ROSE GARDEN LANE DRAINAGE IMPROVEMENTS
FINAL DESIGN REPORT

City Solicitation No. P-04-0057

City Engineering Project No. SS-0203

October 2008

WP #042161

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EXP. 9/30/08
Engineer

Registered Professional Engineer (Civil) CERTIFICATE NO. 24999 JEFFREY R. MINCH DATE SIGNED 10-31-08 ARIZONA, U.S.A.

EXPIRES 9/30/09
Peer Reviewer

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APPENDICES

APPENDIX A	Project Location and Vicinity Maps
APPENDIX B	Hydrologic Analyses
APPENDIX C	Hydraulic Analyses and Design Calculations
APPENDIX D	Miscellaneous Supporting Documentation

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1.0 INTRODUCTION

1.1 Description

The Glendale/Peoria Area Drainage Master Plan (ADMP) was completed in May 1987 by CDM Inc. and JM Montgomery Inc., and was updated in May 2002 by Entellus, for the Flood Control District of Maricopa County (FCDMC) and its partners - the Cities of Peoria and Glendale. Rose Garden Lane drainage system is one of the three drainage projects for the Northwest Region recommended in the Glendale/Peoria ADMP Update. The City of Peoria elected to undertake the Rose Garden Lane project ahead of the schedule proposed by the FCDMC and has taken the lead on the project.

In addition to the flooding issues studied in the ADMP, the City has two local issues that they wanted to be addressed: local flooding in 107th Avenue around the Rose Garden Lane intersection and to the north, and a need to have flows from east of 95th Avenue and north of Rose Garden Lane to be redirected to the west instead of flowing to the south.

Since the completion of the ADMP Update, development has occurred and new developments are occurring which impact the facilities that were recommended. In June 2004 the City of Peoria contracted with Wood, Patel & Associates, Inc. (Wood/Patel) to provide a Concept Refinement Study for the Rose Garden Lane Drainage Improvements including the other two issues identified by the City, and complete the design for the Rose Garden Lane channel improvements. This study was completed and approved on July 26, 2005 (Reference 1).

This project will incorporate the recommended improvements from the Concept Refinement Study Report for Rose Garden Lane. The Concept Refinement Study extended the hydrologic and hydraulic modeling to address drainage issues beyond those covered in the Glendale/Peoria ADMP Update and to provide updates to coincide with plans for development in the area. Further refinements were also made as part of the final design process.

Specifically, the Concept Refinement Study:

- modified the Glendale/Peoria ADMP Update hydrologic model to include the changes in land use associated with the Camino á Lago project and the Lake Pleasant Parkway improvements;
- identified detention/retention basin modifications along 107th Avenue and east of 95th Avenue to achieve project objectives;
- determined appropriate collection and conveyance system locations, alignments, cross sections, and right-of-way (ROW) requirements for Rose Garden Lane between Lake Pleasant Road and the existing 95th Avenue drainage basin;
- determined appropriate collection and conveyance system locations, alignments, cross sections, and right-of-way (ROW) requirements for 107th Avenue between Rose Garden Lane and Williams Road; and
- revised the Glendale/Peoria ADMP Update-recommended improvements of Rose Garden Lane Drainage System.

Final Design refinements included:

- refining the detention storage hydrologic routing east of 95th Avenue;
- Developing and defining the project outfall system west of 109th Avenue to the Agua Fria River;
- Implemented the design of a retention basin at the Agua Fria River to retain watershed runoff for the 100 year storm event.

1.2 Agencies

The City of Peoria is the lead agency for this project. Other project stakeholders include The Flood Control District of Maricopa County and D.R. Horton (Camino á Lago).

2.0 STUDY AREA

2.1 Location

The overall study area for the Glendale/Peoria ADMP Update is approximately 80 square miles and includes portions of the cities of Peoria, Glendale, Sun City, Youngtown, Phoenix, and unincorporated portions of Maricopa County. The project study limits are approximately from the Agua Fria River to the west, Rose Garden Lane to the south, Williams Road alignment to the north, and approximately 93rd Avenue to the east. The project lies primarily within the City of Peoria, as shown on the Project Location and Vicinity Maps contained in Appendix A.

The Rose Garden Lane drainage system recommended in the Concept Refinement Study Report begins at the Dove Valley Ranch Basin east of 95th Avenue and continues to the west along the north side of the proposed Lake Pleasant Parkway alignment to Lake Pleasant Road. From there, the system continues to the west along the north side of Rose Garden Lane to approximately 111th Avenue. There, the alignment turns to the north and then west to outfall into the Agua Fria River.

2.2 Utilities

There are numerous utilities within the proposed drainage corridor alignment as shown on the plans. Some of these utilities will require relocation. Some relocations including water, sewer and high pressure gas (HPG) lines will be project costs. Other utilities including underground electric (UGE), telephone, fiber optic cable (FO) and natural gas distribution lines will be relocated by the facility owners at their expense.

The water and sewer line relocations will be performed as part of the City of Peoria construction contract for this project. The high pressure gas line relocations at 107th Avenue and Rose Garden Lane will be performed by El Paso Natural Gas prior to the construction of drainage improvements and will be a project cost.

2.3 Jurisdictional Delineation

A wash within the project area was found to be have jurisdictional Waters of the U.S. north of Rose Garden Lane and west of 111th Avenue. A Section 404 Permit for Outfall Structures and Maintenance was obtained U.S. Army Corps of Engineers. A copy of the Section Permit Authorization is contained in Appendix D.

2.4 FEMA FIRM Panel

Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel 04013C1170H, dated September 30, 2005, has designated the majority of the project area as Zone X. Zone "X" is defined as areas of 500-year flood, areas of 100-year flood with average depths of less than 1 foot and with drainage areas less than 1 square mile or areas protected by levees from 100-year flood. A FIRMette showing designated in the project area is contained in appendix D.

3.0 ROSE GARDEN LANE DRAINAGE IMPROVEMENTS

The Rose Garden Lane Drainage Improvements will be essentially as planned in the ADMP with some minor refinements. This system consists of a trapezoidal earthen channel along the north side of Rose Garden Lane from the west side of Lake Pleasant Road to immediately east of Rose Garden subdivision. From there flow will be conveyed within a box culvert to the west side of 107th Avenue. A trapezoidal earthen channel will convey the flow from the west side of 107th Avenue to the Agua Fria River. With the implementation of the Rose Garden Lane Channel, the existing gunite channels on the south side of Rose Garden Lane and on the east side of 111th Avenue (to the south) are no longer necessary. At the direction of the City, they will both be removed and backfilled as part of this project.

3.1 Eastern Stormwater System

Along the Rose Garden Lane alignment, east of Lake Pleasant Road no collection/conveyance system was proposed in the ADMP. Currently, storm water east of Lake Pleasant Road flows to the south across the Rose Garden Lane alignment through three natural washes between 91st Avenue and Lake Pleasant Road. The City wanted runoff from two of these three locations to be routed to the west in order to help solve flooding issues south of Rose Garden Lane. The City proposes to use the new Rose Garden Lane Channel to outfall these flows by extending the channel to east of 95th Avenue. The City also wants runoff through the third wash, located in subdivision Parkridge II, to be limited.

The implementation of this extension between 95th Avenue and Lake Pleasant Road will be done by D.R. Horton within the Camino á Lago development and must work in concert with the proposed Lake Pleasant Parkway project. Lake Pleasant Parkway currently ends east of 95th Avenue but is under design to continue to the west through the Camino á Lago area and swing north to meet the current Lake Pleasant Road alignment. Several drainage crossings of the Parkway are planned and these will include Camino á Lago drainage. All three projects – Rose Garden Lane Channel, Camino á Lago, and Lake Pleasant Parkway – are intertwined and contribute to the solution.

In order to reduce the flows to the south between 91st Avenue and 93rd Avenue, this project will modify the existing Dove Valley Ranch Basin drainage improvements. A bulkhead will be constructed at the inlet of the existing triple pipe culvert. Flows from this area will be directed west. A bulkhead will also be constructed at the inlet of the existing 3 barrel 6'x3' box culvert at approximately the 93rd Avenue alignment. A swale will be constructed within the existing basin to convey flow to the west to a new box culvert across 95th Avenue. Since there is not enough topographic relief to positively drain the existing sump from the 93rd Avenue alignment box to the proposed 95th Avenue box, an 18-inch pipe will be extended from the proposed bulkhead to drain the sump. See Appendix B for hydrologic calculations and the HEC-1 Schematic.

Existing culvert to be blocked and grade to drain to west.

Box culvert outlet to be limited to one 18"pipe.

Wood/Patel worked closely with Coe and Van Loo (CVL), the engineering firm for the Camino á Lago developer (D.R. Horton), in developing hydrologic modeling for the project, as documented in the Concept Refinement Study Report. See Appendix B for HEC-1 model summary output.

West of the Camino á Lago development, through 107th Avenue, the Rose Garden Lane drainage improvement takes the form of a double barrel 8' x 6' concrete box culvert due to steep slopes and limited right of way.

3.2 107th Avenue Stormwater System

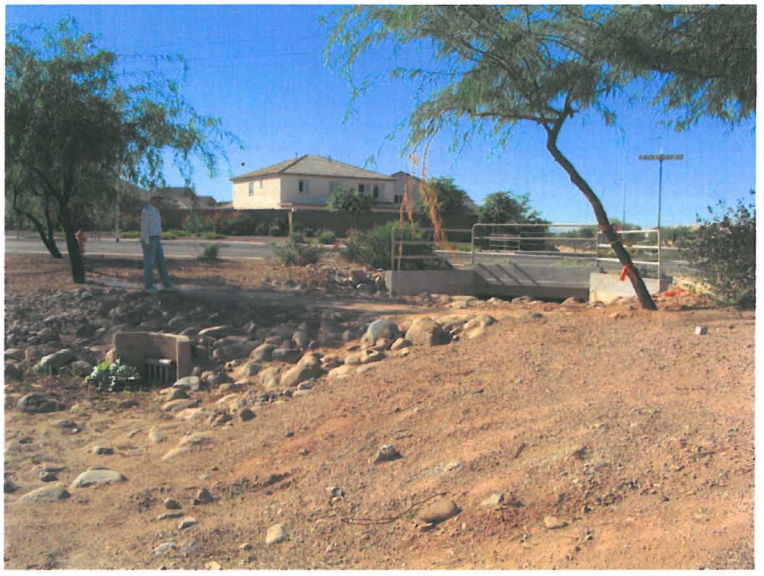
The City took the initiative with this project to address local flooding and capacity issues along 107th Avenue south of Williams Road to the Rose Garden Lane intersection. This area is tributary to the proposed Rose Garden Lane Channel.

The Glendale-Peoria ADMP Update proposed a channel project in Pinnacle Peak Road – 1 ½ miles north of Rose Garden Lane, which will intercept flows from north of Pinnacle Peak Road. Currently, flows from south of Pinnacle Peak Road are conveyed through culverts that serve the Alta Vista Estates Units 3 and 4 and Ironwood subdivisions and cross Williams Road east of 107th Avenue. Refer to the Project Location Map contained in Appendix A. The flows enter an on-line detention basin at the southeast corner of Williams Road and 107th Avenue in Alta Vista Estates Unit 2. The basin has an effective capacity of approximately 15 acre-feet. A 12-inch diameter pipe is used to bleed-off the basin and the emergency spillway height is about two feet above the bottom. The basin fills with flows exiting through the 12-inch pipe outlet until the spillway is overtopped, at which point both the pipe and the spillway deliver flows to the main outlet channel. This arrangement limits outflows and stores a portion of the early part of the storm runoff. The full capacity of the downstream channel only comes into play once the spillway is overtopped and the stored water reaches higher elevations in the basin.

This is viewing upstream at the Williams Road Basin outlet.

The receiving channel has a capacity of approximately 200 cfs, and is overtopped into 107th Avenue with the design flow of the 100-year 6-hour (and smaller) storm events.

Another detention basin with about a 4 acre-feet capacity is located further south (downstream) in this same subdivision at the northeast corner of Deer Valley Rd and 107th Avenue. This on-line basin accepts flows from the southern two-thirds of the Unit 2 and all of Unit 1 of the Alta Vista subdivision. In addition, discharges from the Williams Road Basin outfall channel flow into this basin and the basin outflow crosses Deer Valley Road to south. The outlet configuration in this basin is similar to that at the Williams Road Basin, in that a spillway with a 12-inch pipe outlet is placed just ahead of the Deer Valley Road culvert and outlet channel.



This is the configuration at the outlet of the Deer Valley Basin.

South of Deer Valley Road, the Desert Star subdivision receives the channel flow from the north, and routes it into an on-line basin at its south boundary. This detention basin also receives flows from the Desert Star area. The total inflow to this basin is approximately 300 cfs. The discharge from this basin continues in a channel undersized for the 100-year storm and overtops onto 107th Avenue and flows south to Rose Garden Lane. The Rose Garden subdivision, south of Desert Star, does not have any detention or retention storage for offsite flows.

As a result of capacity limitations (some of which resulted from the original designs) flows overtop the conveyance system onto 107th Avenue at several locations:

- The accumulated inflows north of the Deer Valley Basin are greater than the channel capacity, causing overflows into 107th Avenue north of Deer Valley Road.
- The capacity of the box culvert crossing Deer Valley Road is less than the design event flows, adding to the overtopping upstream at Deer Valley Road.
- The combined flows in the channel just upstream from the Desert Star Basin are greater than the channel capacity, resulting in overflow onto 107th Avenue.
- The channel downstream from the Desert Star Basin is much smaller than at any other place in the system, resulting in further overtopping into 107th Avenue south to Rose Garden Lane.
- The capacity of inlets and structures at Rose Garden Lane is too small to convey the overtopped flows into existing drainage basins west of 107th, adding to flooding at the Rose Garden Lane-107th Avenue intersection.
- Additional flows enter the Rose Garden Lane intersection from 107th Avenue to the south, since the drainage basin boundary is about one-half block to the south. These flows are directed into the existing interceptor channel constructed by the Ventana Lakes subdivision and are conveyed to the west, but any flows that cannot reach that channel during peak events add to flooding at the intersection.

As recommended in the Concept Refinement Study Report, several improvements have been incorporated into the improvement plans along 107th Avenue to attempt to minimize local flooding.

A box culvert outlet for the Desert Star detention/retention basin will be constructed to outfall into the proposed Rose Garden Lane Channel. This structure would capture outflow from the basin as well as a portion of the flows in 107th Avenue. This will make overtopping into 107th Avenue south of the Desert Star Basin much less frequent. The Desert Star Basin will now operate as an online detention basin.

Both the Williams Road and Deer Valley Road basins were designed to operate as on-line detention basins. Inflows are directed into the basins, and the outlet structure holds the

captured flows and releases them at a reduced and prolonged rate. In both cases, there is an emergency spillway that would be overtopped if stored flows reach that level.

The low flow pipes and spillways from the Williams Road basin and the Deer Valley Road basin will be eliminated so that all of the three basins along 107th Avenue will operate as full on-line detention basins. This modification will take advantage of the channel conveyance system to route base flows through the system and reserve storage capacity for when the peak flows arrive. The proposed 107th Avenue drainage system elements and shown on an exhibit contained in Appendix A. The 8' x 4' box culvert outlet will significantly reduce the frequency of flooding in the 107th Avenue-Rose Garden Lane intersection, and the changes in the basins upstream will reduce the frequency of the 107th Avenue channel and basins overtopping into the roadway.

3.3 Rose Garden Lane Outfall Channel Stormwater System

Once runoff was intercepted and conveyed in box culverts along Rose Garden Lane from east of 107th Avenue and from the north along 107th Avenue, it had to be conveyed east and ultimately outfall into the Agua Fria River.

Between 107th Avenue and 107th Lane, the Rose Garden Lane Outfall Channel used rock riprap in the bottom of the channel with rock mulch in upper portions. This was proposed due to the fact that velocities for the 100-year storm would be slightly erosive after exiting the concrete box culverts. East of 107th Lane, the outfall channel is proposed to be earthen with rock mulch and decomposed granite. The decomposed granite was used in upper portions of the channel where landscaping would be installed. It should be noted that for the earthen channels along the project, the design attempts to achieve maximum velocities of approximately 5 fps. Several drops have been incorporated into the channel profile to limit channel velocities. One of these drops has been incorporated into the box culvert inlet.

Box culverts are proposed at each of the roadway crossings along the Rose Garden Lane outfall alignment. A triple 10' x 5' concrete box culvert, per ADOT standards, is proposed at both 107th Lane and 109th Avenue.

At approximately eight hundred feet west of 109th Avenue, the outfall channel transitions into a trapezoidal concrete lined configuration. A drop was incorporated into the transition to help adjoining channel reaches to achieve non-erosive velocities. The

concrete lining also added stability as the outfall channel turns and is directed north away from Rose Garden Lane. Once aligned north, the outfall channel transitions back to an earthen (rock mulch) channel with the use of rock riprap to help lessen velocities. The northern alignment was chosen at the preference of property owners to minimize the bisecting of their properties.

Approximately nine hundred feet north of Rose Garden Lane, the outfall channel is directed northwesterly toward an existing watercourse that conveys runoff to the Agua Fria River. At this location, the channel crosses SRP right of way for their overhead power lines. A four barrel 8' x 6' concrete box culvert is proposed to convey runoff under SRP's maintenance road. From this location to the Agua Fria River, the outfall channel is concrete lined due to the steep slopes and the corresponding velocities. As the channel approaches the river bank, where the slope approaches 25%, it transitions from trapezoidal to rectangular. At the bottom of the bank, a concrete energy dissipater and rock riprap is proposed to minimize the potential for erosion downstream. The proposed dissipater type is a U. S. Bureau of Reclamation (USBR) Type II Dissipater Basin.

3.4 Outfall Retention Basin Stormwater System

To avoid potential impacts to downstream properties and to avoid extensive flowage easements, the City and FCDMC decided to pursue the alternative of constructing a retention basin to retain the runoff from the 100-year storm event at the project outfall. It was determined to be more practical as well as economically feasible.

The retention basin was strategically designed in several aspects. The retention basin utilized the majority of the Arizona State Land Department's parcel. The northwestern portion of the parcel was avoided to stay away from an existing Agua Fria River low flow channel. River flows would need to exceed the low flow channel's capacity before potentially overtopping in to the basin. Adjacent basin side slopes of 10 horizontal to 1 vertical were utilized to add stability if overtopping were to occur. The flatter 10h:1v side slopes were also used on the south side of the basin to provide better accessibility. The remainder of the basin utilized 5h:1v sideslopes. All basin banks are to be vegetated. A rock riprap spillway was provided at the northeast corner of the basin where inflow, other than from the Rose Garden Lane outfall, would most likely occur. Even though the watershed to this low flow channel is relatively isolated and small, the erosion protection was proposed to minimize the potential of head cutting.

To minimize the environmental impacts of the project and to minimize Section 404 requirements, the retention basin was designed for all earthworks to be excavation only. This meant there would not be a discharge from any dredged for fill materials into the waters of the U.S.

An existing APS Power Transmission line bisects a portion of the basin. Also, a future transmission line is planned to the west of and parallel to the existing line by APS. The retention basin was configured to provide a relatively level maintenance access around each (existing and future) tower for a distance of fifty feet.

As determined from the hydrologic model, the amount of runoff that must be stored during the 100-year 6-hour storm is the volume under the hydrograph being diverted from the east (routing element RX10). Per the hydrologic (HEC-1) model, this volume is approximately 147 acre-feet. Factoring in that infiltration will be occurring through the retention basin bottom during the storm event, the minimum required net storage volume is less than 147 acre-feet. Based upon the estimated infiltration in the basin, approximately 7 acre-feet will percolate during the design storm event. Therefore the minimum storage volume required is approximately 140 acre-feet. The proposed volume to be provided, below elevation 1200, is approximately 144 acre-feet. Above this elevation, flows will be allowed to begin discharging downstream. The excess volume of 4 acre-feet will be considered a factor of safety allowing that amount of sedimentation to occur before sediment removal maintenance is necessary.

The hydrologic and volumetric calculations mentioned above were performed based upon the NOAA 2 Atlas rainfall amounts. The Glendale / Peoria ADMP Northwest Region Update, which was recently adopted, utilized the NOAA 14 Atlas which has smaller precipitation amounts than the NOAA 2 Atlas. Based upon the future condition hydrologic model for the ADMP Northwest Region Update, significantly less of a storage volume (98 acre-feet) would be required. This adds additional conservatism to the retention basin design provided.

4.0 HYDRAULIC DESIGN

4.1 Rose Garden Lane Stormwater System

The hydraulic analysis for the proposed drainage system along Rose Garden Lane and the outfall to the Agua Fria River was developed utilizing HEC-RAS software. Discharges from the refined hydrologic model were input into the model. The cross section location map, output summary, profile plot and cross section plots from the hydraulic model are contained in Appendix C. Also, a spreadsheet was developed to calculate and document that sufficient freeboard, per FCDMC and Peoria criteria, has been provided throughout the project. This spreadsheet is also contained in Appendix C.

4.2 107th Avenue Stormwater System

A hydraulic analysis for the proposed drainage system along 107th Avenue was developed with the use of Haestad Methods StormCAD v5.6 software. The models plan and profiles as well as Calculation Results Summary reports are contained in Appendix C. The peak flow rate from the HEC-1 model of 231 cfs (L09IH) was used for the design; although, as additional catch basins were added to the system, peak flows increased to 298 cfs. This provides some added conservatism to the system design since the catch basin flows will actually be gone long before the system peak occurs. In the StormCAD model, junctions were input at each horizontal bend to help simulate minor losses along the system. A portion of the 107th Avenue stormwater system is pressurized, although the hydraulic grade line stays well below the ground surface.

5.0 LANDSCAPE DESIGN CONCEPT

East of 109th Avenue, the landscape design concept was integrated into the channel improvements to allow various factors to be included as part of the overall design of the Rose Garden Lane Drainage Improvements. The key components of this flood control project landscape concept included:

1) Preservation of the existing indigenous vegetation, where possible;
2) Restoration and re-vegetation of all surface areas disturbed as a result of flood control improvements;
3) Providing potential opportunities for future recreation amenities, which may include facilities like multi-use trails, pedestrian nodes, and access control points;
4) Integration of aesthetic grading and sculptural earth forms as part of channel and basins grading where feasible;
5) Establishing transitional areas to enhance the visual quality of the corridor and provide landscape buffers where possible.

6.0 RECOMMENDATIONS

6.1 Conclusions and Recommendations

Peak flows at critical locations were utilized from the hydrologic (HEC-1) model developed in the Concept Refinement Study Report and then refined as part of the Final Design. The Rose Garden Lane conveyance system is quite similar to the ADMP recommended alignment from Lake Pleasant Road to the Agua Fria River with the exception of the alignment west of 111th Avenue, which has been directed to the north to avoid bisecting a privately owned parcel at the outfall.

At the request of the City, a diversion has been incorporated into the design at the Dove Valley Ranch Basin to direct the majority of flows to the west rather than which had previously been conveyed to the south. This helps alleviate potential flooding to the south of Rose Garden Lane.

Drainage improvements along 107th Avenue have been incorporated into the design plans to optimize performance of the stormwater system and to lessen local flooding along 107th Avenue.

The proposed Rose Garden Lane Outfall Channel provides a safe outlet for the watershed's runoff. The large retention basin at the end of the outfall channel captures and retains the anticipated runoff for the 100-year 6-hour storm event necessary to mitigate potential impacts.

Ongoing maintenance is required for all stormwater systems in order to assure design performance. The City will ultimately be responsible for maintenance and safety of the project improvements.

7.0 REFERENCES

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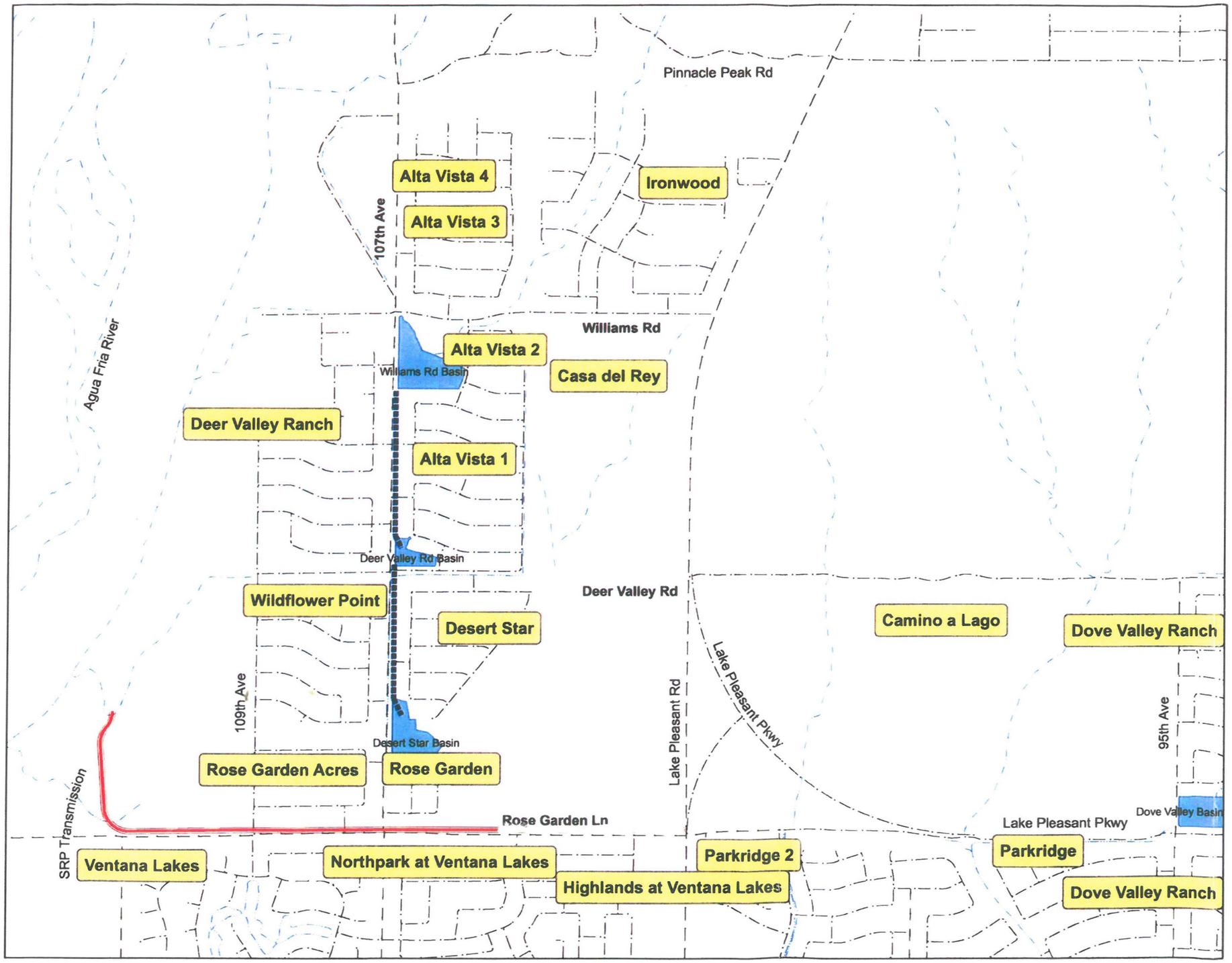
14. FEMA, *Flood Insurance Study, Maricopa County and Incorporated Areas*, Arizona, 2001.

