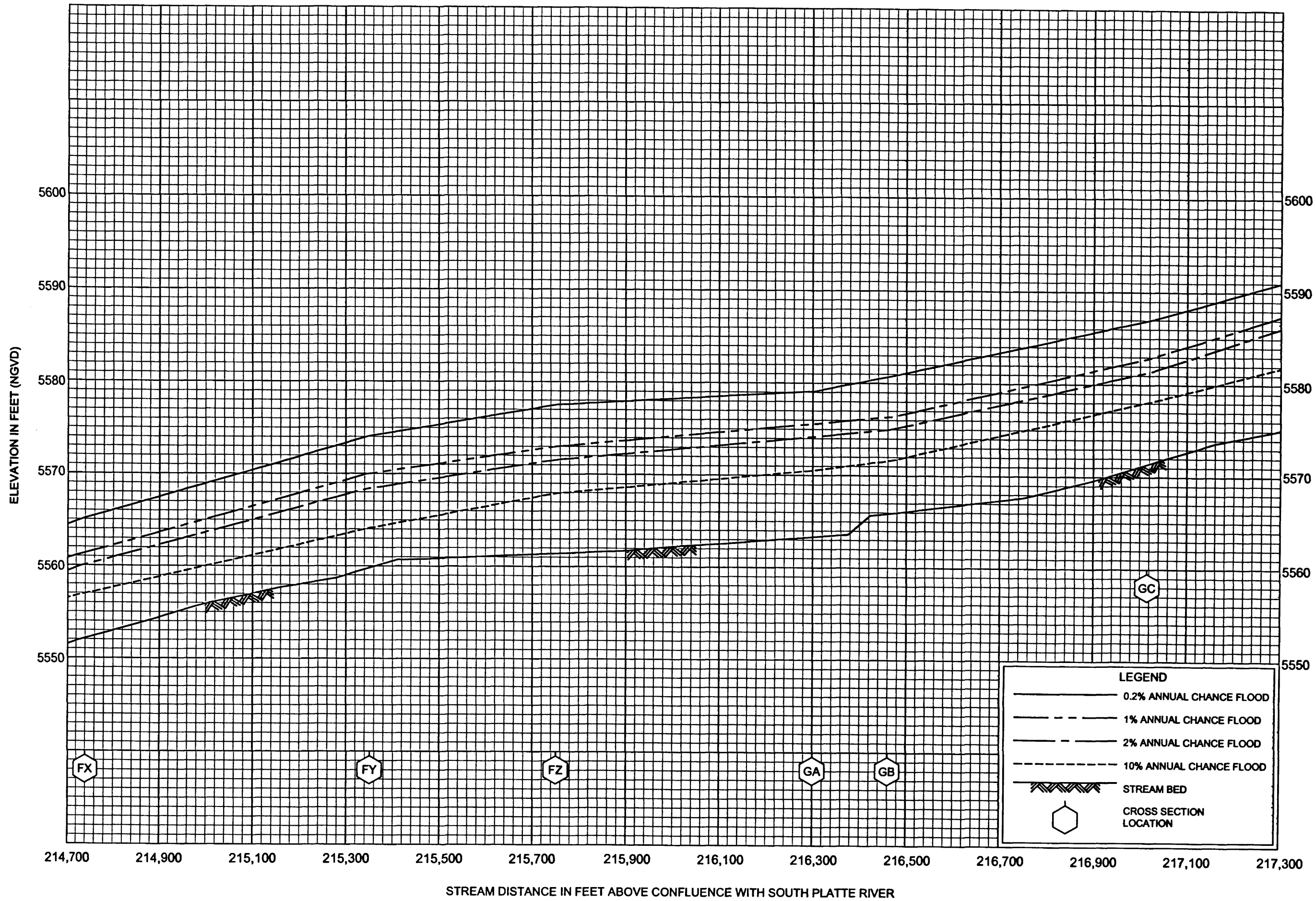
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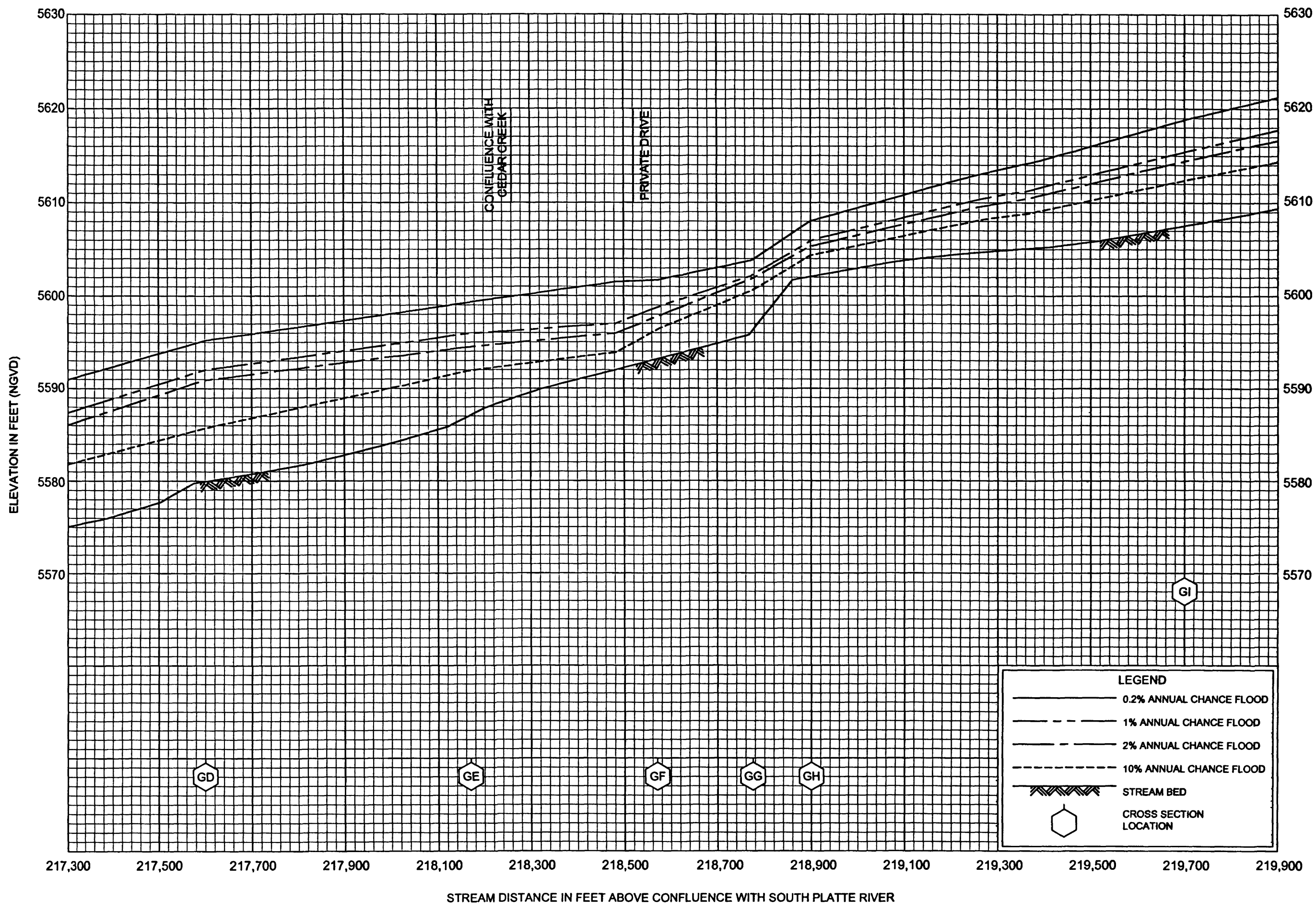
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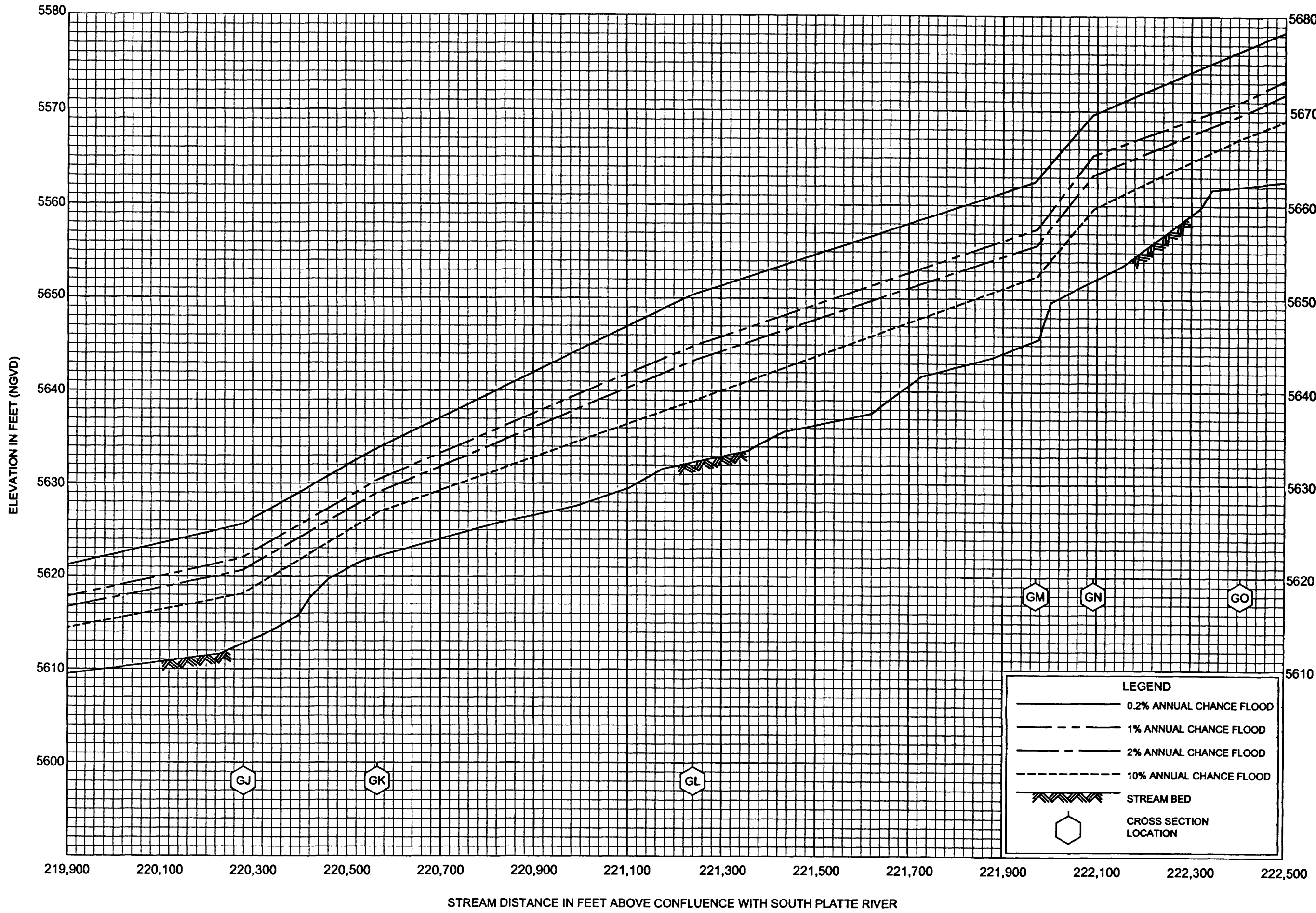
FEDERAL EMERGENCY MANAGEMENT AGENCY
LARAMIE COUNTY, CO
AND INCORPORATED AREAS



| LEGEND | |
|--------|--------------------------|
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| | 1% ANNUAL CHANCE FLOOD |
| | 2% ANNUAL CHANCE FLOOD |
| | 10% ANNUAL CHANCE FLOOD |
| | STREAM BED |
| | CROSS SECTION LOCATION |

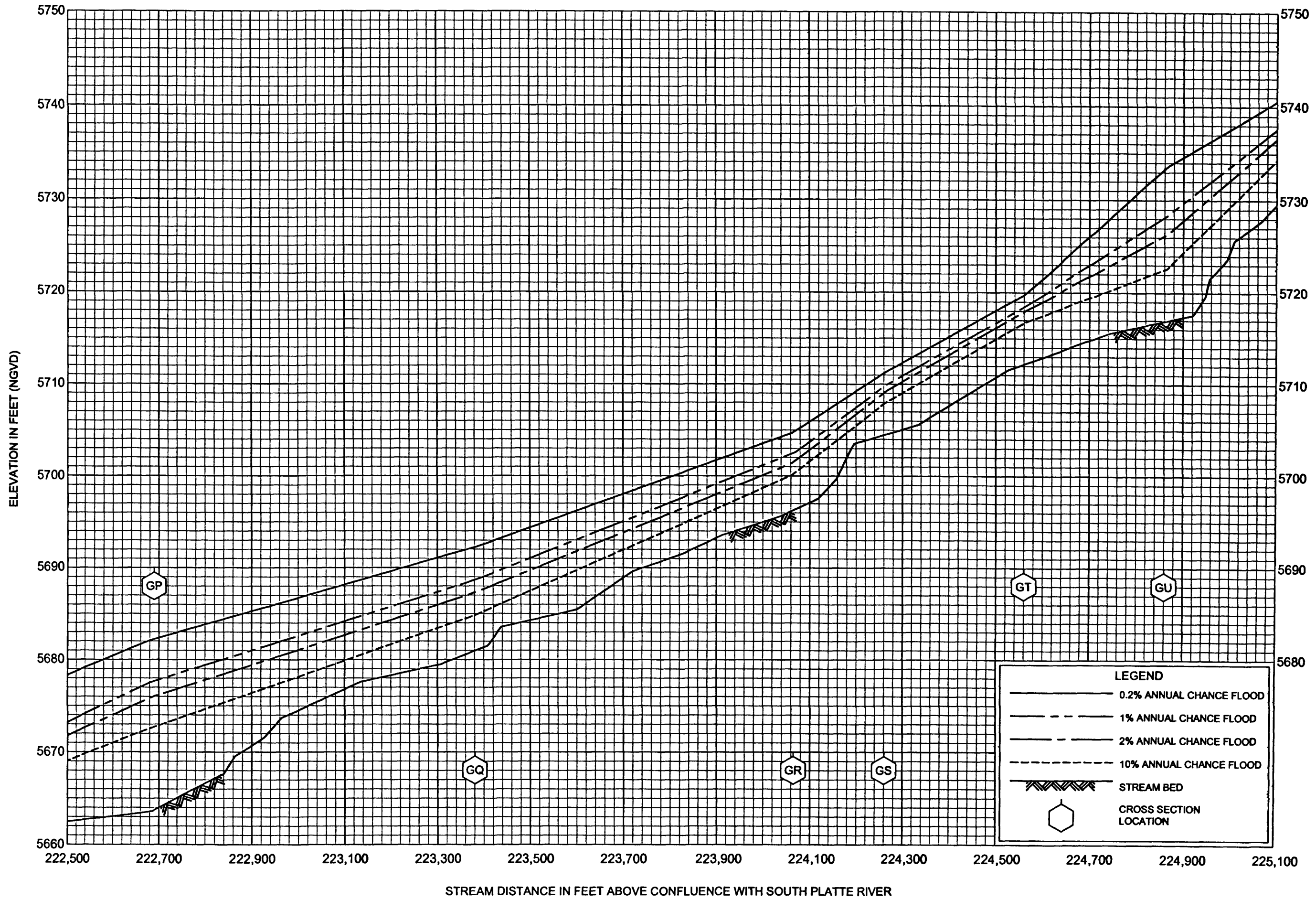
FLOOD PROFILES
BIG THOMPSON RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY
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**FLOOD PROFILES
BIG THOMPSON RIVER**

**FEDERAL EMERGENCY MANAGEMENT AGENCY
LARIMER COUNTY, CO
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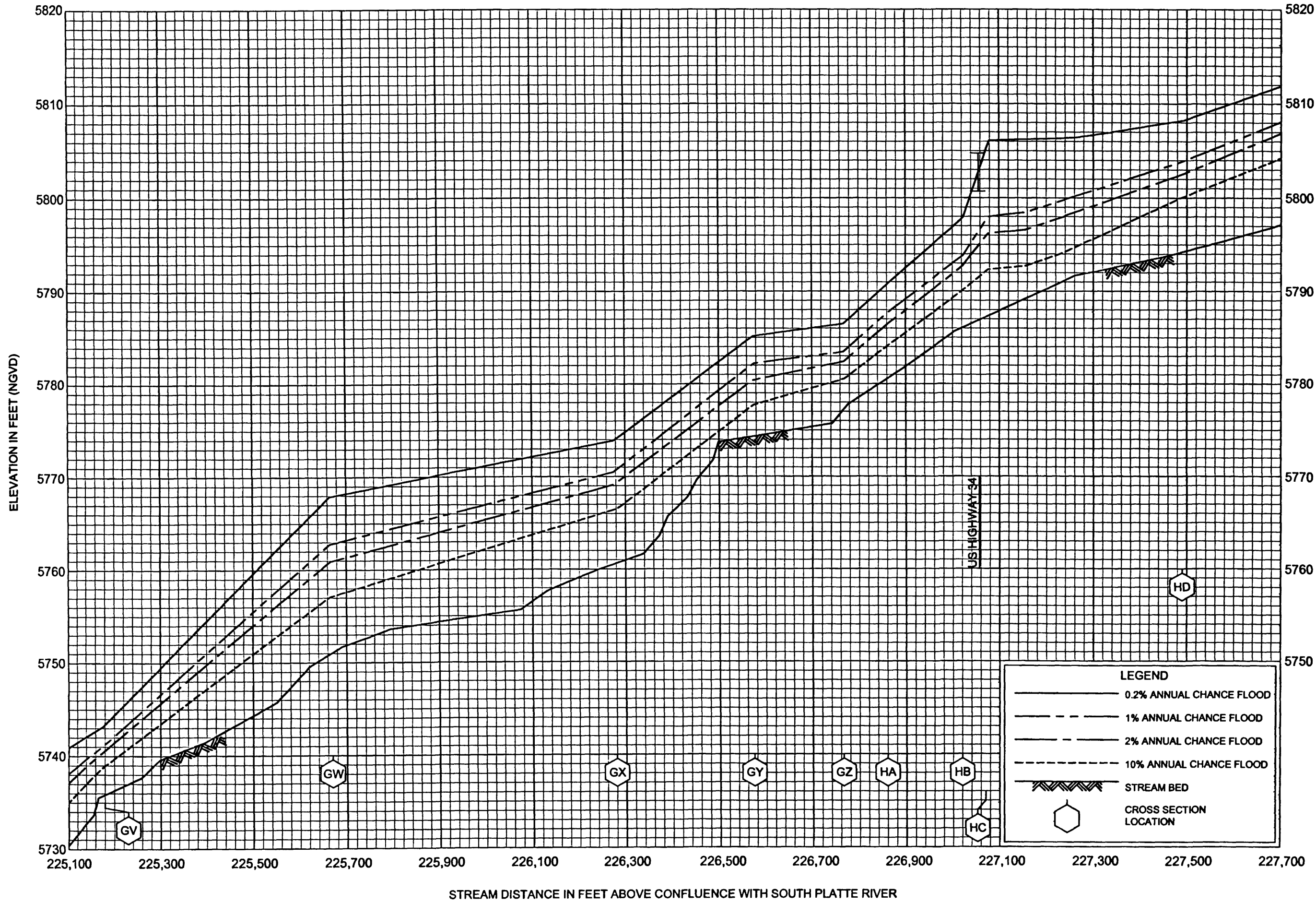
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BIG THOMPSON RIVER

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
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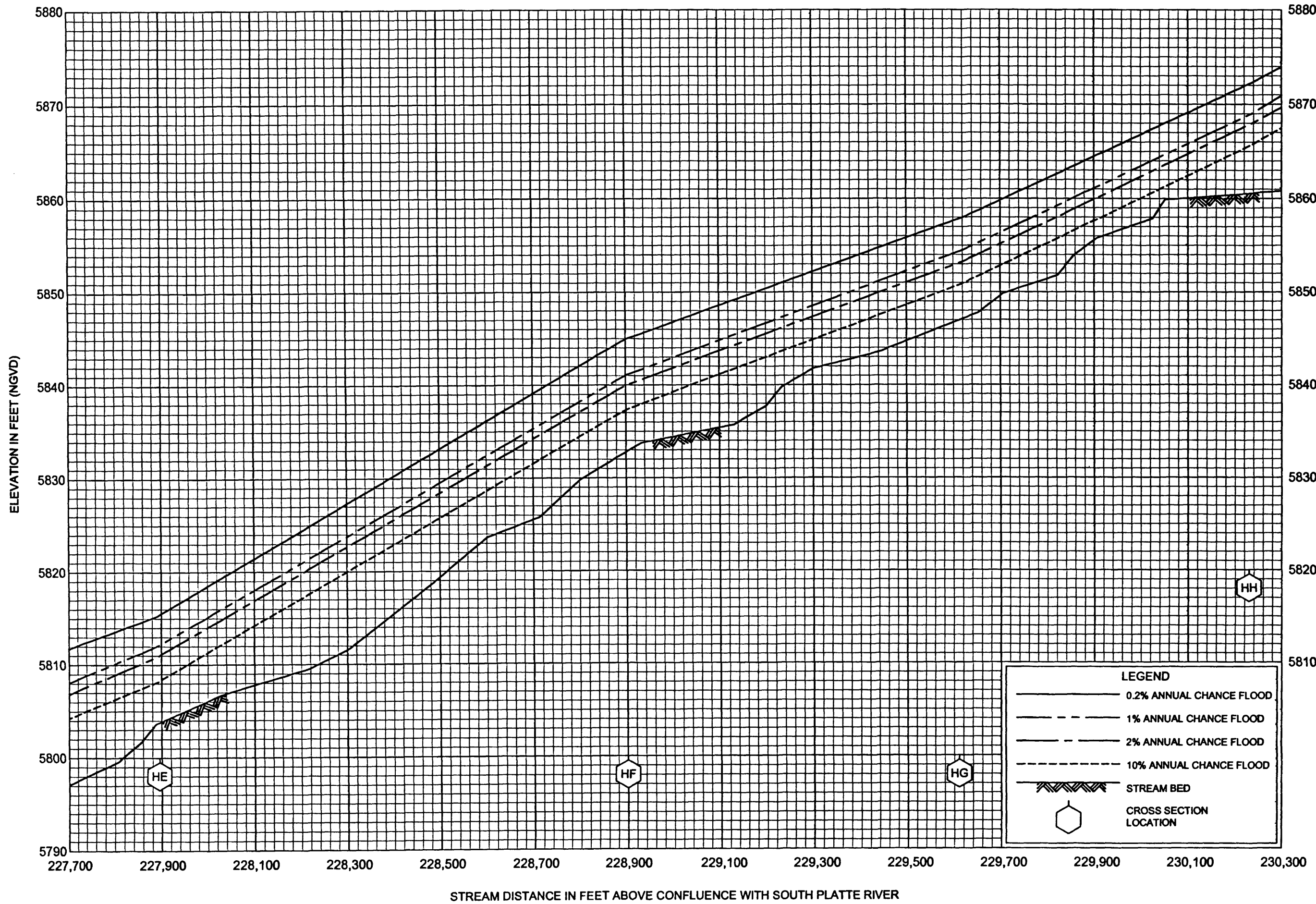
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**FLOOD PROFILES
BIG THOMPSON RIVER**