15. Flood Control District of Maricopa County, Drainage *Design Manual for Maricopa County, Arizona; Volume I – Hydrology,* revised January 1995.

16. Flood Control District of Maricopa County, *Drainage Design Manual for Maricopa County, Arizona; Volume II- Hydraulics,* January 1996.

APPENDIX A

Project Location and Vicinity Maps



Wood/Patel

Civil Engineers
Hydrologists
Land Surveyors
Construction Managers

0 500 1,000 Feet

Legend

- Streets
- Rivers
- Washes
- Parcels
- Existing basins
- Existing channel - 107th Ave
- Proposed Route

City of Peoria
Rose Garden Lane Drainage Improvements
Concept Refinement Study.
Wood Patel & Associates
Job #042161.00

Project Location

Wood/Patel

Civil Engineers
Hydrologists
Land Surveyors
Construction Managers

0 400 800 1,600 Feet

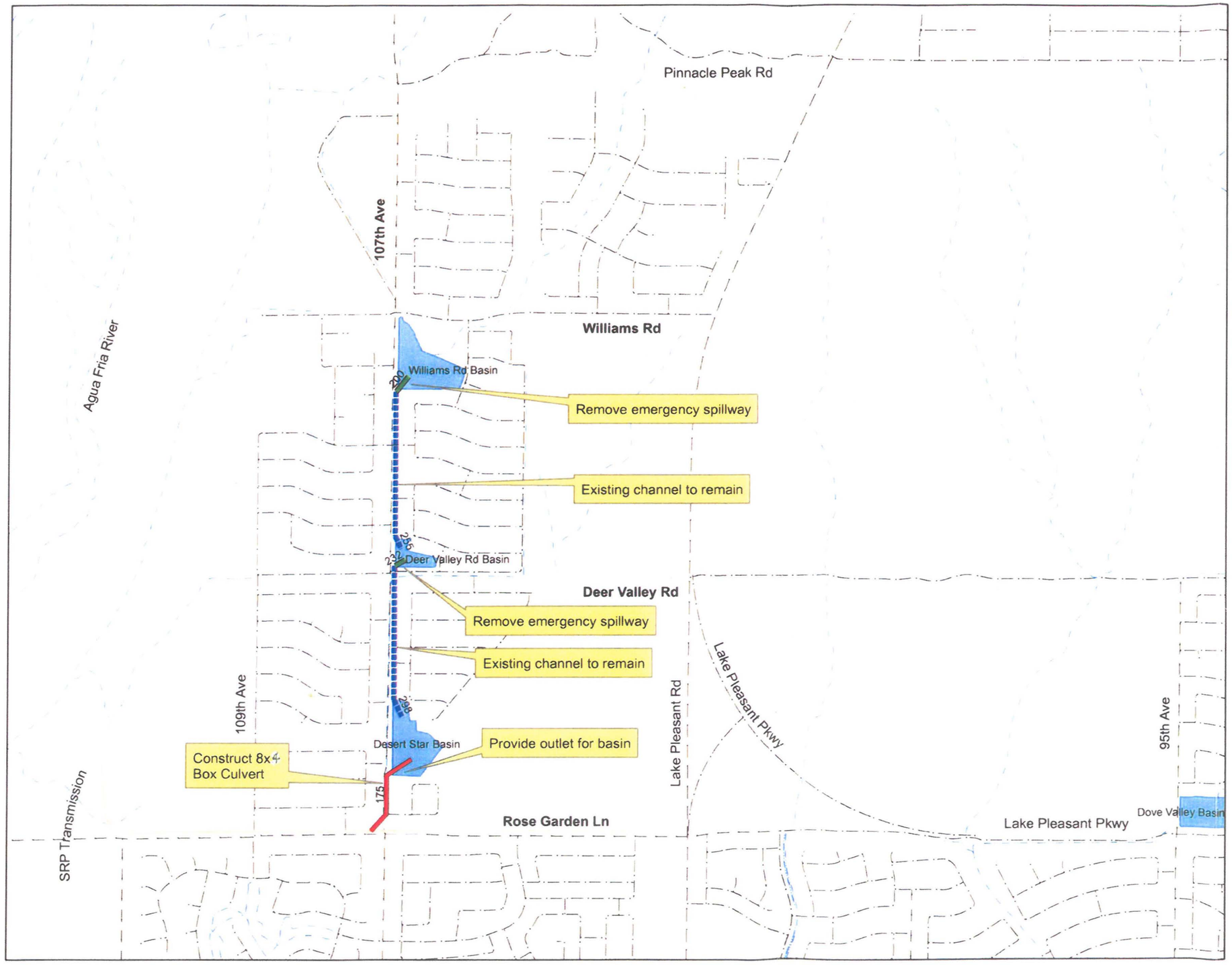
04/03/06

Legend

- Box section
- Trapezoidal section
- Outfall Basin
- FEMA Flood Plain
- Streets
- Parcels

City of Peoria/Flood Control District of Maricopa County
Rose Garden Lane Drainage Improvements
Wood Patel & Associates
Job #042161.05

Rose Garden Lane Channel Project



Wood/Patel

Civil Engineers
Hydrologists
Land Surveyors
Construction Managers

0 500 1,000 Feet

Legend

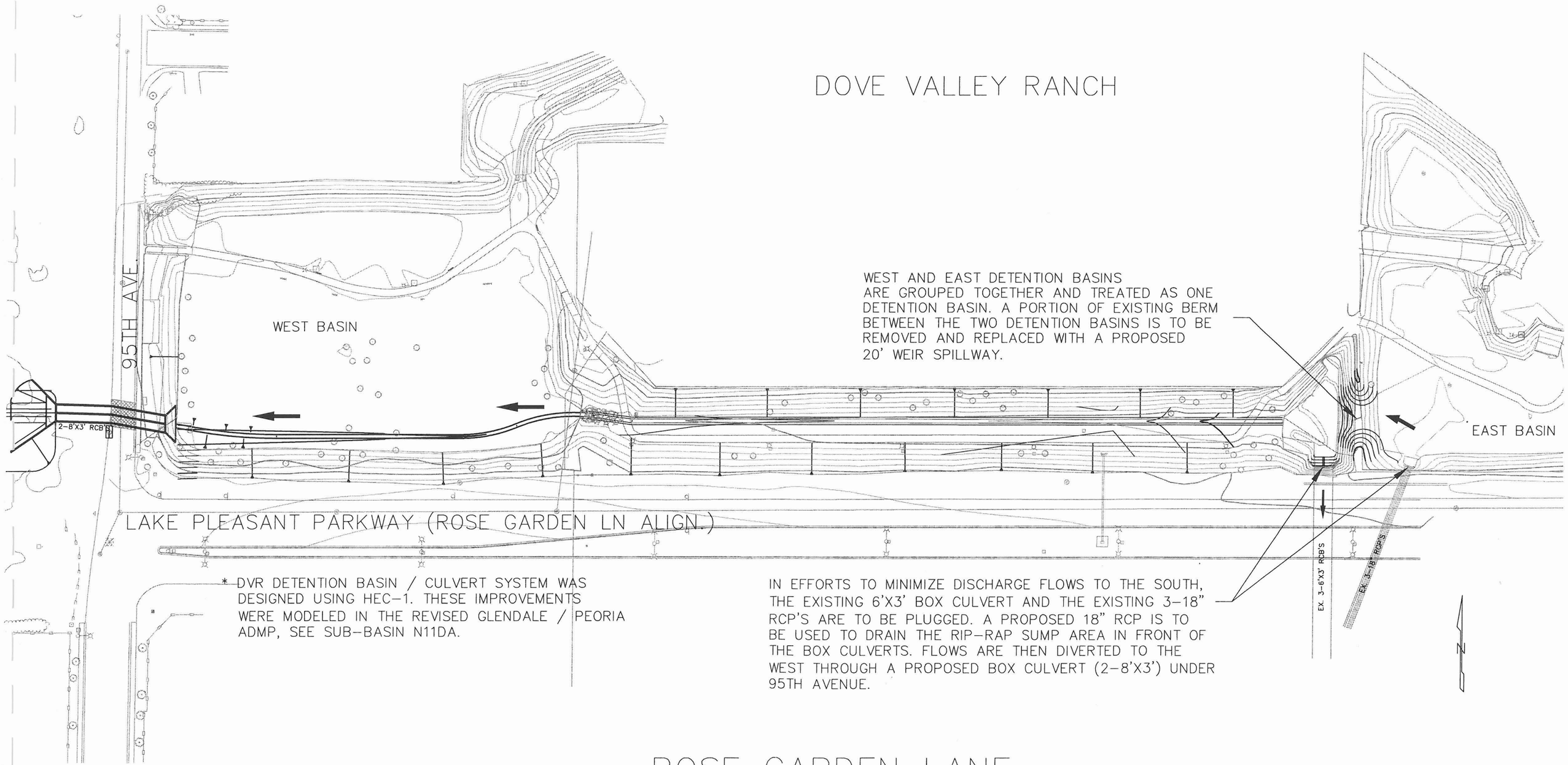
- Streets
- Rivers
- Washes
- Parcels
- Existing basins
- Existing channel - 107th Ave
- Proposed Outlet Changes
- Proposed Box Channel - 107th Ave
- Proposed Channel

All flow rates are Q_{100} in cfs

City of Peoria
Rose Garden Lane Drainage Improvements
Concept Refinement Study.
Wood Patel & Associates
Job #042161.00

107th Avenue

DOVE VALLEY RANCH



WEST AND EAST DETENTION BASINS ARE GROUPED TOGETHER AND TREATED AS ONE DETENTION BASIN. A PORTION OF EXISTING BERM BETWEEN THE TWO DETENTION BASINS IS TO BE REMOVED AND REPLACED WITH A PROPOSED 20' WEIR SPILLWAY.

* DVR DETENTION BASIN / CULVERT SYSTEM WAS DESIGNED USING HEC-1. THESE IMPROVEMENTS WERE MODELED IN THE REVISED GLENDALE / PEORIA ADMP, SEE SUB-BASIN N11DA.

IN EFFORTS TO MINIMIZE DISCHARGE FLOWS TO THE SOUTH, THE EXISTING 6'X3' BOX CULVERT AND THE EXISTING 3-18" RCP'S ARE TO BE PLUGGED. A PROPOSED 18" RCP IS TO BE USED TO DRAIN THE RIP-RAP SUMP AREA IN FRONT OF THE BOX CULVERTS. FLOWS ARE THEN DIVERTED TO THE WEST THROUGH A PROPOSED BOX CULVERT (2-8'X3') UNDER 95TH AVENUE.

ROSE GARDEN LANE

DOVE VALLEY RANCH IMPROVEMENTS

WP# 042161.03
DATE: JUNE 6, 2006

N:2004/042161/Project Support/Hydr/Exhibits/95thAveBasinDesign.dwg

APPENDIX B

Hydrologic Analyses

```
1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*             JUN   1998               *
*           VERSION 4.1                *
*                                      *
*  RUN DATE   14APR06  TIME  16:01:49  *
*                                      *
****************************************
```

```
****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104             *
*                                      *
****************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X       X     X        XX
X     X  X       X               X
XXXXXXX  XXXX    X        XXXXX  X
X     X  X       X               X
X     X  X       X     X         X
X     X  XXXXXXX   XXXXX        XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
1                                          HEC-1 INPUT                                                    PAGE  1

  LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

    1           ID   ******************************************************************************
    2           ID   **                                                                          **
    3           ID   ** CONCEPT REFINEMENT STUDY FOR ROSE GARDEN LANE DRAINAGE IMPROVEMENTS      **
    4           ID   ** ORIGINAL HEC-1 FILE FROM GLENDAL/PEORIA ADMP UPDATE STUDY                **
    5           ID   ** MODIFIED HEC-1 MODEL: LEVEL3R5.DAT, Wood/Patel & CVL, May 2005           **
    6           ID   ** THIS IS THE PREFERRED ALTERNATIVE MODEL                                  **
    7           ID   ** WPA REVISED APRIL 14, 2006 FOR DOVE VALLEY RANCH IMPROVEMENTS            **
    8           ID   ** USING LATEST SURVEY DATA.                                                **
    9           ID   ******************************************************************************
                     *
   10           ID   Project ID: GP - Major Basin: 01 - Return Period: 100 Years
   11           ID   ******************************************************************************
   12           ID   **                                                                          **
   13           ID   **                    Glendale/Peoria ADMP Update                           **
   14           ID   **                                                                          **
   15           ID   ******************************************************************************
   16           ID   ******************************************************************************
   17           ID   PROJECT:                Glendale Peoria ADMP Update
   18           ID   CLIENT:                 Flood Control District of Maricopa County
   19           ID   PREPARED BY:            Entellus, Inc.
   20           ID   PROJECT No:             FCD 99-44              Entellus 310.017
   21           ID   FILE NAME: LEVEL3.DAT              CREATED DATE: JUNE 6, 2001
   22           ID   STORM:                  100-year 6-hour Storm
   23           ID   DEVELOPMENT CONDITIONS: LEVEL 3 HYDROLOGY
   24           ID
   25           ID   DDM MCUHP1
                     *
                     * ****************************************************************************
   26           IT       2                    1000
   27           IO       5
                     *
                     *DIAGRAM
                     * ****************************************************************************
                     * **********************     PRECIPITATION DATA      ****************************
                     * ****************************************************************************
   28           IN      15
   29           JD    3.20    0.01
   30           PC   0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.074
   31           PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931   0.950
   32           PC   0.962   0.972   0.983   0.991   1.000
   33           JD   3.179    0.50
   34           JD   3.120    2.80
   35           PC   0.000   0.009   0.016   0.025   0.034   0.042   0.051   0.059   0.067   0.076
   36           PC   0.087   0.100   0.120   0.163   0.252   0.451   0.694   0.837   0.900   0.938
   37           PC   0.950   0.963   0.975   0.988   1.000
   38           JD   2.950    16.0
   39           PC   0.000   0.009   0.020   0.030   0.048   0.063   0.076   0.090   0.105   0.119
   40           PC   0.135   0.152   0.175   0.222   0.304   0.472   0.670   0.796   0.868   0.912
   41           PC   0.946   0.960   0.973   0.987   1.000
   42           JD   2.598    90.0
   43           PC   0.000   0.021   0.035   0.051   0.071   0.087   0.105   0.125   0.143   0.160
   44           PC   0.179   0.201   0.232   0.281   0.364   0.500   0.658   0.773   0.841   0.888
   45           PC   0.927   0.945   0.964   0.982   1.000
   46           JD   1.824   500.0
   47           PC   0.000   0.024   0.043   0.059   0.078   0.098   0.119   0.141   0.162   0.186
1                                          HEC-1 INPUT                                                    PAGE  2

  LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

   48           PC   0.212   0.239   0.271   0.321   0.408   0.515   0.627   0.735   0.814   0.864
   49           PC   0.907   0.930   0.954   0.977   1.000
                     * ****************************************************************************
                     *
```


W:/2004Projects/042161-RoseGarden/Hydrology/WPA/90%Design/L3R5DVR.DAT

```
2060          KK   N11DA   BASIN
2061          KM   SUB-BASIN N11DA CREATED BY CVL 7/04
2062          KM   BASIN PARAMETERS LG AND UC ARE BASED ON SUB-BASIN N11C
2063          KM   6-HOUR RAINFALL, PATTERN NO. 1.01 WAS USED TO FIND TC & R FOR THIS BASIN
2064          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .993
2065          KM     L =  .82  Kb = .045  Adj. Slope =   24.0
2066          BA    .256
2067          LG    0.13    0.33    4.60    0.30      40
2068          UC    .512    .327
2069          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
2070          UA     100
              *
              *  DOVE VALLEY RANCH RESIDENTIAL DEVELOPMENT STORAGE (ACCOUNTED) *******
              *  STORAGE MODIFIED PER CITY OF PEORIA TO DISCHARGE UP TO 200CFS WEST
              *  TOTAL DETENTION/RETENTION VOLUME = 18 AC-FT, 10 AC-FT MODELED AS RETENTION
              *  8 AC-FT MODELED AS ON-LINE DETENTION BASIN ON NEC OF RGL & 95TH
              *
              * LN11DA
              * LDAOUT    10.0
              *      0     100    1000   10000
              *      0     100    1000   10000
              *

2071          KK  SN11DA
2072          KM    2-8'x3' BOX CULVERTS TO TAKE FLOW TO WEST,
2073          KM   THE WEST + EAST DETENTION BASIN WERE COMBINED WITH 1-18"RCP TO SOUTH
2074          RS       1    STOR       0
2075          SV     0.0     .06    0.16    0.35    1.91    5.62   10.58   16.46
2076          SE    1257    1258    1259    1260    1261    1262    1263    1264
2077          SQ       0       5       9      50      84     113     140     205
              *

2078          KK  N11DAS
2079          KM    SPLIT THE FLOW BETWEEN BOX AND PIPE
2080          DT  D11DAW
2081          DI       0       5       9      50      84     113     140     205
2082          DQ       0       0       0      35      66      93     118     182
              *

2083          KK   N11DB   BASIN
2084          KM   SUB-BASIN N11DB CREATED BY CVL 7/04
2085          KM   6-HOUR RAINFALL, PATTERN NO. 1.01 WAS USED TO FIND TC & R FOR THIS BASIN
2086          KM   THIS BASIN USED RAINFALL REDUCTION FACTOR OF  .993
2087          KM     L =  .82  Kb = .045  Adj. Slope =   24.0
2088          BA    .256
2089          LG    0.13    0.33    4.60    0.30      14
2090          UC    .512    .327
2091          UA       0     5.0    16.0    30.0    65.0    77.0    84.0    90.0    94.0    97.0
2092          UA     100
              *
1                                        HEC-1 INPUT                                          PAGE 86

LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

2093          KK  C11DAB
2094          KM   THIS COMBINES N11DAS AND N11DB
2095          HC       2
              *
              * *** STORAGE ROUTING LN11D ***********************************************
              * *** DOVE VALLEY RANCH RESIDENTIAL DEVELOPMENT STORAGE (ACCOUNTED) *******
              *

2096          KK  LN11DB
2097          DT  LNBOUT      18
2098          DI       0     100    1000   10000
2099          DQ       0     100    1000   10000
              *
              * *** DIVERSION DN11D ***********************************************************
              *
              * A PORTION OF THE SUBDIVISION TO THE NORTH SPILLS OVER 91ST AVENUE TO THE
              * DETENTION BASIN ON THE EAST SIDE.  (ABOUT 10%)
              *

2100          KK   DN11D
2101          DT   N11DI
2102          DI       0       1     100     200     300     500    1000    1500    2000
2103          DQ       0      .1      10      20      30      50     100     150     200
              *
              * *** COMBINE  CN11D ****************************************************
              * COMBINE CN11C*, AND N11DB
              *

2104          KK   CN11D
2105          HC       2
              *
```

```
2060          .          .          .       N11DA
              .          .          .           V
              .          .          .           V
2071          .          .          .      SN11DA
              .          .          .           .
              .          .          .           .
2080          .          .          .           .-------> D11DAW
2078          .          .          .      N11DAS
              .          .          .           .
              .          .          .           .
```

```
2083                                          N11DB
                                                 .
                                                 .
2093                                C11DAB............
                                                 .
                                                 .
2097                                         .-------> LNBOUT
2096                                LN11DB
                                                 .
                                                 .
2101                                         .------->   N11DI
2100                                 DN11D
                                                 .
                                                 .
2104                            CN11D............
                                   V
                                   V
2106                            RWBW1
                                   .
                                   .
2111                                   WBW
                                   .
                                   .
2117                             CWBW............
                                   V
                                   V
2119                             RBWB
                                   V
                                   V
2124                            RWBW2
                                   .
                                   .
```

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	HYDROGRAPH AT	N11P6	367.	4.10	20.	5.	4.	.20		
+	ROUTED TO	R11P6S	350.	4.17	20.	5.	4.	.20		
+	HYDROGRAPH AT	N11P5	81.	4.10	5.	1.	1.	.05		
+	ROUTED TO	R11P5S	74.	4.20	5.	1.	1.	.05		
+	HYDROGRAPH AT	N11P1	124.	4.10	7.	2.	1.	.07		
+	DIVERSION TO	N11P1I	31.	4.10	2.	0.	0.	.07		
+	HYDROGRAPH AT	DN11P1	93.	4.10	5.	1.	1.	.07		
+	ROUTED TO	R11P1E	90.	4.20	5.	1.	1.	.07		
+	HYDROGRAPH AT	N11P2	68.	4.20	6.	2.	1.	.06		
+	4 COMBINED AT	CN11P2	575.	4.17	35.	9.	6.	.38		
+	DIVERSION TO	CALLEI	575.	4.17	35.	9.	6.	.38		
+	HYDROGRAPH AT	CALLE	0.	.00	0.	0.	0.	.38		
+	DIVERSION TO	LEJOSI	0.	.00	0.	0.	0.	.38		
+	HYDROGRAPH AT	LEJOS	0.	.00	0.	0.	0.	.38		
+	ROUTED TO	RN11PS	0.	.00	0.	0.	0.	.38		
+	HYDROGRAPH AT	N11L3	76.	4.13	8.	2.	1.	.06		
+	2 COMBINED AT	CN11L3	76.	4.13	8.	2.	1.	.45		
+	DIVERSION TO	N11L3I	50.	4.13	5.	1.	1.	.45		
+	HYDROGRAPH AT	DN11L3	26.	4.13	3.	1.	0.	.45		
+	ROUTED TO	R11L3W	23.	4.20	3.	1.	0.	.45		

+	HYDROGRAPH AT	N11L2	9.	4.17	1.	0.	0.	.01
+	2 COMBINED AT	CN11L2	32.	4.20	4.	1.	1.	.46
+	ROUTED TO	RN11L2	31.	4.23	4.	1.	1.	.46
+	HYDROGRAPH AT	N11L5	52.	4.23	8.	2.	1.	.07
+	HYDROGRAPH AT	N11LPX	31.	4.10	2.	0.	0.	.07
+	ROUTED TO	RN11P1	28.	4.30	2.	0.	0.	.07
+	3 COMBINED AT	CN11L5	106.	4.27	13.	3.	2.	.53
+	ROUTED TO	RN11L5	105.	4.30	13.	3.	2.	.53
+	HYDROGRAPH AT	N11L1	65.	4.20	9.	2.	2.	.07
+	2 COMBINED AT	CN11L1	155.	4.30	21.	5.	4.	.61
+	DIVERSION TO	N11L1I	155.	4.30	21.	5.	4.	.61
+	HYDROGRAPH AT	DN11L1	0.	.00	0.	0.	0.	.61
+	HYDROGRAPH AT	N11L3X	50.	4.13	5.	1.	1.	.45
+	ROUTED TO	R11L3E	49.	4.17	5.	1.	1.	.45
+	HYDROGRAPH AT	N11L4	8.	4.27	1.	0.	0.	.01
+	2 COMBINED AT	CN11L4	56.	4.17	7.	2.	1.	.46
+	ROUTED TO	R11L4E	55.	4.20	7.	2.	1.	.46
+	HYDROGRAPH AT	N21I1	121.	4.17	12.	3.	2.	.11
+	2 COMBINED AT	CN21I1	166.	4.17	18.	4.	3.	.57
+	ROUTED TO	RN21I1	164.	4.20	17.	4.	3.	.57
+	HYDROGRAPH AT	N21I2	75.	4.17	10.	2.	2.	.06
+	2 COMBINED AT	CN21I2	227.	4.20	26.	7.	5.	.63
+	ROUTED TO	RN21I2	225.	4.20	26.	7.	5.	.63
+	HYDROGRAPH AT	N11P7	234.	4.07	13.	3.	2.	.10
+	DIVERSION TO	N11P7I	187.	4.07	10.	3.	2.	.10
+	HYDROGRAPH AT	DN11P7	47.	4.07	3.	1.	0.	.10
+	ROUTED TO	R11P7E	34.	4.27	3.	1.	0.	.10
+	HYDROGRAPH AT	DN11P7	187.	4.07	10.	3.	2.	.10
+	ROUTED TO	R11P7W	136.	4.27	10.	3.	2.	.10
+	HYDROGRAPH AT	N11P4	172.	4.20	13.	3.	2.	.12
+	3 COMBINED AT	CN11P4	333.	4.23	26.	6.	5.	.23
+	ROUTED TO	RN11P4	326.	4.27	26.	6.	5.	.23
+	HYDROGRAPH AT	N11P3	52.	4.20	4.	1.	1.	.04
+	2 COMBINED AT	CN11P3	371.	4.27	30.	7.	5.	.27
+	ROUTED TO	RN11P3	370.	4.30	30.	7.	5.	.27