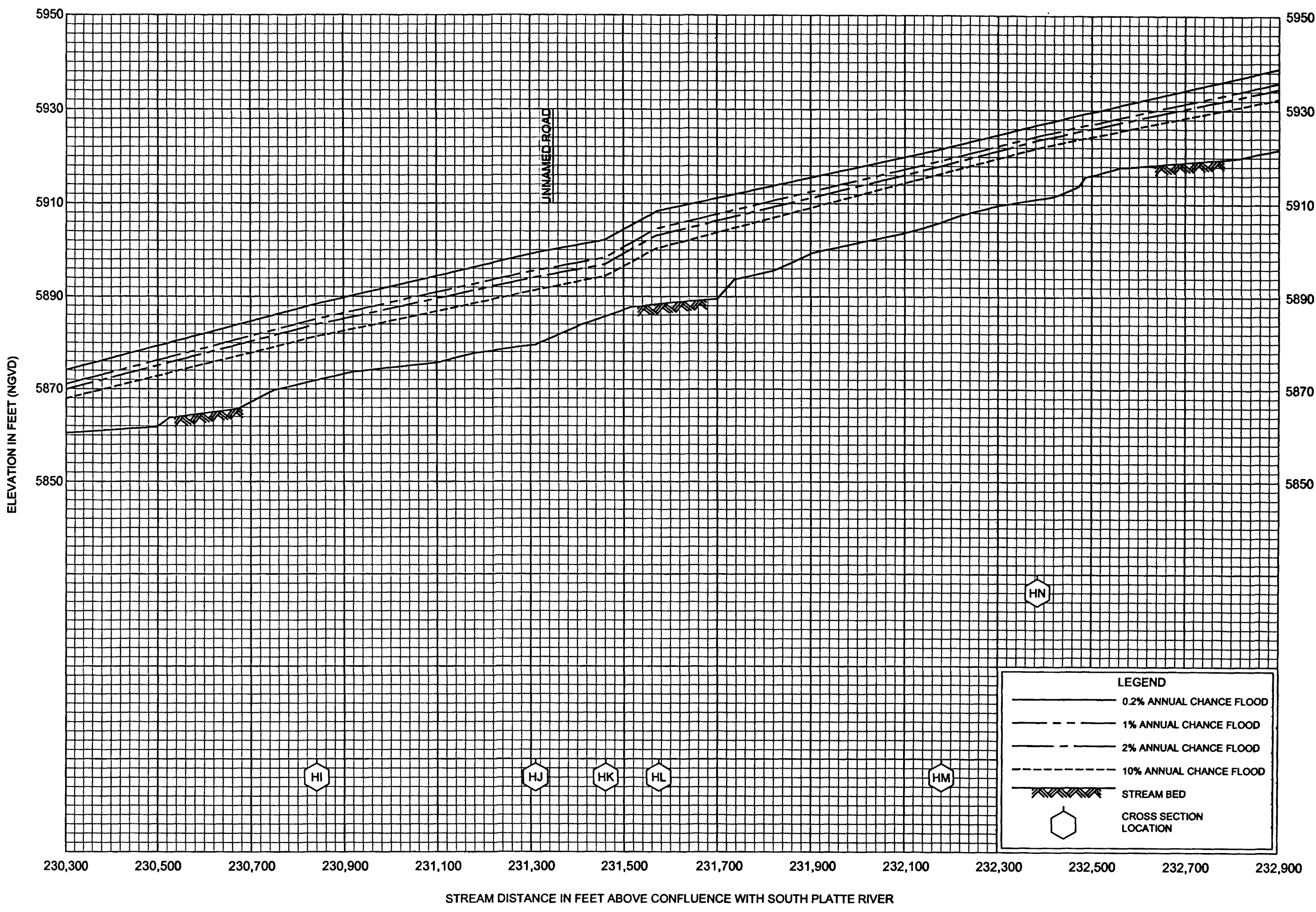
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AND INCORPORATED AREAS**

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FLOOD PROFILES
BIG THOMPSON RIVER

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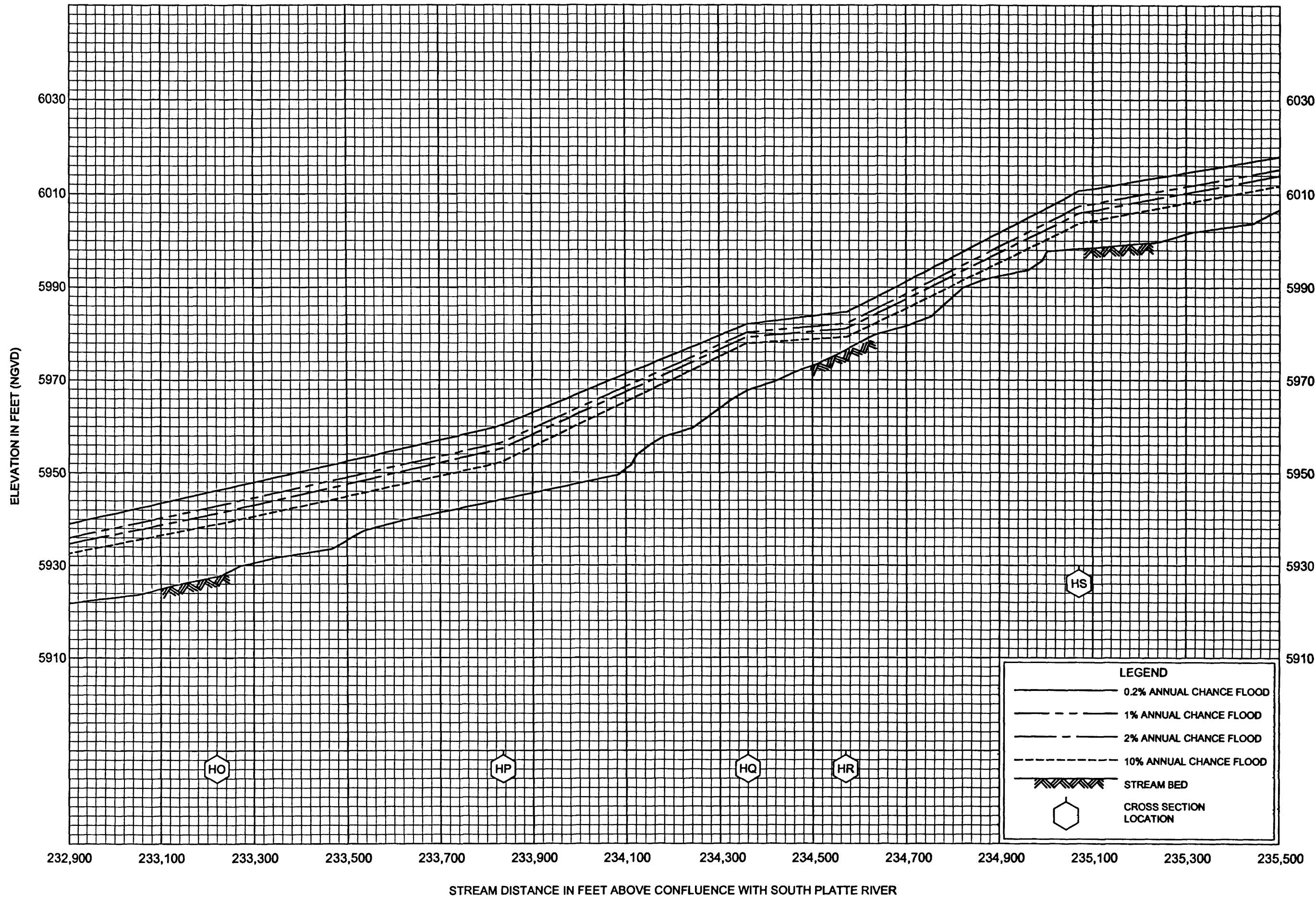
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BIG THOMPSON RIVER

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
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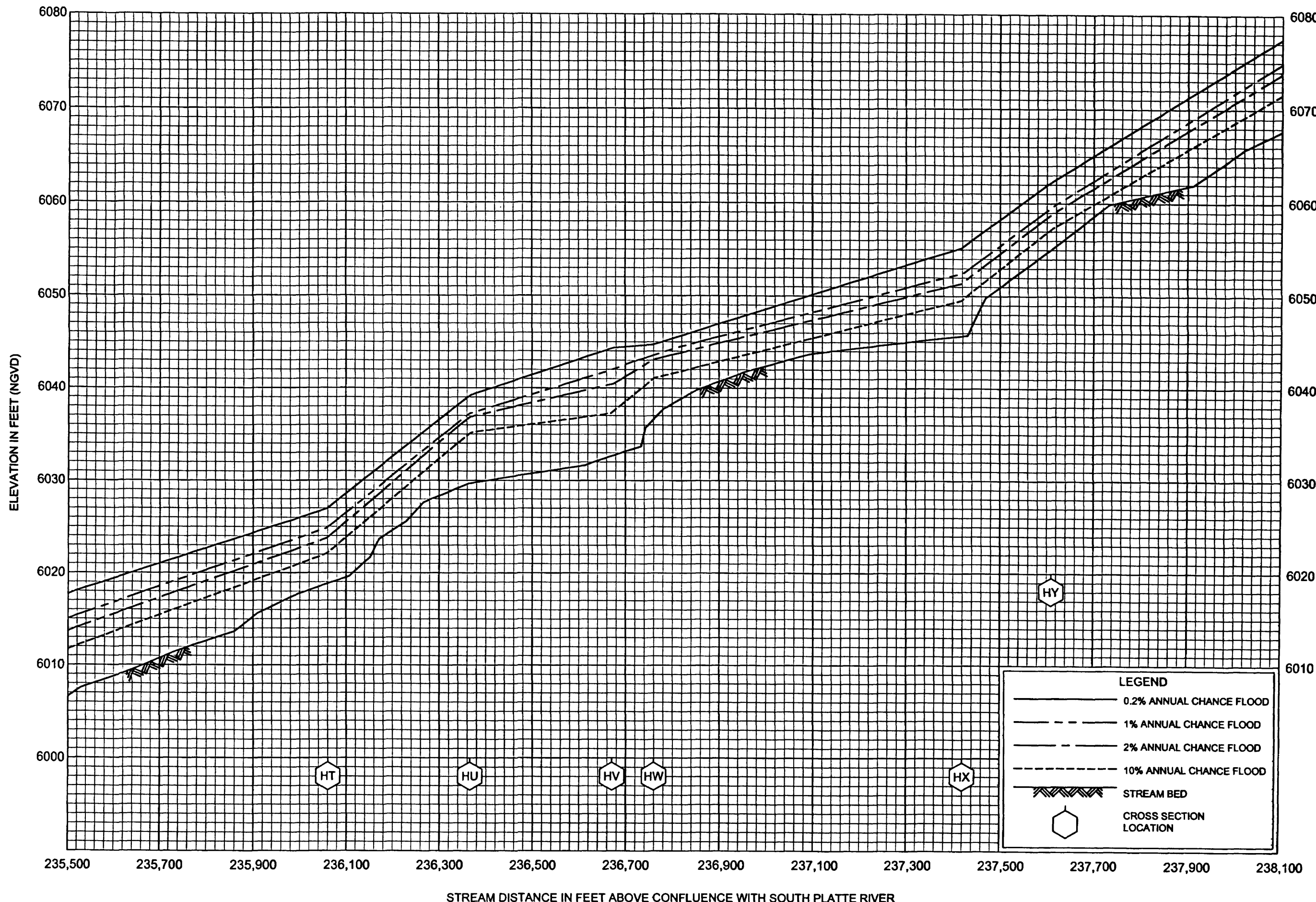
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BIG THOMPSON RIVER**

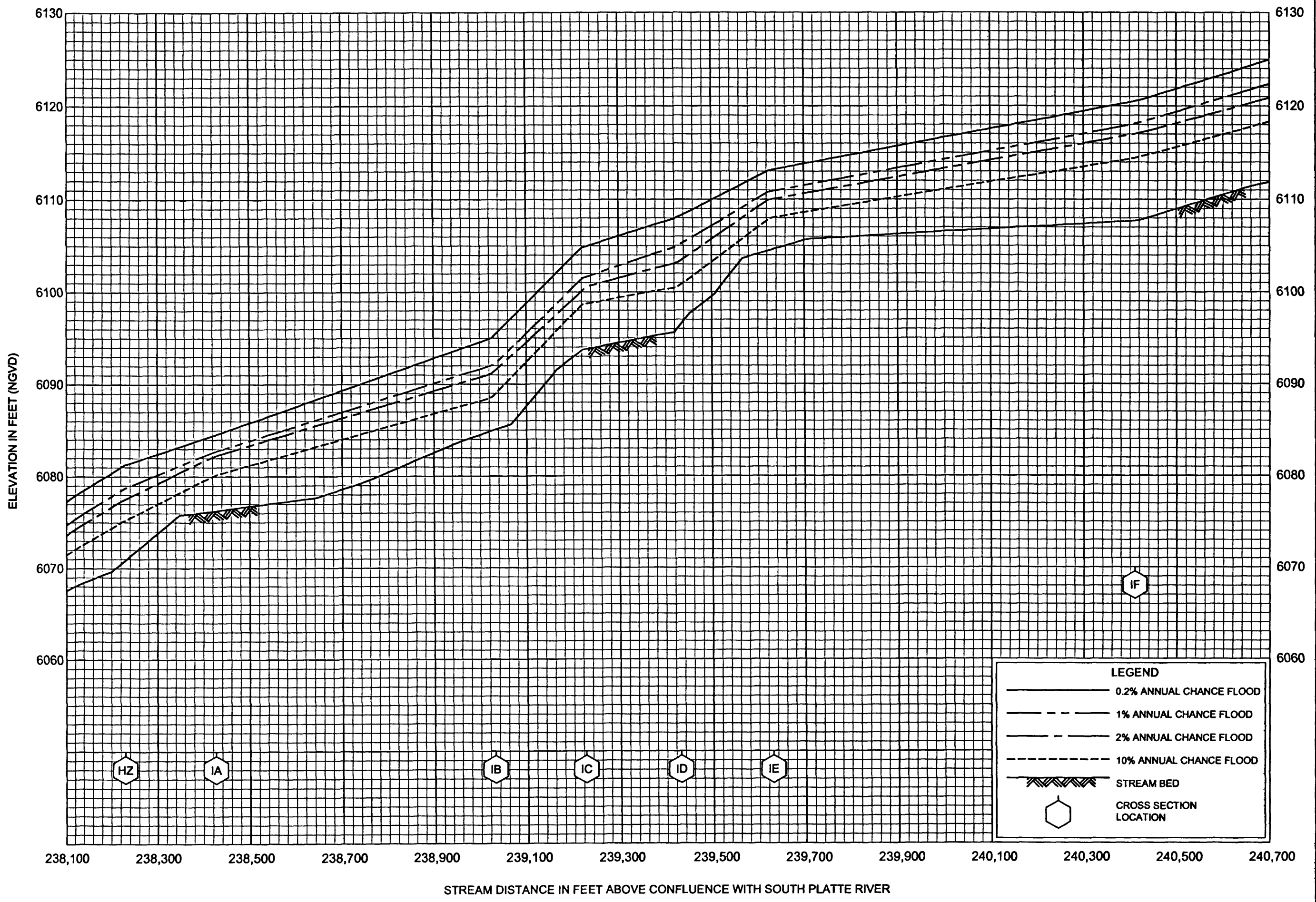
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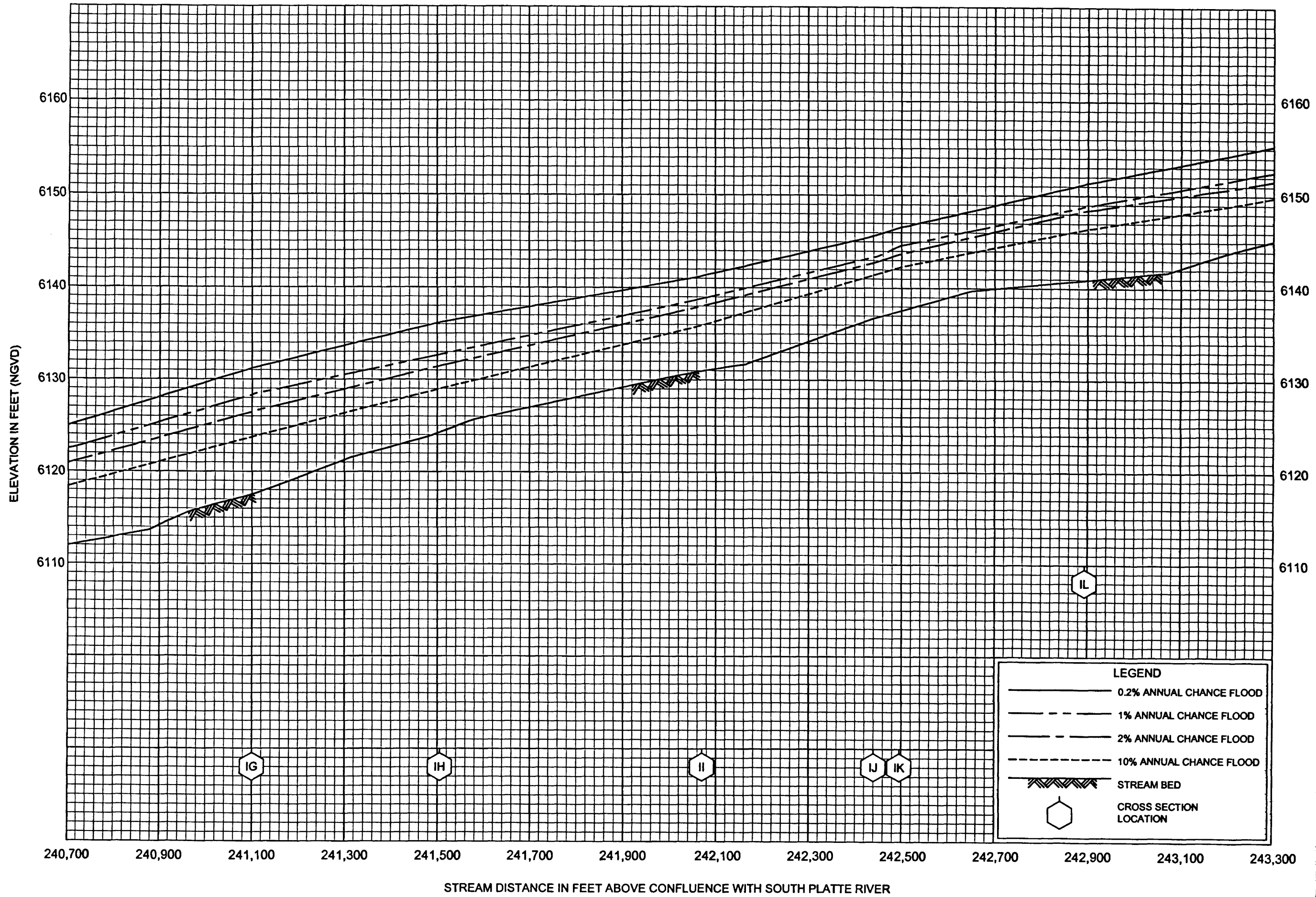
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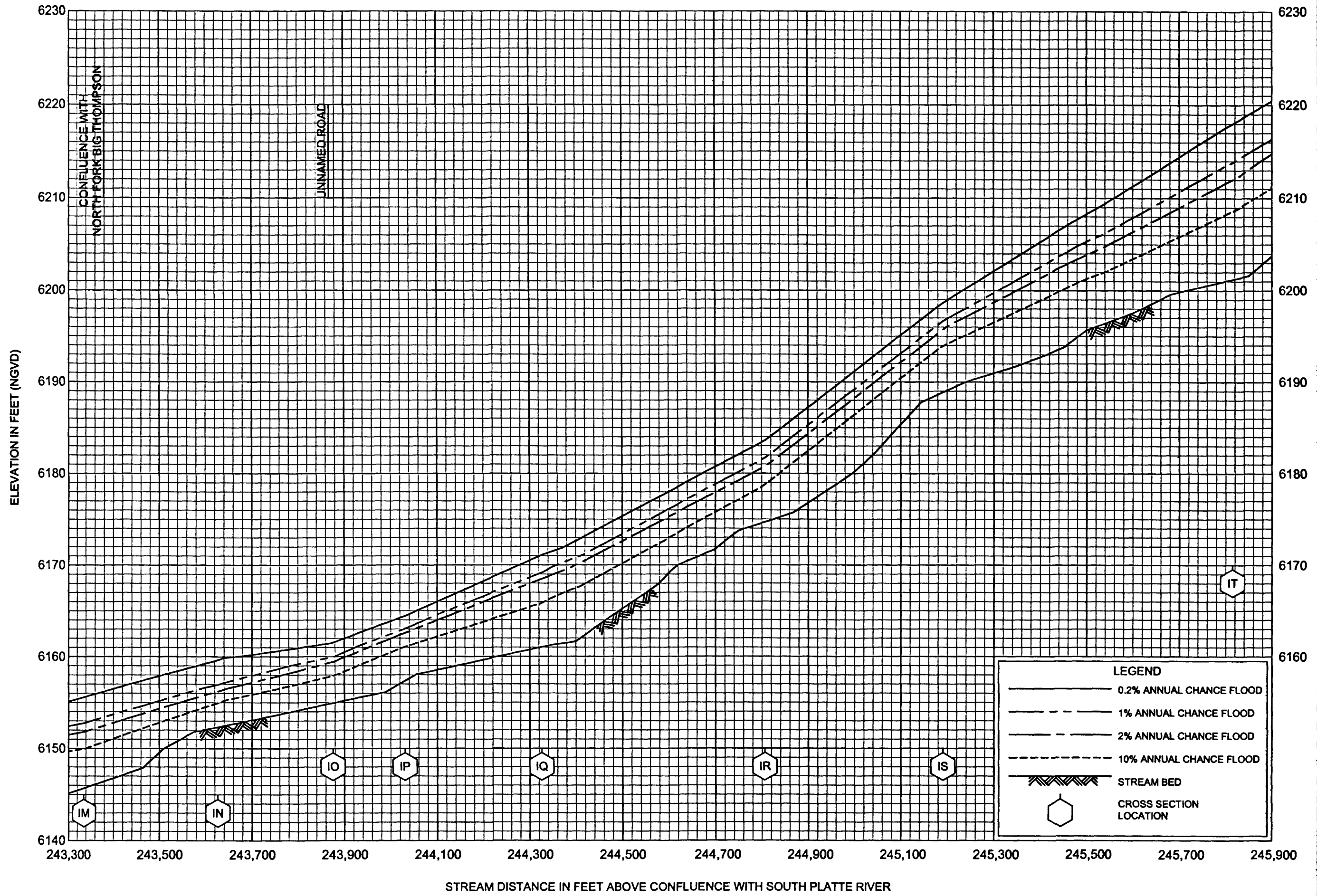
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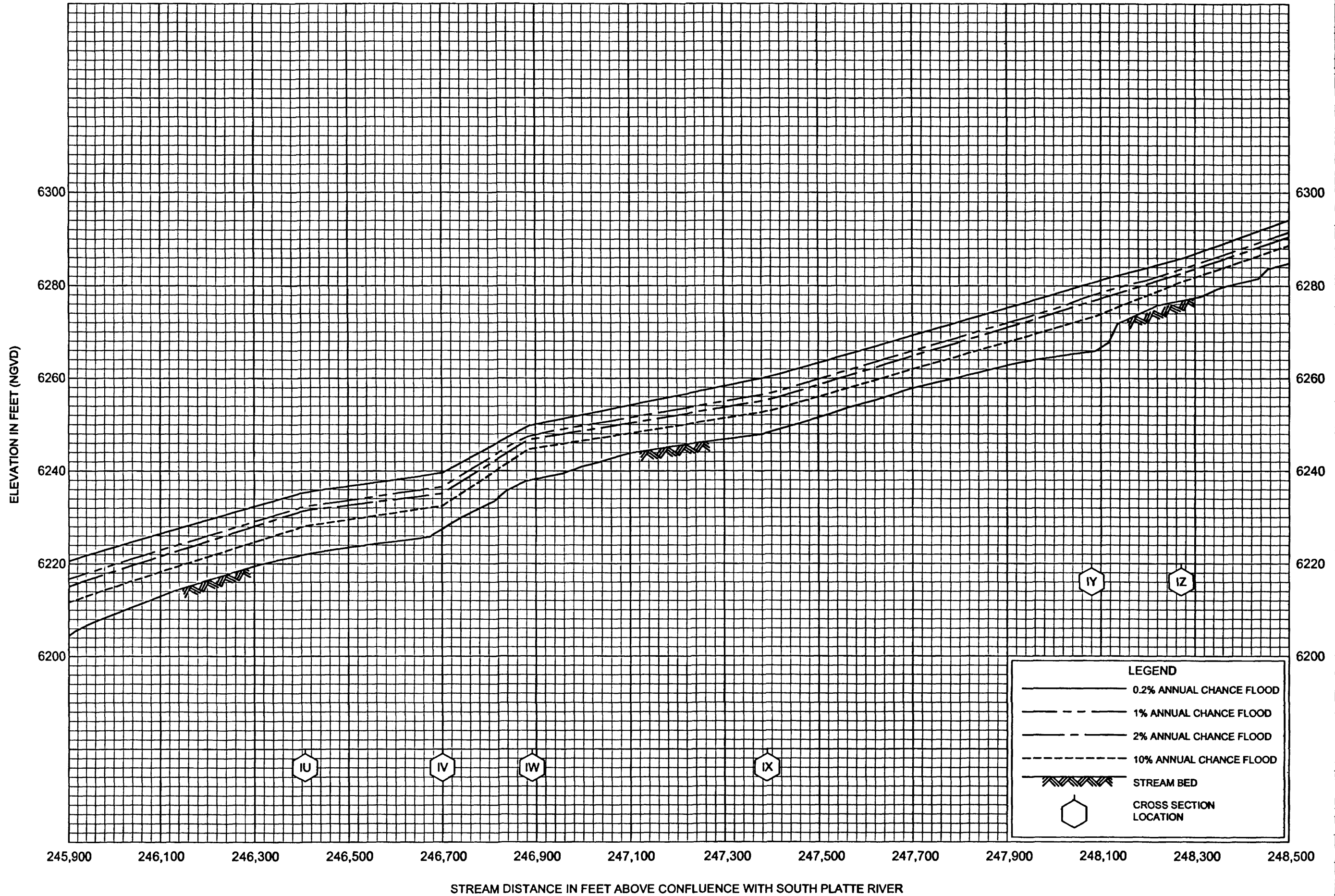
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BIG THOMPSON RIVER