+	HYDROGRAPH AT	N21J	565.	4.07	39.	10.	7.	.23
+	DIVERSION TO	N21JI	174.	4.07	12.	3.	2.	.23
+	HYDROGRAPH AT	DN21JO	390.	4.07	27.	7.	5.	.23
+	ROUTED TO	RN21JS	348.	4.23	27.	7.	5.	.23
+	HYDROGRAPH AT	N21Z	249.	4.10	22.	5.	4.	.11
+	DIVERSION TO	LN21ZD	191.	4.00	6.	2.	1.	.11
+	HYDROGRAPH AT	LN21Z	249.	4.10	15.	4.	3.	.11
+	2 COMBINED AT	CN21Z	546.	4.20	42.	11.	8.	.34
+	DIVERSION TO	N21ZI	42.	4.20	2.	0.	0.	.34
+	HYDROGRAPH AT	DN21ZO	504.	4.20	41.	10.	7.	.34
+	DIVERSION TO	N21ZI*	164.	4.20	5.	1.	1.	.34
+	HYDROGRAPH AT	DN21Z*	384.	4.07	35.	9.	6.	.34
+	ROUTED TO	RN21ZW	328.	4.37	35.	9.	6.	.34
+	HYDROGRAPH AT	N21I3	128.	4.17	13.	3.	2.	.12
+	4 COMBINED AT	CN21I	667.	4.33	80.	20.	14.	1.63
+	ROUTED TO	83RD	72.	5.20	67.	20.	14.	1.63
+	ROUTED TO	RN21I	72.	5.23	67.	20.	14.	1.63
+	HYDROGRAPH AT	N22B	455.	4.10	40.	10.	7.	.19
+	DIVERSION TO	N22BI	410.	4.10	36.	9.	6.	.19
+	HYDROGRAPH AT	DN22B	46.	4.10	4.	1.	1.	.19
+	ROUTED TO	RN22BE	24.	4.33	4.	1.	1.	.19
+	HYDROGRAPH AT	N21F	158.	4.23	28.	7.	5.	.10
+	3 COMBINED AT	CN21F	209.	4.33	95.	27.	19.	1.92
+	ROUTED TO	RN21F	208.	4.47	95.	27.	19.	1.92
+	HYDROGRAPH AT	N21G	121.	4.13	17.	4.	3.	.06
+	HYDROGRAPH AT	DR21Z*	164.	4.20	5.	1.	1.	.34
+	ROUTED TO	RN21ZS	102.	4.53	5.	1.	1.	.34
+	2 COMBINED AT	CN21G	150.	4.53	21.	5.	4.	.63
+	DIVERSION TO	N21GI	64.	4.53	3.	1.	1.	.63
+	HYDROGRAPH AT	DN21GO	88.	4.17	18.	5.	3.	.63
+	ROUTED TO	RN21GS	88.	4.53	18.	5.	3.	.63
+	HYDROGRAPH AT	N21E	93.	4.23	18.	4.	3.	.06
+	3 COMBINED AT	CN21E	361.	4.43	126.	35.	25.	1.98
+	ROUTED TO	RN21E	355.	4.63	126.	35.	25.	1.98
+	HYDROGRAPH AT	N21D	152.	4.07	13.	3.	2.	.05
	DIVERSION TO							

+		LN21DD	152.	4.07	10.	2.	2.	.05
+	HYDROGRAPH AT	LN21D	95.	4.20	4.	1.	1.	.05
+	HYDROGRAPH AT	N22BIX	410.	4.10	36.	9.	6.	.19
+	ROUTED TO	RN22BS	385.	4.27	36.	9.	6.	.19
+	HYDROGRAPH AT	N22A	368.	4.17	48.	12.	9.	.18
+	2 COMBINED AT	CN22A	728.	4.23	84.	21.	15.	.37
+	DIVERSION TO	N22AI	109.	4.23	13.	3.	2.	.37
+	HYDROGRAPH AT	DN22A	619.	4.23	71.	18.	13.	.37
+	ROUTED TO	RN22AE	568.	4.50	71.	18.	13.	.37
+	3 COMBINED AT	CN21D	786.	4.53	194.	52.	38.	2.21
+	DIVERSION TO	N21DI	118.	4.53	29.	8.	6.	2.21
+	HYDROGRAPH AT	DN21D	668.	4.53	165.	45.	32.	2.21
+	ROUTED TO	RN21DS	637.	5.00	163.	45.	32.	2.21
+	HYDROGRAPH AT	N21C	522.	4.30	95.	24.	17.	.39
+	DIVERSION TO	LN21CD	97.	3.80	6.	2.	1.	.39
+	HYDROGRAPH AT	LN21C	522.	4.30	90.	22.	16.	.39
+	2 COMBINED AT	CN21C	860.	4.93	241.	65.	47.	2.61
+	ROUTED TO	RN21C	860.	4.93	241.	65.	47.	2.61
+	HYDROGRAPH AT	N24Q	100.	4.07	7.	2.	1.	.04
+	ROUTED TO	RN24Q	66.	4.53	7.	2.	1.	.04
+	HYDROGRAPH AT	N24R	97.	4.07	7.	2.	1.	.03
+	ROUTED TO	RN24R	75.	4.47	7.	2.	1.	.03
+	HYDROGRAPH AT	N24O	374.	4.13	26.	6.	5.	.16
+	3 COMBINED AT	CN24O	401.	4.17	40.	10.	7.	.22
+	ROUTED TO	RN24O	380.	4.23	40.	10.	7.	.22
+	HYDROGRAPH AT	N24S	147.	4.07	10.	2.	2.	.05
+	ROUTED TO	RN24S	93.	4.60	10.	2.	2.	.05
+	HYDROGRAPH AT	N24T	50.	4.03	3.	1.	1.	.02
+	ROUTED TO	RN24T	37.	4.63	3.	1.	1.	.02
+	HYDROGRAPH AT	N24P	297.	4.13	21.	5.	4.	.12
+	4 COMBINED AT	CN24P	615.	4.17	73.	18.	13.	.41
+	ROUTED TO	RN24P	614.	4.20	73.	18.	13.	.41
+	HYDROGRAPH AT	N24U	333.	4.07	21.	5.	4.	.11
+	ROUTED TO	RN24U	293.	4.23	21.	5.	4.	.11
+	2 COMBINED AT	CN24U*	883.	4.23	93.	23.	17.	.52
+	ROUTED TO	RN24U*	849.	4.30	93.	23.	17.	.52

+	HYDROGRAPH AT	N24V	116.	4.07	7.	2.	1.	.05
+	ROUTED TO	RN24V	74.	4.50	7.	2.	1.	.05
+	2 COMBINED AT	CN24V*	848.	4.30	100.	25.	18.	.57
+	ROUTED TO	RN24V*	811.	4.40	100.	25.	18.	.57
+	HYDROGRAPH AT	N24M	504.	4.20	40.	10.	7.	.25
+	2 COMBINED AT	CN24M	996.	4.37	134.	33.	24.	.82
+	ROUTED TO	RN24M	976.	4.43	134.	33.	24.	.82
+	HYDROGRAPH AT	N24L	1077.	4.07	68.	17.	12.	.38
+	ROUTED TO	RN24L	999.	4.17	68.	17.	12.	.38
+	2 COMBINED AT	CN24I*	1211.	4.23	190.	48.	34.	1.20
+	ROUTED TO	RN24I*	1166.	4.60	190.	48.	34.	1.20
+	HYDROGRAPH AT	N24I	256.	4.50	41.	10.	7.	.30
+	HYDROGRAPH AT	N24H	641.	4.13	59.	15.	11.	.29
+	HYDROGRAPH AT	N24N	214.	4.20	19.	5.	3.	.13
+	ROUTED TO	RN24N	146.	4.67	19.	5.	3.	.13
+	HYDROGRAPH AT	N24J	101.	4.43	16.	4.	3.	.12
+	2 COMBINED AT	CN24J	227.	4.63	35.	9.	6.	.25
+	ROUTED TO	RN24J	225.	4.67	35.	9.	6.	.25
+	HYDROGRAPH AT	N24K	137.	4.60	29.	7.	5.	.21
+	5 COMBINED AT	CN24I	1517.	4.63	309.	78.	56.	2.25
+	ROUTED TO	RN24I	1512.	4.73	309.	78.	56.	2.25
+	HYDROGRAPH AT	DRN21J	174.	4.07	12.	3.	2.	.23
+	ROUTED TO	RN21JE	141.	4.43	12.	3.	2.	.23
+	2 COMBINED AT	CN24G*	1508.	4.73	311.	79.	57.	2.71
+	ROUTED TO	RN24G*	1496.	4.83	311.	79.	57.	2.71
+	HYDROGRAPH AT	N24G	503.	4.43	63.	16.	11.	.44
+	DIVERSION TO	LN24GD	43.	4.00	1.	0.	0.	.44
+	HYDROGRAPH AT	LN24G	503.	4.43	62.	15.	11.	.44
+	2 COMBINED AT	CN24G	1643.	4.80	348.	88.	63.	3.26
+	HYDROGRAPH AT	DRN21Z	42.	4.20	2.	0.	0.	.34
+	ROUTED TO	RN21ZE	10.	4.33	2.	0.	0.	.34
+	2 COMBINED AT	CN24G+	1643.	4.80	348.	88.	63.	3.26
+	ROUTED TO	RN24G	1636.	4.83	348.	88.	63.	3.26
+	HYDROGRAPH AT	N24F	194.	4.20	17.	4.	3.	.11
+	2 COMBINED AT	CN24F	1648.	4.83	359.	91.	65.	3.37

+	HYDROGRAPH AT	N24D	184.	4.10	17.	4.	3.	.09
+	2 COMBINED AT	CN24D	1656.	4.83	371.	94.	68.	3.45
+	ROUTED TO	LN24D	13.	9.00	12.	11.	9.	3.45
+	HYDROGRAPH AT	N21H	76.	4.07	6.	2.	1.	.03
+	HYDROGRAPH AT	DRN21G	64.	4.53	3.	1.	1.	.63
+	ROUTED TO	RN21GE	43.	4.80	3.	1.	1.	.63
+	2 COMBINED AT	CN21H	76.	4.07	10.	3.	2.	.03
+	ROUTED TO	RN21H	55.	5.00	10.	3.	2.	.03
+	HYDROGRAPH AT	N24E	24.	4.27	3.	1.	1.	.02
+	ROUTED TO	RN24E	22.	4.47	3.	1.	1.	.02
+	3 COMBINED AT	CN24D*	55.	4.90	19.	13.	11.	3.51
+	HYDROGRAPH AT	N27F	659.	4.10	48.	12.	9.	.28
+	ROUTED TO	RN27F	630.	4.17	48.	12.	9.	.28
+	HYDROGRAPH AT	N27G	498.	4.17	42.	11.	8.	.26
+	2 COMBINED AT	CN27G	1098.	4.17	89.	22.	16.	.55
+	ROUTED TO	RN27G	1024.	4.27	89.	22.	16.	.55
+	HYDROGRAPH AT	N27E	287.	4.27	26.	6.	5.	.19
+	ROUTED TO	RN27E	266.	4.40	26.	6.	5.	.19
+	HYDROGRAPH AT	N27H	451.	4.13	33.	8.	6.	.21
+	ROUTED TO	RN27H	394.	4.30	33.	8.	6.	.21
+	HYDROGRAPH AT	N27C	156.	4.17	12.	3.	2.	.09
+	4 COMBINED AT	CN27C	1412.	4.27	145.	36.	26.	1.03
+	ROUTED TO	RN27C	1375.	4.33	145.	36.	26.	1.03
+	HYDROGRAPH AT	N27I	411.	4.10	28.	7.	5.	.17
+	ROUTED TO	RN27I	344.	4.33	28.	7.	5.	.17
+	HYDROGRAPH AT	N27B	109.	4.23	11.	3.	2.	.08
+	HYDROGRAPH AT	N27J	501.	4.10	32.	8.	6.	.19
+	DIVERSION TO	N27JI	189.	4.10	9.	2.	2.	.19
+	HYDROGRAPH AT	DN27J	312.	4.10	23.	6.	4.	.19
+	ROUTED TO	RN27JW	270.	4.37	23.	6.	4.	.19
+	4 COMBINED AT	CN27B	1738.	4.33	193.	48.	35.	1.46
+	ROUTED TO	RN27B	1642.	4.47	193.	48.	35.	1.46
+	HYDROGRAPH AT	N27D	158.	4.10	17.	4.	3.	.09
+	DIVERSION TO	LN27DD	158.	4.10	13.	3.	2.	.09
+	HYDROGRAPH AT	LN27D	67.	4.43	4.	1.	1.	.09
	HYDROGRAPH AT							

+		DRN27J	189.	4.10	9.	2.	2.	.19
+	ROUTED TO	RN27JS	175.	4.17	9.	2.	2.	.19
+	2 COMBINED AT	CN27D	175.	4.17	13.	3.	2.	.28
+	DIVERSION TO	N27DI	86.	4.17	10.	2.	2.	.28
+	HYDROGRAPH AT	DN27DO	89.	4.17	3.	1.	1.	.28
+	ROUTED TO	RN27DW	41.	4.63	3.	1.	1.	.28
+	HYDROGRAPH AT	DRN27D	86.	4.17	10.	2.	2.	.28
+	ROUTED TO	RN27DS	67.	4.70	10.	2.	2.	.28
+	HYDROGRAPH AT	N27K	676.	4.57	105.	26.	19.	.63
+	ROUTED TO	RN27K	651.	4.77	105.	26.	19.	.63
+	HYDROGRAPH AT	N27L	721.	4.30	80.	20.	15.	.47
+	2 COMBINED AT	CN27L	843.	4.67	173.	43.	31.	1.09
+	ROUTED TO	RN27L	842.	4.70	173.	43.	31.	1.09
+	HYDROGRAPH AT	N25S	80.	4.07	7.	2.	1.	.03
+	ROUTED TO	RN25S	76.	4.10	7.	2.	1.	.03
+	2 COMBINED AT	CN25O*	847.	4.70	179.	45.	32.	1.12
+	ROUTED TO	RN25O*	843.	4.73	179.	45.	32.	1.12
+	HYDROGRAPH AT	N25O	267.	4.07	24.	6.	4.	.13
+	DIVERSION TO	LN25OD	267.	4.07	13.	3.	2.	.13
+	HYDROGRAPH AT	LN25O	229.	4.17	11.	3.	2.	.13
+	2 COMBINED AT	CN25O	854.	4.73	186.	47.	34.	1.25
+	ROUTED TO	RN25O	848.	4.87	186.	47.	34.	1.25
+	4 COMBINED AT	CN27*	1873.	4.50	347.	87.	63.	2.99
+	HYDROGRAPH AT	N27	243.	4.37	38.	10.	7.	.28
+	HYDROGRAPH AT	N27A	160.	4.27	17.	4.	3.	.11
+	HYDROGRAPH AT	N26B	317.	4.17	41.	10.	7.	.22
+	DIVERSION TO	LN26BD	317.	4.17	28.	7.	5.	.22
+	HYDROGRAPH AT	LN26B	164.	4.53	13.	3.	2.	.22
+	4 COMBINED AT	CN27	1998.	4.50	379.	96.	69.	3.62
+	ROUTED TO	RN27	1971.	4.63	379.	96.	69.	3.62
+	HYDROGRAPH AT	N26	79.	4.13	5.	1.	1.	.04
+	HYDROGRAPH AT	N26A	476.	4.17	57.	14.	10.	.35
+	DIVERSION TO	LN26AD	476.	4.17	27.	7.	5.	.35
+	HYDROGRAPH AT	LN26A	399.	4.33	30.	7.	5.	.35
+	3 COMBINED AT	CN26*	2065.	4.63	391.	99.	71.	4.01
+	HYDROGRAPH AT	N25R	290.	4.07	25.	6.	5.	.09

+	ROUTED TO	RN25R	277.	4.10	25.	6.	5.	.09
+	HYDROGRAPH AT	N25Q	88.	4.07	8.	2.	1.	.03
+	ROUTED TO	RN25Q	83.	4.13	8.	2.	1.	.03
+	HYDROGRAPH AT	N25P	498.	4.07	44.	11.	8.	.17
+	ROUTED TO	RN25P	470.	4.13	44.	11.	8.	.17
+	HYDROGRAPH AT	N25M	592.	4.07	55.	14.	10.	.24
+	DIVERSION TO	LN25MD	592.	4.07	35.	9.	6.	.24
+	HYDROGRAPH AT	LN25M	464.	4.17	21.	5.	4.	.24
+	4 COMBINED AT	CN25M	1230.	4.17	97.	24.	18.	.53
+	DIVERSION TO	N25MI	1053.	4.17	90.	23.	16.	.53
+	HYDROGRAPH AT	DN25M	178.	4.17	7.	2.	1.	.53
+	ROUTED TO	RN25MW	124.	4.33	7.	2.	1.	.53
+	HYDROGRAPH AT	N25N	49.	4.07	5.	1.	1.	.03
+	DIVERSION TO	LN25ND	49.	4.07	3.	1.	1.	.03
+	HYDROGRAPH AT	LN25N	32.	4.27	2.	0.	0.	.03
+	ROUTED TO	RN25N	27.	4.37	2.	0.	0.	.03
+	2 COMBINED AT	CX3	143.	4.37	8.	2.	2.	.55
+	DIVERSION TO	X3I	79.	4.37	5.	1.	1.	.55
+	HYDROGRAPH AT	DX3O	64.	4.37	4.	1.	1.	.55
+	ROUTED TO	RX3W	39.	4.87	4.	1.	1.	.55
+	2 COMBINED AT	CN26	2051.	4.63	391.	99.	71.	4.56
+	ROUTED TO	RN26	1974.	4.73	384.	97.	70.	4.56
+	HYDROGRAPH AT	N25L	133.	4.13	10.	2.	2.	.06
+	DIVERSION TO	N25LI	72.	4.13	5.	1.	1.	.06
+	HYDROGRAPH AT	DN25L	61.	4.13	5.	1.	1.	.06
+	ROUTED TO	RN25LW	56.	4.37	5.	1.	1.	.06
+	HYDROGRAPH AT	N25K	216.	4.10	15.	4.	3.	.09
+	2 COMBINED AT	CN25K	219.	4.10	20.	5.	4.	.15
+	DIVERSION TO	N25KI	189.	4.10	14.	3.	3.	.15
+	HYDROGRAPH AT	DN25K	30.	3.90	6.	2.	1.	.15
+	ROUTED TO	RN25KW	30.	4.43	6.	2.	1.	.15
+	HYDROGRAPH AT	N25J	194.	4.17	13.	3.	2.	.10
+	3 COMBINED AT	CN25J	1988.	4.73	395.	100.	72.	4.81
+	ROUTED TO	RN25J	1912.	4.97	395.	100.	72.	4.81
+	HYDROGRAPH AT	N25G	115.	4.17	10.	2.	2.	.06

+	HYDROGRAPH AT	DRN25K	189.	4.10	14.	3.	3.	.15
+	ROUTED TO	RN25KS	139.	4.67	14.	3.	3.	.15
+	2 COMBINED AT	CN25G	160.	4.67	24.	6.	4.	.21
+	ROUTED TO	RN25G	128.	5.43	24.	6.	4.	.21
+	HYDROGRAPH AT	N25I	219.	4.20	17.	4.	3.	.12
+	3 COMBINED AT	CN25I	1913.	4.97	419.	106.	76.	4.99
+	ROUTED TO	RN25I	1864.	5.13	418.	106.	76.	4.99
+	HYDROGRAPH AT	N25E	303.	4.37	42.	11.	8.	.27
+	HYDROGRAPH AT	DRN25M	1053.	4.17	90.	23.	16.	.53
+	ROUTED TO	RN25MS	837.	4.37	90.	23.	16.	.53
+	HYDROGRAPH AT	DRX3	79.	4.37	5.	1.	1.	.55
+	ROUTED TO	RX3S	59.	4.67	5.	1.	1.	.55
+	3 COMBINED AT	CN25E	992.	4.37	131.	33.	24.	.82
+	DIVERSION TO	N25EI	496.	4.37	66.	16.	12.	.82
+	HYDROGRAPH AT	DN25E	496.	4.37	66.	16.	12.	.82
+	ROUTED TO	RN25EW	459.	4.60	66.	16.	12.	.82
+	HYDROGRAPH AT	N25D	580.	4.03	35.	9.	6.	.20
+	HYDROGRAPH AT	DRN25E	496.	4.37	66.	16.	12.	.82
+	ROUTED TO	RN25ES	434.	4.73	66.	16.	12.	.82
+	2 COMBINED AT	CN25D	580.	4.03	102.	26.	19.	1.03
+	DIVERSION TO	N25DI	143.	4.03	29.	7.	5.	1.03
+	HYDROGRAPH AT	DN25D	335.	4.03	68.	17.	12.	1.03
+	ROUTED TO	RN25DW	304.	4.13	68.	17.	12.	1.03
+	HYDROGRAPH AT	N25C	294.	4.23	28.	7.	5.	.17
+	3 COMBINED AT	CN25C	677.	4.63	155.	39.	28.	1.20
+	DIVERSION TO	N25CI	0.	4.63	0.	0.	0.	1.20
+	HYDROGRAPH AT	DN25C	677.	4.63	155.	39.	28.	1.20
+	ROUTED TO	RN25CW	677.	4.67	155.	39.	28.	1.20
+	HYDROGRAPH AT	N25F	195.	4.13	14.	3.	2.	.09
+	HYDROGRAPH AT	DRN25L	72.	4.13	5.	1.	1.	.06
+	ROUTED TO	RN25LS	46.	4.83	5.	1.	1.	.06
+	2 COMBINED AT	CN25F	195.	4.13	19.	5.	3.	.15
+	ROUTED TO	RN25F	160.	4.43	19.	5.	3.	.15
+	HYDROGRAPH AT	N25B	158.	4.27	19.	5.	3.	.11
+	3 COMBINED AT	CN25B	836.	4.53	184.	46.	33.	1.46

DIVERSION TO

+		N25BI	0.	4.47	0.	0.	0.	1.46
+	HYDROGRAPH AT	DN25B	836.	4.53	184.	46.	33.	1.46
+	ROUTED TO	RN25BW	832.	4.60	184.	46.	33.	1.46
+	HYDROGRAPH AT	N25A	163.	4.20	15.	4.	3.	.09
+	2 COMBINED AT	CN25A	881.	4.53	196.	49.	36.	1.55
+	DIVERSION TO	N25AI	0.	4.47	0.	0.	0.	1.55
+	HYDROGRAPH AT	DN25A	881.	4.53	196.	49.	36.	1.55
+	HYDROGRAPH AT	N25	200.	4.47	30.	7.	5.	.24
+	HYDROGRAPH AT	N25H	78.	4.27	10.	2.	2.	.07
+	4 COMBINED AT	CN25	2199.	5.13	574.	146.	105.	6.85
+	ROUTED TO	RN25	2095.	5.40	574.	146.	105.	6.85
+	HYDROGRAPH AT	N24B	129.	4.13	12.	3.	2.	.07
+	HYDROGRAPH AT	DRN25D	143.	4.03	29.	7.	5.	1.03
+	ROUTED TO	RN25DS	122.	4.33	29.	7.	5.	1.03
+	2 COMBINED AT	CN24B	238.	4.23	43.	11.	8.	.27
+	ROUTED TO	RN24B	236.	4.33	43.	11.	8.	.27
+	HYDROGRAPH AT	DRN25C	0.	4.63	0.	0.	0.	1.20
+	ROUTED TO	RN25CS	0.	4.80	0.	0.	0.	1.20
+	2 COMBINED AT	CN24B*	236.	4.33	43.	11.	8.	.64
+	DIVERSION TO	N24BI	0.	4.30	0.	0.	0.	.64
+	HYDROGRAPH AT	DN24B*	223.	4.33	42.	11.	8.	.64
+	ROUTED TO	RN24BW	219.	4.40	42.	11.	8.	.64
+	HYDROGRAPH AT	DRN25B	0.	4.47	0.	0.	0.	1.46
+	ROUTED TO	RN25BS	0.	4.87	0.	0.	0.	1.46
+	2 COMBINED AT	CN24C*	219.	4.40	42.	11.	8.	2.09
+	ROUTED TO	RN24C*	162.	4.47	37.	9.	7.	2.09
+	HYDROGRAPH AT	DRN25A	0.	4.47	0.	0.	0.	1.55
+	ROUTED TO	RN25AS	0.	4.70	0.	0.	0.	1.55
+	HYDROGRAPH AT	N24C	404.	4.10	38.	10.	7.	.19
+	3 COMBINED AT	CN24C	298.	4.33	66.	17.	12.	3.73
+	ROUTED TO	RN24C	295.	4.37	66.	17.	12.	3.73
+	HYDROGRAPH AT	N24	153.	4.27	14.	4.	3.	.11
+	HYDROGRAPH AT	N24A	356.	4.20	53.	13.	10.	.24
+	DIVERSION TO	LN24AD	339.	4.13	18.	5.	3.	.24
+	HYDROGRAPH AT	LN24A	356.	4.20	35.	9.	6.	.24
+	HYDROGRAPH AT	DRN24B	0.	4.30	0.	0.	0.	.64

+	ROUTED TO	RN24BS	0.	4.43	0.	0.	0.	.64
+	DIVERSION TO	X30I	0.	4.43	0.	0.	0.	.64
+	HYDROGRAPH AT	DX30	0.	.00	0.	0.	0.	.64
+	ROUTED TO	RX30W	0.	.00	0.	0.	0.	.64
+	6 COMBINED AT	CN24	2021.	5.43	626.	167.	123.	10.60
+	ROUTED TO	RN24	1991.	5.63	625.	167.	123.	10.60
+	HYDROGRAPH AT	DRX30	0.	4.43	0.	0.	0.	.64
+	ROUTED TO	RX30S	0.	4.73	0.	0.	0.	.64
+	HYDROGRAPH AT	N23A	1012.	4.13	106.	27.	19.	.49
+	DIVERSION TO	LN23AD	728.	4.00	32.	8.	6.	.49
+	HYDROGRAPH AT	LN23A	1012.	4.13	74.	19.	13.	.49
+	2 COMBINED AT	CN23A	1013.	4.13	74.	19.	13.	.49
+	DIVERSION TO	N23AI	242.	4.13	18.	5.	3.	.49
+	HYDROGRAPH AT	DN23A	771.	4.13	56.	14.	10.	.49
+	ROUTED TO	RN23AW	703.	4.33	56.	14.	10.	.49
+	HYDROGRAPH AT	N23	390.	4.33	66.	17.	12.	.39
+	HYDROGRAPH AT	DRN21D	118.	4.53	29.	8.	6.	2.21
+	ROUTED TO	RN21DE	111.	5.13	29.	8.	6.	2.21
+	4 COMBINED AT	CN23	2009.	5.63	692.	185.	136.	13.79
+	ROUTED TO	RN23	1940.	5.97	691.	185.	136.	13.79
+	HYDROGRAPH AT	N21B	2824.	4.10	356.	89.	64.	1.66
+	DIVERSION TO	LN21BD	2824.	4.10	234.	58.	42.	1.66
+	HYDROGRAPH AT	LN21B	1879.	4.33	124.	31.	22.	1.66
+	ROUTED TO	RN21B	1300.	4.73	124.	31.	22.	1.66
+	HYDROGRAPH AT	DRN23A	242.	4.13	18.	5.	3.	.49
+	ROUTED TO	RN23AS	179.	4.77	18.	5.	3.	.49
+	HYDROGRAPH AT	N21A	964.	4.40	209.	53.	38.	.93
+	DIVERSION TO	LN21AD	964.	4.40	150.	37.	27.	.93
+	HYDROGRAPH AT	LN21A	431.	5.17	61.	15.	11.	.93
+	3 COMBINED AT	CN21A	1327.	4.77	180.	45.	32.	3.07
+	ROUTED TO	RN21A	1161.	4.87	172.	43.	31.	3.07
+	HYDROGRAPH AT	N21	626.	4.40	132.	33.	24.	.62
+	4 COMBINED AT	CN21	2629.	5.10	1045.	279.	203.	17.39
+	HYDROGRAPH AT	A09U	454.	4.10	31.	8.	6.	.17
+	DIVERSION TO	A09UI	91.	4.10	6.	2.	1.	.17

+	HYDROGRAPH AT	DA09U	364.	4.10	25.	6.	4.	.17
+	ROUTED TO	RA09US	309.	4.33	25.	6.	4.	.17
+	HYDROGRAPH AT	N11N	700.	4.03	42.	11.	8.	.26
+	DIVERSION TO	N11NI	661.	4.03	39.	10.	7.	.26
+	HYDROGRAPH AT	DN11N	39.	4.03	3.	1.	1.	.26
+	ROUTED TO	RN11NW	32.	4.57	3.	1.	1.	.26
+	HYDROGRAPH AT	N11O	119.	4.13	8.	2.	1.	.05
+	DIVERSION TO	N11OI	12.	4.13	1.	0.	0.	.05
+	HYDROGRAPH AT	DN11O	107.	4.13	7.	2.	1.	.05
+	ROUTED TO	RN11OS	85.	4.50	7.	2.	1.	.05
+	HYDROGRAPH AT	N11M	234.	4.13	14.	3.	2.	.10
+	4 COMBINED AT	CN11M	410.	4.27	48.	12.	9.	.33
+	DIVERSION TO	N11MI	102.	4.27	12.	3.	2.	.33
+	HYDROGRAPH AT	DN11M	307.	4.27	36.	9.	7.	.33
+	ROUTED TO	RN11MS	294.	4.53	36.	9.	7.	.33
+	HYDROGRAPH AT	N11J	492.	4.10	40.	10.	7.	.24
+	DIVERSION TO	LN11JD	137.	3.87	5.	1.	1.	.24
+	HYDROGRAPH AT	LN11J	492.	4.10	36.	9.	6.	.24
+	2 COMBINED AT	CN11J	515.	4.13	71.	18.	13.	.57
+	DIVERSION TO	N11JI	257.	4.13	36.	9.	6.	.57
+	HYDROGRAPH AT	DN11J	257.	4.13	35.	9.	6.	.57
+	ROUTED TO	RN11JS	228.	4.67	35.	9.	6.	.57
+	HYDROGRAPH AT	N11G	716.	4.37	73.	18.	13.	.52
+	HYDROGRAPH AT	N11K	301.	4.17	31.	8.	6.	.19
+	DIVERSION TO	LN11KD	68.	3.87	3.	1.	0.	.19
+	HYDROGRAPH AT	LN11K	301.	4.17	29.	7.	5.	.19
+	HYDROGRAPH AT	DRN11N	661.	4.03	39.	10.	7.	.26
+	ROUTED TO	RN11NS	546.	4.23	39.	10.	7.	.26
+	HYDROGRAPH AT	DN11LI	155.	4.30	21.	5.	4.	.61
+	ROUTED TO	RN11L1	152.	4.30	21.	5.	4.	.61
+	3 COMBINED AT	CN11K	751.	4.23	77.	19.	14.	1.13
+	DIVERSION TO	LN11K1	209.	3.97	6.	2.	1.	1.13
+	HYDROGRAPH AT	LN11KX	751.	4.23	71.	18.	13.	1.13
+	ROUTED TO	RN11K	714.	4.43	71.	18.	13.	1.13
+	DIVERSION TO	X5I	558.	4.43	40.	10.	7.	1.13
	HYDROGRAPH AT							

+		DX5	156.	4.47	31.	8.	6.	1.13
+	ROUTED TO	RX5W	149.	4.87	31.	8.	6.	1.13
+	HYDROGRAPH AT	N11H	603.	4.37	64.	16.	11.	.44
+	2 COMBINED AT	CN11H	446.	4.53	84.	21.	15.	1.56
+	ROUTED TO	RN11H	440.	4.67	84.	21.	15.	1.56
+	3 COMBINED AT	CN11G	908.	4.60	168.	42.	30.	2.09
+	DIVERSION TO	N11GI	908.	4.60	168.	42.	30.	2.09
+	HYDROGRAPH AT	DN11G	0.	.00	0.	0.	0.	2.09
+	ROUTED TO	RN11GS	0.	.00	0.	0.	0.	2.09
+	ROUTED TO	RN11F	0.	.00	0.	0.	0.	2.09
+	HYDROGRAPH AT	N11C	398.	4.20	51.	13.	9.	.25
+	DIVERSION TO	LN11CD	398.	4.20	31.	8.	6.	.25
+	HYDROGRAPH AT	LN11C	277.	4.43	20.	5.	4.	.25
+	2 COMBINED AT	CN11C	163.	4.60	13.	3.	2.	2.34
+	DIVERSION TO	N11CWI	0.	4.43	0.	0.	0.	2.34
+	HYDROGRAPH AT	DN11CW	163.	4.60	13.	3.	2.	2.34
+	DIVERSION TO	N11CEI	12.	4.60	3.	1.	0.	2.34
+	HYDROGRAPH AT	DN11CE	151.	4.60	10.	3.	2.	2.34
+	HYDROGRAPH AT	DRN11C	0.	4.43	0.	0.	0.	2.34
+	ROUTED TO	LN11CW	0.	.00	0.	0.	0.	2.34
+	HYDROGRAPH AT	DR11C*	12.	4.60	3.	1.	0.	2.34
+	ROUTED TO	LN11CE	3.	6.43	2.	1.	0.	2.34
+	3 COMBINED AT	CN11C*	152.	4.60	13.	3.	2.	2.34
+	HYDROGRAPH AT	N11DA	438.	4.20	61.	15.	11.	.26
+	ROUTED TO	SN11DA	168.	4.67	60.	15.	11.	.26
+	DIVERSION TO	D11DAW	145.	4.67	47.	12.	8.	.26
+	HYDROGRAPH AT	N11DAS	22.	4.67	14.	4.	3.	.26
+	HYDROGRAPH AT	N11DB	404.	4.20	49.	12.	9.	.26
+	2 COMBINED AT	C11DAB	422.	4.20	63.	16.	11.	.51
+	DIVERSION TO	LNBOUT	422.	4.20	36.	9.	7.	.51
+	HYDROGRAPH AT	LN11DB	300.	4.43	27.	7.	5.	.51
+	DIVERSION TO	N11DI	30.	4.43	3.	1.	0.	.51
+	HYDROGRAPH AT	DN11D	270.	4.43	24.	6.	4.	.51
+	2 COMBINED AT	CN11D	316.	4.60	29.	7.	5.	2.85
+	ROUTED TO	RWBW1	140.	5.17	29.	7.	5.	2.85
+	HYDROGRAPH AT	WBW	831.	4.77	214.	55.	39.	1.00

+	2 COMBINED AT	CWBW	743.	4.97	221.	57.	41.	3.85
+	ROUTED TO	RBWB	25.	5.27	25.	25.	22.	3.85
+	ROUTED TO	RWBW2	25.	9.10	25.	25.	21.	3.85
+	HYDROGRAPH AT	N11I	1112.	4.17	133.	33.	24.	.62
+	HYDROGRAPH AT	DRN22A	109.	4.23	13.	3.	2.	.37
+	ROUTED TO	RN22AW	100.	4.50	13.	3.	2.	.37
+	2 COMBINED AT	CN11I	1112.	4.20	144.	36.	26.	.98
+	DIVERSION TO	N11II	519.	4.20	71.	18.	13.	.98
+	HYDROGRAPH AT	DN11I	519.	4.20	71.	18.	13.	.98
+	ROUTED TO	RN11IS	506.	4.30	70.	18.	13.	.98
+	HYDROGRAPH AT	DRN11I	519.	4.20	71.	18.	13.	.98
+	ROUTED TO	RN11IW	505.	4.40	70.	18.	13.	.98
+	2 COMBINED AT	CX50	991.	4.37	141.	35.	25.	.98
+	ROUTED TO	LX50	867.	4.53	232.	166.	160.	.98
+	DIVERSION TO	DX50I	627.	4.53	198.	153.	149.	.98
+	HYDROGRAPH AT	DX50	240.	4.53	34.	13.	11.	.98
+	ROUTED TO	RX50E	234.	4.70	34.	13.	11.	.98
+	HYDROGRAPH AT	N22	579.	4.37	121.	31.	22.	.47
+	DIVERSION TO	LN22D	579.	4.37	76.	19.	14.	.47
+	HYDROGRAPH AT	LN22	397.	4.87	46.	12.	8.	.47
+	2 COMBINED AT	CN22	518.	4.97	76.	23.	18.	1.46
+	DIVERSION TO	N22I	500.	4.97	75.	23.	18.	1.46
+	HYDROGRAPH AT	DN22	48.	4.87	1.	0.	0.	1.46
+	ROUTED TO	RN22W	24.	5.10	1.	0.	0.	1.46
+	HYDROGRAPH AT	DRX50I	627.	4.53	198.	153.	149.	.98
+	ROUTED TO	RX50W	619.	4.67	198.	153.	148.	.98
+	HYDROGRAPH AT	N11E	762.	4.23	112.	28.	20.	.49
+	2 COMBINED AT	CN11E1	1012.	4.53	300.	179.	166.	1.47
+	DIVERSION TO	LN11ED	169.	3.43	79.	20.	14.	1.47
+	HYDROGRAPH AT	LN11E	1012.	4.53	295.	178.	152.	1.47
+	HYDROGRAPH AT	DRN11D	30.	4.43	3.	1.	0.	.51
+	ROUTED TO	RN11DE	18.	4.83	3.	1.	0.	.51
+	HYDROGRAPH AT	DRX5	558.	4.43	40.	10.	7.	1.13
+	ROUTED TO	RX5S	387.	4.87	40.	10.	7.	1.13
+	2 COMBINED AT	CX1	497.	4.87	49.	12.	9.	.70

+	DIVERSION TO	X1I	46.	4.83	2.	1.	0.	.70
+	HYDROGRAPH AT	DX1	451.	4.87	47.	12.	8.	.70
+	ROUTED TO	RX1E	446.	4.90	47.	12.	8.	.70
+	3 COMBINED AT	CN11E	1030.	4.87	332.	187.	159.	1.47
+	ROUTED TO	R-WBE1	1029.	4.87	332.	187.	159.	1.47
+	HYDROGRAPH AT	WB1	285.	4.20	32.	8.	6.	.12
+	2 COMBINED AT	CPWB1	1126.	4.50	359.	194.	164.	1.59
+	ROUTED TO	R-R3	1125.	4.50	352.	192.	162.	1.59
+	HYDROGRAPH AT	WB2	156.	4.47	28.	7.	5.	.10
+	2 COMBINED AT	CPWB2	1243.	4.50	376.	198.	166.	1.69
+	ROUTED TO	R-4-5	1137.	4.70	305.	180.	150.	1.69
+	HYDROGRAPH AT	WB3	35.	4.10	3.	1.	1.	.01
+	2 COMBINED AT	CPWB3	1139.	4.70	306.	180.	151.	1.71
+	ROUTED TO	R-6	1136.	4.87	304.	180.	151.	1.71
+	HYDROGRAPH AT	DRN22	500.	4.97	75.	23.	18.	1.46
+	HYDROGRAPH AT	WB4	161.	4.13	16.	4.	3.	.06
+	2 COMBINED AT	CPWB4	511.	4.97	90.	27.	21.	1.52
+	ROUTED TO	R-R1	526.	5.00	83.	27.	21.	1.52
+	HYDROGRAPH AT	WB5	178.	4.17	20.	5.	4.	.08
+	2 COMBINED AT	CPWB5	544.	5.00	99.	31.	24.	1.60
+	ROUTED TO	R-R2	208.	5.53	45.	27.	22.	1.60
+	2 COMBINED AT	CPR6	1128.	4.87	344.	206.	172.	2.33
+	ROUTED TO	RCR26	1059.	5.00	336.	203.	169.	2.33
+	HYDROGRAPH AT	WB7	97.	4.10	10.	2.	2.	.03
+	2 COMBINED AT	CR6W7	1061.	5.00	337.	204.	171.	2.36
+	ROUTED TO	R-R7	1062.	5.03	335.	203.	169.	2.36
+	HYDROGRAPH AT	WB6	178.	4.27	23.	6.	4.	.08
+	ROUTED TO	R-R8	21.	5.10	18.	6.	4.	.08
+	2 COMBINED AT	C7R8	1074.	5.03	350.	208.	173.	2.45
+	ROUTED TO	RC78	1072.	5.07	349.	208.	173.	2.45
+	HYDROGRAPH AT	WB8	103.	4.07	10.	3.	2.	.03
+	2 COMBINED AT	CP-678	1073.	5.07	350.	208.	174.	2.48
+	HYDROGRAPH AT	WB10	139.	4.17	14.	4.	3.	.06
+	ROUTED TO	R-R9	24.	4.63	14.	4.	3.	.06
+	2 COMBINED AT	WBEOT	1093.	5.07	358.	210.	177.	2.50

DIVERSION TO

+		TONRI	100.	4.73	76.	59.	50.	2.50
+	HYDROGRAPH AT	DVNR	993.	5.07	283.	151.	127.	2.50
+	DIVERSION TO	DCLUB	216.	5.07	48.	17.	13.	2.50
+	HYDROGRAPH AT	CCLUB	776.	5.07	235.	134.	114.	2.50
+	ROUTED TO	RR287	775.	5.10	235.	134.	114.	2.50
+	DIVERSION TO	DV87SI	225.	5.10	50.	18.	14.	2.50
+	HYDROGRAPH AT	DV87S	550.	5.10	184.	117.	100.	2.50
+	ROUTED TO	RR289	549.	5.13	184.	116.	100.	2.50
+	DIVERSION TO	DV89I	202.	5.13	33.	8.	6.	2.50
+	HYDROGRAPH AT	DS89	347.	5.13	151.	108.	94.	2.50
+	ROUTED TO	TODET	346.	5.17	151.	108.	93.	2.50
+	DIVERSION TO	DV91I	225.	5.17	47.	12.	8.	2.50
+	HYDROGRAPH AT	DV91	121.	5.23	104.	96.	85.	2.50
+	HYDROGRAPH AT	WB9	627.	4.10	71.	18.	13.	.28
+	ROUTED TO	R-R10	331.	4.37	23.	6.	4.	.28
+	HYDROGRAPH AT	DRX1I	46.	4.83	2.	1.	0.	.70
+	ROUTED TO	RX1S	23.	5.53	2.	1.	0.	.70
+	4 COMBINED AT	CN11B	365.	4.63	170.	138.	120.	4.79
+	ROUTED TO	RCP91	212.	4.67	160.	135.	117.	4.79
+	HYDROGRAPH AT	SB-G4a	142.	4.07	13.	3.	2.	.06
+	HYDROGRAPH AT	DR91	225.	5.17	47.	12.	8.	2.50
+	ROUTED TO	R2DET	225.	5.17	47.	12.	8.	2.50
+	3 COMBINED AT	CPDET	371.	5.23	204.	147.	126.	4.94
+	ROUTED TO	S-DET	267.	6.07	196.	145.	130.	4.94
+	ROUTED TO	RDET	267.	6.10	196.	145.	130.	4.94
+	ROUTED TO	RN11BS	266.	6.40	196.	145.	129.	4.94
+	HYDROGRAPH AT	N11	1231.	4.30	223.	56.	40.	.90
+	HYDROGRAPH AT	DRV87	225.	5.10	50.	18.	14.	2.50
+	ROUTED TO	RDV87S	224.	5.13	50.	18.	13.	2.50
+	ROUTED TO	R-G1	223.	5.20	50.	18.	13.	2.50
+	DIVERSION TO	DX55I	150.	5.00	44.	16.	12.	2.50
+	HYDROGRAPH AT	DX55	73.	5.20	6.	1.	1.	2.50
+	DIVERSION TO	DX56I	56.	5.20	5.	1.	1.	2.50
+	HYDROGRAPH AT	DX56	16.	5.17	1.	0.	0.	2.50
+	ROUTED TO	DX56W	8.	5.50	1.	0.	0.	2.50
+	HYDROGRAPH AT	DRV89	202.	5.13	33.	8.	6.	2.50

+	ROUTED TO	RDV89S	160.	5.47	33.	8.	6.	2.50
+	ROUTED TO	RDV89E	136.	5.80	33.	8.	6.	2.50
+	4 COMBINED AT	CN11	1231.	4.37	472.	218.	185.	5.69
+	ROUTED TO	RN11	989.	4.53	392.	197.	169.	5.69
+	HYDROGRAPH AT	N10	614.	4.30	115.	29.	21.	.49
+	HYDROGRAPH AT	S10R	37.	4.23	8.	2.	1.	.03
+	DIVERSION TO	S10RI	24.	4.23	4.	1.	1.	.03
+	HYDROGRAPH AT	DS10RO	13.	4.23	3.	1.	1.	.03
+	ROUTED TO	RS10RS	9.	4.70	3.	1.	1.	.03
+	3 COMBINED AT	CN10	1382.	4.50	480.	219.	186.	6.22
+	DIVERSION TO	N10I	632.	4.50	73.	19.	14.	6.22
+	HYDROGRAPH AT	DN10	750.	4.27	407.	201.	173.	6.22
+	ROUTED TO	RN10E	750.	4.53	407.	201.	172.	6.22
+	HYDROGRAPH AT	DR56	56.	5.20	5.	1.	1.	2.50
+	ROUTED TO	RDR56	21.	5.57	5.	1.	1.	2.50
+	HYDROGRAPH AT	N09	1068.	4.23	170.	43.	31.	.65
+	3 COMBINED AT	CN09*	1431.	4.30	540.	236.	199.	6.87
+	HYDROGRAPH AT	CN21	2629.	5.10	1045.	279.	203.	17.39
+	ROUTED TO	RN21	2548.	5.37	1041.	279.	203.	17.39
+	HYDROGRAPH AT	DRTONR	100.	4.73	76.	59.	50.	2.50
+	HYDROGRAPH AT	N20	472.	4.27	83.	21.	15.	.36
+	3 COMBINED AT	CN20	2709.	5.37	1145.	346.	262.	17.74
+	ROUTED TO	RN20	2654.	5.60	1144.	346.	261.	17.74
+	HYDROGRAPH AT	N12	475.	4.50	123.	31.	23.	.51
+	DIVERSION TO	LN12D	21.	3.37	6.	1.	1.	.51
+	HYDROGRAPH AT	LN12	475.	4.50	120.	30.	22.	.51
+	HYDROGRAPH AT	N13	184.	5.10	112.	34.	25.	.50
+	3 COMBINED AT	CN12	2891.	5.60	1291.	393.	296.	18.75
+	ROUTED TO	RN12	2825.	5.83	1290.	393.	295.	18.75
+	2 COMBINED AT	CN09+	2976.	5.83	1635.	586.	464.	26.16
+	ROUTED TO	RN09*	2954.	5.93	1634.	586.	463.	26.16
+	HYDROGRAPH AT	N19E	726.	4.60	123.	31.	22.	.70
+	HYDROGRAPH AT	N19F	323.	4.63	58.	14.	10.	.37
+	2 COMBINED AT	CN19E	937.	4.63	169.	43.	31.	1.08
+	ROUTED TO	RN19E	853.	4.80	169.	43.	31.	1.08

+	HYDROGRAPH AT	N19D	575.	4.33	75.	19.	14.	.39
+	2 COMBINED AT	CN19D	1029.	4.70	230.	58.	42.	1.47
+	ROUTED TO	RN19D	1013.	4.97	230.	58.	42.	1.47
+	HYDROGRAPH AT	N19C	1498.	4.10	141.	35.	26.	.76
+	2 COMBINED AT	CN19C	1082.	4.13	344.	88.	63.	2.23
+	ROUTED TO	RN19C	1070.	4.30	344.	88.	63.	2.23
+	HYDROGRAPH AT	N19B	808.	4.07	61.	15.	11.	.32
+	2 COMBINED AT	CN19B	1321.	4.23	390.	100.	72.	2.54
+	ROUTED TO	RN19B	1244.	4.60	390.	100.	72.	2.54
+	HYDROGRAPH AT	N19A	1061.	4.07	97.	24.	17.	.47
+	2 COMBINED AT	CN19A	1382.	4.57	461.	119.	86.	3.02
+	ROUTED TO	397RR	1261.	4.70	460.	119.	86.	3.02
+	HYDROGRAPH AT	398AS	718.	4.20	60.	15.	11.	.30
+	ROUTED TO	398ARR	564.	4.27	39.	10.	7.	.30
+	HYDROGRAPH AT	398BS	618.	4.77	216.	56.	40.	.90
+	3 COMBINED AT	HC398	1881.	4.70	669.	174.	125.	4.22
+	ROUTED TO	398BR1	1610.	5.03	663.	174.	125.	4.22
+	ROUTED TO	398BR2	1219.	6.03	631.	174.	125.	4.22
+	ROUTED TO	398BR3	792.	7.30	533.	172.	125.	4.22
+	ROUTED TO	398BR4	708.	8.17	500.	172.	125.	4.22
+	ROUTED TO	RM399	705.	8.30	498.	172.	125.	4.22
+	HYDROGRAPH AT	N18	788.	4.20	103.	26.	19.	.50
+	2 COMBINED AT	CN18	704.	8.30	497.	191.	140.	4.73
+	ROUTED TO	RN18	693.	8.53	489.	189.	138.	4.73
+	HYDROGRAPH AT	N17	546.	4.23	85.	21.	15.	.41
+	2 COMBINED AT	CN17	794.	4.43	489.	206.	151.	5.14
+	ROUTED TO	RN17	760.	4.67	483.	204.	150.	5.14
+	HYDROGRAPH AT	N16	1155.	4.30	201.	50.	36.	.92
+	2 COMBINED AT	CN16	1415.	4.63	553.	244.	179.	6.06
+	ROUTED TO	RN16	1405.	4.73	552.	244.	179.	6.06
+	HYDROGRAPH AT	N15B	792.	4.37	161.	41.	29.	.75
+	ROUTED TO	RN15B	753.	4.90	160.	41.	29.	.75
+	HYDROGRAPH AT	N15A	948.	4.37	193.	49.	35.	.80
+	DIVERSION TO	LN15AD	948.	4.37	151.	38.	27.	.80
+	HYDROGRAPH AT	LN15A	333.	5.03	43.	11.	8.	.80
	2 COMBINED AT							

+		CN15A	882.	5.27	192.	48.	35.	1.54
+	ROUTED TO	RN15A	808.	5.47	191.	48.	35.	1.54
+	HYDROGRAPH AT	N15	546.	4.40	121.	31.	22.	.54
+	3 COMBINED AT	CN15	1990.	4.80	762.	301.	220.	8.14
+	ROUTED TO	RN15	1978.	4.87	761.	301.	220.	8.14
+	HYDROGRAPH AT	N14A	458.	4.40	102.	26.	19.	.44
+	ROUTED TO	RN14A	454.	4.50	102.	26.	19.	.44
+	HYDROGRAPH AT	N14	195.	4.07	24.	6.	4.	.08
+	3 COMBINED AT	CN14	2265.	4.87	835.	326.	238.	8.66
+	ROUTED TO	RN14	2112.	5.17	818.	325.	238.	8.66
+	HYDROGRAPH AT	N08B	750.	4.40	165.	42.	30.	.70
+	DIVERSION TO	LN08BD	750.	4.40	116.	29.	21.	.70
+	HYDROGRAPH AT	LN08B	373.	4.97	51.	13.	9.	.70
+	ROUTED TO	RN08B	260.	5.87	51.	13.	9.	.70
+	HYDROGRAPH AT	N08A	702.	4.43	174.	44.	32.	.74
+	DIVERSION TO	LN08AD	702.	4.43	109.	27.	20.	.74
+	HYDROGRAPH AT	LN08A	432.	5.07	69.	17.	12.	.74
+	2 COMBINED AT	CN08A	420.	5.07	109.	27.	20.	1.43
+	ROUTED TO	RN08A	334.	6.07	108.	27.	20.	1.43
+	HYDROGRAPH AT	N08	918.	4.30	183.	46.	33.	.79
+	3 COMBINED AT	CN08	2321.	5.17	946.	372.	272.	10.88
+	ROUTED TO	RN08	2317.	5.20	946.	372.	272.	10.88
+	2 COMBINED AT	CN09	3937.	5.87	2243.	856.	661.	37.04
+	ROUTED TO	RN09	3903.	6.00	2240.	856.	659.	37.04
+	HYDROGRAPH AT	DRN10	632.	4.50	73.	19.	14.	6.22
+	ROUTED TO	RN10S	625.	4.60	73.	19.	14.	6.22
+	DIVERSION TO	DX26I	590.	4.60	66.	17.	12.	6.22
+	HYDROGRAPH AT	DX26O	35.	4.33	7.	2.	1.	6.22
+	ROUTED TO	RX26S	35.	5.40	7.	2.	1.	6.22
+	HYDROGRAPH AT	DRX26	590.	4.60	66.	17.	12.	6.22
+	HYDROGRAPH AT	N07A	809.	4.13	81.	20.	15.	.36
+	DIVERSION TO	LN07AD	809.	4.13	56.	14.	10.	.36
+	HYDROGRAPH AT	LN07A	531.	4.30	26.	6.	5.	.36
+	2 COMBINED AT	CN07A	1456.	4.43	150.	38.	27.	.36
+	HYDROGRAPH AT	N07	962.	4.27	160.	40.	29.	.75
+	4 COMBINED AT	CN07	3926.	6.00	2329.	885.	681.	38.15