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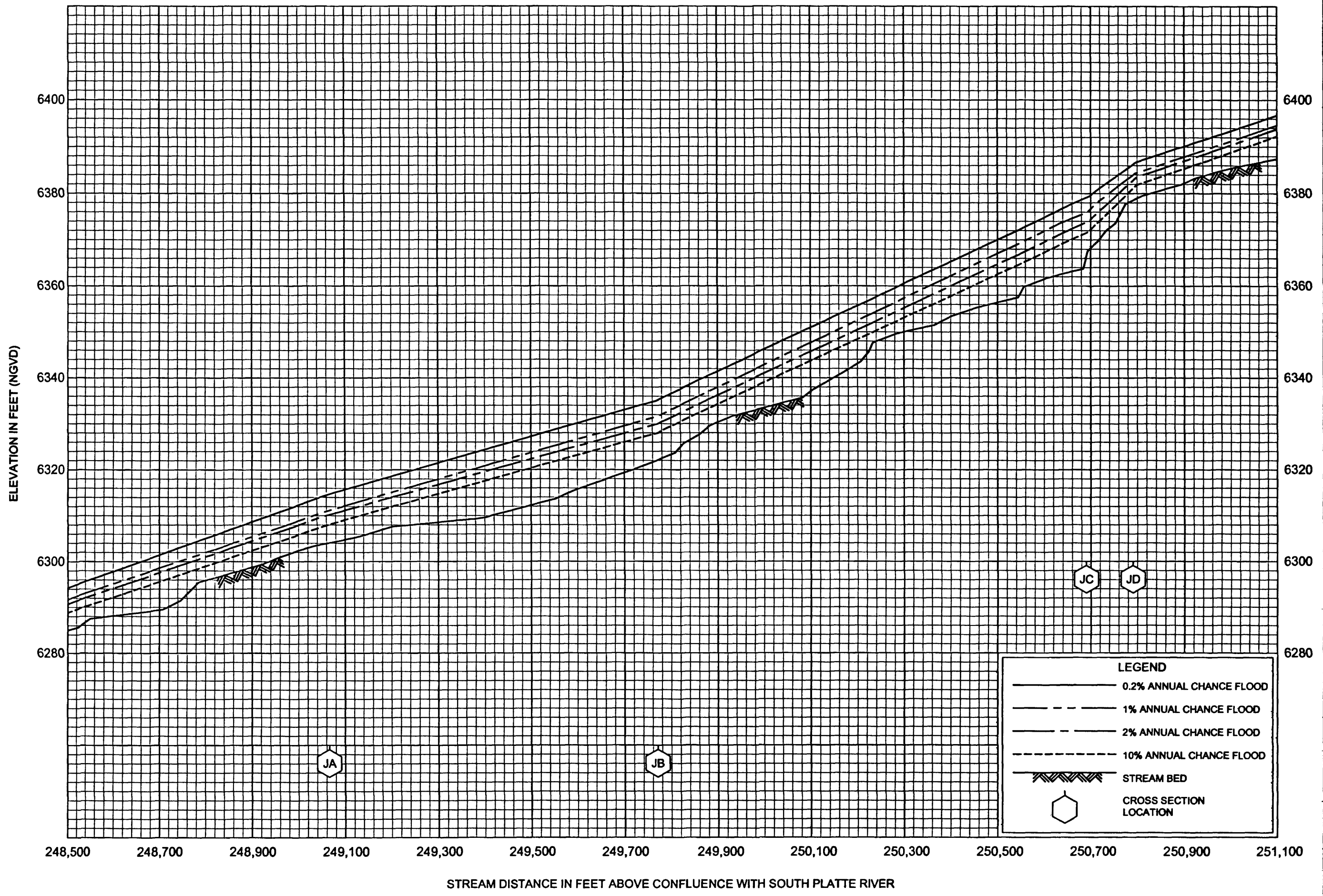








LEGEND

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BIG THOMPSON RIVER

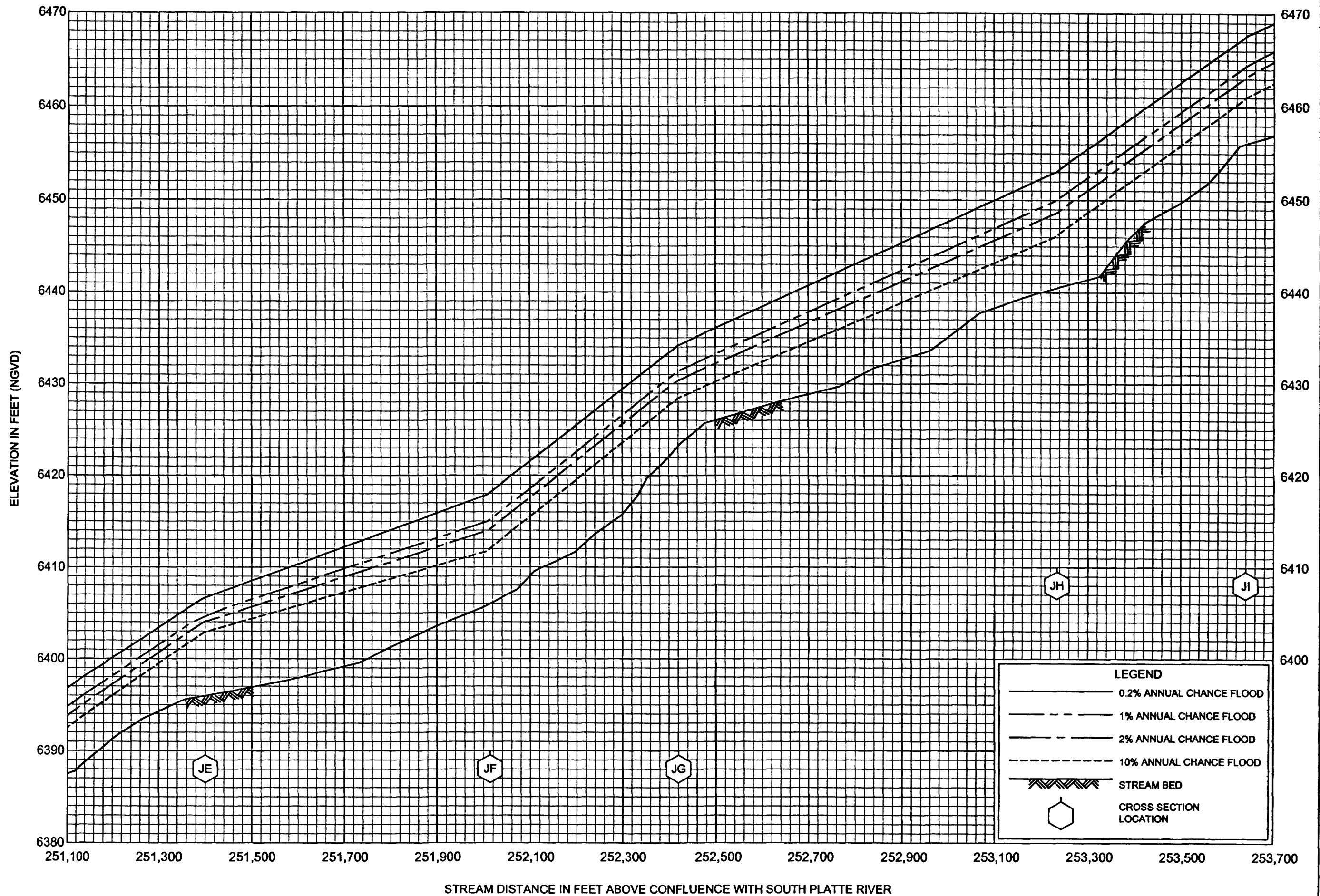
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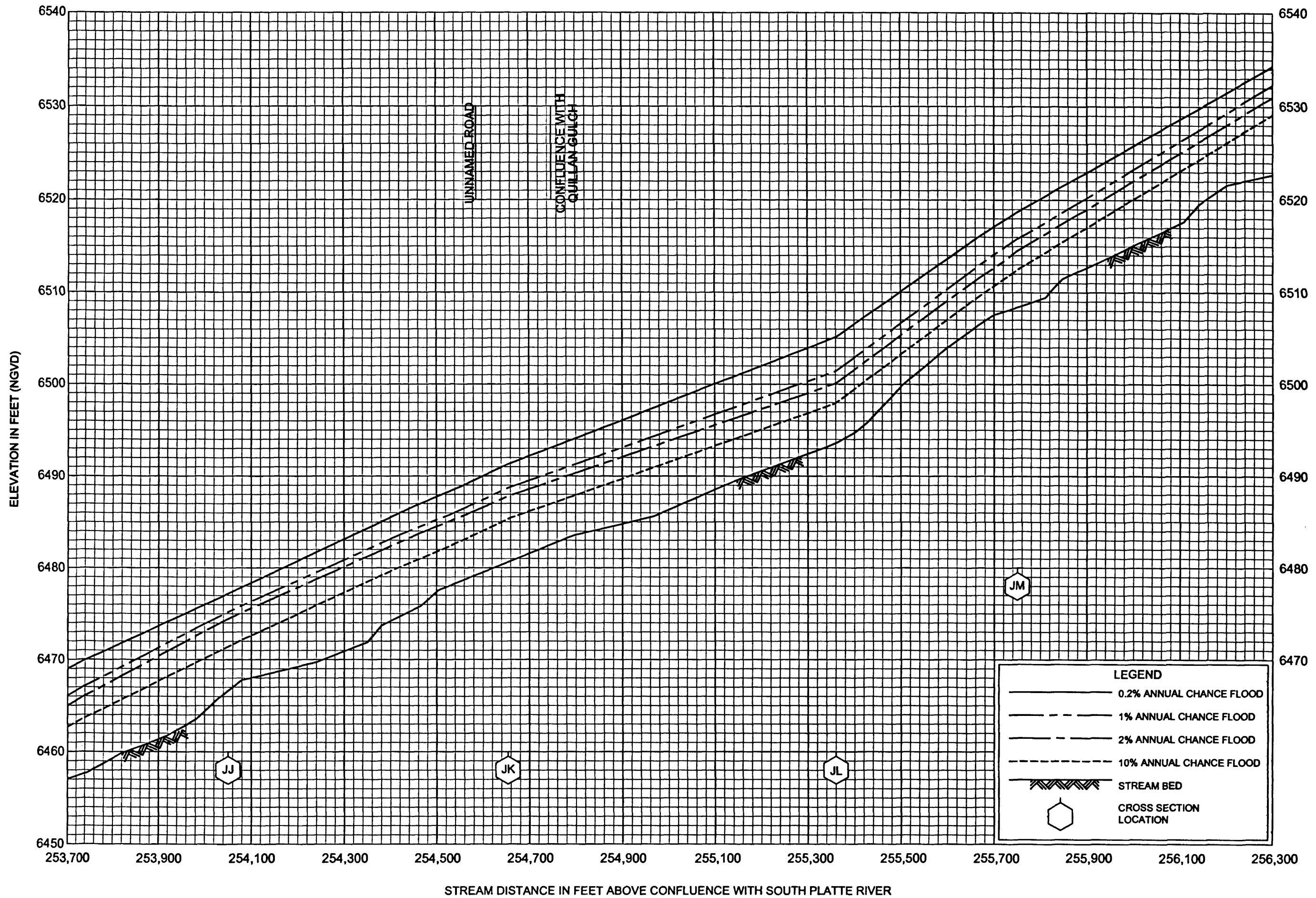
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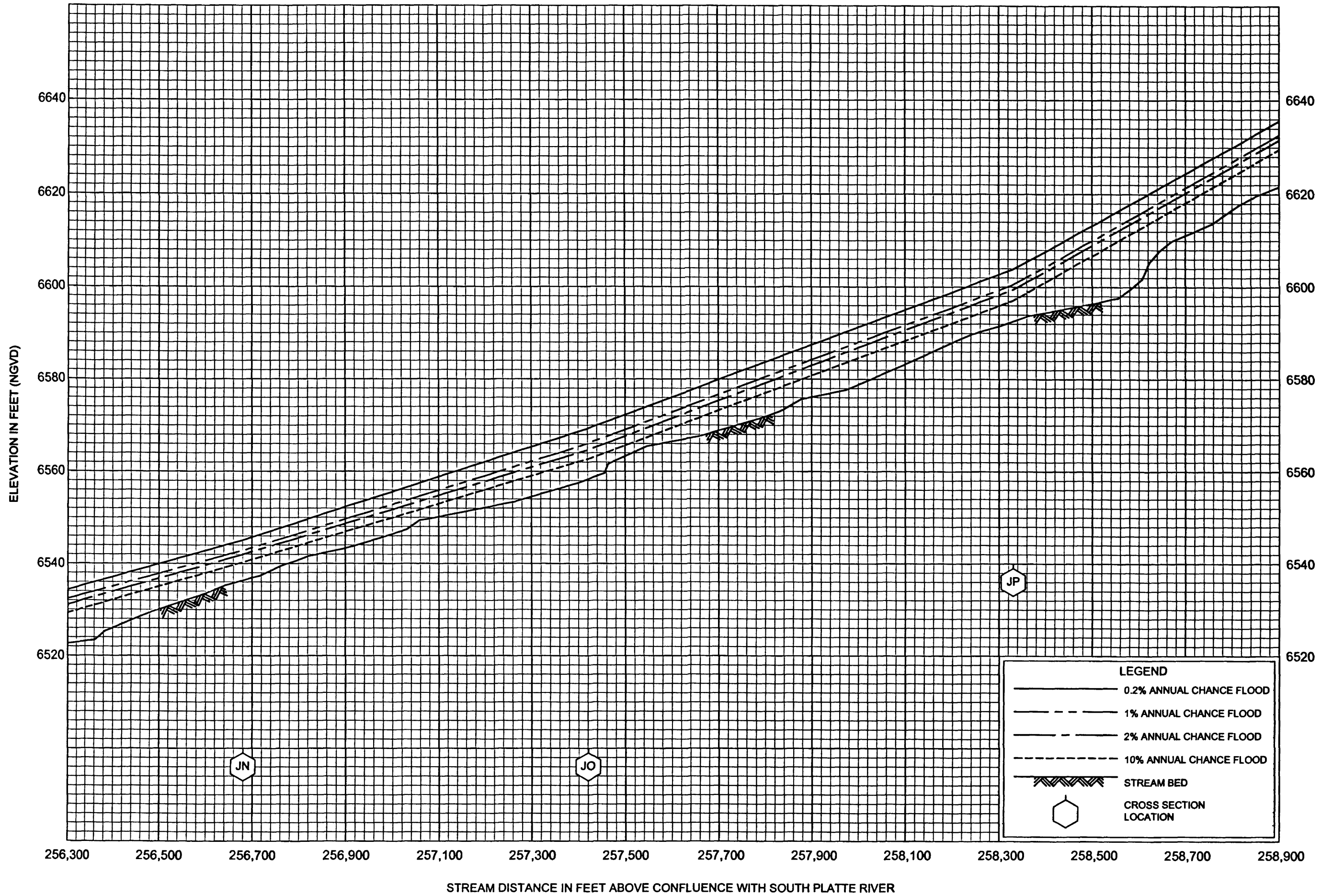
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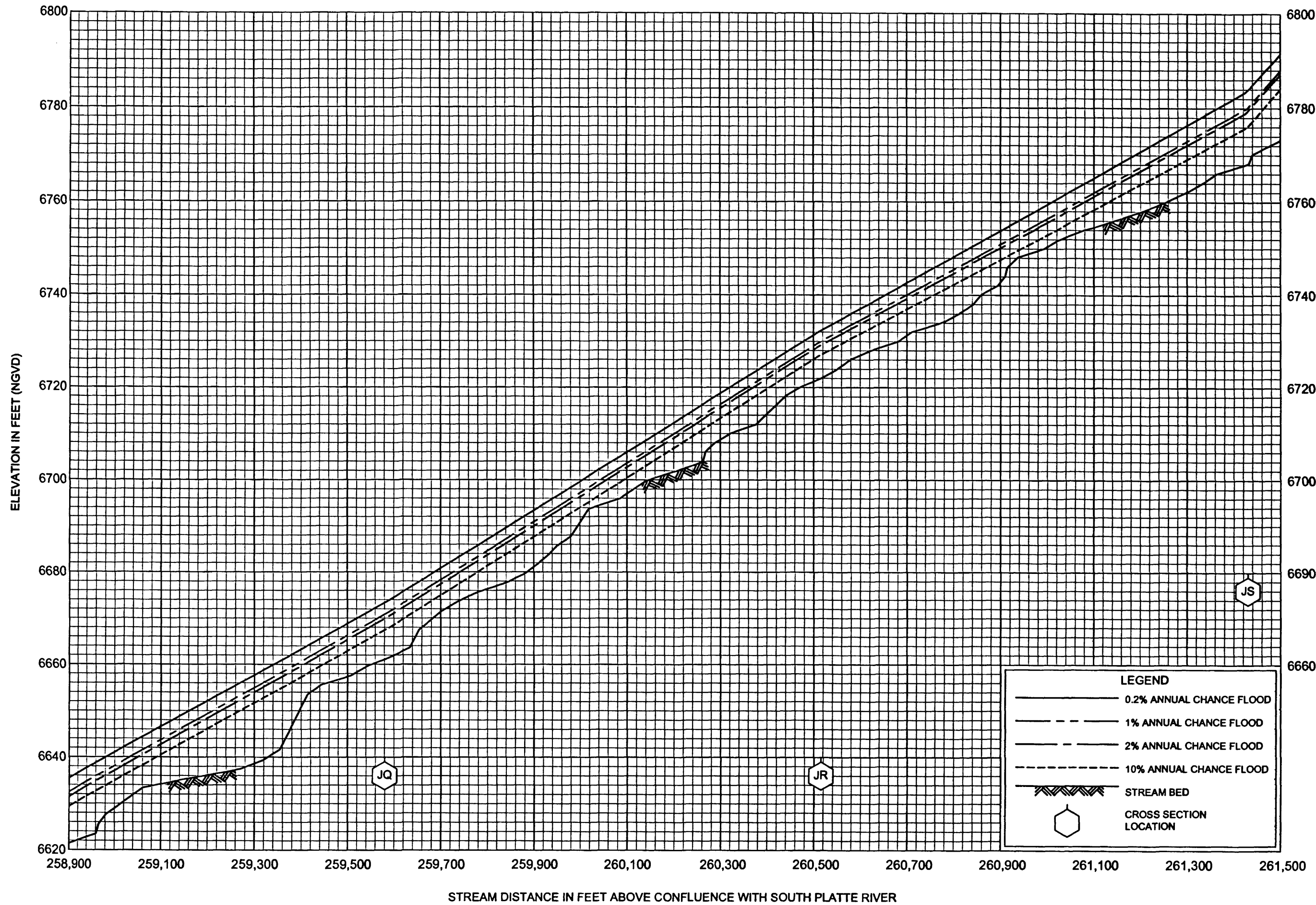
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
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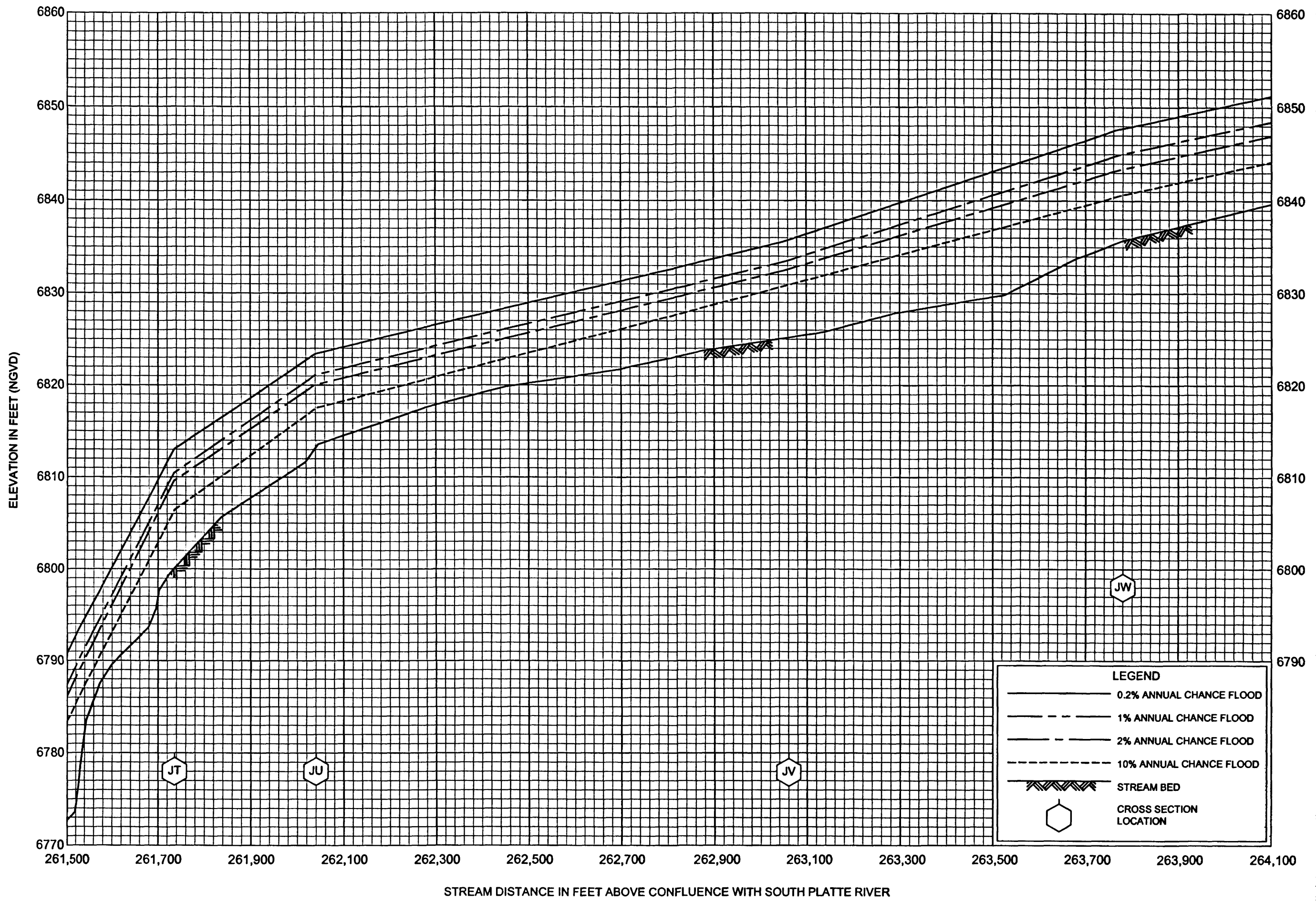
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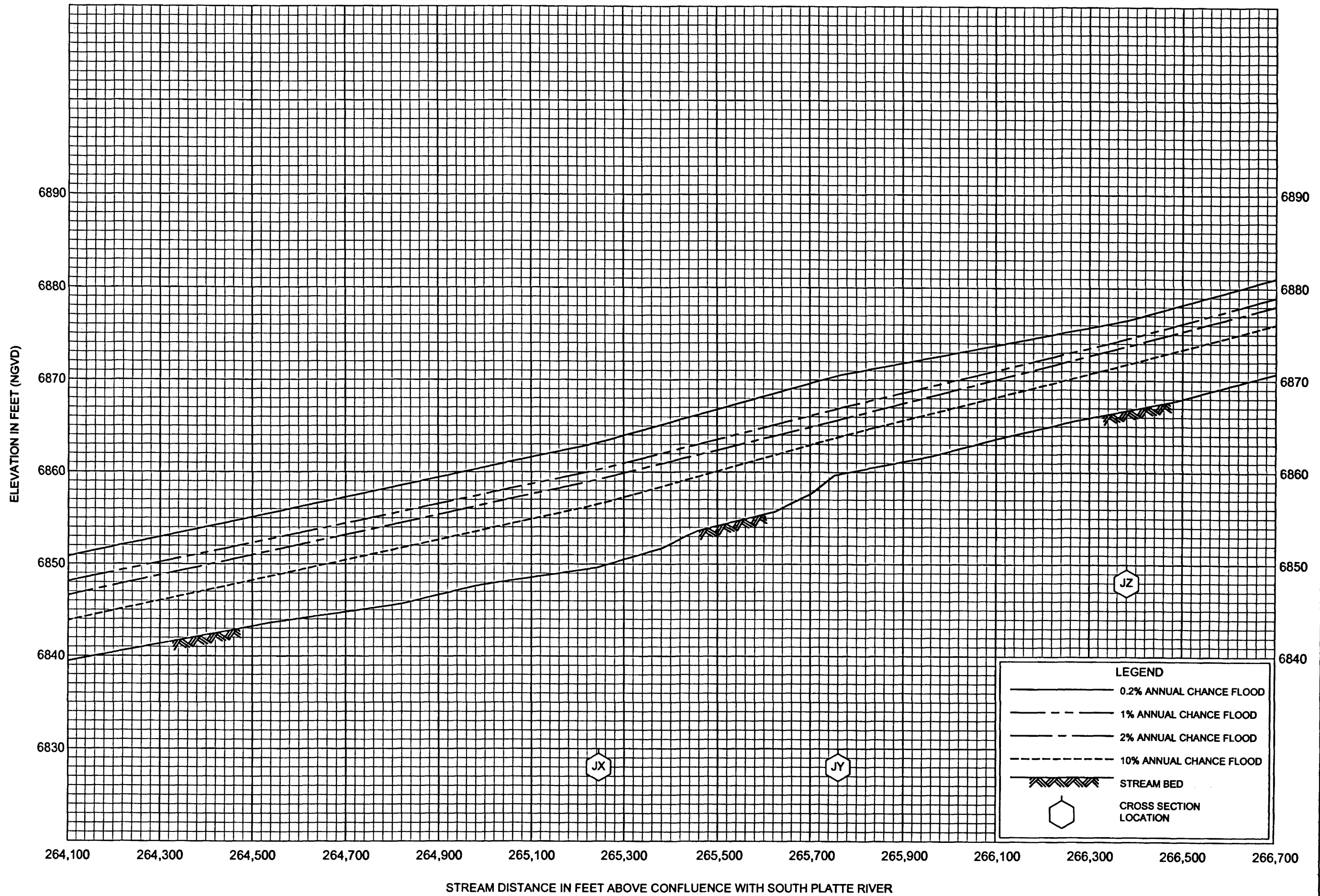
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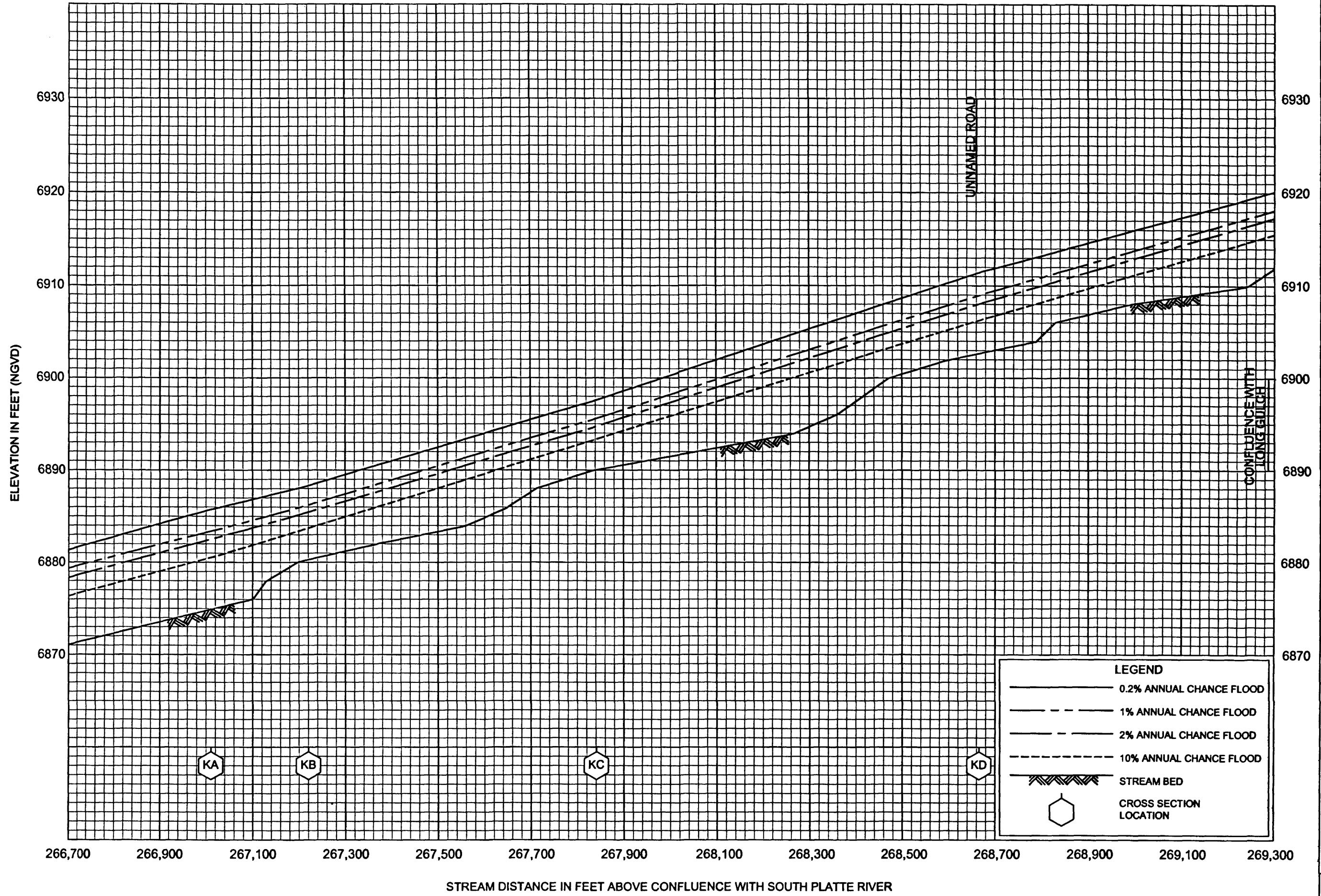
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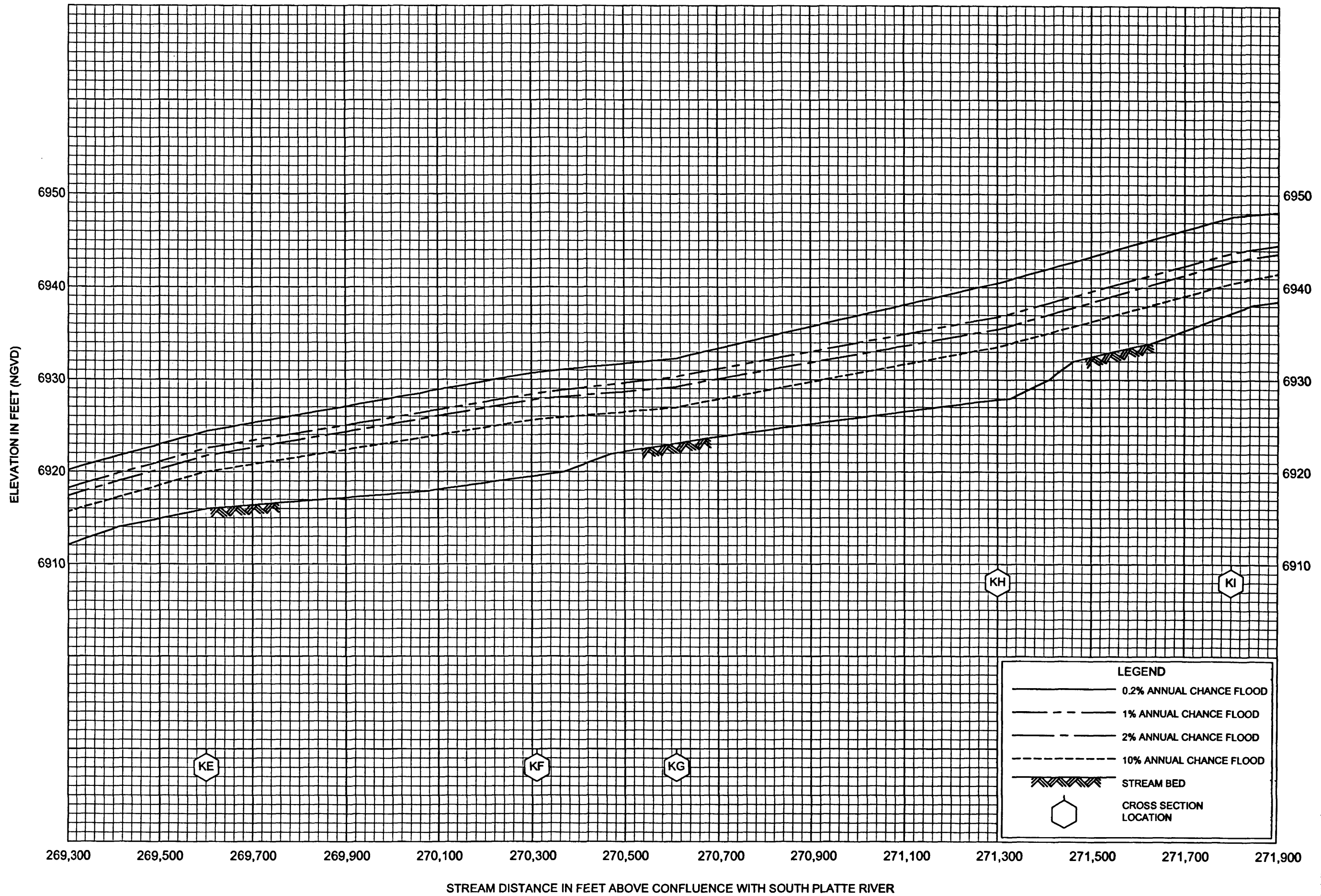
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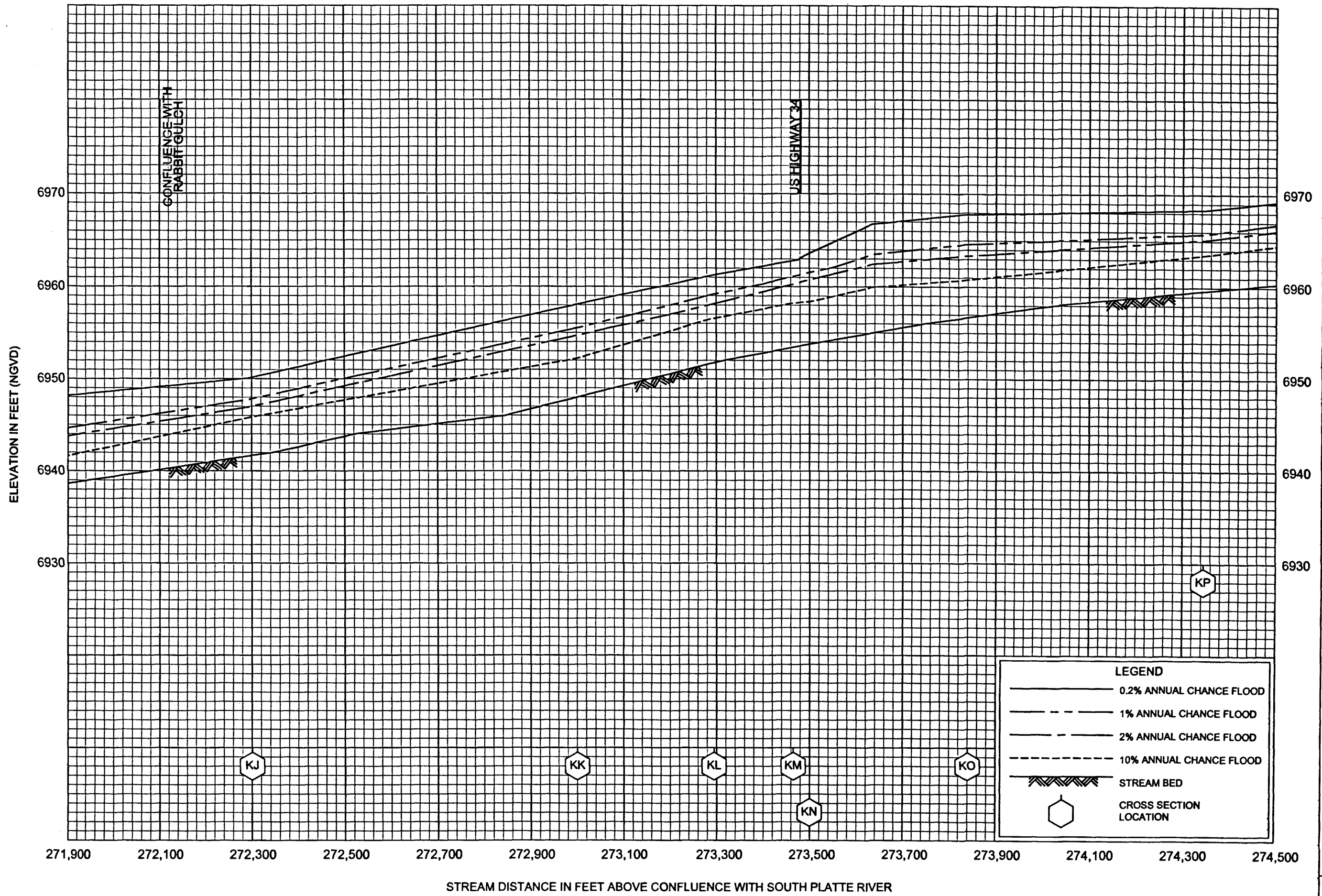
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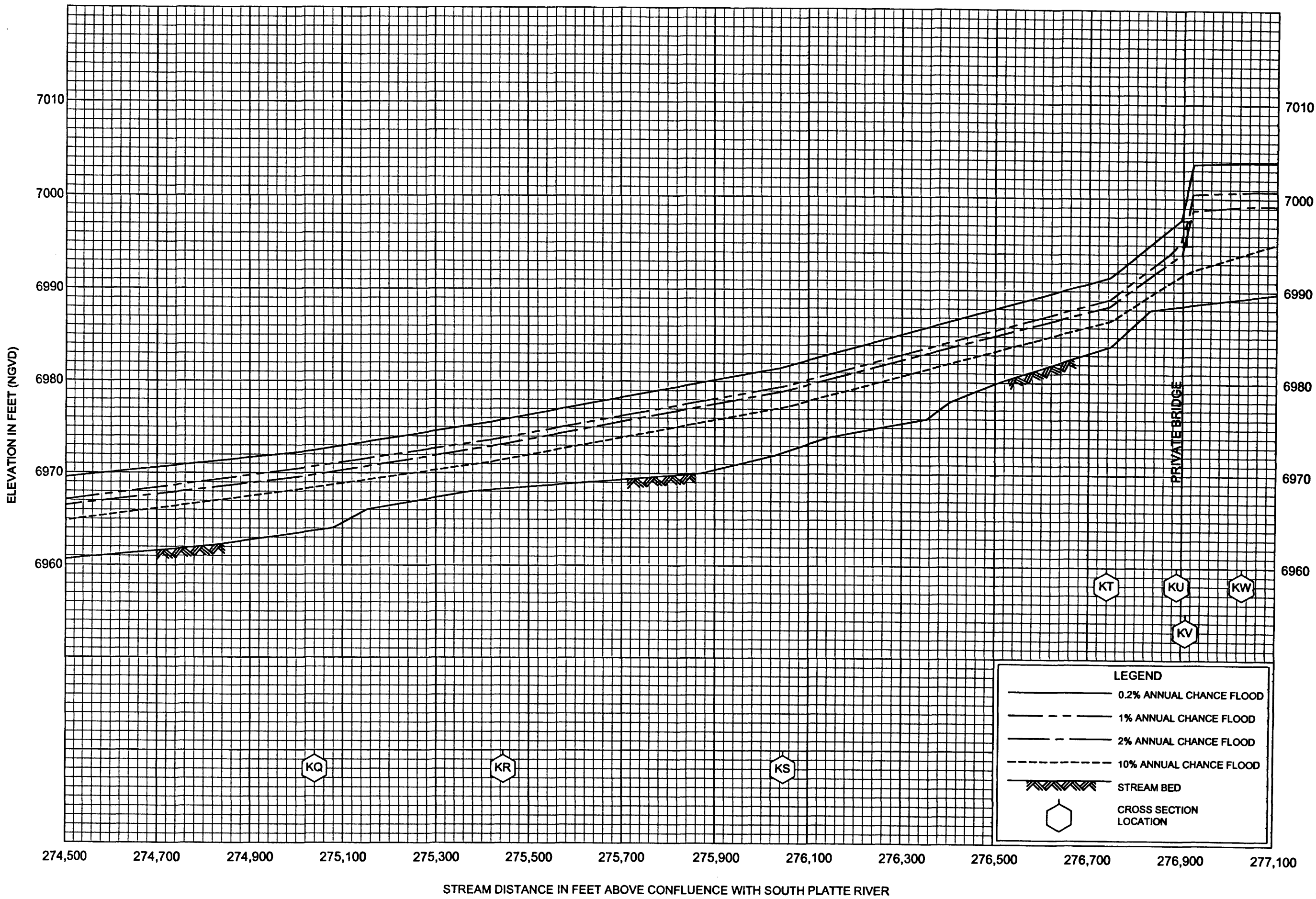
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
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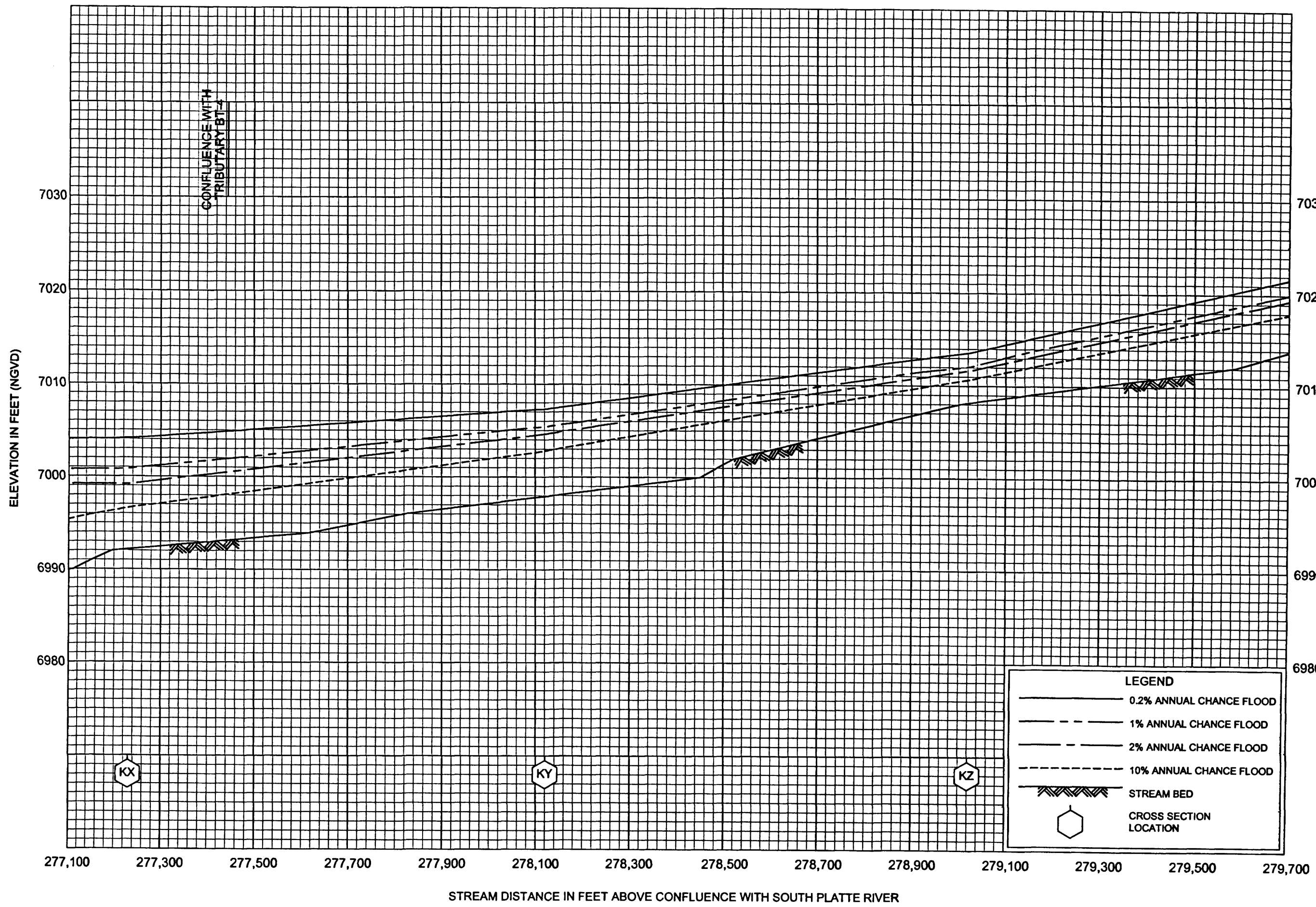