+	ROUTED TO	RN07	3907.	6.27	2324.	885.	676.	38.15
+	HYDROGRAPH AT	A11L	662.	4.20	62.	15.	11.	.25
+	ROUTED TO	RA11L	607.	4.37	62.	15.	11.	.25
+	HYDROGRAPH AT	A11M	722.	4.10	55.	14.	10.	.26
+	ROUTED TO	RA11M	670.	4.20	55.	14.	10.	.26
+	HYDROGRAPH AT	A11J	181.	4.17	16.	4.	3.	.08
+	HYDROGRAPH AT	A11N	210.	4.10	14.	4.	3.	.08
+	ROUTED TO	RA11N	200.	4.13	14.	4.	3.	.08
+	HYDROGRAPH AT	A11O	146.	4.07	10.	2.	2.	.06
+	ROUTED TO	RA11O	136.	4.17	10.	2.	2.	.06
+	2 COMBINED AT	CX21	334.	4.17	24.	6.	4.	.14
+	ROUTED TO	RX21	290.	4.33	24.	6.	4.	.14
+	3 COMBINED AT	CA11K*	1046.	4.23	95.	24.	17.	.47
+	HYDROGRAPH AT	A11K	777.	4.10	46.	12.	8.	.30
+	HYDROGRAPH AT	A11G	189.	4.03	13.	3.	2.	.07
+	DIVERSION TO	A11GI	0.	4.03	0.	0.	0.	.07
+	HYDROGRAPH AT	DA11G	189.	4.03	13.	3.	2.	.07
+	ROUTED TO	RA11GN	178.	4.10	13.	3.	2.	.07
+	4 COMBINED AT	CA11K	1803.	4.17	205.	51.	37.	1.09
+	ROUTED TO	RA11K	1735.	4.27	205.	51.	37.	1.09
+	HYDROGRAPH AT	DRA11G	0.	4.03	0.	0.	0.	.07
+	ROUTED TO	RA11GW	0.	4.20	0.	0.	0.	.07
+	HYDROGRAPH AT	A11I	884.	4.07	58.	14.	10.	.28
+	4 COMBINED AT	CA11I	3888.	6.27	2390.	923.	704.	39.52
+	ROUTED TO	RA11I	3862.	6.47	2389.	923.	701.	39.52
+	HYDROGRAPH AT	A11E	542.	4.20	44.	11.	8.	.30
+	HYDROGRAPH AT	A11F	898.	4.20	79.	20.	14.	.47
+	DIVERSION TO	A11FI	1.	4.20	0.	0.	0.	.47
+	HYDROGRAPH AT	DA11F	897.	4.20	79.	20.	14.	.47
+	ROUTED TO	RA11FN	866.	4.23	78.	20.	14.	.47
+	3 COMBINED AT	CA11E	3843.	6.47	2414.	933.	709.	40.28
+	ROUTED TO	RA11E	3837.	6.53	2413.	933.	708.	40.28
+	HYDROGRAPH AT	A11H	188.	4.07	10.	2.	2.	.07
+	ROUTED TO	RA11H	149.	4.37	10.	2.	2.	.07
+	HYDROGRAPH AT	DRA09U	91.	4.10	6.	2.	1.	.17

+	ROUTED TO	RA09UW	67.	4.33	6.	2.	1.	.17
+	HYDROGRAPH AT	A09T	348.	4.17	26.	7.	5.	.18
+	2 COMBINED AT	CA09T	407.	4.17	32.	8.	6.	.18
+	DIVERSION TO	A09TI	197.	4.17	8.	2.	1.	.18
+	HYDROGRAPH AT	DA09T	210.	4.03	24.	6.	4.	.18
+	ROUTED TO	RA09TW	210.	4.37	24.	6.	4.	.18
+	HYDROGRAPH AT	DRA11F	1.	4.20	0.	0.	0.	.47
+	ROUTED TO	RA11FS	0.	4.63	0.	0.	0.	.47
+	2 COMBINED AT	CX22	210.	4.37	25.	6.	4.	.18
+	ROUTED TO	RX22	210.	4.43	25.	6.	4.	.18
+	3 COMBINED AT	CX23	3831.	6.53	2424.	936.	710.	40.53
+	ROUTED TO	RX23	3828.	6.70	2420.	936.	706.	40.53
+	HYDROGRAPH AT	A99Z	333.	4.17	32.	8.	6.	.16
+	ROUTED TO	RA99Z	302.	4.43	32.	8.	6.	.16
+	HYDROGRAPH AT	A11D	313.	4.13	20.	5.	4.	.15
+	2 COMBINED AT	CA11D	397.	4.17	51.	13.	9.	.30
+	ROUTED TO	RA11D	357.	4.97	51.	13.	9.	.30
+	HYDROGRAPH AT	A11B	196.	4.23	21.	5.	4.	.15
+	HYDROGRAPH AT	A11A	659.	4.43	93.	23.	17.	.59
+	4 COMBINED AT	CA11A	3823.	6.70	2459.	949.	716.	41.58
+	ROUTED TO	RA11A	3820.	6.73	2458.	948.	715.	41.58
+	HYDROGRAPH AT	A11C	152.	4.33	16.	4.	3.	.12
+	ROUTED TO	RA11C	140.	4.60	16.	4.	3.	.12
+	2 COMBINED AT	CA11*	3817.	6.73	2461.	949.	716.	41.70
+	ROUTED TO	RA11*	3806.	6.80	2459.	949.	715.	41.70
+	HYDROGRAPH AT	A11	254.	4.30	22.	6.	4.	.16
+	2 COMBINED AT	CA11	3802.	6.80	2459.	950.	715.	41.86
+	HYDROGRAPH AT	DRN11O	12.	4.13	1.	0.	0.	.05
+	ROUTED TO	RN11OW	3.	4.40	1.	0.	0.	.05
+	HYDROGRAPH AT	DRA09T	197.	4.17	8.	2.	1.	.18
+	ROUTED TO	RA09TS	69.	5.23	8.	2.	1.	.18
+	HYDROGRAPH AT	A09R	173.	4.33	20.	5.	4.	.14
+	3 COMBINED AT	CA09R	176.	4.33	28.	7.	5.	.32
+	DIVERSION TO	A09RI	0.	4.33	0.	0.	0.	.32
+	HYDROGRAPH AT	DA09R	176.	4.33	28.	7.	5.	.32
	ROUTED TO							

+		RA09RS	161.	4.67	28.	7.	5.	.32
+	HYDROGRAPH AT	DRN11M	102.	4.27	12.	3.	2.	.33
+	ROUTED TO	RN11MW	93.	4.80	12.	3.	2.	.33
+	HYDROGRAPH AT	DRN11J	257.	4.13	36.	9.	6.	.57
+	ROUTED TO	RN11JW	234.	4.27	36.	9.	6.	.57
+	2 COMBINED AT	CX4	252.	4.63	48.	12.	9.	.57
+	ROUTED TO	RX4	250.	4.80	48.	12.	9.	.57
+	HYDROGRAPH AT	A09O	200.	4.43	29.	7.	5.	.19
+	3 COMBINED AT	CA09O	474.	4.67	92.	23.	17.	1.09
+	DIVERSION TO	A09OI	474.	4.67	92.	23.	17.	1.09
+	HYDROGRAPH AT	DA09O	0.	.00	0.	0.	0.	1.09
+	ROUTED TO	RA09OS	0.	.00	0.	0.	0.	1.09
+	HYDROGRAPH AT	A09K	524.	4.40	59.	15.	11.	.41
+	DIVERSION TO	A09KI	382.	4.40	43.	11.	8.	.41
+	HYDROGRAPH AT	DA09K	141.	4.40	16.	4.	3.	.41
+	2 COMBINED AT	CX7	142.	4.40	16.	4.	3.	.11
+	ROUTED TO	RX7S	131.	4.60	16.	4.	3.	.11
+	HYDROGRAPH AT	N11DAW	145.	4.67	47.	12.	8.	.26
+	ROUTED TO	RN11DA	144.	4.83	47.	12.	8.	.26
+	HYDROGRAPH AT	N11FB	196.	4.27	35.	9.	6.	.18
+	DIVERSION TO	LN1FBD	196.	4.27	27.	7.	5.	.18
+	HYDROGRAPH AT	LN11FB	85.	4.93	9.	2.	2.	.18
+	2 COMBINED AT	CN11FB	227.	4.93	56.	14.	10.	.44
+	HYDROGRAPH AT	DRN11G	908.	4.60	168.	42.	30.	2.09
+	ROUTED TO	RN11G	898.	4.70	168.	42.	30.	2.09
+	2 COMBINED AT	C98RGL	965.	4.73	209.	52.	38.	2.53
+	ROUTED TO	RN11FB	960.	4.77	209.	52.	38.	2.53
+	HYDROGRAPH AT	DRA09K	382.	4.40	43.	11.	8.	.41
+	ROUTED TO	RA09KS	368.	4.53	43.	11.	8.	.41
+	HYDROGRAPH AT	N11FA	157.	4.23	26.	7.	5.	.13
+	DIVERSION TO	LN1FAD	157.	4.23	19.	5.	3.	.13
+	HYDROGRAPH AT	LN11FA	71.	4.80	7.	2.	1.	.13
+	HYDROGRAPH AT	A09GA	280.	4.07	30.	7.	5.	.10
+	DIVERSION TO	LO9GAD	259.	4.00	15.	4.	3.	.10
+	HYDROGRAPH AT	LA09GA	280.	4.07	15.	4.	3.	.10
+	4 COMBINED AT	CN11FA	1141.	4.73	251.	63.	45.	3.06

+	ROUTED TO	RN11FA	1138.	4.77	251.	63.	45.	3.06
+	HYDROGRAPH AT	A09GB	88.	4.13	10.	2.	2.	.05
+	DIVERSION TO	L09GBD	88.	4.13	7.	2.	1.	.05
+	HYDROGRAPH AT	LA09GB	45.	4.40	3.	1.	0.	.05
+	2 COMBINED AT	CA09G	1149.	4.77	252.	63.	46.	3.10
+	DIVERSION TO	A09GI	150.	4.73	44.	11.	8.	3.10
+	HYDROGRAPH AT	DA09G	999.	4.77	208.	52.	38.	3.10
+	ROUTED TO	RA09GW	995.	4.83	208.	52.	38.	3.10
+	2 COMBINED AT	CX8	1058.	4.80	218.	55.	39.	3.21
+	ROUTED TO	RX8W	1046.	4.93	217.	55.	39.	3.21
+	HYDROGRAPH AT	A09H	278.	4.23	44.	11.	8.	.21
+	DIVERSION TO	LA09HD	278.	4.23	32.	8.	6.	.21
+	HYDROGRAPH AT	LA09H	146.	4.70	13.	3.	2.	.21
+	2 COMBINED AT	CA09H1	1066.	5.00	221.	56.	40.	3.42
+	HYDROGRAPH AT	A09J	300.	4.27	35.	9.	6.	.17
+	DIVERSION TO	LA09JD	300.	4.27	19.	5.	3.	.17
+	HYDROGRAPH AT	LA09J	237.	4.40	16.	4.	3.	.17
+	DIVERSION TO	A09JI	0.	.00	0.	0.	0.	.17
+	HYDROGRAPH AT	DA09J	237.	4.40	16.	4.	3.	.17
+	ROUTED TO	RA09JS	173.	4.67	16.	4.	3.	.17
+	2 COMBINED AT	CA09H	1123.	5.00	229.	58.	42.	3.59
+	ROUTED TO	RA09H	1115.	5.03	229.	58.	42.	3.59
+	HYDROGRAPH AT	A09S	142.	4.17	11.	3.	2.	.07
+	HYDROGRAPH AT	DRA09R	0.	4.33	0.	0.	0.	.32
+	ROUTED TO	RA09RW	0.	5.60	0.	0.	0.	.32
+	2 COMBINED AT	CA09S	142.	4.17	11.	3.	2.	.07
+	DIVERSION TO	A09SI	1.	4.17	0.	0.	0.	.07
+	HYDROGRAPH AT	DA09S	142.	4.17	11.	3.	2.	.07
+	ROUTED TO	RA09SS	119.	4.53	11.	3.	2.	.07
+	HYDROGRAPH AT	A09Q	327.	4.30	32.	8.	6.	.22
+	HYDROGRAPH AT	A09P	189.	4.40	27.	7.	5.	.18
+	HYDROGRAPH AT	DRA09O	474.	4.67	92.	23.	17.	1.09
+	ROUTED TO	RA09OW	466.	4.73	92.	23.	17.	1.09
+	2 COMBINED AT	CA09P	563.	4.67	113.	28.	20.	1.27
+	ROUTED TO	RA09P	562.	4.70	113.	28.	20.	1.27

+	3 COMBINED AT	CA09Q	729.	4.60	145.	36.	26.	1.56
+	DIVERSION TO	A09QI	729.	4.60	145.	36.	26.	1.56
+	HYDROGRAPH AT	DA09Q	0.	.00	0.	0.	0.	1.56
+	ROUTED TO	RA09QS	0.	.00	0.	0.	0.	1.56
+	HYDROGRAPH AT	A09M	540.	4.10	42.	10.	8.	.25
+	DIVERSION TO	LA09MD	503.	4.03	17.	4.	3.	.25
+	HYDROGRAPH AT	LA09M	540.	4.10	24.	6.	4.	.25
+	2 COMBINED AT	CA09M	540.	4.10	24.	6.	4.	.25
+	ROUTED TO	RA09M	452.	4.20	24.	6.	4.	.25
+	HYDROGRAPH AT	A09N	204.	4.47	30.	8.	5.	.15
+	2 COMBINED AT	CA09N	551.	4.20	54.	14.	10.	.40
+	ROUTED TO	LA09N	200.	4.70	52.	14.	10.	.40
+	ROUTED TO	RA09N	200.	4.77	52.	14.	10.	.40
+	HYDROGRAPH AT	DRA09J	0.	.00	0.	0.	0.	.17
+	ROUTED TO	RA09JW	0.	.00	0.	0.	0.	.17
+	HYDROGRAPH AT	A09L	127.	4.20	19.	5.	3.	.09
+	3 COMBINED AT	CA09L	255.	4.67	69.	18.	13.	.49
+	ROUTED TO	LA09L	232.	4.90	69.	18.	13.	.49
+	ROUTED TO	RA09LS	231.	4.97	69.	18.	13.	.49
+	HYDROGRAPH AT	A09IH	109.	4.60	20.	5.	4.	.10
+	2 COMBINED AT	CA09IH	298.	4.93	87.	23.	17.	.59
+	ROUTED TO	LA09IH	231.	5.27	85.	23.	17.	.59
+	HYDROGRAPH AT	A09I	251.	4.13	27.	7.	5.	.13
+	DIVERSION TO	LA09ID	251.	4.13	14.	3.	2.	.13
+	HYDROGRAPH AT	LA09I	228.	4.23	14.	3.	3.	.13
+	3 COMBINED AT	CX10	1210.	5.03	296.	76.	55.	4.31
+	ROUTED TO	RX10	1193.	5.13	296.	76.	55.	4.31
+	HYDROGRAPH AT	A99V	396.	4.23	35.	9.	6.	.21
+	2 COMBINED AT	CA99V	1193.	5.13	317.	82.	59.	4.51
+	HYDROGRAPH AT	DRA09G	150.	4.73	44.	11.	8.	3.10
+	ROUTED TO	RA09GS	150.	5.27	44.	11.	8.	3.10
+	HYDROGRAPH AT	A09F	577.	4.20	76.	19.	14.	.37
+	DIVERSION TO	LA09FD	577.	4.20	34.	9.	6.	.37
+	HYDROGRAPH AT	LA09F	542.	4.30	42.	11.	8.	.37
+	2 COMBINED AT	CA09F	492.	4.30	87.	22.	16.	.59
	ROUTED TO							

+		RA09FW	396.	4.53	87.	22.	16.	.59
+	HYDROGRAPH AT	A09E	159.	4.30	32.	8.	6.	.15
+	DIVERSION TO	LA09ED	159.	4.30	21.	5.	4.	.15
+	HYDROGRAPH AT	LA09E	101.	4.80	12.	3.	2.	.15
+	2 COMBINED AT	CA09E	372.	4.57	97.	24.	18.	.73
+	ROUTED TO	RA09E	345.	4.70	97.	24.	18.	.73
+	HYDROGRAPH AT	A09D	745.	4.07	62.	15.	11.	.25
+	DIVERSION TO	LA09DD	745.	4.07	39.	10.	7.	.25
+	HYDROGRAPH AT	LA09D	642.	4.13	23.	6.	4.	.25
+	2 COMBINED AT	CA09C*	388.	4.13	116.	29.	21.	.99
+	ROUTED TO	RA09C*	350.	4.73	116.	29.	21.	.99
+	HYDROGRAPH AT	A09C	120.	4.20	11.	3.	2.	.07
+	2 COMBINED AT	CA09C	419.	4.23	124.	31.	23.	1.06
+	ROUTED TO	RA09C	418.	4.27	124.	31.	23.	1.06
+	HYDROGRAPH AT	A09B	130.	4.00	10.	3.	2.	.04
+	ROUTED TO	RA09B	106.	4.43	10.	3.	2.	.04
+	HYDROGRAPH AT	A09A	80.	4.30	15.	4.	3.	.08
+	3 COMBINED AT	CA09A	527.	4.37	145.	37.	27.	1.19
+	DIVERSION TO	DA09I	158.	4.37	38.	10.	7.	1.19
+	HYDROGRAPH AT	DA09	370.	4.37	107.	27.	20.	1.19
+	ROUTED TO	RA09AW	280.	5.60	105.	27.	20.	1.19
+	HYDROGRAPH AT	A99T	73.	4.03	3.	1.	1.	.03
+	DIVERSION TO	LA99TD	68.	3.97	2.	0.	0.	.03
+	HYDROGRAPH AT	LA99T	73.	4.03	2.	0.	0.	.03
+	ROUTED TO	RA99T	42.	4.27	2.	0.	0.	.03
+	HYDROGRAPH AT	A09	339.	4.23	23.	6.	4.	.18
+	3 COMBINED AT	CA09	274.	5.63	119.	32.	23.	1.39
+	3 COMBINED AT	DUMMYZ	3929.	6.37	2583.	983.	740.	47.76
+	HYDROGRAPH AT	S30D	271.	4.17	33.	8.	6.	.13
+	ROUTED TO	RS30D	183.	4.40	32.	8.	6.	.13
+	HYDROGRAPH AT	S30C	591.	4.30	119.	30.	22.	.46
+	2 COMBINED AT	XX1	753.	4.33	151.	38.	28.	.59
+	HYDROGRAPH AT	S30B	373.	4.40	88.	22.	16.	.40
+	2 COMBINED AT	CS30B	1035.	4.37	232.	59.	43.	.98
+	DIVERSION TO	DS30BI	485.	4.37	49.	12.	9.	.98
+	HYDROGRAPH AT	DS30BO	550.	4.20	184.	47.	34.	.98

+	ROUTED TO	RS30BW	550.	4.43	184.	47.	34.	.98
+	HYDROGRAPH AT	S30A	637.	4.33	121.	30.	22.	.53
+	2 COMBINED AT	CS30A	1085.	4.40	298.	76.	55.	1.52
+	DIVERSION TO	DS30AI	535.	4.40	74.	19.	13.	1.52
+	HYDROGRAPH AT	DS30AO	550.	4.20	224.	57.	41.	1.52
+	ROUTED TO	RS30AW	550.	4.53	224.	57.	41.	1.52
+	HYDROGRAPH AT	S30	418.	4.23	65.	16.	12.	.32
+	2 COMBINED AT	CS30	857.	4.30	281.	72.	52.	1.84
+	ROUTED TO	RS30	857.	4.33	281.	72.	52.	1.84
+	HYDROGRAPH AT	A07G	685.	4.07	63.	16.	11.	.26
+	DIVERSION TO	LA07GD	685.	4.07	32.	8.	6.	.26
+	HYDROGRAPH AT	LA07G	643.	4.13	31.	8.	6.	.26
+	ROUTED TO	RA07G	625.	4.27	31.	8.	6.	.26
+	HYDROGRAPH AT	A07F	232.	4.33	50.	13.	9.	.23
+	ROUTED TO	RA07F	230.	4.43	50.	13.	9.	.23
+	HYDROGRAPH AT	A07E	524.	4.13	62.	15.	11.	.23
+	3 COMBINED AT	CA07E	1066.	4.27	139.	35.	25.	.72
+	ROUTED TO	RA07E	907.	4.43	139.	35.	25.	.72
+	HYDROGRAPH AT	A07C	298.	4.27	28.	7.	5.	.17
+	2 COMBINED AT	CA07C	1073.	4.40	163.	41.	30.	.89
+	ROUTED TO	RA07C	1071.	4.43	163.	41.	30.	.89
+	HYDROGRAPH AT	A07H	268.	4.03	19.	5.	3.	.09
+	ROUTED TO	RA07H	254.	4.17	19.	5.	3.	.09
+	HYDROGRAPH AT	DRA09A	158.	4.37	38.	10.	7.	1.19
+	HYDROGRAPH AT	A08B	149.	4.17	17.	4.	3.	.10
+	2 COMBINED AT	CA08B	245.	4.37	52.	13.	9.	1.29
+	ROUTED TO	RA08B	209.	4.63	52.	13.	9.	1.29
+	HYDROGRAPH AT	A07D	129.	4.60	40.	10.	7.	.23
+	4 COMBINED AT	CA07D	1151.	4.47	246.	63.	45.	2.50
+	ROUTED TO	RA07D	1081.	4.67	245.	63.	45.	2.50
+	ROUTED TO	LA07D	1082.	4.67	210.	53.	38.	2.50
+	HYDROGRAPH AT	A07B	936.	4.20	123.	31.	22.	.65
+	DIVERSION TO	LA07BD	921.	4.17	48.	12.	9.	.65
+	HYDROGRAPH AT	LA07B	863.	4.30	76.	19.	14.	.65
+	3 COMBINED AT	CA07B	2126.	4.53	515.	132.	95.	4.99

+	ROUTED TO	RA07B	2029.	4.63	515.	132.	95.	4.99
+	HYDROGRAPH AT	A06A	541.	4.13	54.	14.	10.	.28
+	2 COMBINED AT	CA06A	2130.	4.63	554.	143.	103.	5.27
+	HYDROGRAPH AT	A07A	103.	4.30	21.	5.	4.	.12
+	ROUTED TO	RA07A	103.	4.37	21.	5.	4.	.12
+	HYDROGRAPH AT	A07	319.	4.03	15.	4.	3.	.12
+	2 COMBINED AT	CA07	349.	4.03	36.	9.	7.	.24
+	ROUTED TO	RA07	260.	4.20	36.	9.	7.	.24
+	HYDROGRAPH AT	A06	605.	4.17	34.	9.	6.	.28
+	3 COMBINED AT	CA06	2201.	4.60	590.	152.	109.	5.79
+	ROUTED TO	RA06	2165.	4.77	590.	152.	109.	5.79
+	HYDROGRAPH AT	A99Q	345.	4.00	15.	4.	3.	.12
+	2 COMBINED AT	CA99Q	2158.	4.77	597.	154.	111.	5.90
+	2 COMBINED AT	DUMMY1	4315.	6.27	2874.	1061.	800.	53.67
+	DIVERSION TO	DUMMYO	4315.	6.27	2874.	1061.	800.	53.67
+	HYDROGRAPH AT	DUMMY	0.	.00	0.	0.	0.	53.67
+	ROUTED TO	EMPTY	0.	.00	0.	0.	0.	53.67
+	HYDROGRAPH AT	S10V	303.	4.20	46.	12.	8.	.20
+	ROUTED TO	RS10V	289.	4.40	46.	12.	8.	.20
+	HYDROGRAPH AT	S10U	136.	4.20	21.	5.	4.	.11
+	2 COMBINED AT	CS10U	406.	4.37	67.	17.	12.	.30
+	ROUTED TO	RS10U	396.	4.50	67.	17.	12.	.30
+	HYDROGRAPH AT	S10T	470.	4.27	79.	20.	14.	.34
+	2 COMBINED AT	CS10T	762.	4.43	143.	36.	26.	.64
+	ROUTED TO	RS10T	754.	4.50	143.	36.	26.	.64
+	HYDROGRAPH AT	DS30BX	485.	4.37	49.	12.	9.	.98
+	ROUTED TO	RS30BS	466.	4.60	49.	12.	9.	.98
+	HYDROGRAPH AT	S10S	973.	4.20	136.	34.	25.	.49
+	2 COMBINED AT	XX2	884.	4.57	175.	44.	32.	1.47
+	2 COMBINED AT	CS10S	1429.	4.57	301.	76.	55.	2.11
+	ROUTED TO	RS10S	1390.	4.67	301.	76.	55.	2.11
+	HYDROGRAPH AT	S10Q	369.	4.27	69.	17.	13.	.25
+	2 COMBINED AT	CS10Q	1590.	4.63	363.	92.	66.	2.37
+	ROUTED TO	RS10Q	1568.	4.73	363.	92.	66.	2.37
+	HYDROGRAPH AT	DRS10R	24.	4.23	4.	1.	1.	.03
	ROUTED TO							