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FLOOD PROFILES

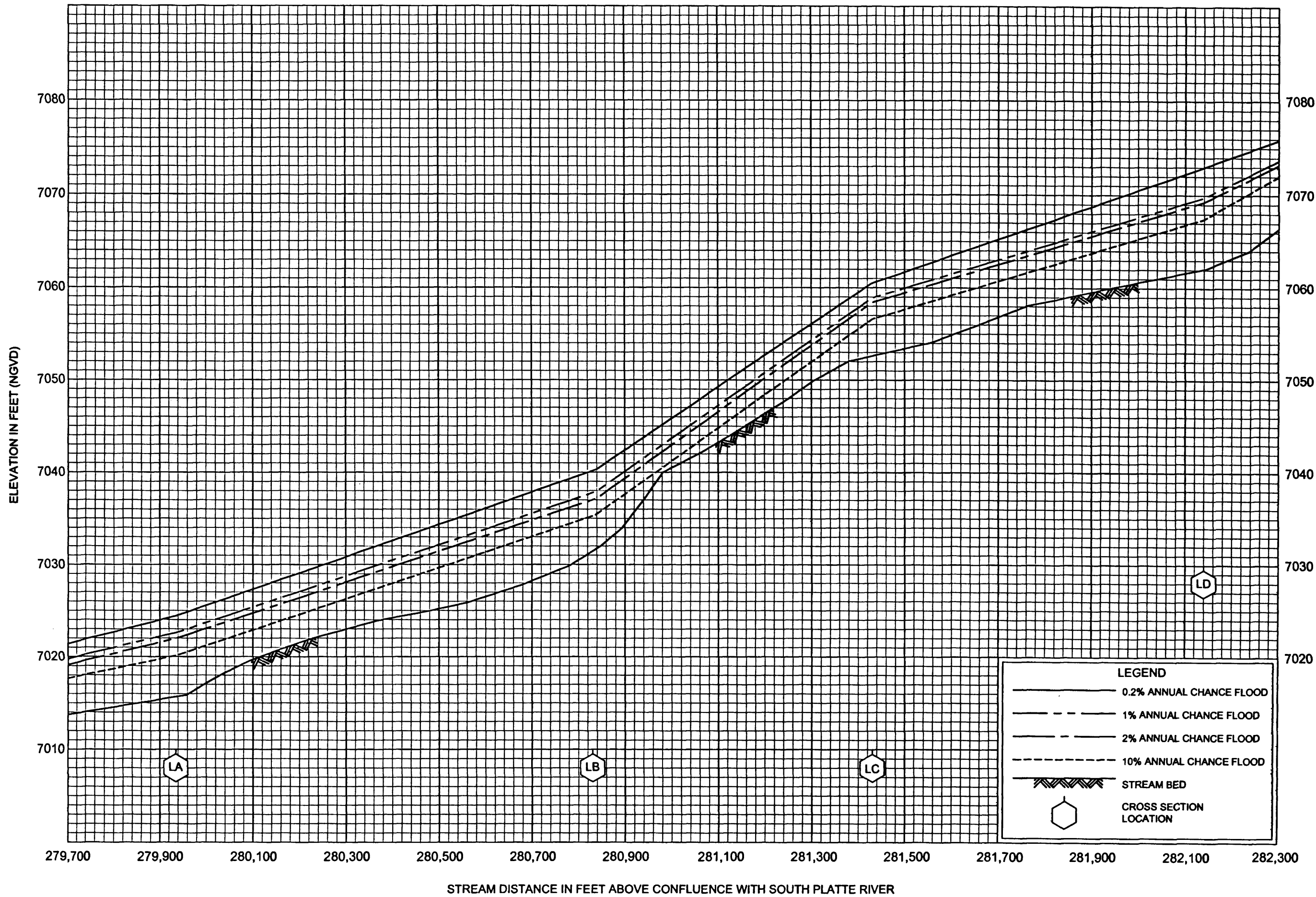
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


FLOOD PROFILES
BIG THOMPSON RIVER

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LEGEND

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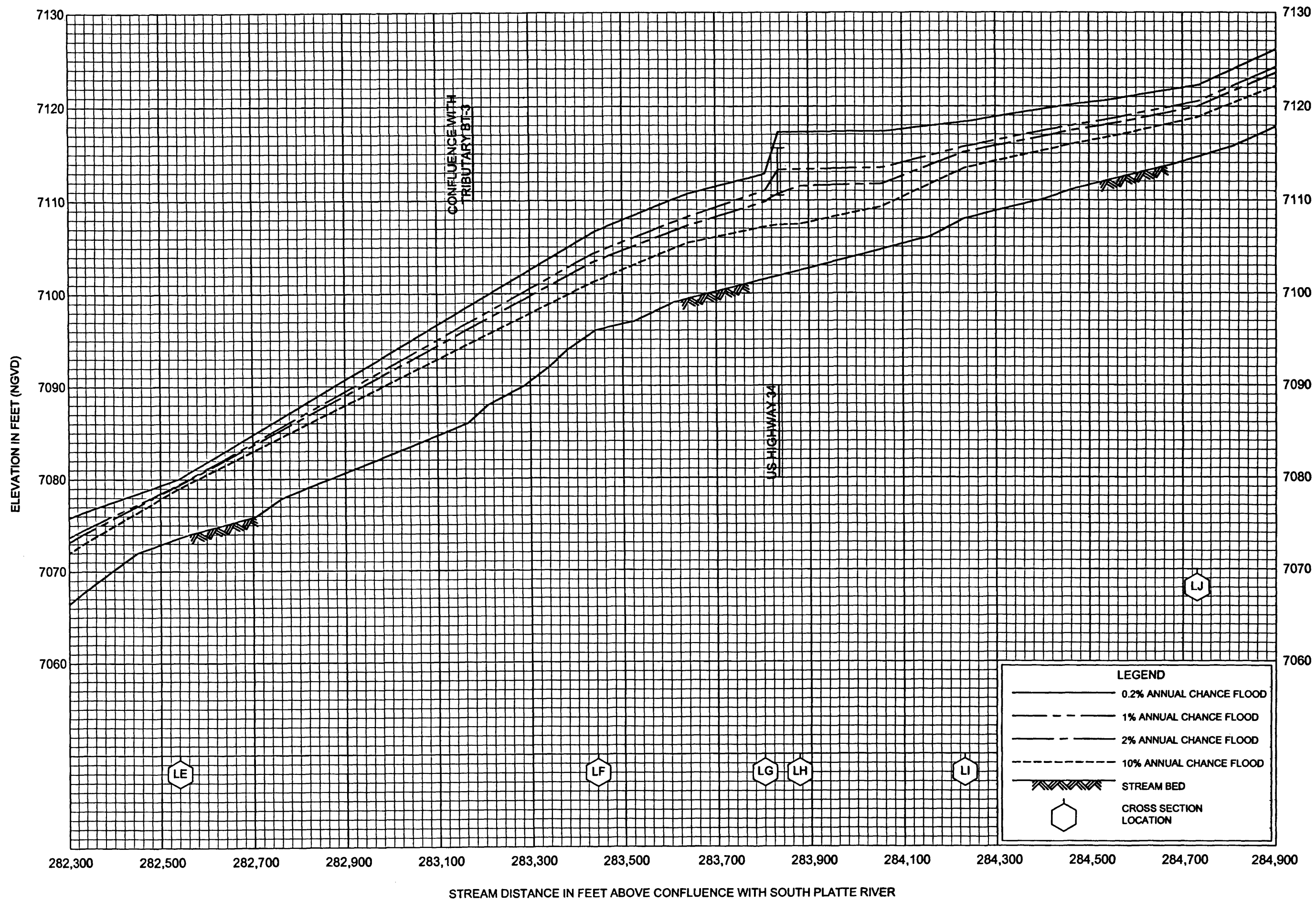
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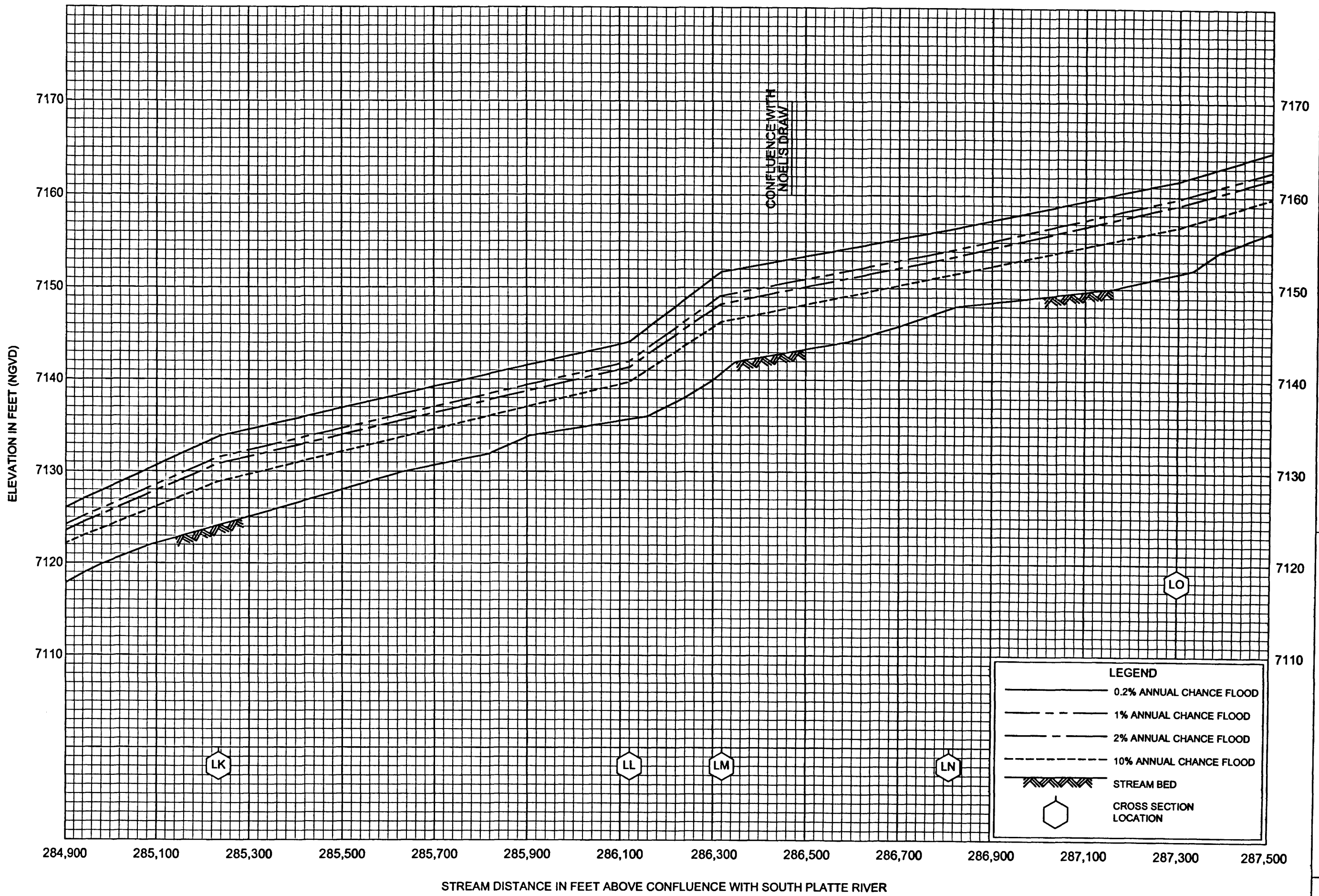


LEGEND

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BIG THOMPSON RIVER

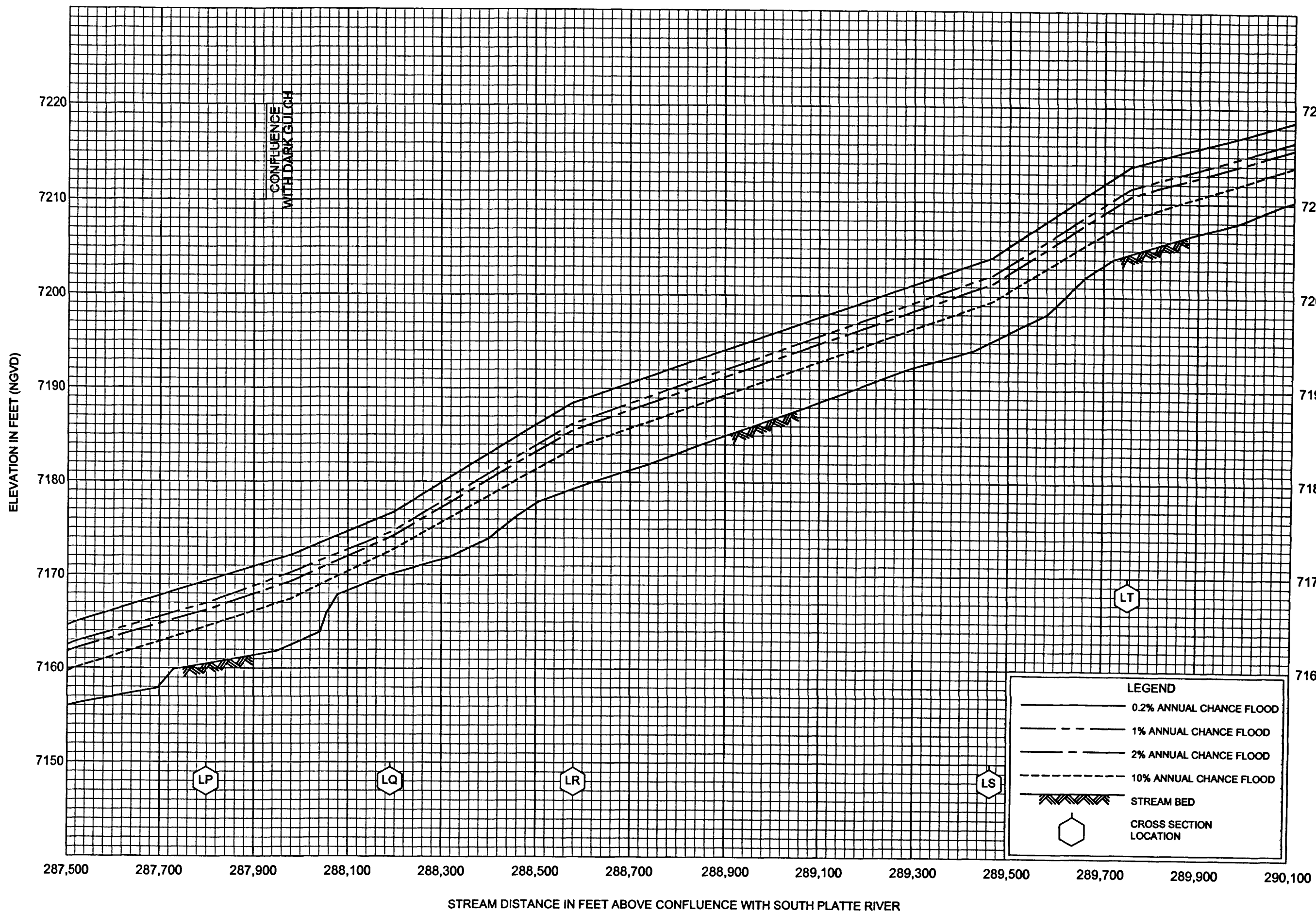
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
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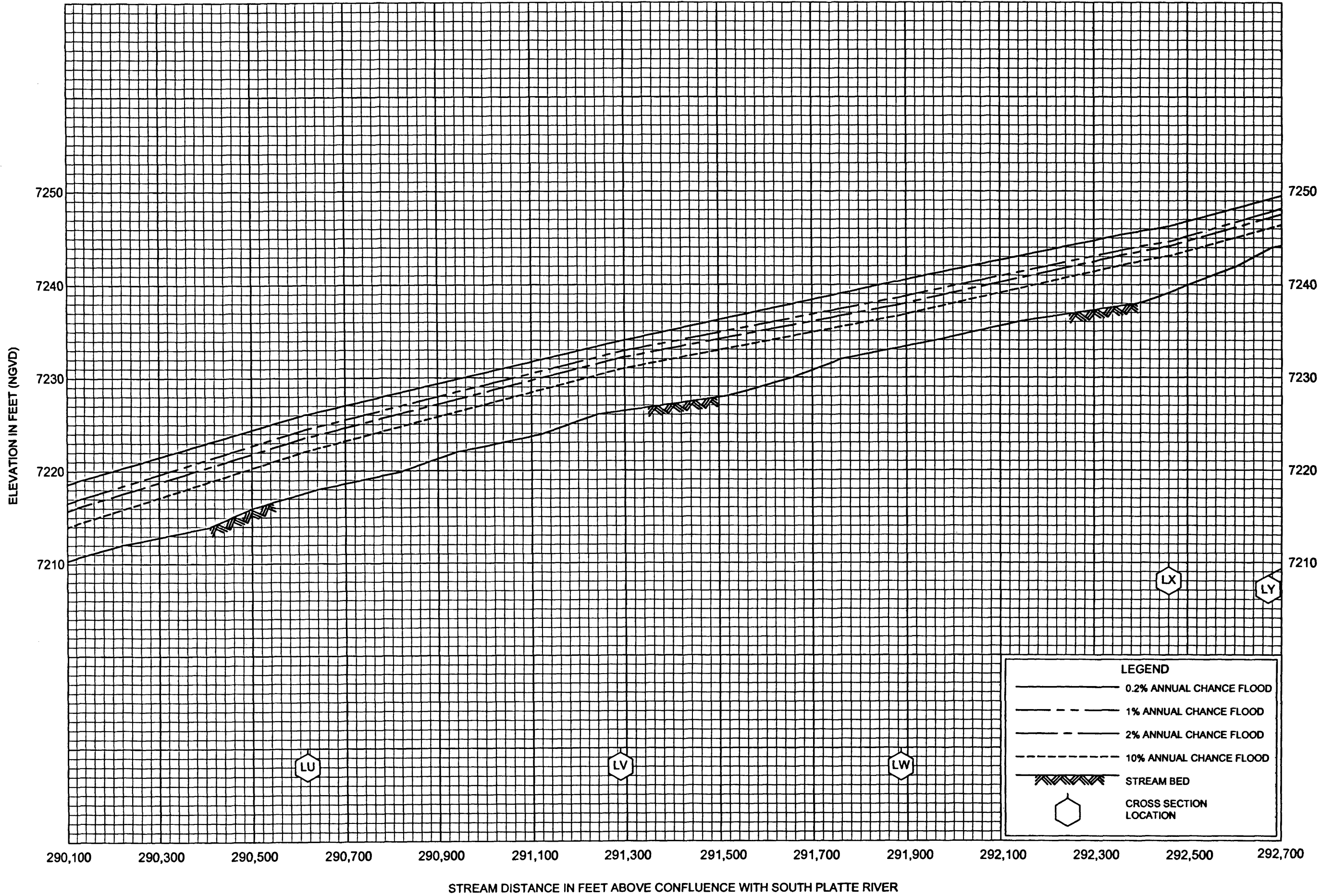
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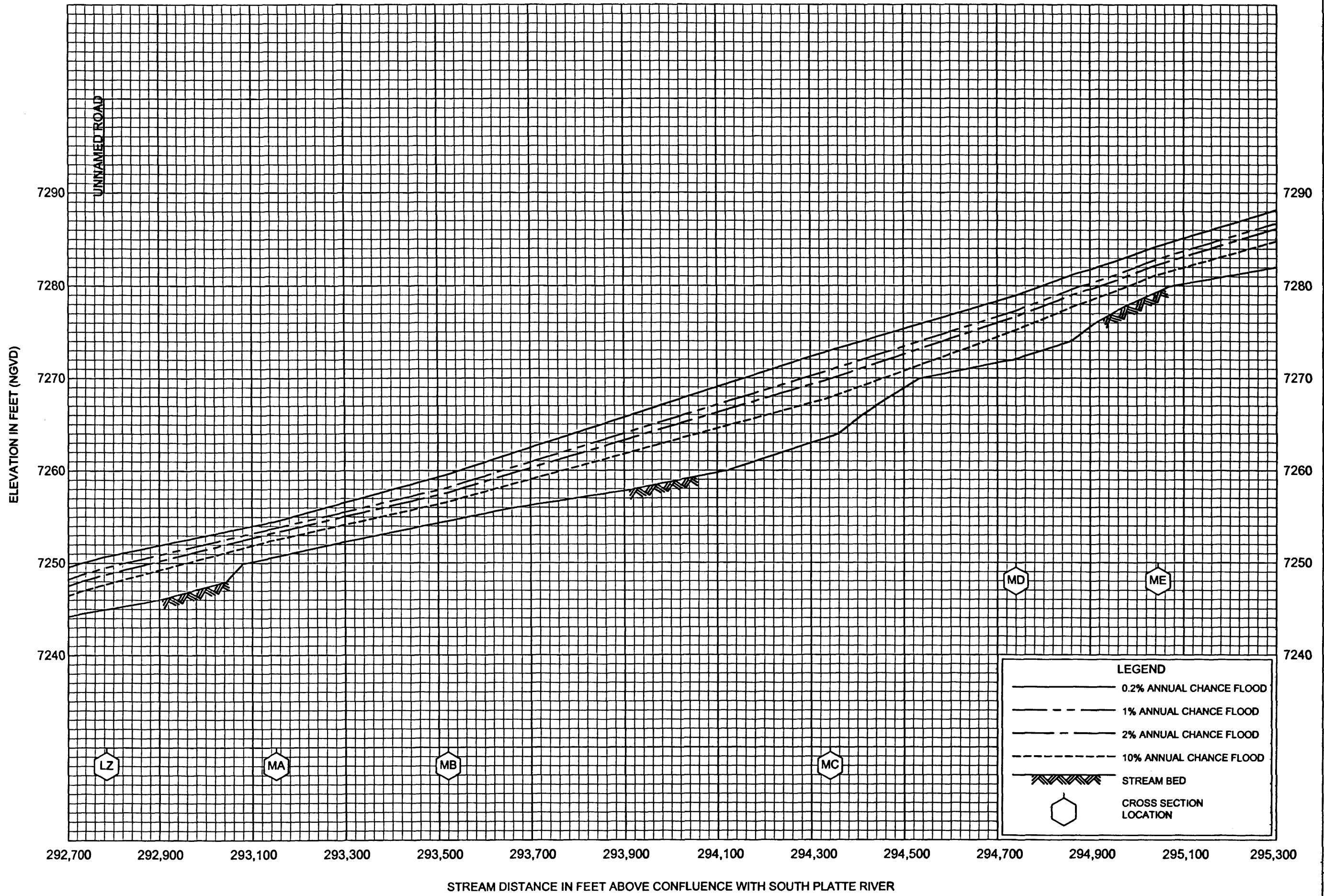
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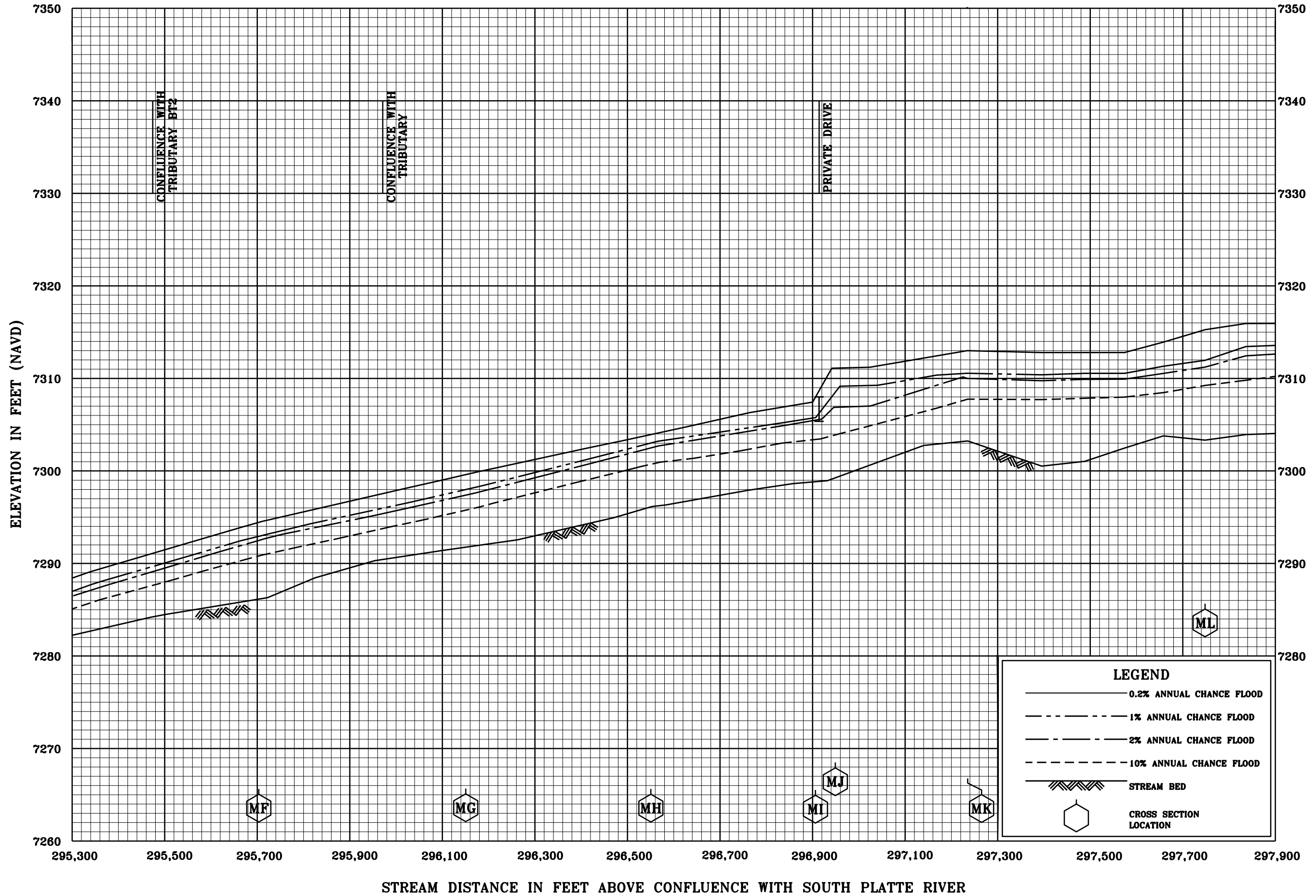
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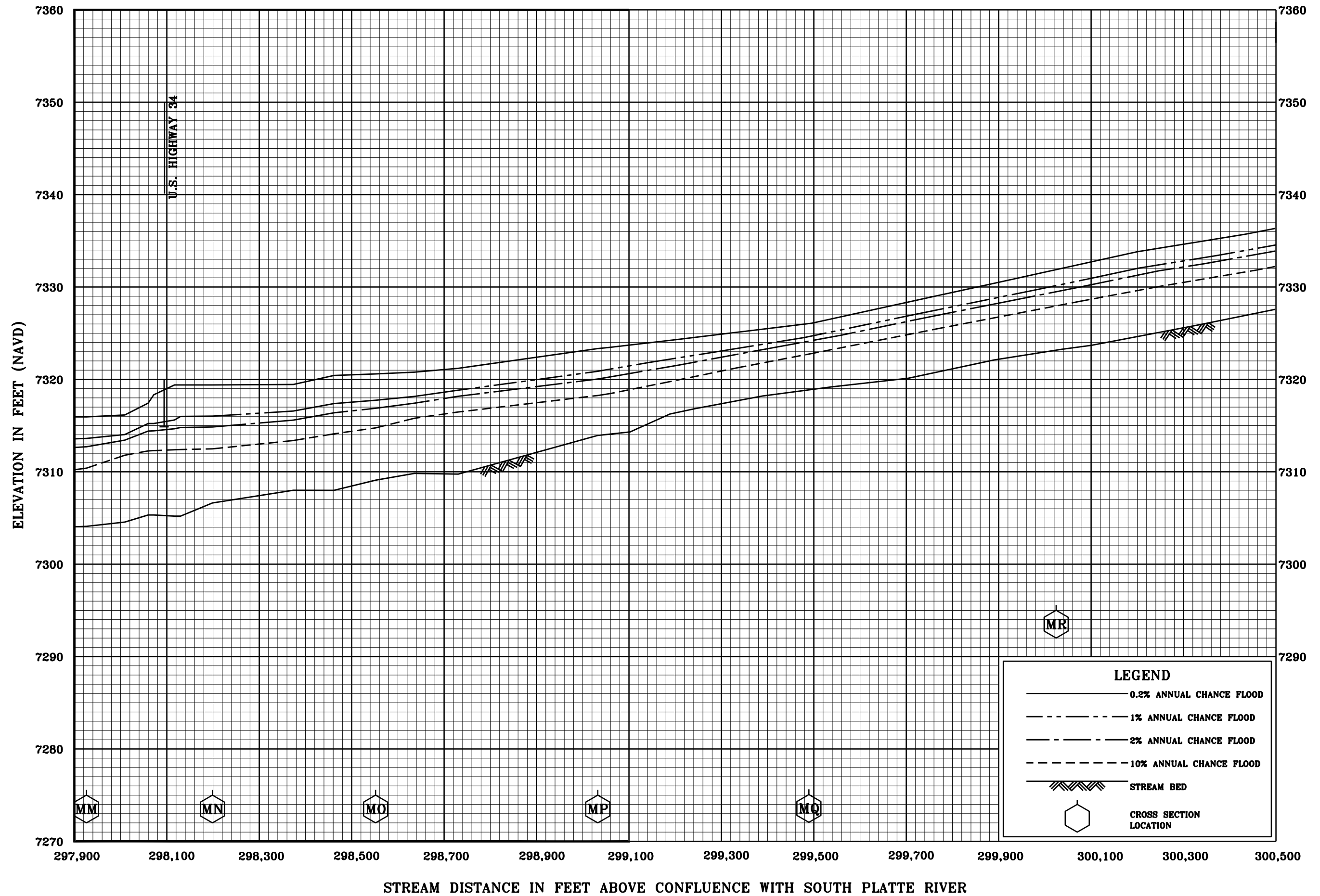
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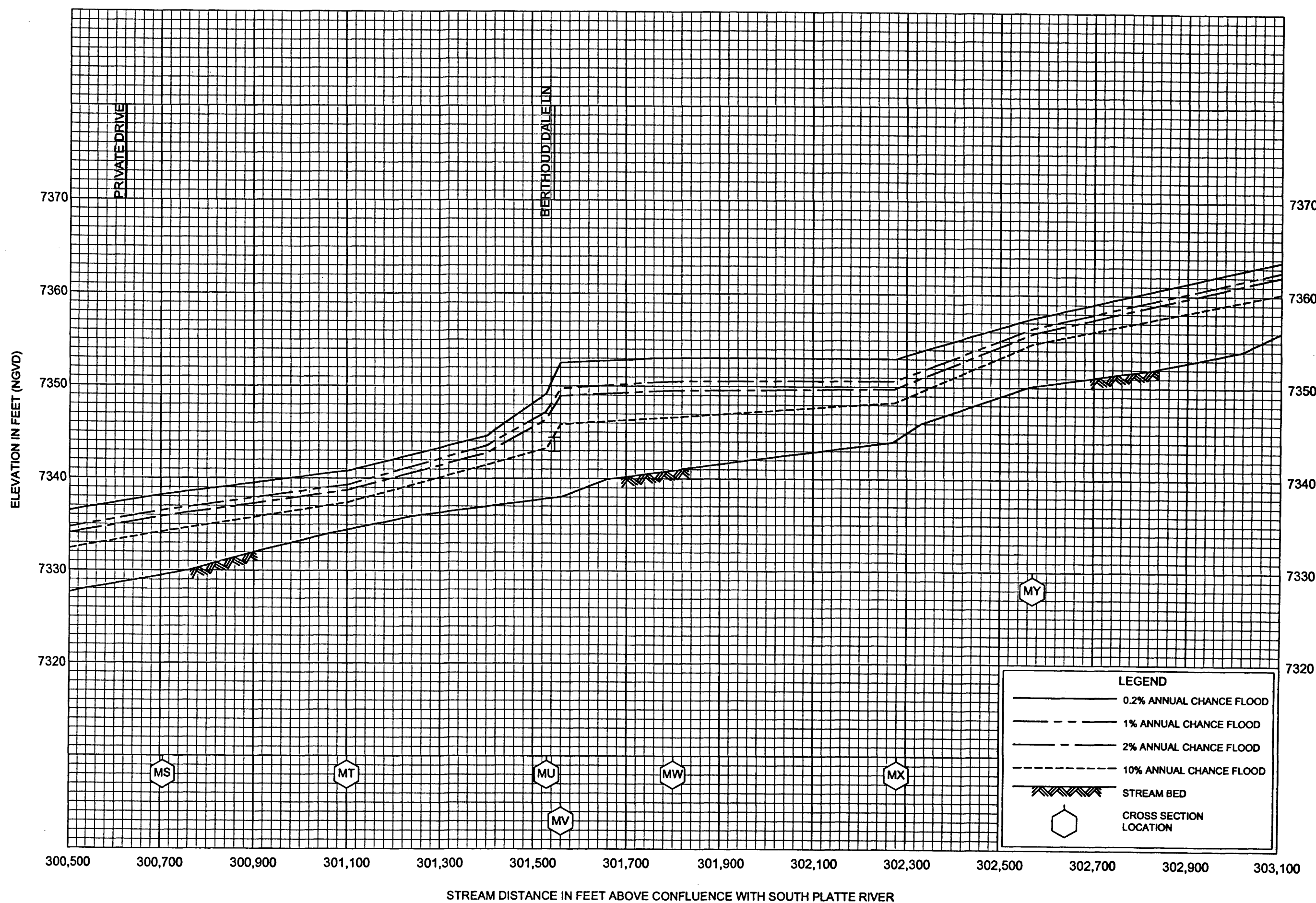
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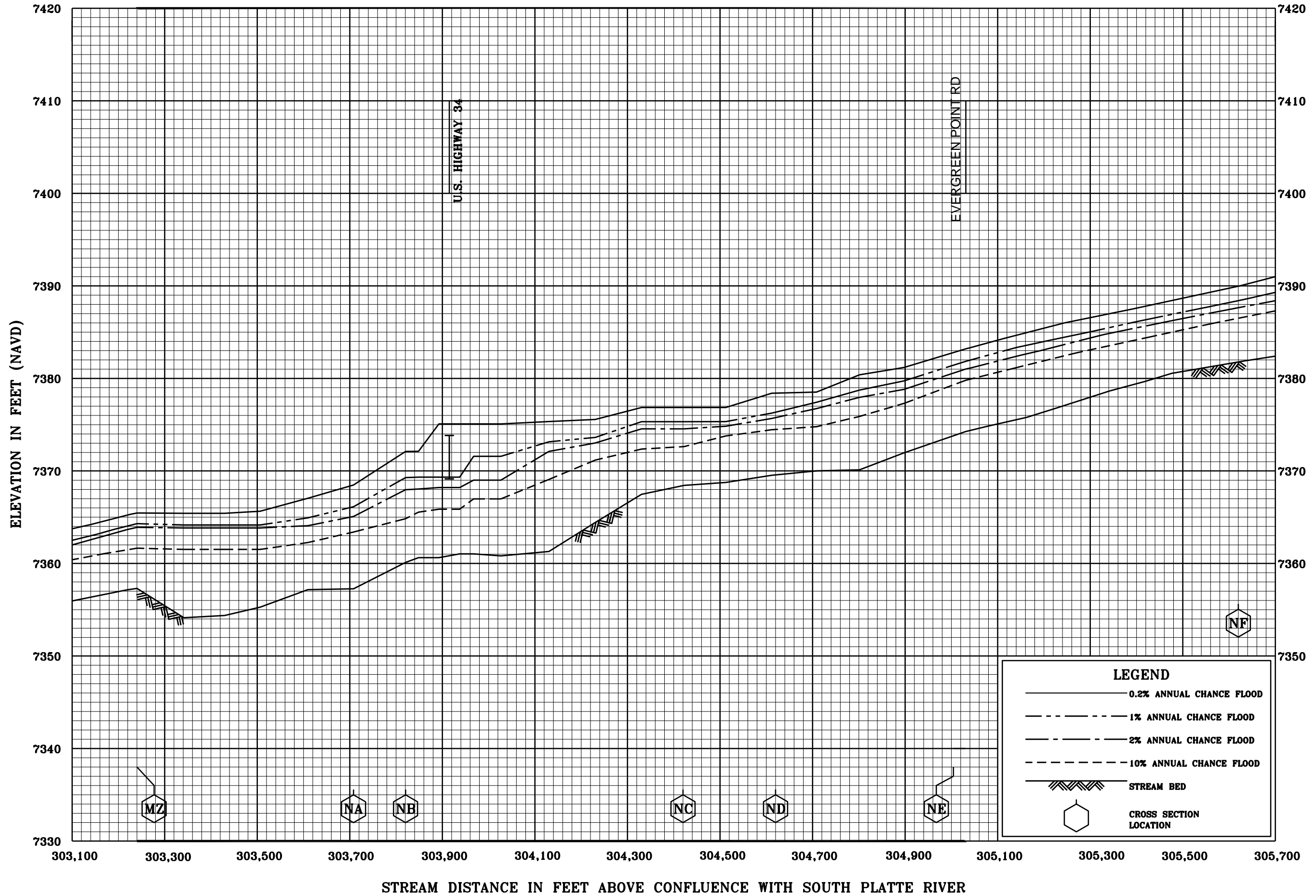
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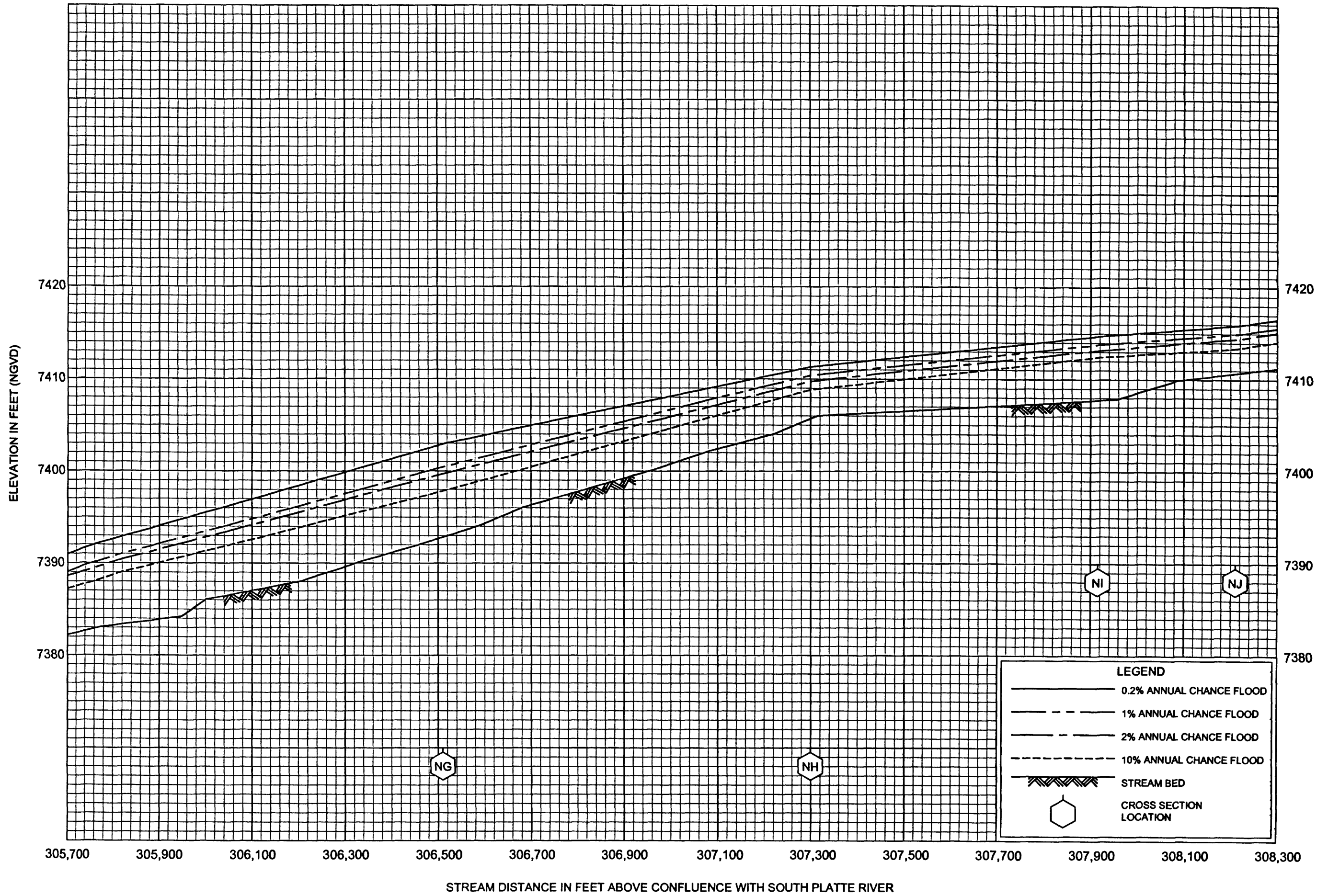
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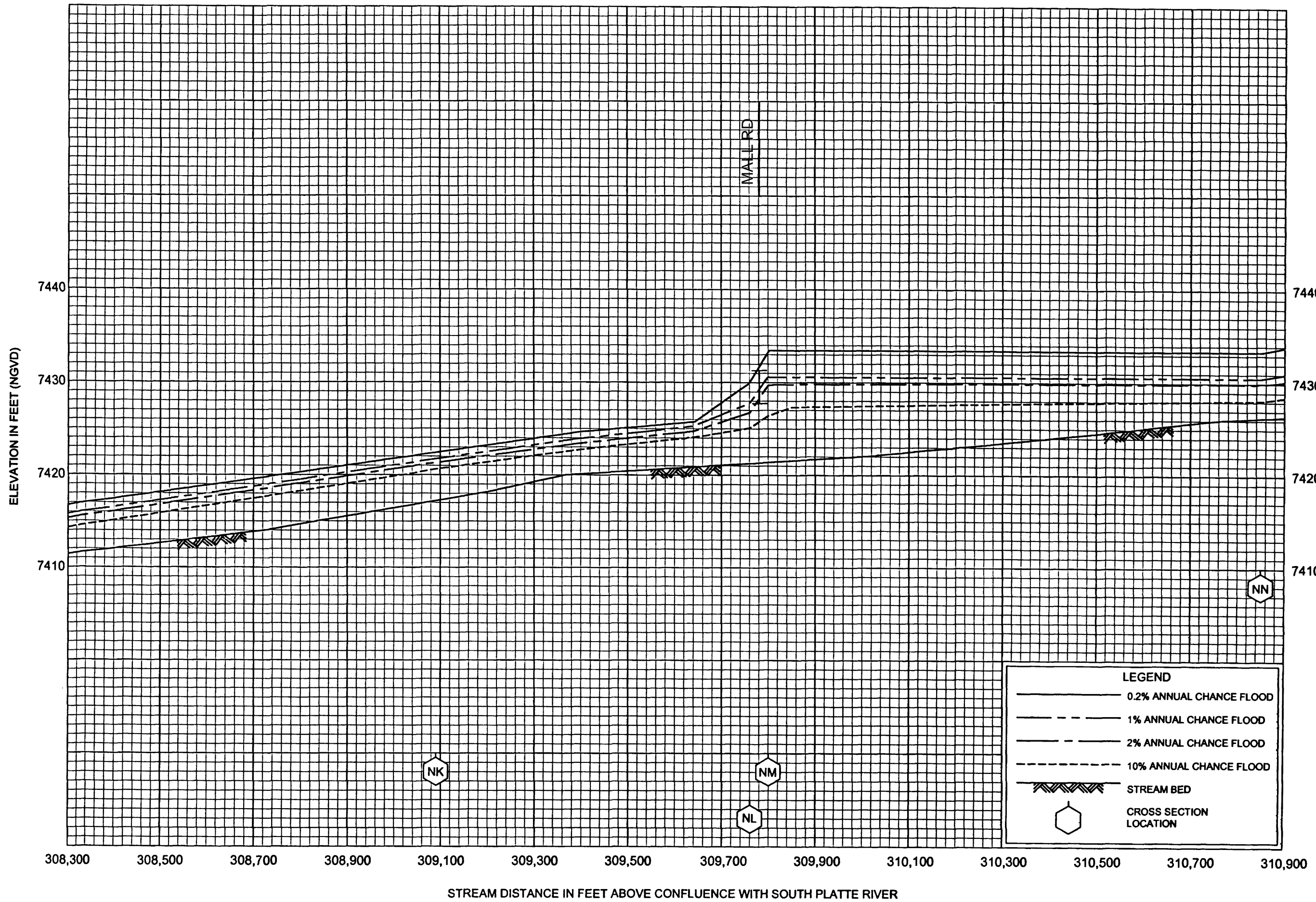
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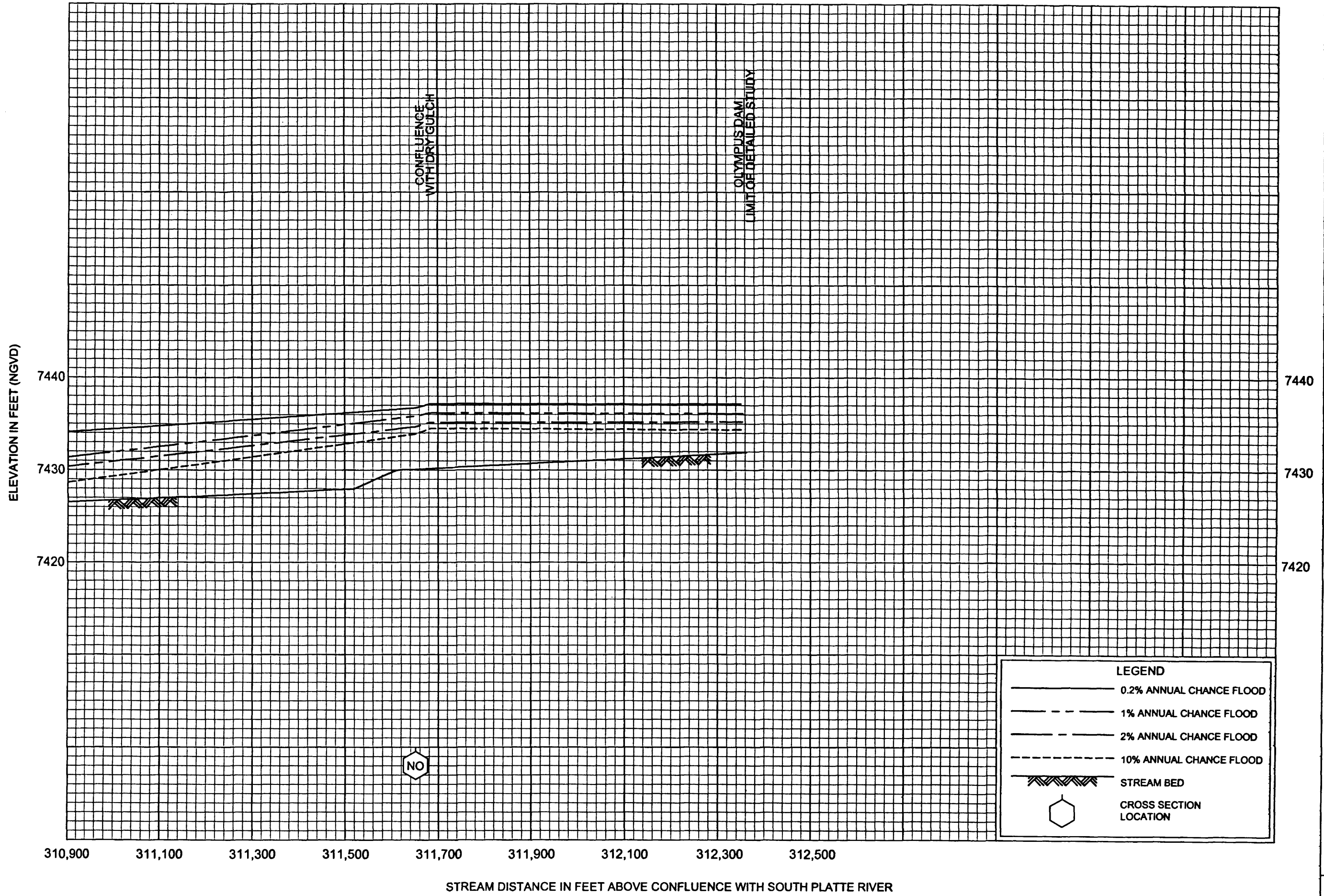
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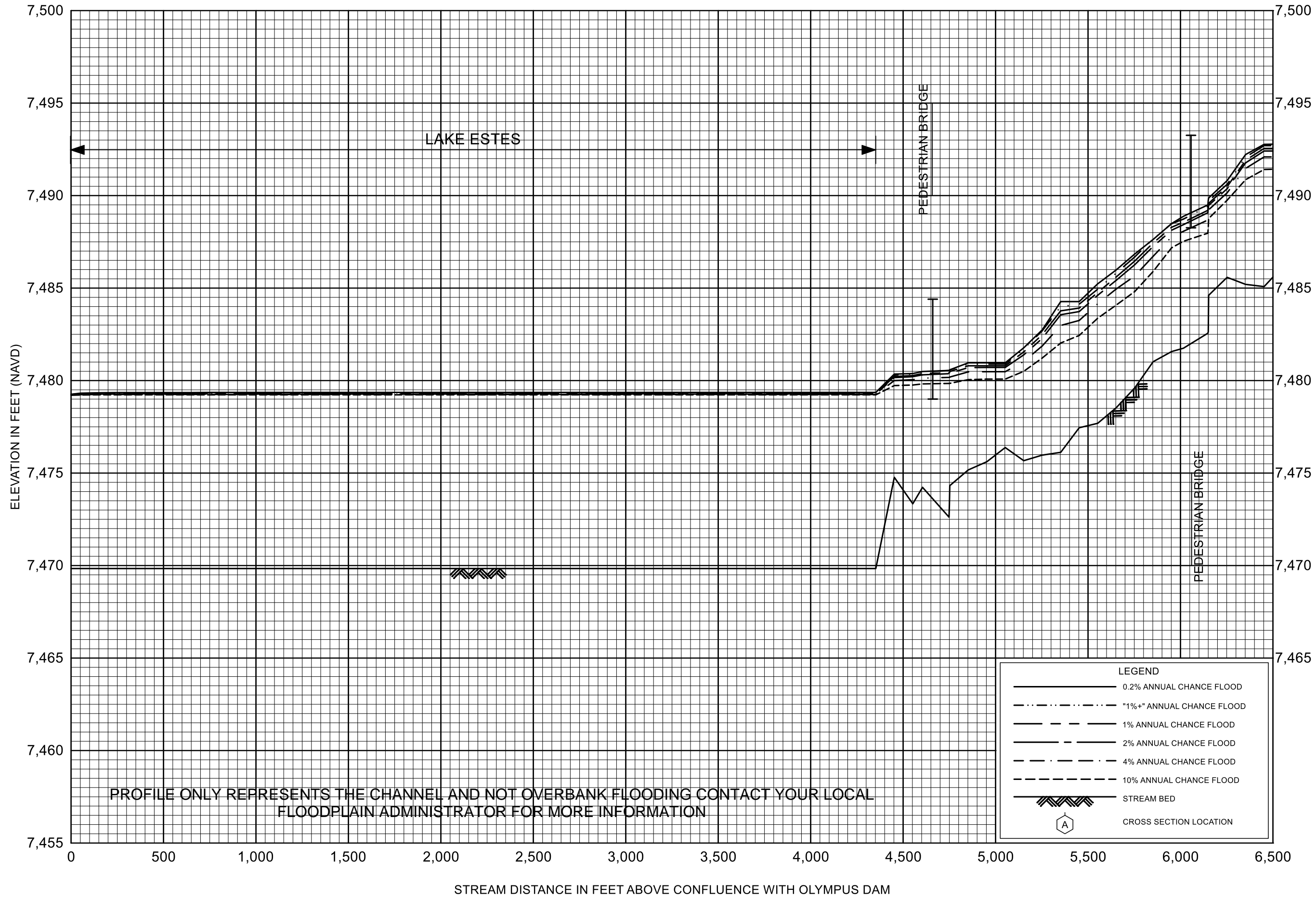
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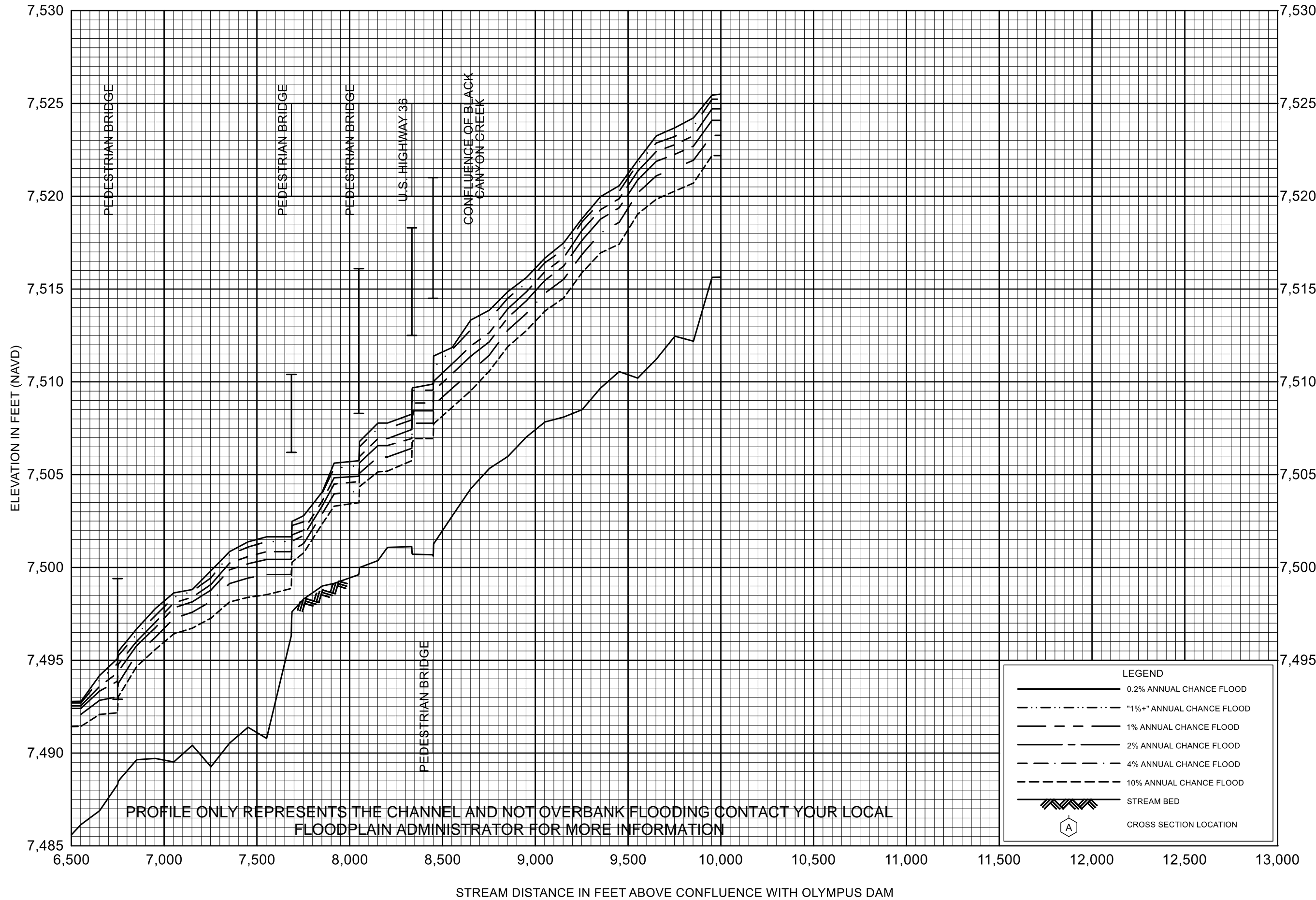