+		RS10RW	22.	4.87	4.	1.	1.	.03
+	HYDROGRAPH AT	S10O	1089.	4.27	179.	45.	32.	.79
+	3 COMBINED AT	CS10O	2169.	4.50	523.	132.	95.	3.19
+	HYDROGRAPH AT	S10J	163.	4.10	18.	4.	3.	.08
+	DIVERSION TO	S10JI	96.	4.10	10.	2.	2.	.08
+	HYDROGRAPH AT	DS10JO	68.	4.10	8.	2.	1.	.08
+	ROUTED TO	RS10JW	67.	4.13	8.	2.	1.	.08
+	2 COMBINED AT	CS10KN	2187.	4.50	528.	134.	96.	3.27
+	ROUTED TO	RS10KN	2181.	4.53	528.	134.	96.	3.27
+	HYDROGRAPH AT	S10JX	96.	4.10	10.	2.	2.	.08
+	ROUTED TO	RS10JS	93.	4.17	10.	2.	2.	.08
+	HYDROGRAPH AT	S10I	211.	4.17	30.	7.	5.	.13
+	2 COMBINED AT	CS10I	303.	4.17	40.	10.	7.	.21
+	DIVERSION TO	S10II	178.	4.17	23.	6.	4.	.21
+	HYDROGRAPH AT	DS10IO	126.	4.17	17.	4.	3.	.21
+	ROUTED TO	RS10IW	124.	4.20	17.	4.	3.	.21
+	2 COMBINED AT	CS10KM	2232.	4.53	541.	137.	99.	3.40
+	ROUTED TO	RS10KM	2211.	4.60	541.	137.	99.	3.40
+	HYDROGRAPH AT	S10IX	178.	4.17	23.	6.	4.	.21
+	ROUTED TO	RS10IS	173.	4.30	23.	6.	4.	.21
+	HYDROGRAPH AT	S10N	210.	4.20	32.	8.	6.	.14
+	2 COMBINED AT	CS10N	373.	4.27	55.	14.	10.	.34
+	DIVERSION TO	S10NI	187.	4.27	27.	7.	5.	.34
+	HYDROGRAPH AT	DS10NO	187.	4.27	27.	7.	5.	.34
+	ROUTED TO	RS10NW	187.	4.27	27.	7.	5.	.34
+	HYDROGRAPH AT	S10K	499.	4.27	87.	22.	16.	.34
+	3 COMBINED AT	CS10K	2583.	4.53	639.	162.	117.	3.87
+	ROUTED TO	RS10K	2559.	4.63	639.	162.	117.	3.87
+	HYDROGRAPH AT	S10NX	187.	4.27	27.	7.	5.	.34
+	ROUTED TO	RS10NS	180.	4.47	27.	7.	5.	.34
+	HYDROGRAPH AT	S10G	592.	4.17	68.	17.	12.	.28
+	3 COMBINED AT	CS10G	2836.	4.60	719.	182.	131.	4.16
+	ROUTED TO	RS10G	2819.	4.67	718.	182.	131.	4.16
+	DIVERSION TO	X40I	916.	4.70	279.	71.	51.	4.16
+	HYDROGRAPH AT	DX40	1903.	4.67	440.	111.	80.	4.16
+	ROUTED TO	RX40S	1887.	4.77	440.	111.	80.	4.16

+	HYDROGRAPH AT	S10D	550.	4.33	114.	29.	21.	.46
+	2 COMBINED AT	CS10D	2189.	4.73	535.	135.	98.	4.61
+	HYDROGRAPH AT	DS30X	535.	4.40	74.	19.	13.	1.52
+	ROUTED TO	RS30AS	515.	4.73	74.	19.	13.	1.52
+	HYDROGRAPH AT	S10P	439.	4.27	78.	20.	14.	.33
+	2 COMBINED AT	CS10P	739.	4.70	145.	36.	26.	1.84
+	ROUTED TO	RS10P	689.	5.03	145.	36.	26.	1.84
+	HYDROGRAPH AT	S10E	369.	4.77	141.	37.	27.	.63
+	2 COMBINED AT	CS10E	985.	5.07	273.	71.	51.	2.47
+	ROUTED TO	RS10E	974.	5.13	273.	71.	51.	2.47
+	HYDROGRAPH AT	S10M	722.	4.17	95.	24.	17.	.35
+	ROUTED TO	RS10M	673.	4.40	95.	24.	17.	.35
+	2 COMBINED AT	CS10E*	1160.	5.13	358.	93.	67.	2.83
+	ROUTED TO	RS10E*	1156.	5.17	358.	93.	67.	2.83
+	HYDROGRAPH AT	S10F	345.	4.37	76.	19.	14.	.33
+	ROUTED TO	RS10F	337.	4.63	76.	19.	14.	.33
+	2 COMBINED AT	CS10F*	1335.	5.13	421.	109.	79.	3.16
+	ROUTED TO	RS10F*	1323.	5.23	421.	109.	79.	3.16
+	HYDROGRAPH AT	S10C	330.	4.57	106.	28.	20.	.37
+	3 COMBINED AT	CS10C	3283.	4.77	976.	253.	182.	8.15
+	ROUTED TO	RS10C	3270.	4.83	975.	253.	182.	8.15
+	HYDROGRAPH AT	S10	149.	4.27	29.	7.	5.	.11
+	2 COMBINED AT	XX3	3333.	4.83	999.	259.	187.	8.26
+	HYDROGRAPH AT	DRX40	916.	4.70	279.	71.	51.	4.16
+	ROUTED TO	RX40E	916.	4.77	279.	71.	51.	4.16
+	HYDROGRAPH AT	S10B	197.	4.23	35.	9.	6.	.14
+	2 COMBINED AT	CS10B	1103.	4.40	315.	80.	58.	.14
+	ROUTED TO	RS10B	1097.	4.47	315.	80.	58.	.14
+	HYDROGRAPH AT	S10A	46.	4.30	11.	3.	2.	.05
+	3 COMBINED AT	CS10	4333.	4.83	1304.	337.	243.	8.44
+	ROUTED TO	RS10	4331.	4.83	1304.	337.	243.	8.44
+	HYDROGRAPH AT	N06	952.	4.20	135.	34.	25.	.59
+	4 COMBINED AT	CN06	4611.	5.03	1818.	495.	359.	52.61
+	ROUTED TO	RN06	4562.	5.10	1817.	495.	359.	52.61
+	HYDROGRAPH AT	N05C	357.	4.27	60.	15.	11.	.28

+	2 COMBINED AT	CN05C	4622.	5.10	1848.	504.	366.	52.89
+	ROUTED TO	RN05C	4579.	5.17	1847.	504.	365.	52.89
+	HYDROGRAPH AT	N05B	221.	4.53	69.	18.	13.	.31
+	DIVERSION TO	DN05BI	199.	4.53	62.	16.	12.	.31
+	HYDROGRAPH AT	DN05B	22.	4.53	7.	2.	1.	.31
+	ROUTED TO	RN05BE	22.	4.67	7.	2.	1.	.31
+	HYDROGRAPH AT	N05A	330.	4.17	41.	10.	7.	.17
+	HYDROGRAPH AT	N05	393.	4.27	73.	18.	13.	.28
+	4 COMBINED AT	CN05	4681.	5.17	1916.	524.	380.	53.65
+	ROUTED TO	RN05	4672.	5.23	1915.	524.	380.	53.65
+	HYDROGRAPH AT	DN05BX	199.	4.53	62.	16.	12.	.31
+	ROUTED TO	RN05BS	198.	4.70	62.	16.	12.	.31
+	HYDROGRAPH AT	N04A	101.	4.17	17.	4.	3.	.07
+	3 COMBINED AT	CN04A	4777.	5.23	1963.	537.	389.	53.72
+	ROUTED TO	RN04A	4695.	5.37	1958.	537.	389.	53.72
+	HYDROGRAPH AT	N04	1090.	4.30	198.	50.	36.	.83
+	DIVERSION TO	LN04D	574.	4.03	37.	9.	7.	.83
+	HYDROGRAPH AT	LN04	1090.	4.30	162.	40.	29.	.83
+	2 COMBINED AT	CN04	4854.	5.33	2055.	561.	407.	54.54
+	ROUTED TO	RN04	4850.	5.33	2055.	561.	407.	54.54
+	HYDROGRAPH AT	S01G	469.	4.23	74.	18.	13.	.28
+	ROUTED TO	RS01G	446.	4.53	74.	18.	13.	.28
+	HYDROGRAPH AT	S01D	569.	4.43	138.	35.	25.	.63
+	2 COMBINED AT	CS01D	941.	4.53	207.	52.	38.	.91
+	ROUTED TO	RS01D	925.	4.70	207.	52.	38.	.91
+	HYDROGRAPH AT	S01H	329.	4.33	69.	17.	13.	.32
+	ROUTED TO	RS01H	323.	4.53	69.	17.	13.	.32
+	HYDROGRAPH AT	S01E	342.	4.20	49.	12.	9.	.23
+	2 COMBINED AT	CS01E	575.	4.40	117.	30.	21.	.55
+	ROUTED TO	RS01E	566.	4.53	117.	30.	21.	.55
+	HYDROGRAPH AT	S01C	526.	4.30	93.	23.	17.	.40
+	3 COMBINED AT	CS01C	1599.	4.67	390.	99.	72.	1.87
+	ROUTED TO	RS01C	1596.	4.70	390.	99.	72.	1.87
+	HYDROGRAPH AT	S01I	333.	4.23	54.	14.	10.	.23
+	ROUTED TO	RS01I	323.	4.37	54.	14.	10.	.23
	HYDROGRAPH AT							

+		S01F	184.	4.23	30.	7.	5.	.15
+	2 COMBINED AT	CS01F	494.	4.33	83.	21.	15.	.38
+	ROUTED TO	RS01F	483.	4.53	83.	21.	15.	.38
+	HYDROGRAPH AT	S01B	468.	4.23	73.	18.	13.	.31
+	3 COMBINED AT	CS01B	2085.	4.67	522.	133.	96.	2.56
+	ROUTED TO	RS01B	2077.	4.73	522.	133.	96.	2.56
+	HYDROGRAPH AT	S01A	342.	4.33	71.	18.	13.	.35
+	2 COMBINED AT	CS01A	2254.	4.73	578.	147.	106.	2.91
+	ROUTED TO	RS01A	2244.	4.77	578.	147.	106.	2.91
+	HYDROGRAPH AT	S01	221.	4.40	56.	14.	10.	.26
+	2 COMBINED AT	CS01	2374.	4.77	623.	159.	115.	3.16
+	ROUTED TO	RS01	2373.	4.77	623.	159.	115.	3.16
+	2 COMBINED AT	CN03*	5826.	5.27	2443.	667.	483.	57.71
+	ROUTED TO	RN03*	5812.	5.40	2443.	667.	483.	57.71
+	HYDROGRAPH AT	N03A	351.	4.40	82.	21.	15.	.39
+	ROUTED TO	RN03A	347.	4.50	82.	21.	15.	.39
+	HYDROGRAPH AT	N03B	723.	4.40	146.	37.	26.	.63
+	ROUTED TO	RN03B	720.	4.43	146.	37.	26.	.63
+	HYDROGRAPH AT	N03	464.	4.50	119.	30.	22.	.60
+	4 COMBINED AT	CN03	6186.	5.37	2632.	719.	520.	59.33
+	ROUTED TO	RN03	6183.	5.43	2632.	719.	520.	59.33
+	HYDROGRAPH AT	N02B	183.	4.27	30.	8.	6.	.15
+	DIVERSION TO	LN02BD	153.	4.13	7.	2.	1.	.15
+	HYDROGRAPH AT	LN02B	183.	4.27	24.	6.	4.	.15
+	2 COMBINED AT	CN02B	6196.	5.43	2640.	721.	522.	59.48
+	ROUTED TO	RN02B	6189.	5.50	2639.	721.	522.	59.48
+	HYDROGRAPH AT	N02	994.	4.47	150.	37.	27.	.76
+	HYDROGRAPH AT	N02A	361.	4.20	35.	9.	6.	.18
+	3 COMBINED AT	CN02	6266.	5.50	2721.	744.	539.	60.42
+	HYDROGRAPH AT	S20A	247.	4.23	44.	11.	8.	.16
+	ROUTED TO	RS20A	245.	4.30	44.	11.	8.	.16
+	HYDROGRAPH AT	S20	231.	4.20	38.	10.	7.	.14
+	2 COMBINED AT	CS20	466.	4.27	82.	21.	15.	.30
+	ROUTED TO	RS20	464.	4.30	82.	21.	15.	.30
+	HYDROGRAPH AT	A05A	260.	4.17	37.	9.	7.	.14
+	ROUTED TO	RA05A	249.	4.43	37.	9.	7.	.14

+	HYDROGRAPH AT	A99N	341.	4.13	41.	10.	7.	.16
+	3 COMBINED AT	CA99N	875.	4.37	159.	40.	29.	.60
+	HYDROGRAPH AT	DRA09S	1.	4.17	0.	0.	0.	.07
+	ROUTED TO	RA09SW	0.	4.77	0.	0.	0.	.07
+	HYDROGRAPH AT	A99Y	410.	4.37	45.	11.	8.	.32
+	2 COMBINED AT	CA99Y	410.	4.37	45.	11.	8.	.32
+	HYDROGRAPH AT	A10	551.	4.10	33.	8.	6.	.21
+	HYDROGRAPH AT	DRA09Q	729.	4.60	145.	36.	26.	1.56
+	ROUTED TO	RA09QW	727.	4.67	145.	36.	26.	1.56
+	HYDROGRAPH AT	A10A	423.	4.17	32.	8.	6.	.19
+	2 COMBINED AT	CA10A	1001.	4.53	207.	52.	37.	.19
+	ROUTED TO	RA10A	1000.	4.57	207.	52.	37.	.19
+	HYDROGRAPH AT	A99X	723.	4.07	58.	14.	10.	.26
+	2 COMBINED AT	CA99X	1030.	4.57	262.	66.	48.	.45
+	5 COMBINED AT	DUMMY2	6538.	5.43	2923.	802.	581.	62.01
+	HYDROGRAPH AT	A99W	312.	4.23	44.	11.	8.	.22
+	DIVERSION TO	LA99WD	312.	4.23	17.	4.	3.	.22
+	HYDROGRAPH AT	LA99W	305.	4.30	27.	7.	5.	.22
+	HYDROGRAPH AT	A99U	100.	4.20	9.	2.	2.	.07
+	HYDROGRAPH AT	A99S	66.	4.43	10.	2.	2.	.08
+	HYDROGRAPH AT	A08A	86.	4.43	22.	6.	4.	.14
+	ROUTED TO	RA08A	85.	4.60	22.	6.	4.	.14
+	HYDROGRAPH AT	A99R	88.	4.07	6.	1.	1.	.04
+	ROUTED TO	RA99R	73.	4.30	6.	1.	1.	.04
+	HYDROGRAPH AT	A08	218.	4.00	11.	3.	2.	.08
+	3 COMBINED AT	CA08	227.	4.00	38.	10.	7.	.25
+	6 COMBINED AT	DUMMY3	6549.	5.43	2933.	805.	583.	63.22
+	HYDROGRAPH AT	A99P	959.	4.17	123.	31.	22.	.57
+	HYDROGRAPH AT	A05	368.	4.03	23.	6.	4.	.13
+	HYDROGRAPH AT	A99O	299.	4.03	22.	5.	4.	.10
+	HYDROGRAPH AT	A99M	193.	4.00	17.	4.	3.	.06
+	HYDROGRAPH AT	A99L	255.	4.00	18.	4.	3.	.08
+	6 COMBINED AT	DUMMY4	6584.	5.43	3020.	832.	602.	64.17
+	HYDROGRAPH AT	A99K	240.	4.07	25.	6.	5.	.11
+	HYDROGRAPH AT	A99J	242.	4.13	33.	8.	6.	.14

+	HYDROGRAPH AT	A99I	319.	4.10	32.	8.	6.	.14
+	HYDROGRAPH AT	A04A	412.	4.17	51.	13.	9.	.22
+	ROUTED TO	RA04A	392.	4.30	51.	13.	9.	.22
+	HYDROGRAPH AT	A04	124.	4.20	9.	2.	2.	.08
+	2 COMBINED AT	CA04	499.	4.23	61.	15.	11.	.30
+	ROUTED TO	RA04	463.	4.53	60.	15.	11.	.30
+	HYDROGRAPH AT	A03D	96.	4.50	14.	3.	2.	.13
+	2 COMBINED AT	CA03D	557.	4.53	74.	19.	13.	.43
+	ROUTED TO	RA03D	520.	4.80	74.	19.	13.	.43
+	HYDROGRAPH AT	A03E	216.	4.17	29.	7.	5.	.15
+	ROUTED TO	RA03E	208.	4.30	29.	7.	5.	.15
+	HYDROGRAPH AT	A03B	153.	4.10	10.	2.	2.	.07
+	2 COMBINED AT	CA03B	304.	4.17	39.	10.	7.	.23
+	ROUTED TO	RA03B	267.	4.70	39.	10.	7.	.23
+	HYDROGRAPH AT	A03A	249.	4.20	19.	5.	3.	.14
+	2 COMBINED AT	CA03A	308.	4.57	58.	15.	11.	.37
+	ROUTED TO	RA03A	303.	4.73	58.	15.	11.	.37
+	HYDROGRAPH AT	A03	179.	4.67	32.	8.	6.	.28
+	3 COMBINED AT	CA03	824.	4.77	145.	37.	26.	1.07
+	5 COMBINED AT	DUMMY5	6726.	5.40	3105.	858.	620.	65.63
+	HYDROGRAPH AT	A99G	63.	4.00	3.	1.	0.	.02
+	DIVERSION TO	LA99GD	62.	3.93	2.	0.	0.	.02
+	HYDROGRAPH AT	LA99G	63.	4.00	1.	0.	0.	.02
+	HYDROGRAPH AT	A99H	35.	4.90	10.	3.	2.	.10
+	DIVERSION TO	LA99HD	35.	4.90	8.	2.	1.	.10
+	HYDROGRAPH AT	LA99H	10.	6.60	2.	1.	0.	.10
+	ROUTED TO	RA99H	5.	7.43	2.	1.	0.	.10
+	HYDROGRAPH AT	A02D	154.	4.00	6.	2.	1.	.06
+	DIVERSION TO	LA02DD	152.	3.97	5.	1.	1.	.06
+	HYDROGRAPH AT	LA02D	146.	4.03	1.	0.	0.	.06
+	ROUTED TO	RA02D	46.	4.20	1.	0.	0.	.06
+	HYDROGRAPH AT	A99F	37.	5.03	12.	3.	2.	.11
+	3 COMBINED AT	CA99F	48.	4.20	15.	4.	3.	.28
+	HYDROGRAPH AT	A02	32.	4.10	2.	0.	0.	.02
+	HYDROGRAPH AT	A01H	195.	4.00	9.	2.	2.	.07
	DIVERSION TO							

+		LA01HD	193.	3.93	6.	2.	1.	.07
+	HYDROGRAPH AT	LA01H	195.	4.00	2.	1.	0.	.07
+	HYDROGRAPH AT	A99E	74.	4.00	4.	1.	1.	.02
+	DIVERSION TO	LA99ED	74.	4.00	3.	1.	1.	.02
+	HYDROGRAPH AT	LA99E	37.	4.07	0.	0.	0.	.02
+	6 COMBINED AT	DUMMY6	6725.	5.40	3105.	858.	621.	66.03
+	HYDROGRAPH AT	A99B	143.	4.03	7.	2.	1.	.05
+	HYDROGRAPH AT	A99C	74.	4.00	3.	1.	1.	.03
+	DIVERSION TO	LA99CD	74.	4.00	3.	1.	1.	.03
+	HYDROGRAPH AT	LA99C	2.	4.10	0.	0.	0.	.03
+	HYDROGRAPH AT	A99D	91.	4.00	4.	1.	1.	.03
+	DIVERSION TO	LA99DD	91.	3.97	3.	1.	1.	.03
+	HYDROGRAPH AT	LA99D	86.	4.03	1.	0.	0.	.03
+	HYDROGRAPH AT	A01A	97.	4.13	7.	2.	1.	.05
+	ROUTED TO	RA01A	82.	4.40	7.	2.	1.	.05
+	HYDROGRAPH AT	A01	274.	4.27	27.	7.	5.	.20
+	2 COMBINED AT	CA01	337.	4.30	34.	9.	6.	.25
+	HYDROGRAPH AT	A99A	366.	4.07	25.	6.	5.	.13
+	DIVERSION TO	LA99AD	366.	4.07	18.	4.	3.	.13
+	HYDROGRAPH AT	LA99A	280.	4.13	8.	2.	1.	.13
+	HYDROGRAPH AT	A99	161.	4.27	16.	4.	3.	.14
+	7 COMBINED AT	DUMMY7	6710.	5.40	3104.	858.	621.	66.66
+	HYDROGRAPH AT	A01E	218.	4.07	21.	5.	4.	.08
+	DIVERSION TO	A01EI	131.	4.07	13.	3.	2.	.08
+	HYDROGRAPH AT	DA01E	87.	4.07	9.	2.	2.	.08
+	ROUTED TO	RA01ES	49.	5.13	9.	2.	2.	.08
+	HYDROGRAPH AT	N01A	570.	4.33	56.	14.	10.	.41
+	ROUTED TO	RN01A	534.	4.50	56.	14.	10.	.41
+	HYDROGRAPH AT	N01	951.	4.20	136.	34.	25.	.65
+	3 COMBINED AT	CN01	1019.	4.43	185.	47.	34.	1.14
+	HYDROGRAPH AT	A03C	529.	4.17	61.	15.	11.	.33
+	ROUTED TO	RA03C	501.	4.33	61.	15.	11.	.33
+	HYDROGRAPH AT	A02B	760.	4.03	51.	13.	9.	.27
+	ROUTED TO	RA02B	702.	4.10	51.	13.	9.	.27
+	2 COMBINED AT	CA02A*	941.	4.17	110.	28.	20.	.60
+	ROUTED TO	RA02A*	869.	4.30	110.	28.	20.	.60

+	HYDROGRAPH AT	A02A	530.	4.70	91.	23.	16.	.61
+	HYDROGRAPH AT	A01G	599.	4.00	35.	9.	6.	.19
+	DIVERSION TO	LA01GD	595.	3.93	26.	6.	5.	.19
+	HYDROGRAPH AT	LA01G	599.	4.00	9.	2.	2.	.19
+	3 COMBINED AT	CA01G	932.	4.50	187.	47.	34.	1.39
+	ROUTED TO	RA01G	901.	4.63	187.	47.	34.	1.39
+	HYDROGRAPH AT	A02C	462.	4.23	68.	17.	12.	.33
+	DIVERSION TO	LA02CD	462.	4.23	32.	8.	6.	.33
+	HYDROGRAPH AT	LA02C	418.	4.37	36.	9.	7.	.33
+	ROUTED TO	RA02C	284.	4.97	36.	9.	7.	.33
+	HYDROGRAPH AT	A01F	436.	4.17	57.	14.	10.	.28
+	DIVERSION TO	LA01FD	365.	4.07	17.	4.	3.	.28
+	HYDROGRAPH AT	LA01F	436.	4.17	40.	10.	7.	.28
+	2 COMBINED AT	CA01F	416.	4.17	74.	19.	13.	.61
+	ROUTED TO	RA01F	369.	4.40	74.	19.	13.	.61
+	HYDROGRAPH AT	A01D	520.	4.13	45.	11.	8.	.21
+	DIVERSION TO	LA01DD	520.	4.13	32.	8.	6.	.21
+	HYDROGRAPH AT	LA01D	275.	4.30	12.	3.	2.	.21
+	HYDROGRAPH AT	DRA01E	131.	4.07	13.	3.	2.	.08
+	ROUTED TO	RA01EW	124.	4.13	13.	3.	2.	.08
+	3 COMBINED AT	CA01D	521.	4.37	94.	24.	17.	.82
+	ROUTED TO	RA01D	442.	4.63	94.	24.	17.	.82
+	HYDROGRAPH AT	A01C	472.	4.13	56.	14.	10.	.22
+	DIVERSION TO	LA01CD	472.	4.13	39.	10.	7.	.22
+	HYDROGRAPH AT	LA01C	294.	4.33	17.	4.	3.	.22
+	HYDROGRAPH AT	A01B	357.	4.10	19.	5.	3.	.15
+	DIVERSION TO	LA01BD	357.	4.10	15.	4.	3.	.15
+	HYDROGRAPH AT	LA01B	190.	4.20	5.	1.	1.	.15
+	4 COMBINED AT	CA01B	1222.	4.70	260.	66.	47.	2.58

Wood/Patel

	Basin Elevation, Area, & Volume Relationship (Dove Valley Ranch - LPP & 95th Ave)												
								Bleed Off Pipe Diam.		1.5	ft		
	Elevation	Area	Area	Diff-Z	Diff-V	Volume	Volume	Pipe Flow	2-8'x3' RCBC's[1]	Total Flow			
	(ft)	(ft²)	(acre)	(ft)	(ft^3)	(ft^3)	(ac-ft)	(cfs)	(cfs)	(cfs)			
SW + SE -BASINS	1257	2105	0.05						0				
	1258	3038	0.07	1.0	2572	2572	0.06	4.8	0	5			
	1259	5400	0.12	1.0	4219	6791	0.16	8.8	0	9			
	1260	11180	0.26	1.0	8290	15081	0.35	15.2	35	50			
	1261	125120	2.87	1.0	68150	83231	1.91	17.6	66	84			
	1262	197934	4.54	1.0	161527	244758	5.62	19.7	93	113			
	1263	234025	5.37	1.0	215980	460737	10.58	21.5	118	140			
	1264	278900	6.40	1.0	256463	717200	16.46	23.3	182	205			
	Notes:												
	1.) Culvert flow capacities were obtained by adjusting the flows in the RGL HEC-RAS model and accounting for tailwater effects downstream of 95th Ave.												