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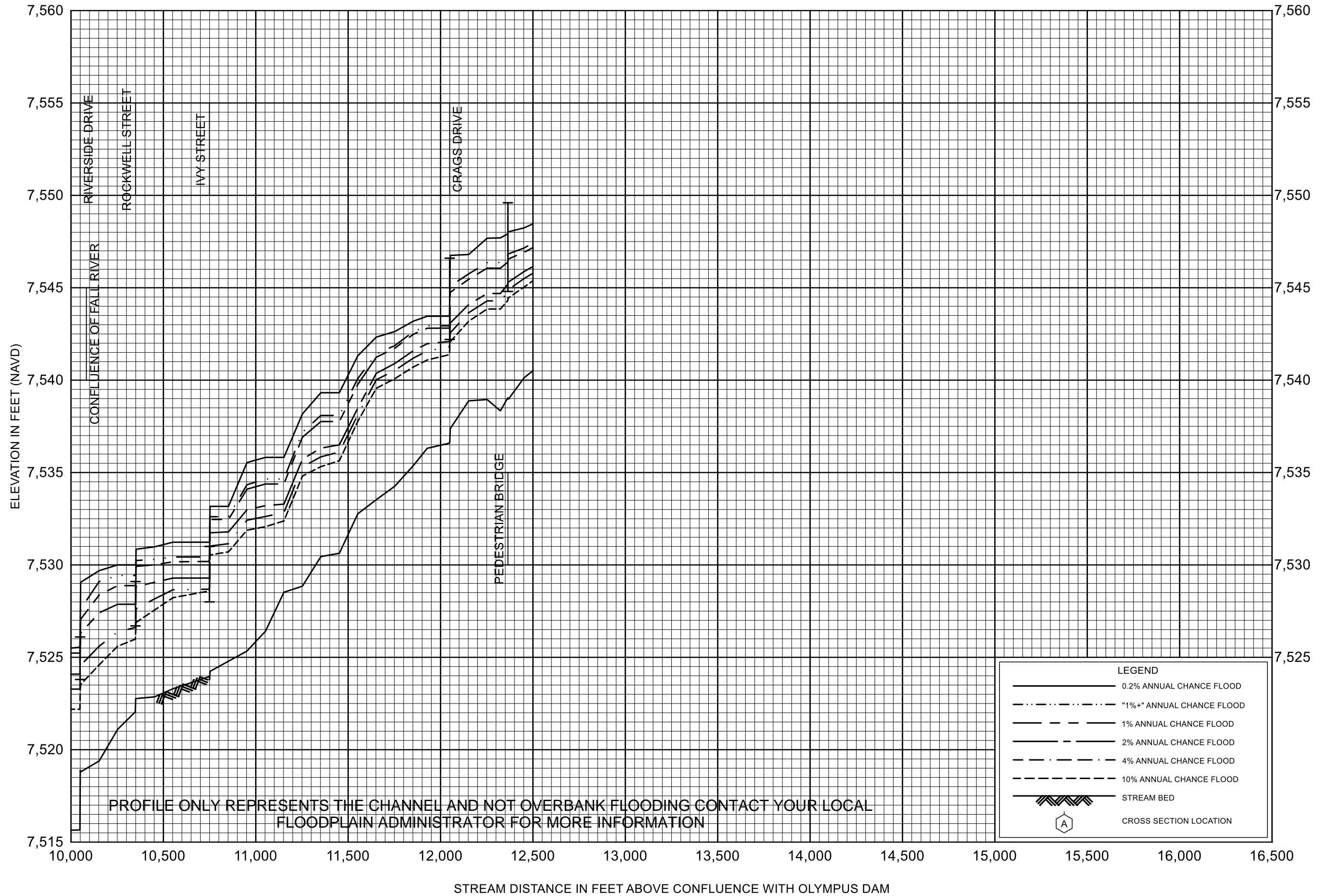


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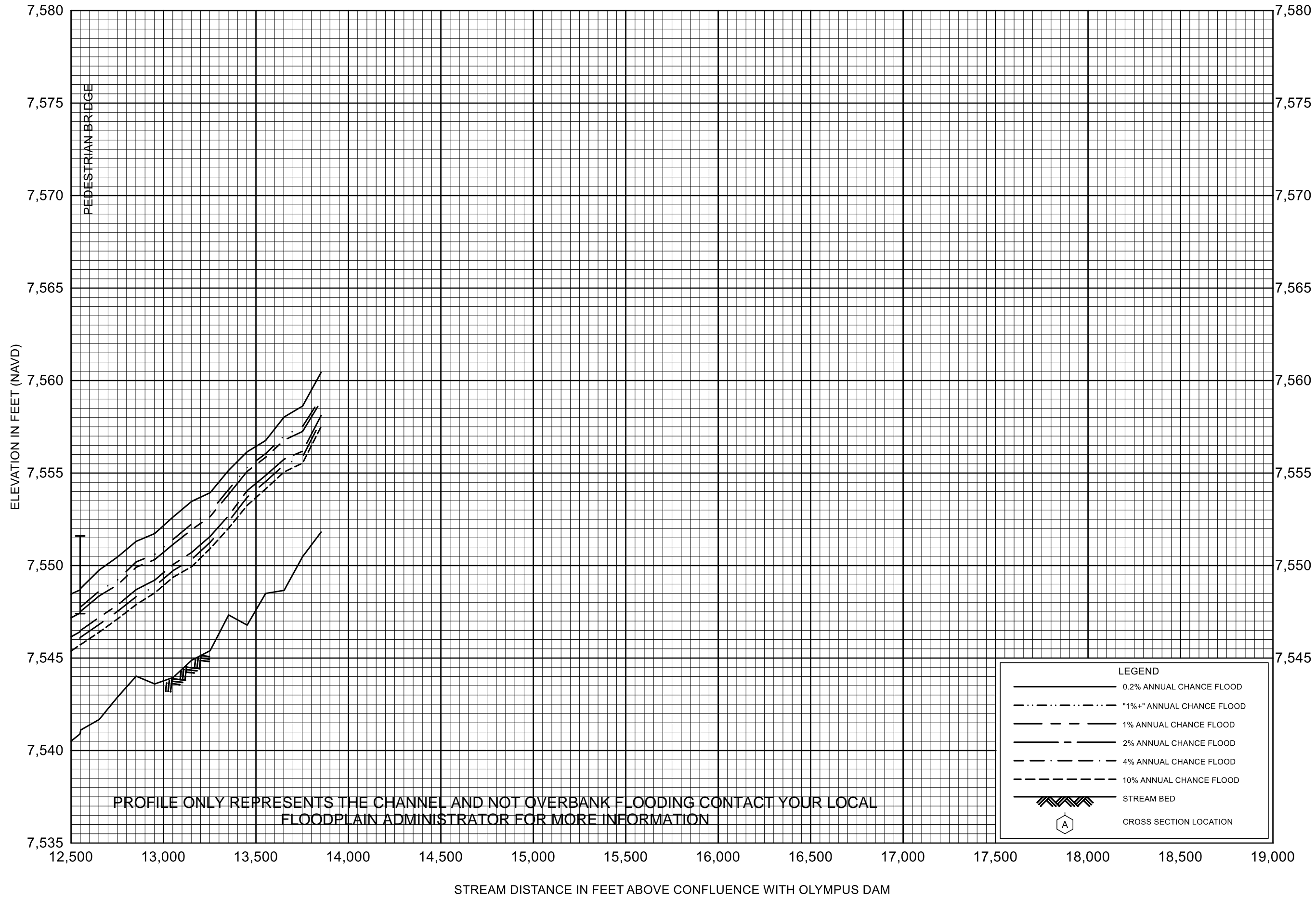


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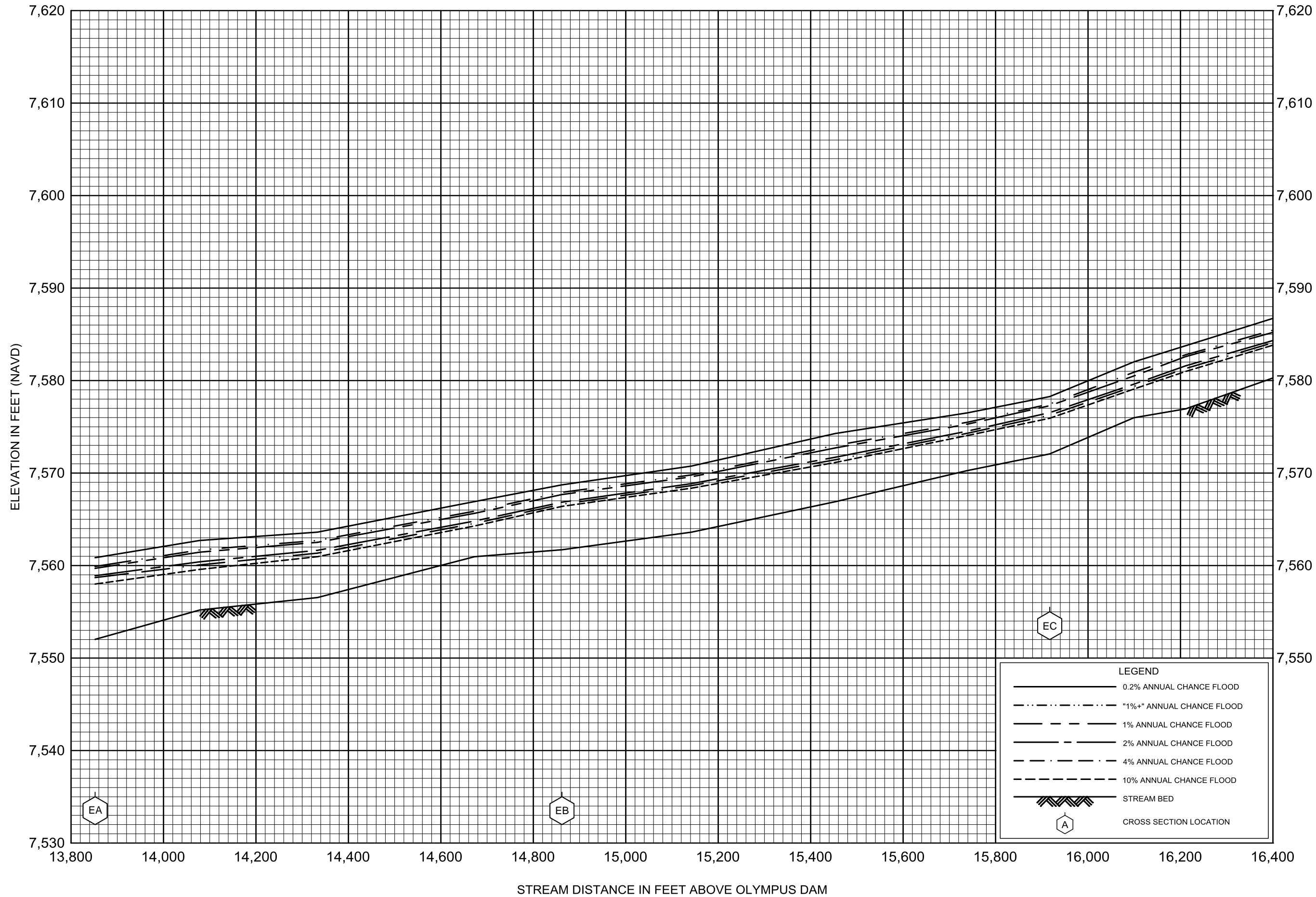