INTERPOLATED HYDROGRAPH AT RX10

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0820	251	63.	1		1640	501	2.	2		0100	751	0.
1		0002	2	0.	1		0822	252	62.	1		1642	502	2.	2		0102	752	0.
1		0004	3	0.	1		0824	253	61.	1		1644	503	2.	2		0104	753	0.
1		0006	4	0.	1		0826	254	61.	1		1646	504	2.	2		0106	754	0.
1		0008	5	0.	1		0828	255	60.	1		1648	505	2.	2		0108	755	0.
1		0010	6	0.	1		0830	256	59.	1		1650	506	2.	2		0110	756	0.
1		0012	7	0.	1		0832	257	59.	1		1652	507	2.	2		0112	757	0.
1		0014	8	0.	1		0834	258	58.	1		1654	508	2.	2		0114	758	0.
1		0016	9	0.	1		0836	259	57.	1		1656	509	2.	2		0116	759	0.
1		0018	10	0.	1		0838	260	57.	1		1658	510	2.	2		0118	760	0.
1		0020	11	0.	1		0840	261	56.	1		1700	511	2.	2		0120	761	0.
1		0022	12	0.	1		0842	262	55.	1		1702	512	2.	2		0122	762	0.
1		0024	13	0.	1		0844	263	54.	1		1704	513	2.	2		0124	763	0.
1		0026	14	0.	1		0846	264	53.	1		1706	514	2.	2		0126	764	0.
1		0028	15	0.	1		0848	265	52.	1		1708	515	2.	2		0128	765	0.
1		0030	16	0.	1		0850	266	51.	1		1710	516	2.	2		0130	766	0.
1		0032	17	0.	1		0852	267	50.	1		1712	517	2.	2		0132	767	0.
1		0034	18	0.	1		0854	268	49.	1		1714	518	2.	2		0134	768	0.
1		0036	19	0.	1		0856	269	48.	1		1716	519	2.	2		0136	769	0.
1		0038	20	0.	1		0858	270	47.	1		1718	520	2.	2		0138	770	0.
1		0040	21	0.	1		0900	271	46.	1		1720	521	2.	2		0140	771	0.
1		0042	22	0.	1		0902	272	45.	1		1722	522	2.	2		0142	772	0.
1		0044	23	0.	1		0904	273	44.	1		1724	523	2.	2		0144	773	0.
1		0046	24	0.	1		0906	274	43.	1		1726	524	1.	2		0146	774	0.
1		0048	25	0.	1		0908	275	42.	1		1728	525	1.	2		0148	775	0.
1		0050	26	0.	1		0910	276	41.	1		1730	526	1.	2		0150	776	0.
1		0052	27	0.	1		0912	277	40.	1		1732	527	1.	2		0152	777	0.
1		0054	28	0.	1		0914	278	39.	1		1734	528	1.	2		0154	778	0.
1		0056	29	0.	1		0916	279	38.	1		1736	529	1.	2		0156	779	0.
1		0058	30	0.	1		0918	280	37.	1		1738	530	1.	2		0158	780	0.
1		0100	31	0.	1		0920	281	36.	1		1740	531	1.	2		0200	781	0.
1		0102	32	0.	1		0922	282	35.	1		1742	532	1.	2		0202	782	0.
1		0104	33	0.	1		0924	283	35.	1		1744	533	1.	2		0204	783	0.
1		0106	34	0.	1		0926	284	34.	1		1746	534	1.	2		0206	784	0.
1		0108	35	0.	1		0928	285	33.	1		1748	535	1.	2		0208	785	0.
1		0110	36	0.	1		0930	286	32.	1		1750	536	1.	2		0210	786	0.
1		0112	37	0.	1		0932	287	31.	1		1752	537	1.	2		0212	787	0.
1		0114	38	0.	1		0934	288	31.	1		1754	538	1.	2		0214	788	0.
1		0116	39	0.	1		0936	289	30.	1		1756	539	1.	2		0216	789	0.
1		0118	40	0.	1		0938	290	29.	1		1758	540	1.	2		0218	790	0.
1		0120	41	0.	1		0940	291	29.	1		1800	541	1.	2		0220	791	0.
1		0122	42	0.	1		0942	292	28.	1		1802	542	1.	2		0222	792	0.
1		0124	43	0.	1		0944	293	27.	1		1804	543	1.	2		0224	793	0.
1		0126	44	0.	1		0946	294	27.	1		1806	544	1.	2		0226	794	0.
1		0128	45	0.	1		0948	295	26.	1		1808	545	1.	2		0228	795	0.
1		0130	46	0.	1		0950	296	25.	1		1810	546	1.	2		0230	796	0.
1		0132	47	0.	1		0952	297	25.	1		1812	547	1.	2		0232	797	0.
1		0134	48	0.	1		0954	298	24.	1		1814	548	1.	2		0234	798	0.
1		0136	49	0.	1		0956	299	24.	1		1816	549	1.	2		0236	799	0.
1		0138	50	0.	1		0958	300	23.	1		1818	550	1.	2		0238	800	0.
1		0140	51	0.	1		1000	301	23.	1		1820	551	1.	2		0240	801	0.
1		0142	52	0.	1		1002	302	23.	1		1822	552	1.	2		0242	802	0.
1		0144	53	0.	1		1004	303	22.	1		1824	553	1.	2		0244	803	0.
1		0146	54	0.	1		1006	304	22.	1		1826	554	1.	2		0246	804	0.
1		0148	55	0.	1		1008	305	21.	1		1828	555	1.	2		0248	805	0.
1		0150	56	0.	1		1010	306	21.	1		1830	556	1.	2		0250	806	0.
1		0152	57	0.	1		1012	307	21.	1		1832	557	1.	2		0252	807	0.
1		0154	58	0.	1		1014	308	20.	1		1834	558	1.	2		0254	808	0.
1		0156	59	0.	1		1016	309	20.	1		1836	559	1.	2		0256	809	0.
1		0158	60	0.	1		1018	310	20.	1		1838	560	1.	2		0258	810	0.
1		0200	61	0.	1		1020	311	19.	1		1840	561	1.	2		0300	811	0.
1		0202	62	1.	1		1022	312	19.	1		1842	562	1.	2		0302	812	0.
1		0204	63	1.	1		1024	313	19.	1		1844	563	1.	2		0304	813	0.
1		0206	64	1.	1		1026	314	18.	1		1846	564	1.	2		0306	814	0.
1		0208	65	1.	1		1028	315	18.	1		1848	565	1.	2		0308	815	0.
1		0210	66	1.	1		1030	316	18.	1		1850	566	1.	2		0310	816	0.
1		0212	67	1.	1		1032	317	18.	1		1852	567	1.	2		0312	817	0.
1		0214	68	1.	1		1034	318	17.	1		1854	568	1.	2		0314	818	0.
1		0216	69	1.	1		1036	319	17.	1		1856	569	1.	2		0316	819	0.
1		0218	70	1.	1		1038	320	17.	1		1858	570	1.	2		0318	820	0.
1		0220	71	1.	1		1040	321	17.	1		1900	571	1.	2		0320	821	0.
1		0222	72	1.	1		1042	322	17.	1		1902	572	1.	2		0322	822	0.
1		0224	73	1.	1		1044	323	16.	1		1904	573	1.	2		0324	823	0.
1		0226	74	1.	1		1046	324	16.	1		1906	574	1.	2		0326	824	0.
1		0228	75	1.	1		1048	325	16.	1		1908	575	1.	2		0328	825	0.
1		0230	76	1.	1		1050	326	16.	1		1910	576	1.	2		0330	826	0.
1		0232	77	1.	1		1052	327	16.	1		1912	577	1.	2		0332	827	0.
1		0234	78	1.	1		1054	328	16.	1		1914	578	1.	2		0334	828	0.
1		0236	79	1.	1		1056	329	16.	1		1916	579	1.	2		0336	829	0.

1	0238	80	1.	*	1	1058	330	15.	*	1	1918	580	1.	*	2	0338	830	0.
1	0240	81	1.	*	1	1100	331	15.	*	1	1920	581	1.	*	2	0340	831	0.
1	0242	82	1.	*	1	1102	332	15.	*	1	1922	582	1.	*	2	0342	832	0.
1	0244	83	1.	*	1	1104	333	15.	*	1	1924	583	1.	*	2	0344	833	0.
1	0246	84	1.	*	1	1106	334	15.	*	1	1926	584	1.	*	2	0346	834	0.
1	0248	85	1.	*	1	1108	335	15.	*	1	1928	585	1.	*	2	0348	835	0.
1	0250	86	1.	*	1	1110	336	15.	*	1	1930	586	1.	*	2	0350	836	0.
1	0252	87	1.	*	1	1112	337	15.	*	1	1932	587	1.	*	2	0352	837	0.
1	0254	88	1.	*	1	1114	338	14.	*	1	1934	588	1.	*	2	0354	838	0.
1	0256	89	1.	*	1	1116	339	14.	*	1	1936	589	1.	*	2	0356	839	0.
1	0258	90	1.	*	1	1118	340	14.	*	1	1938	590	1.	*	2	0358	840	0.
1	0300	91	1.	*	1	1120	341	14.	*	1	1940	591	1.	*	2	0400	841	0.
1	0302	92	1.	*	1	1122	342	14.	*	1	1942	592	1.	*	2	0402	842	0.
1	0304	93	1.	*	1	1124	343	14.	*	1	1944	593	1.	*	2	0404	843	0.
1	0306	94	1.	*	1	1126	344	14.	*	1	1946	594	1.	*	2	0406	844	0.
1	0308	95	2.	*	1	1128	345	13.	*	1	1948	595	1.	*	2	0408	845	0.
1	0310	96	2.	*	1	1130	346	13.	*	1	1950	596	1.	*	2	0410	846	0.
1	0312	97	2.	*	1	1132	347	13.	*	1	1952	597	1.	*	2	0412	847	0.
1	0314	98	2.	*	1	1134	348	13.	*	1	1954	598	1.	*	2	0414	848	0.
1	0316	99	2.	*	1	1136	349	13.	*	1	1956	599	1.	*	2	0416	849	0.
1	0318	100	2.	*	1	1138	350	13.	*	1	1958	600	1.	*	2	0418	850	0.
1	0320	101	2.	*	1	1140	351	13.	*	1	2000	601	1.	*	2	0420	851	0.
1	0322	102	2.	*	1	1142	352	13.	*	1	2002	602	1.	*	2	0422	852	0.
1	0324	103	2.	*	1	1144	353	12.	*	1	2004	603	1.	*	2	0424	853	0.
1	0326	104	2.	*	1	1146	354	12.	*	1	2006	604	1.	*	2	0426	854	0.
1	0328	105	2.	*	1	1148	355	12.	*	1	2008	605	1.	*	2	0428	855	0.
1	0330	106	2.	*	1	1150	356	12.	*	1	2010	606	1.	*	2	0430	856	0.
1	0332	107	2.	*	1	1152	357	12.	*	1	2012	607	1.	*	2	0432	857	0.
1	0334	108	2.	*	1	1154	358	12.	*	1	2014	608	1.	*	2	0434	858	0.
1	0336	109	2.	*	1	1156	359	12.	*	1	2016	609	1.	*	2	0436	859	0.
1	0338	110	2.	*	1	1158	360	12.	*	1	2018	610	1.	*	2	0438	860	0.
1	0340	111	2.	*	1	1200	361	11.	*	1	2020	611	1.	*	2	0440	861	0.
1	0342	112	2.	*	1	1202	362	11.	*	1	2022	612	1.	*	2	0442	862	0.
1	0344	113	2.	*	1	1204	363	11.	*	1	2024	613	1.	*	2	0444	863	0.
1	0346	114	2.	*	1	1206	364	11.	*	1	2026	614	1.	*	2	0446	864	0.
1	0348	115	2.	*	1	1208	365	11.	*	1	2028	615	1.	*	2	0448	865	0.
1	0350	116	2.	*	1	1210	366	11.	*	1	2030	616	1.	*	2	0450	866	0.
1	0352	117	2.	*	1	1212	367	11.	*	1	2032	617	1.	*	2	0452	867	0.
1	0354	118	2.	*	1	1214	368	11.	*	1	2034	618	1.	*	2	0454	868	0.
1	0356	119	2.	*	1	1216	369	10.	*	1	2036	619	1.	*	2	0456	869	0.
1	0358	120	2.	*	1	1218	370	10.	*	1	2038	620	1.	*	2	0458	870	0.
1	0400	121	2.	*	1	1220	371	10.	*	1	2040	621	1.	*	2	0500	871	0.
1	0402	122	2.	*	1	1222	372	10.	*	1	2042	622	1.	*	2	0502	872	0.
1	0404	123	3.	*	1	1224	373	10.	*	1	2044	623	1.	*	2	0504	873	0.
1	0406	124	3.	*	1	1226	374	10.	*	1	2046	624	1.	*	2	0506	874	0.
1	0408	125	3.	*	1	1228	375	10.	*	1	2048	625	0.	*	2	0508	875	0.
1	0410	126	3.	*	1	1230	376	10.	*	1	2050	626	0.	*	2	0510	876	0.
1	0412	127	3.	*	1	1232	377	9.	*	1	2052	627	0.	*	2	0512	877	0.
1	0414	128	3.	*	1	1234	378	9.	*	1	2054	628	0.	*	2	0514	878	0.
1	0416	129	3.	*	1	1236	379	9.	*	1	2056	629	0.	*	2	0516	879	0.
1	0418	130	3.	*	1	1238	380	9.	*	1	2058	630	0.	*	2	0518	880	0.
1	0420	131	4.	*	1	1240	381	9.	*	1	2100	631	0.	*	2	0520	881	0.
1	0422	132	4.	*	1	1242	382	9.	*	1	2102	632	0.	*	2	0522	882	0.
1	0424	133	5.	*	1	1244	383	9.	*	1	2104	633	0.	*	2	0524	883	0.
1	0426	134	7.	*	1	1246	384	9.	*	1	2106	634	0.	*	2	0526	884	0.
1	0428	135	10.	*	1	1248	385	8.	*	1	2108	635	0.	*	2	0528	885	0.
1	0430	136	14.	*	1	1250	386	8.	*	1	2110	636	0.	*	2	0530	886	0.
1	0432	137	21.	*	1	1252	387	8.	*	1	2112	637	0.	*	2	0532	887	0.
1	0434	138	31.	*	1	1254	388	8.	*	1	2114	638	0.	*	2	0534	888	0.
1	0436	139	46.	*	1	1256	389	8.	*	1	2116	639	0.	*	2	0536	889	0.
1	0438	140	79.	*	1	1258	390	8.	*	1	2118	640	0.	*	2	0538	890	0.
1	0440	141	125.	*	1	1300	391	8.	*	1	2120	641	0.	*	2	0540	891	0.
1	0442	142	194.	*	1	1302	392	8.	*	1	2122	642	0.	*	2	0542	892	0.
1	0444	143	292.	*	1	1304	393	8.	*	1	2124	643	0.	*	2	0544	893	0.
1	0446	144	419.	*	1	1306	394	7.	*	1	2126	644	0.	*	2	0546	894	0.
1	0448	145	546.	*	1	1308	395	7.	*	1	2128	645	0.	*	2	0548	895	0.
1	0450	146	679.	*	1	1310	396	7.	*	1	2130	646	0.	*	2	0550	896	0.
1	0452	147	794.	*	1	1312	397	7.	*	1	2132	647	0.	*	2	0552	897	0.
1	0454	148	903.	*	1	1314	398	7.	*	1	2134	648	0.	*	2	0554	898	0.
1	0456	149	993.	*	1	1316	399	7.	*	1	2136	649	0.	*	2	0556	899	0.
1	0458	150	1062.	*	1	1318	400	7.	*	1	2138	650	0.	*	2	0558	900	0.
1	0500	151	1113.	*	1	1320	401	7.	*	1	2140	651	0.	*	2	0600	901	0.
1	0502	152	1148.	*	1	1322	402	7.	*	1	2142	652	0.	*	2	0602	902	0.
1	0504	153	1170.	*	1	1324	403	7.	*	1	2144	653	0.	*	2	0604	903	0.
1	0506	154	1185.	*	1	1326	404	7.	*	1	2146	654	0.	*	2	0606	904	0.
1	0508	155	1193.	*	1	1328	405	6.	*	1	2148	655	0.	*	2	0608	905	0.
1	0510	156	1192.	*	1	1330	406	6.	*	1	2150	656	0.	*	2	0610	906	0.
1	0512	157	1182.	*	1	1332	407	6.	*	1	2152	657	0.	*	2	0612	907	0.
1	0514	158	1165.	*	1	1334	408	6.	*	1	2154	658	0.	*	2	0614	908	0.
1	0516	159	1142.	*	1	1336	409	6.	*	1	2156	659	0.	*	2	0616	909	0.
1	0518	160	1114.	*	1	1338	410	6.	*	1	2158	660	0.	*	2	0618	910	0.
1	0520	161	1083.	*	1	1340	411	6.	*	1	2200	661	0.	*	2	0620	911	0.
1	0522	162	1050.	*	1	1342	412	6.	*	1	2202	662	0.	*	2	0622	912	0.
1	0524	163	1017.	*	1	1344	413	6.	*	1	2204	663	0.	*	2	0624	913	0.
1	0526	164	983.	*	1	1346	414	6.	*	1	2206	664	0.	*	2	0626	914	0.
1	0528	165	951.	*	1	1348	415	6.	*	1	2208	665	0.	*	2	0628	915	0.
1	0530	166	919.	*	1	1350	416	6.	*	1	2210	666	0.	*	2	0630	916	0.

1	0532	167	890.	*	1	1352	417	5.	*	1	2212	667	0.	*	2	0632	917	0.
1	0534	168	864.	*	1	1354	418	5.	*	1	2214	668	0.	*	2	0634	918	0.
1	0536	169	837.	*	1	1356	419	5.	*	1	2216	669	0.	*	2	0636	919	0.
1	0538	170	810.	*	1	1358	420	5.	*	1	2218	670	0.	*	2	0638	920	0.
1	0540	171	784.	*	1	1400	421	5.	*	1	2220	671	0.	*	2	0640	921	0.
1	0542	172	758.	*	1	1402	422	5.	*	1	2222	672	0.	*	2	0642	922	0.
1	0544	173	734.	*	1	1404	423	5.	*	1	2224	673	0.	*	2	0644	923	0.
1	0546	174	710.	*	1	1406	424	5.	*	1	2226	674	0.	*	2	0646	924	0.
1	0548	175	687.	*	1	1408	425	5.	*	1	2228	675	0.	*	2	0648	925	0.
1	0550	176	665.	*	1	1410	426	5.	*	1	2230	676	0.	*	2	0650	926	0.
1	0552	177	645.	*	1	1412	427	5.	*	1	2232	677	0.	*	2	0652	927	0.
1	0554	178	625.	*	1	1414	428	5.	*	1	2234	678	0.	*	2	0654	928	0.
1	0556	179	608.	*	1	1416	429	5.	*	1	2236	679	0.	*	2	0656	929	0.
1	0558	180	592.	*	1	1418	430	5.	*	1	2238	680	0.	*	2	0658	930	0.
1	0600	181	575.	*	1	1420	431	4.	*	1	2240	681	0.	*	2	0700	931	0.
1	0602	182	559.	*	1	1422	432	4.	*	1	2242	682	0.	*	2	0702	932	0.
1	0604	183	542.	*	1	1424	433	4.	*	1	2244	683	0.	*	2	0704	933	0.
1	0606	184	526.	*	1	1426	434	4.	*	1	2246	684	0.	*	2	0706	934	0.
1	0608	185	510.	*	1	1428	435	4.	*	1	2248	685	0.	*	2	0708	935	0.
1	0610	186	495.	*	1	1430	436	4.	*	1	2250	686	0.	*	2	0710	936	0.
1	0612	187	481.	*	1	1432	437	4.	*	1	2252	687	0.	*	2	0712	937	0.
1	0614	188	468.	*	1	1434	438	4.	*	1	2254	688	0.	*	2	0714	938	0.
1	0616	189	454.	*	1	1436	439	4.	*	1	2256	689	0.	*	2	0716	939	0.
1	0618	190	441.	*	1	1438	440	4.	*	1	2258	690	0.	*	2	0718	940	0.
1	0620	191	428.	*	1	1440	441	4.	*	1	2300	691	0.	*	2	0720	941	0.
1	0622	192	416.	*	1	1442	442	4.	*	1	2302	692	0.	*	2	0722	942	0.
1	0624	193	403.	*	1	1444	443	4.	*	1	2304	693	0.	*	2	0724	943	0.
1	0626	194	391.	*	1	1446	444	4.	*	1	2306	694	0.	*	2	0726	944	0.
1	0628	195	380.	*	1	1448	445	4.	*	1	2308	695	0.	*	2	0728	945	0.
1	0630	196	370.	*	1	1450	446	4.	*	1	2310	696	0.	*	2	0730	946	0.
1	0632	197	361.	*	1	1452	447	4.	*	1	2312	697	0.	*	2	0732	947	0.
1	0634	198	351.	*	1	1454	448	4.	*	1	2314	698	0.	*	2	0734	948	0.
1	0636	199	340.	*	1	1456	449	4.	*	1	2316	699	0.	*	2	0736	949	0.
1	0638	200	330.	*	1	1458	450	3.	*	1	2318	700	0.	*	2	0738	950	0.
1	0640	201	319.	*	1	1500	451	3.	*	1	2320	701	0.	*	2	0740	951	0.
1	0642	202	309.	*	1	1502	452	3.	*	1	2322	702	0.	*	2	0742	952	0.
1	0644	203	300.	*	1	1504	453	3.	*	1	2324	703	0.	*	2	0744	953	0.
1	0646	204	290.	*	1	1506	454	3.	*	1	2326	704	0.	*	2	0746	954	0.
1	0648	205	281.	*	1	1508	455	3.	*	1	2328	705	0.	*	2	0748	955	0.
1	0650	206	272.	*	1	1510	456	3.	*	1	2330	706	0.	*	2	0750	956	0.
1	0652	207	263.	*	1	1512	457	3.	*	1	2332	707	0.	*	2	0752	957	0.
1	0654	208	254.	*	1	1514	458	3.	*	1	2334	708	0.	*	2	0754	958	0.
1	0656	209	246.	*	1	1516	459	3.	*	1	2336	709	0.	*	2	0756	959	0.
1	0658	210	238.	*	1	1518	460	3.	*	1	2338	710	0.	*	2	0758	960	0.
1	0700	211	230.	*	1	1520	461	3.	*	1	2340	711	0.	*	2	0800	961	0.
1	0702	212	223.	*	1	1522	462	3.	*	1	2342	712	0.	*	2	0802	962	0.
1	0704	213	216.	*	1	1524	463	3.	*	1	2344	713	0.	*	2	0804	963	0.
1	0706	214	209.	*	1	1526	464	3.	*	1	2346	714	0.	*	2	0806	964	0.
1	0708	215	203.	*	1	1528	465	3.	*	1	2348	715	0.	*	2	0808	965	0.
1	0710	216	196.	*	1	1530	466	3.	*	1	2350	716	0.	*	2	0810	966	0.
1	0712	217	190.	*	1	1532	467	3.	*	1	2352	717	0.	*	2	0812	967	0.
1	0714	218	186.	*	1	1534	468	3.	*	1	2354	718	0.	*	2	0814	968	0.
1	0716	219	181.	*	1	1536	469	3.	*	1	2356	719	0.	*	2	0816	969	0.
1	0718	220	176.	*	1	1538	470	3.	*	1	2358	720	0.	*	2	0818	970	0.
1	0720	221	170.	*	1	1540	471	3.	*	2	0000	721	0.	*	2	0820	971	0.
1	0722	222	165.	*	1	1542	472	3.	*	2	0002	722	0.	*	2	0822	972	0.
1	0724	223	159.	*	1	1544	473	3.	*	2	0004	723	0.	*	2	0824	973	0.
1	0726	224	153.	*	1	1546	474	3.	*	2	0006	724	0.	*	2	0826	974	0.
1	0728	225	148.	*	1	1548	475	3.	*	2	0008	725	0.	*	2	0828	975	0.
1	0730	226	142.	*	1	1550	476	3.	*	2	0010	726	0.	*	2	0830	976	0.
1	0732	227	137.	*	1	1552	477	3.	*	2	0012	727	0.	*	2	0832	977	0.
1	0734	228	132.	*	1	1554	478	2.	*	2	0014	728	0.	*	2	0834	978	0.
1	0736	229	127.	*	1	1556	479	2.	*	2	0016	729	0.	*	2	0836	979	0.
1	0738	230	122.	*	1	1558	480	2.	*	2	0018	730	0.	*	2	0838	980	0.
1	0740	231	118.	*	1	1600	481	2.	*	2	0020	731	0.	*	2	0840	981	0.
1	0742	232	114.	*	1	1602	482	2.	*	2	0022	732	0.	*	2	0842	982	0.
1	0744	233	110.	*	1	1604	483	2.	*	2	0024	733	0.	*	2	0844	983	0.
1	0746	234	107.	*	1	1606	484	2.	*	2	0026	734	0.	*	2	0846	984	0.
1	0748	235	103.	*	1	1608	485	2.	*	2	0028	735	0.	*	2	0848	985	0.
1	0750	236	100.	*	1	1610	486	2.	*	2	0030	736	0.	*	2	0850	986	0.
1	0752	237	96.	*	1	1612	487	2.	*	2	0032	737	0.	*	2	0852	987	0.
1	0754	238	93.	*	1	1614	488	2.	*	2	0034	738	0.	*	2	0854	988	0.
1	0756	239	90.	*	1	1616	489	2.	*	2	0036	739	0.	*	2	0856	989	0.
1	0758	240	87.	*	1	1618	490	2.	*	2	0038	740	0.	*	2	0858	990	0.
1	0800	241	85.	*	1	1620	491	2.	*	2	0040	741	0.	*	2	0900	991	0.
1	0802	242	82.	*	1	1622	492	2.	*	2	0042	742	0.	*	2	0902	992	0.
1	0804	243	79.	*	1	1624	493	2.	*	2	0044	743	0.	*	2	0904	993	0.
1	0806	244	77.	*	1	1626	494	2.	*	2	0046	744	0.	*	2	0906	994	0.
1	0808	245	74.	*	1	1628	495	2.	*	2	0048	745	0.	*	2	0908	995	0.
1	0810	246	72.	*	1	1630	496	2.	*	2	0050	746	0.	*	2	0910	996	0.
1	0812	247	70.	*	1	1632	497	2.	*	2	0052	747	0.	*	2	0912	997	0.
1	0814	248	68.	*	1	1634	498	2.	*	2	0054	748	0.	*	2	0914	998	0.
1	0816	249	66.	*	1	1636	499	2.	*	2	0056	749	0.	*	2	0916	999	0.
1	0818	250	65.	*	1	1638	500	2.	*	2	0058	750	0.	*	2	0918	1000	0.
				*					*					*				

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	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	33.30-HR
+	(CFS)	(HR)					
			(CFS)				
+	1193.	5.13		296.	76.	55.	55.
			(INCHES)	.638	.659	.659	.659
			(AC-FT)	147.	151.	151.	151.