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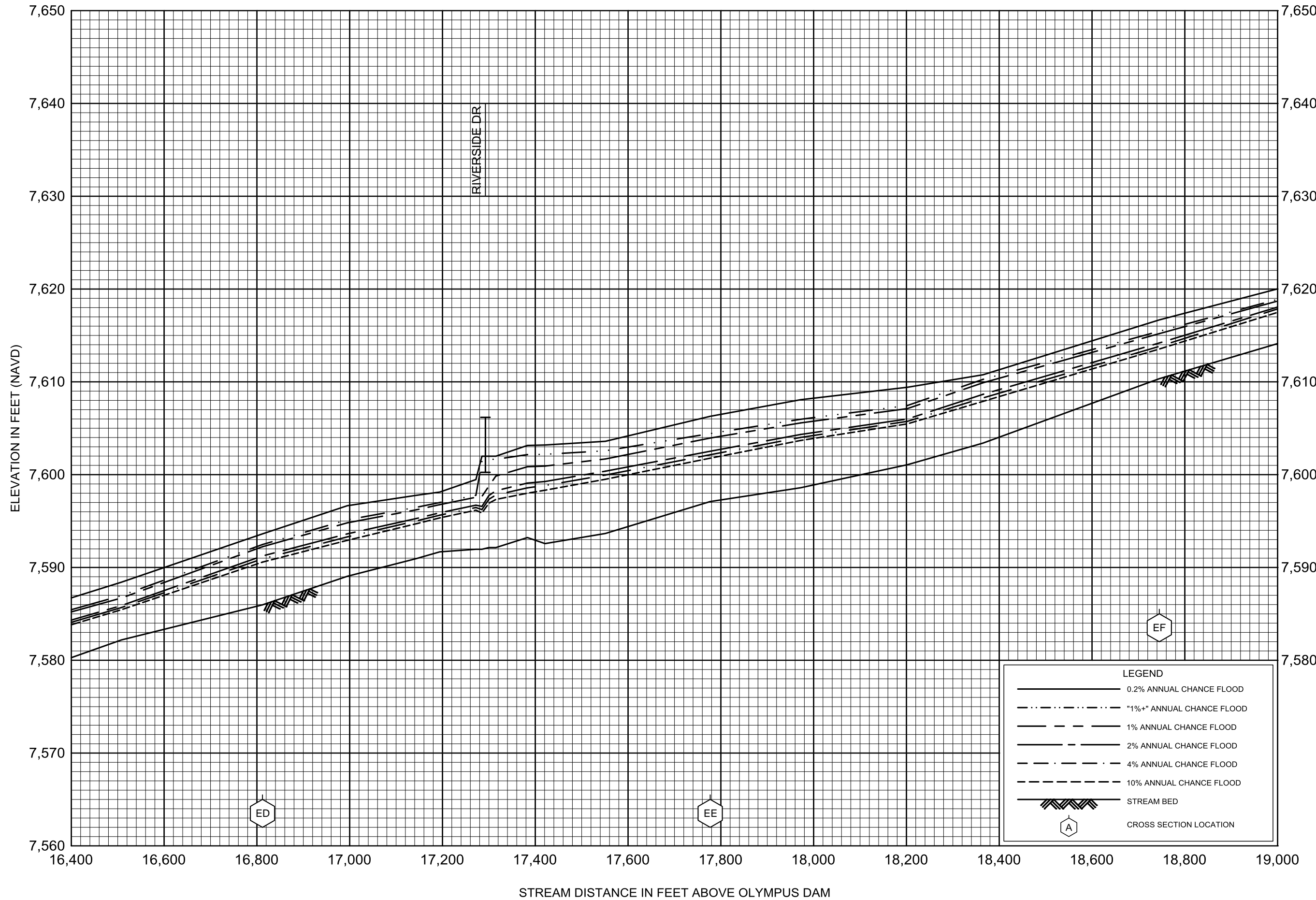
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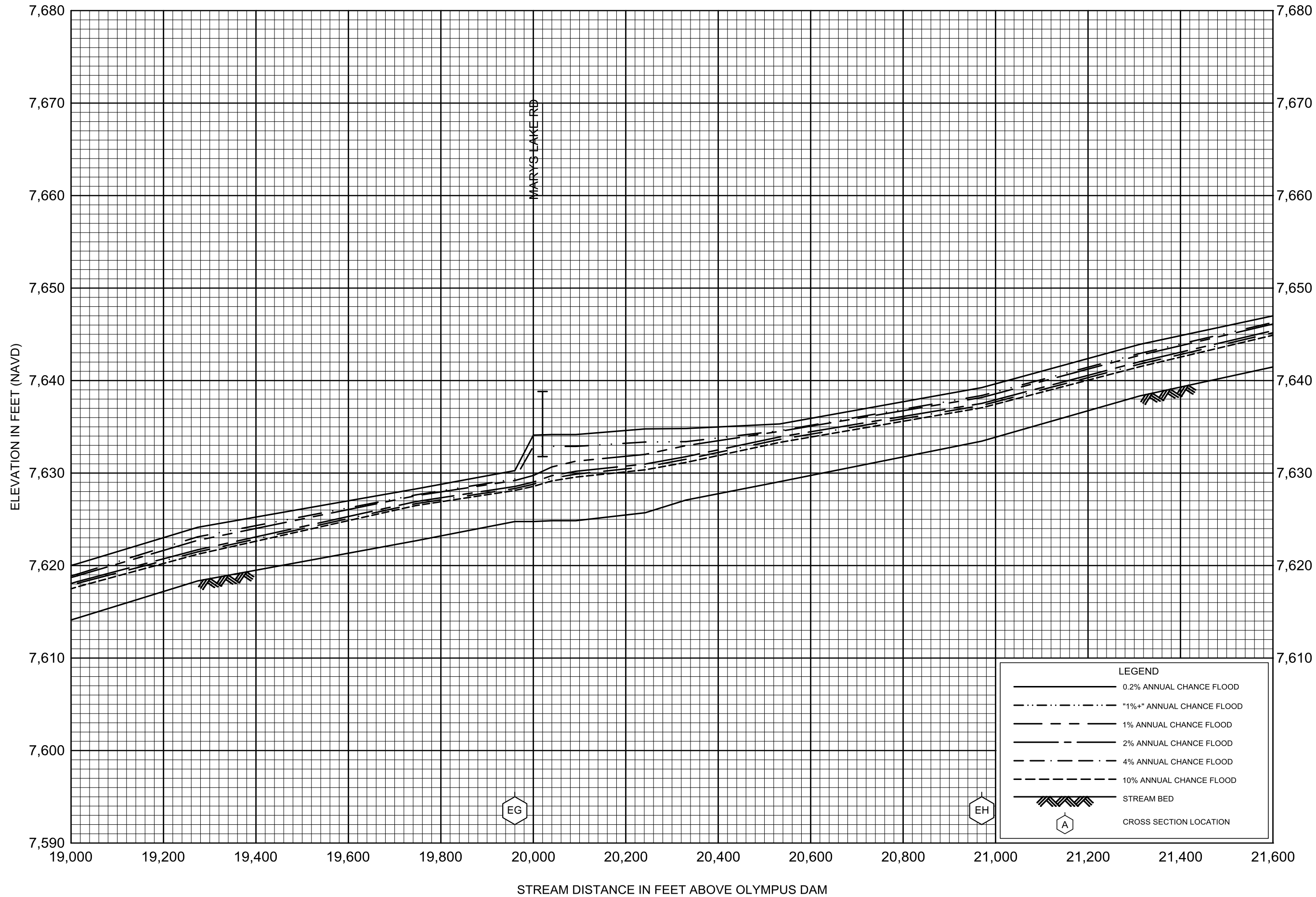
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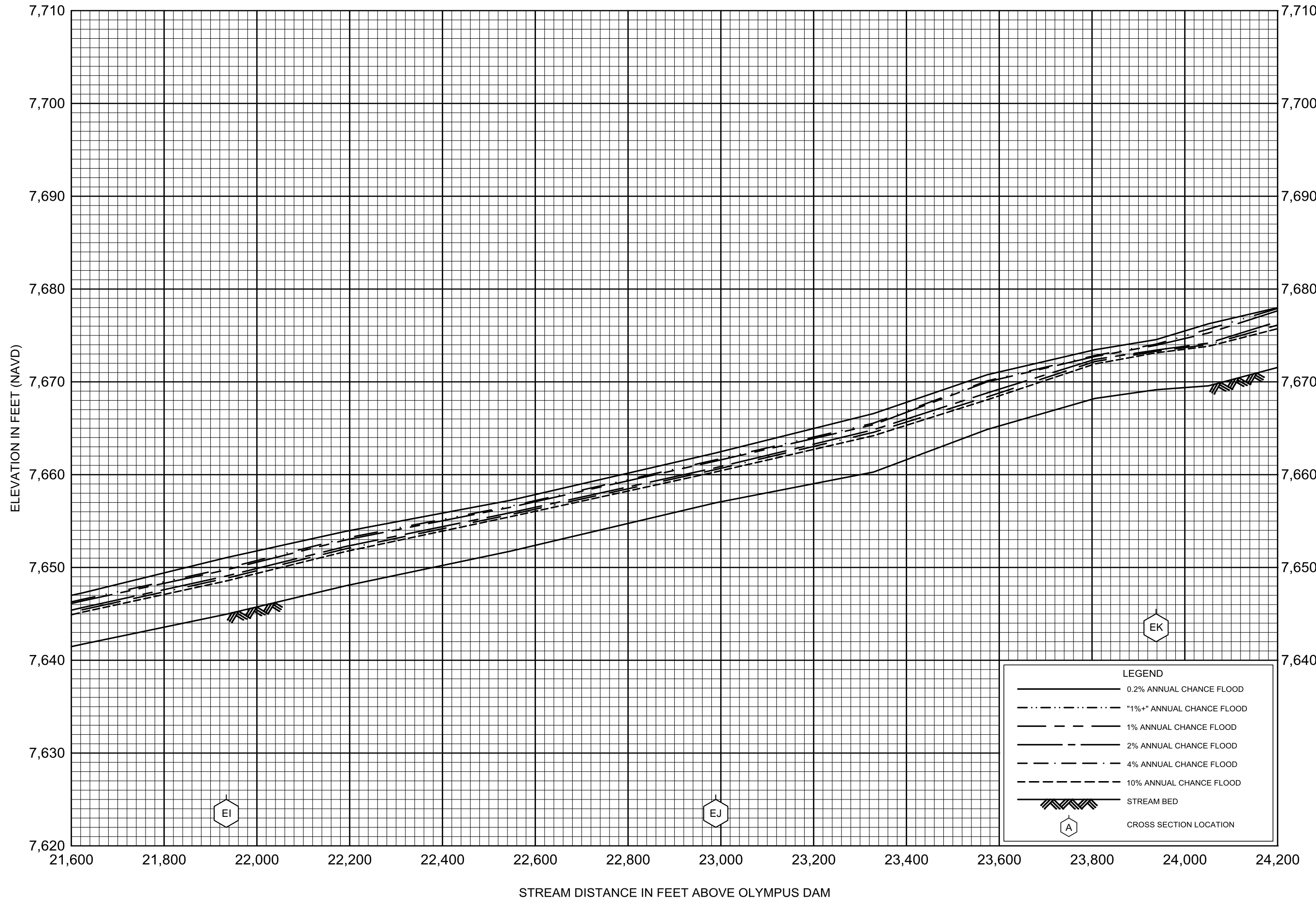
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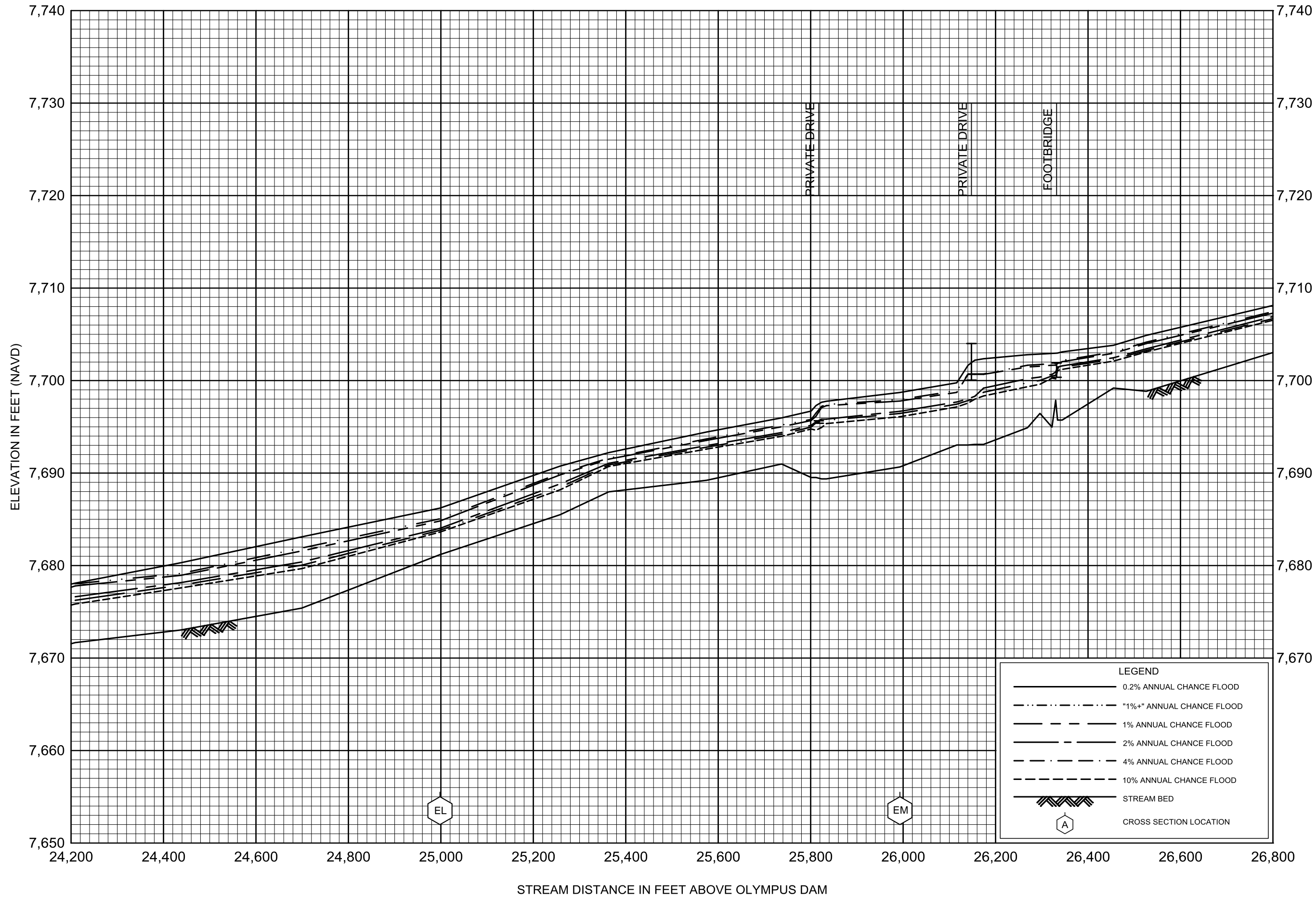
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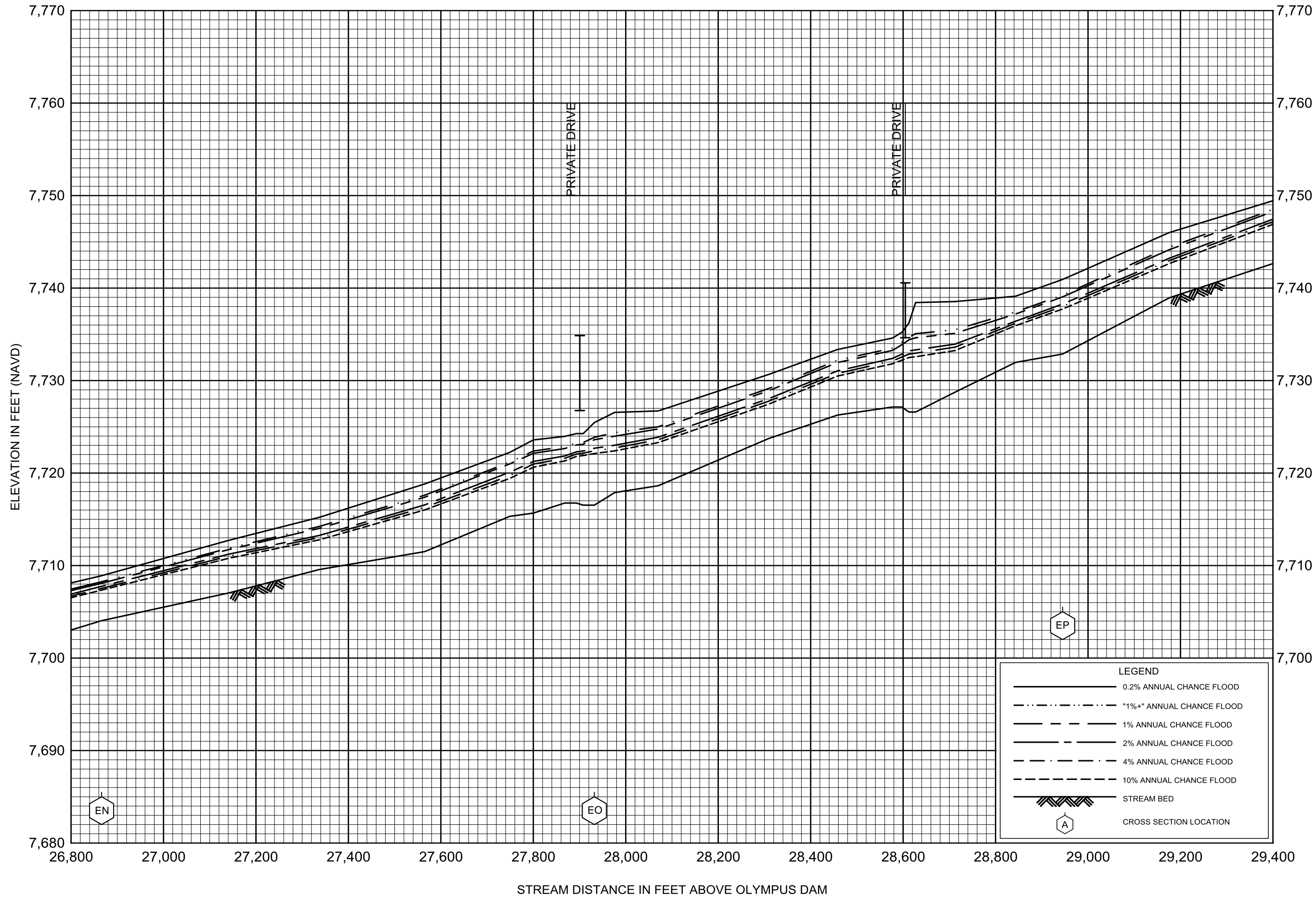
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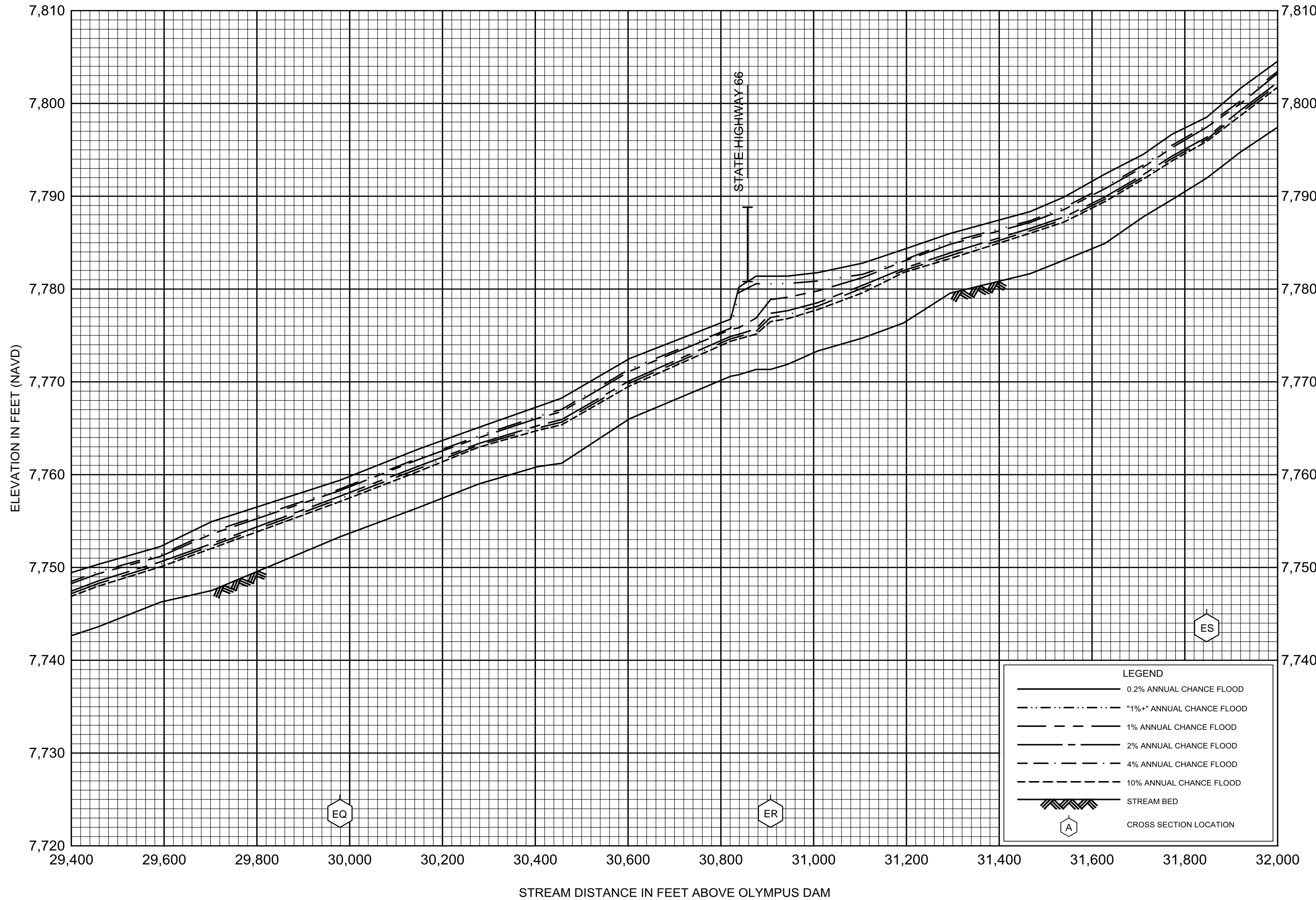
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BIG THOMPSON RIVER

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LARAMIE COUNTY, CO
AND INCORPORATED AREAS



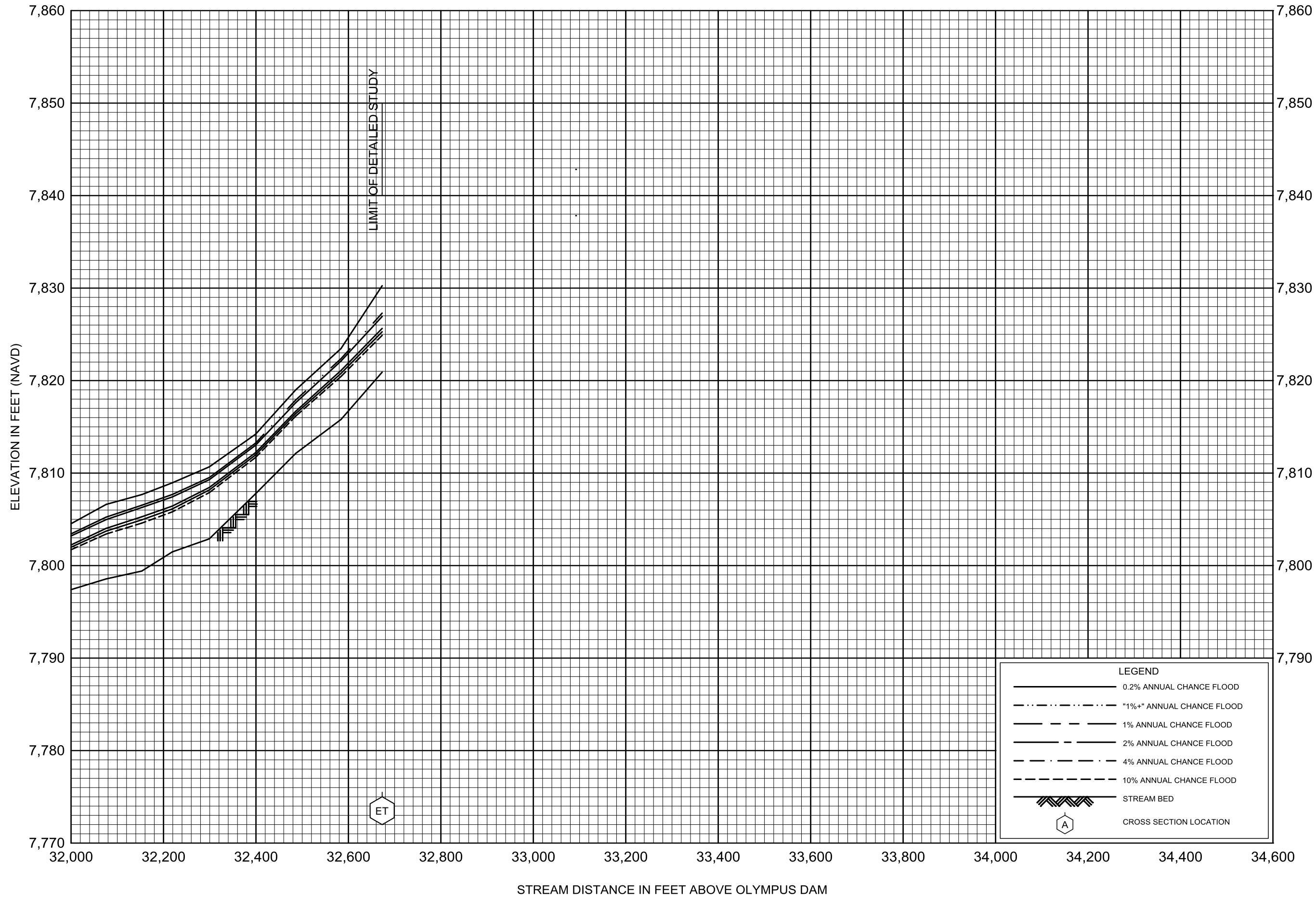
FLOOD PROFILES
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