CUMULATIVE AREA = 4.31 SQ MI

From NORTHWEST REGION UPDATE

INTERPOLATED HYDROGRAPH AT RX10

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0820	251	94.	1		1640	501	4.	2		0100	751	0.
1		0002	2	0.	1		0822	252	91.	1		1642	502	4.	2		0102	752	0.
1		0004	3	0.	1		0824	253	89.	1		1644	503	4.	2		0104	753	0.
1		0006	4	0.	1		0826	254	87.	1		1646	504	4.	2		0106	754	0.
1		0008	5	0.	1		0828	255	84.	1		1648	505	4.	2		0108	755	0.
1		0010	6	0.	1		0830	256	82.	1		1650	506	4.	2		0110	756	0.
1		0012	7	0.	1		0832	257	80.	1		1652	507	4.	2		0112	757	0.
1		0014	8	0.	1		0834	258	78.	1		1654	508	4.	2		0114	758	0.
1		0016	9	0.	1		0836	259	76.	1		1656	509	4.	2		0116	759	0.
1		0018	10	0.	1		0838	260	74.	1		1658	510	4.	2		0118	760	0.
1		0020	11	0.	1		0840	261	73.	1		1700	511	4.	2		0120	761	0.
1		0022	12	0.	1		0842	262	71.	1		1702	512	4.	2		0122	762	0.
1		0024	13	0.	1		0844	263	69.	1		1704	513	4.	2		0124	763	0.
1		0026	14	0.	1		0846	264	67.	1		1706	514	4.	2		0126	764	0.
1		0028	15	0.	1		0848	265	66.	1		1708	515	4.	2		0128	765	0.
1		0030	16	0.	1		0850	266	64.	1		1710	516	4.	2		0130	766	0.
1		0032	17	0.	1		0852	267	63.	1		1712	517	4.	2		0132	767	0.
1		0034	18	0.	1		0854	268	62.	1		1714	518	4.	2		0134	768	0.
1		0036	19	0.	1		0856	269	61.	1		1716	519	4.	2		0136	769	0.
1		0038	20	0.	1		0858	270	61.	1		1718	520	4.	2		0138	770	0.
1		0040	21	0.	1		0900	271	60.	1		1720	521	4.	2		0140	771	0.
1		0042	22	0.	1		0902	272	60.	1		1722	522	4.	2		0142	772	0.
1		0044	23	0.	1		0904	273	59.	1		1724	523	4.	2		0144	773	0.
1		0046	24	0.	1		0906	274	59.	1		1726	524	3.	2		0146	774	0.
1		0048	25	0.	1		0908	275	58.	1		1728	525	3.	2		0148	775	0.
1		0050	26	0.	1		0910	276	58.	1		1730	526	3.	2		0150	776	0.
1		0052	27	0.	1		0912	277	57.	1		1732	527	3.	2		0152	777	0.
1		0054	28	0.	1		0914	278	56.	1		1734	528	3.	2		0154	778	0.
1		0056	29	0.	1		0916	279	55.	1		1736	529	3.	2		0156	779	0.
1		0058	30	0.	1		0918	280	54.	1		1738	530	3.	2		0158	780	0.
1		0100	31	0.	1		0920	281	53.	1		1740	531	3.	2		0200	781	0.
1		0102	32	0.	1		0922	282	52.	1		1742	532	3.	2		0202	782	0.
1		0104	33	0.	1		0924	283	51.	1		1744	533	3.	2		0204	783	0.
1		0106	34	0.	1		0926	284	50.	1		1746	534	3.	2		0206	784	0.
1		0108	35	0.	1		0928	285	49.	1		1748	535	3.	2		0208	785	0.
1		0110	36	0.	1		0930	286	48.	1		1750	536	3.	2		0210	786	0.
1		0112	37	0.	1		0932	287	47.	1		1752	537	3.	2		0212	787	0.
1		0114	38	0.	1		0934	288	46.	1		1754	538	3.	2		0214	788	0.
1		0116	39	0.	1		0936	289	45.	1		1756	539	3.	2		0216	789	0.
1		0118	40	0.	1		0938	290	44.	1		1758	540	3.	2		0218	790	0.
1		0120	41	0.	1		0940	291	44.	1		1800	541	3.	2		0220	791	0.
1		0122	42	0.	1		0942	292	43.	1		1802	542	3.	2		0222	792	0.
1		0124	43	0.	1		0944	293	42.	1		1804	543	3.	2		0224	793	0.
1		0126	44	0.	1		0946	294	41.	1		1806	544	3.	2		0226	794	0.
1		0128	45	0.	1		0948	295	41.	1		1808	545	3.	2		0228	795	0.
1		0130	46	0.	1		0950	296	40.	1		1810	546	3.	2		0230	796	0.
1		0132	47	0.	1		0952	297	39.	1		1812	547	3.	2		0232	797	0.
1		0134	48	0.	1		0954	298	39.	1		1814	548	3.	2		0234	798	0.
1		0136	49	0.	1		0956	299	38.	1		1816	549	3.	2		0236	799	0.
1		0138	50	0.	1		0958	300	37.	1		1818	550	3.	2		0238	800	0.
1		0140	51	0.	1		1000	301	37.	1		1820	551	3.	2		0240	801	0.
1		0142	52	0.	1		1002	302	36.	1		1822	552	3.	2		0242	802	0.
1		0144	53	0.	1		1004	303	35.	1		1824	553	3.	2		0244	803	0.
1		0146	54	0.	1		1006	304	35.	1		1826	554	3.	2		0246	804	0.
1		0148	55	0.	1		1008	305	34.	1		1828	555	3.	2		0248	805	0.
1		0150	56	0.	1		1010	306	34.	1		1830	556	3.	2		0250	806	0.
1		0152	57	0.	1		1012	307	33.	1		1832	557	3.	2		0252	807	0.
1		0154	58	0.	1		1014	308	33.	1		1834	558	3.	2		0254	808	0.
1		0156	59	0.	1		1016	309	32.	1		1836	559	3.	2		0256	809	0.
1		0158	60	0.	1		1018	310	32.	1		1838	560	3.	2		0258	810	0.
1		0200	61	0.	1		1020	311	31.	1		1840	561	3.	2		0300	811	0.
1		0202	62	0.	1		1022	312	31.	1		1842	562	2.	2		0302	812	0.
1		0204	63	0.	1		1024	313	31.	1		1844	563	2.	2		0304	813	0.
1		0206	64	0.	1		1026	314	30.	1		1846	564	2.	2		0306	814	0.
1		0208	65	0.	1		1028	315	30.	1		1848	565	2.	2		0308	815	0.
1		0210	66	0.	1		1030	316	29.	1		1850	566	2.	2		0310	816	0.
1		0212	67	0.	1		1032	317	29.	1		1852	567	2.	2		0312	817	0.
1		0214	68	0.	1		1034	318	29.	1		1854	568	2.	2		0314	818	0.
1		0216	69	0.	1		1036	319	28.	1		1856	569	2.	2		0316	819	0.
1		0218	70	0.	1		1038	320	28.	1		1858	570	2.	2		0318	820	0.
1		0220	71	0.	1		1040	321	27.	1		1900	571	2.	2		0320	821	0.
1		0222	72	0.	1		1042	322	27.	1		1902	572	2.	2		0322	822	0.
1		0224	73	0.	1		1044	323	27.	1		1904	573	2.	2		0324	823	0.
1		0226	74	0.	1		1046	324	26.	1		1906	574	2.	2		0326	824	0.
1		0228	75	0.	1		1048	325	26.	1		1908	575	2.	2		0328	825	0.
1		0230	76	0.	1		1050	326	25.	1		1910	576	2.	2		0330	826	0.
1		0232	77	1.	1		1052	327	25.	1		1912	577	2.	2		0332	827	0.
1		0234	78	1.	1		1054	328	25.	1		1914	578	2.	2		0334	828	0.
1		0236	79	1.	1		1056	329	24.	1		1916	579	2.	2		0336	829	0.

1	0238	80	1.	*	1	1058	330	24.	*	1	1918	580	2.	*	2	0338	830	0.
1	0240	81	1.	*	1	1100	331	24.	*	1	1920	581	2.	*	2	0340	831	0.
1	0242	82	1.	*	1	1102	332	23.	*	1	1922	582	2.	*	2	0342	832	0.
1	0244	83	1.	*	1	1104	333	23.	*	1	1924	583	2.	*	2	0344	833	0.
1	0246	84	1.	*	1	1106	334	23.	*	1	1926	584	2.	*	2	0346	834	0.
1	0248	85	1.	*	1	1108	335	22.	*	1	1928	585	2.	*	2	0348	835	0.
1	0250	86	1.	*	1	1110	336	22.	*	1	1930	586	2.	*	2	0350	836	0.
1	0252	87	1.	*	1	1112	337	22.	*	1	1932	587	2.	*	2	0352	837	0.
1	0254	88	1.	*	1	1114	338	21.	*	1	1934	588	2.	*	2	0354	838	0.
1	0256	89	1.	*	1	1116	339	21.	*	1	1936	589	2.	*	2	0356	839	0.
1	0258	90	1.	*	1	1118	340	21.	*	1	1938	590	2.	*	2	0358	840	0.
1	0300	91	1.	*	1	1120	341	21.	*	1	1940	591	2.	*	2	0400	841	0.
1	0302	92	1.	*	1	1122	342	20.	*	1	1942	592	2.	*	2	0402	842	0.
1	0304	93	1.	*	1	1124	343	20.	*	1	1944	593	2.	*	2	0404	843	0.
1	0306	94	1.	*	1	1126	344	20.	*	1	1946	594	2.	*	2	0406	844	0.
1	0308	95	1.	*	1	1128	345	20.	*	1	1948	595	2.	*	2	0408	845	0.
1	0310	96	1.	*	1	1130	346	19.	*	1	1950	596	2.	*	2	0410	846	0.
1	0312	97	1.	*	1	1132	347	19.	*	1	1952	597	2.	*	2	0412	847	0.
1	0314	98	1.	*	1	1134	348	19.	*	1	1954	598	2.	*	2	0414	848	0.
1	0316	99	1.	*	1	1136	349	19.	*	1	1956	599	2.	*	2	0416	849	0.
1	0318	100	1.	*	1	1138	350	19.	*	1	1958	600	2.	*	2	0418	850	0.
1	0320	101	1.	*	1	1140	351	19.	*	1	2000	601	2.	*	2	0420	851	0.
1	0322	102	2.	*	1	1142	352	18.	*	1	2002	602	2.	*	2	0422	852	0.
1	0324	103	2.	*	1	1144	353	18.	*	1	2004	603	2.	*	2	0424	853	0.
1	0326	104	2.	*	1	1146	354	18.	*	1	2006	604	2.	*	2	0426	854	0.
1	0328	105	2.	*	1	1148	355	18.	*	1	2008	605	2.	*	2	0428	855	0.
1	0330	106	2.	*	1	1150	356	18.	*	1	2010	606	2.	*	2	0430	856	0.
1	0332	107	2.	*	1	1152	357	18.	*	1	2012	607	2.	*	2	0432	857	0.
1	0334	108	2.	*	1	1154	358	17.	*	1	2014	608	2.	*	2	0434	858	0.
1	0336	109	2.	*	1	1156	359	17.	*	1	2016	609	2.	*	2	0436	859	0.
1	0338	110	2.	*	1	1158	360	17.	*	1	2018	610	2.	*	2	0438	860	0.
1	0340	111	2.	*	1	1200	361	17.	*	1	2020	611	2.	*	2	0440	861	0.
1	0342	112	2.	*	1	1202	362	17.	*	1	2022	612	2.	*	2	0442	862	0.
1	0344	113	2.	*	1	1204	363	17.	*	1	2024	613	2.	*	2	0444	863	0.
1	0346	114	2.	*	1	1206	364	16.	*	1	2026	614	2.	*	2	0446	864	0.
1	0348	115	2.	*	1	1208	365	16.	*	1	2028	615	2.	*	2	0448	865	0.
1	0350	116	3.	*	1	1210	366	16.	*	1	2030	616	2.	*	2	0450	866	0.
1	0352	117	3.	*	1	1212	367	16.	*	1	2032	617	2.	*	2	0452	867	0.
1	0354	118	3.	*	1	1214	368	16.	*	1	2034	618	2.	*	2	0454	868	0.
1	0356	119	3.	*	1	1216	369	16.	*	1	2036	619	2.	*	2	0456	869	0.
1	0358	120	3.	*	1	1218	370	15.	*	1	2038	620	1.	*	2	0458	870	0.
1	0400	121	3.	*	1	1220	371	15.	*	1	2040	621	1.	*	2	0500	871	0.
1	0402	122	3.	*	1	1222	372	15.	*	1	2042	622	1.	*	2	0502	872	0.
1	0404	123	3.	*	1	1224	373	15.	*	1	2044	623	1.	*	2	0504	873	0.
1	0406	124	4.	*	1	1226	374	15.	*	1	2046	624	1.	*	2	0506	874	0.
1	0408	125	4.	*	1	1228	375	14.	*	1	2048	625	1.	*	2	0508	875	0.
1	0410	126	4.	*	1	1230	376	14.	*	1	2050	626	1.	*	2	0510	876	0.
1	0412	127	4.	*	1	1232	377	14.	*	1	2052	627	1.	*	2	0512	877	0.
1	0414	128	5.	*	1	1234	378	14.	*	1	2054	628	1.	*	2	0514	878	0.
1	0416	129	5.	*	1	1236	379	14.	*	1	2056	629	1.	*	2	0516	879	0.
1	0418	130	6.	*	1	1238	380	14.	*	1	2058	630	1.	*	2	0518	880	0.
1	0420	131	6.	*	1	1240	381	14.	*	1	2100	631	1.	*	2	0520	881	0.
1	0422	132	7.	*	1	1242	382	13.	*	1	2102	632	1.	*	2	0522	882	0.
1	0424	133	8.	*	1	1244	383	13.	*	1	2104	633	1.	*	2	0524	883	0.
1	0426	134	9.	*	1	1246	384	13.	*	1	2106	634	1.	*	2	0526	884	0.
1	0428	135	10.	*	1	1248	385	13.	*	1	2108	635	1.	*	2	0528	885	0.
1	0430	136	11.	*	1	1250	386	13.	*	1	2110	636	1.	*	2	0530	886	0.
1	0432	137	13.	*	1	1252	387	13.	*	1	2112	637	1.	*	2	0532	887	0.
1	0434	138	15.	*	1	1254	388	12.	*	1	2114	638	1.	*	2	0534	888	0.
1	0436	139	17.	*	1	1256	389	12.	*	1	2116	639	1.	*	2	0536	889	0.
1	0438	140	19.	*	1	1258	390	12.	*	1	2118	640	1.	*	2	0538	890	0.
1	0440	141	22.	*	1	1300	391	12.	*	1	2120	641	1.	*	2	0540	891	0.
1	0442	142	27.	*	1	1302	392	12.	*	1	2122	642	1.	*	2	0542	892	0.
1	0444	143	35.	*	1	1304	393	12.	*	1	2124	643	1.	*	2	0544	893	0.
1	0446	144	50.	*	1	1306	394	12.	*	1	2126	644	1.	*	2	0546	894	0.
1	0448	145	82.	*	1	1308	395	12.	*	1	2128	645	1.	*	2	0548	895	0.
1	0450	146	115.	*	1	1310	396	11.	*	1	2130	646	1.	*	2	0550	896	0.
1	0452	147	138.	*	1	1312	397	11.	*	1	2132	647	1.	*	2	0552	897	0.
1	0454	148	155.	*	1	1314	398	11.	*	1	2134	648	1.	*	2	0554	898	0.
1	0456	149	169.	*	1	1316	399	11.	*	1	2136	649	1.	*	2	0556	899	0.
1	0458	150	182.	*	1	1318	400	11.	*	1	2138	650	1.	*	2	0558	900	0.
1	0500	151	197.	*	1	1320	401	11.	*	1	2140	651	1.	*	2	0600	901	0.
1	0502	152	217.	*	1	1322	402	11.	*	1	2142	652	1.	*	2	0602	902	0.
1	0504	153	238.	*	1	1324	403	11.	*	1	2144	653	1.	*	2	0604	903	0.
1	0506	154	264.	*	1	1326	404	11.	*	1	2146	654	1.	*	2	0606	904	0.
1	0508	155	299.	*	1	1328	405	10.	*	1	2148	655	1.	*	2	0608	905	0.
1	0510	156	344.	*	1	1330	406	10.	*	1	2150	656	1.	*	2	0610	906	0.
1	0512	157	400.	*	1	1332	407	10.	*	1	2152	657	1.	*	2	0612	907	0.
1	0514	158	453.	*	1	1334	408	10.	*	1	2154	658	1.	*	2	0614	908	0.
1	0516	159	487.	*	1	1336	409	10.	*	1	2156	659	1.	*	2	0616	909	0.
1	0518	160	510.	*	1	1338	410	10.	*	1	2158	660	1.	*	2	0618	910	0.
1	0520	161	529.	*	1	1340	411	10.	*	1	2200	661	1.	*	2	0620	911	0.
1	0522	162	547.	*	1	1342	412	10.	*	1	2202	662	1.	*	2	0622	912	0.
1	0524	163	563.	*	1	1344	413	10.	*	1	2204	663	1.	*	2	0624	913	0.
1	0526	164	574.	*	1	1346	414	9.	*	1	2206	664	1.	*	2	0626	914	0.
1	0528	165	580.	*	1	1348	415	9.	*	1	2208	665	1.	*	2	0628	915	0.
1	0530	166	581.	*	1	1350	416	9.	*	1	2210	666	1.	*	2	0630	916	0.

1	0532	167	577.	*	1	1352	417	9.	*	1	2212	667	1.	*	2	0632	917	0.
1	0534	168	569.	*	1	1354	418	9.	*	1	2214	668	1.	*	2	0634	918	0.
1	0536	169	559.	*	1	1356	419	9.	*	1	2216	669	1.	*	2	0636	919	0.
1	0538	170	548.	*	1	1358	420	9.	*	1	2218	670	1.	*	2	0638	920	0.
1	0540	171	537.	*	1	1400	421	9.	*	1	2220	671	1.	*	2	0640	921	0.
1	0542	172	525.	*	1	1402	422	9.	*	1	2222	672	1.	*	2	0642	922	0.
1	0544	173	513.	*	1	1404	423	9.	*	1	2224	673	1.	*	2	0644	923	0.
1	0546	174	502.	*	1	1406	424	9.	*	1	2226	674	1.	*	2	0646	924	0.
1	0548	175	491.	*	1	1408	425	9.	*	1	2228	675	1.	*	2	0648	925	0.
1	0550	176	481.	*	1	1410	426	8.	*	1	2230	676	1.	*	2	0650	926	0.
1	0552	177	472.	*	1	1412	427	8.	*	1	2232	677	1.	*	2	0652	927	0.
1	0554	178	462.	*	1	1414	428	8.	*	1	2234	678	1.	*	2	0654	928	0.
1	0556	179	454.	*	1	1416	429	8.	*	1	2236	679	1.	*	2	0656	929	0.
1	0558	180	446.	*	1	1418	430	8.	*	1	2238	680	1.	*	2	0658	930	0.
1	0600	181	439.	*	1	1420	431	8.	*	1	2240	681	1.	*	2	0700	931	0.
1	0602	182	432.	*	1	1422	432	8.	*	1	2242	682	1.	*	2	0702	932	0.
1	0604	183	426.	*	1	1424	433	8.	*	1	2244	683	1.	*	2	0704	933	0.
1	0606	184	421.	*	1	1426	434	8.	*	1	2246	684	1.	*	2	0706	934	0.
1	0608	185	415.	*	1	1428	435	8.	*	1	2248	685	1.	*	2	0708	935	0.
1	0610	186	409.	*	1	1430	436	8.	*	1	2250	686	1.	*	2	0710	936	0.
1	0612	187	402.	*	1	1432	437	8.	*	1	2252	687	1.	*	2	0712	937	0.
1	0614	188	396.	*	1	1434	438	8.	*	1	2254	688	1.	*	2	0714	938	0.
1	0616	189	390.	*	1	1436	439	7.	*	1	2256	689	1.	*	2	0716	939	0.
1	0618	190	385.	*	1	1438	440	7.	*	1	2258	690	1.	*	2	0718	940	0.
1	0620	191	380.	*	1	1440	441	7.	*	1	2300	691	1.	*	2	0720	941	0.
1	0622	192	374.	*	1	1442	442	7.	*	1	2302	692	1.	*	2	0722	942	0.
1	0624	193	367.	*	1	1444	443	7.	*	1	2304	693	1.	*	2	0724	943	0.
1	0626	194	360.	*	1	1446	444	7.	*	1	2306	694	1.	*	2	0726	944	0.
1	0628	195	353.	*	1	1448	445	7.	*	1	2308	695	1.	*	2	0728	945	0.
1	0630	196	346.	*	1	1450	446	7.	*	1	2310	696	1.	*	2	0730	946	0.
1	0632	197	339.	*	1	1452	447	7.	*	1	2312	697	1.	*	2	0732	947	0.
1	0634	198	332.	*	1	1454	448	7.	*	1	2314	698	1.	*	2	0734	948	0.
1	0636	199	325.	*	1	1456	449	7.	*	1	2316	699	1.	*	2	0736	949	0.
1	0638	200	318.	*	1	1458	450	7.	*	1	2318	700	1.	*	2	0738	950	0.
1	0640	201	311.	*	1	1500	451	7.	*	1	2320	701	1.	*	2	0740	951	0.
1	0642	202	304.	*	1	1502	452	7.	*	1	2322	702	1.	*	2	0742	952	0.
1	0644	203	297.	*	1	1504	453	7.	*	1	2324	703	1.	*	2	0744	953	0.
1	0646	204	290.	*	1	1506	454	7.	*	1	2326	704	1.	*	2	0746	954	0.
1	0648	205	283.	*	1	1508	455	6.	*	1	2328	705	1.	*	2	0748	955	0.
1	0650	206	276.	*	1	1510	456	6.	*	1	2330	706	1.	*	2	0750	956	0.
1	0652	207	269.	*	1	1512	457	6.	*	1	2332	707	1.	*	2	0752	957	0.
1	0654	208	263.	*	1	1514	458	6.	*	1	2334	708	1.	*	2	0754	958	0.
1	0656	209	258.	*	1	1516	459	6.	*	1	2336	709	1.	*	2	0756	959	0.
1	0658	210	253.	*	1	1518	460	6.	*	1	2338	710	1.	*	2	0758	960	0.
1	0700	211	248.	*	1	1520	461	6.	*	1	2340	711	1.	*	2	0800	961	0.
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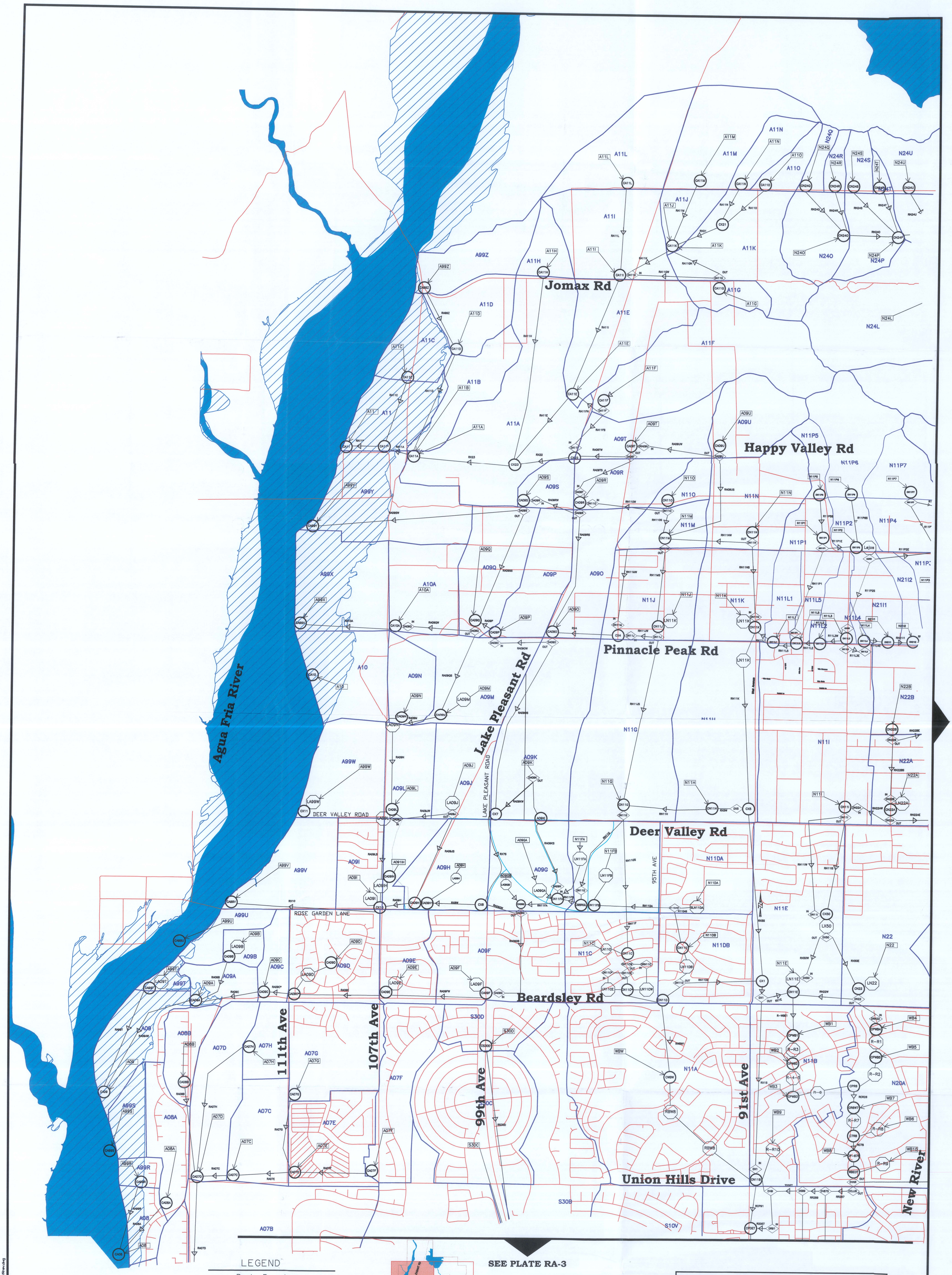
1	0708	215	232.	*	1	1528	465	6.	*	1	2348	715	1.	*	2	0808	965	0.
1	0710	216	227.	*	1	1530	466	6.	*	1	2350	716	1.	*	2	0810	966	0.
1	0712	217	223.	*	1	1532	467	6.	*	1	2352	717	1.	*	2	0812	967	0.
1	0714	218	219.	*	1	1534	468	6.	*	1	2354	718	1.	*	2	0814	968	0.
1	0716	219	214.	*	1	1536	469	6.	*	1	2356	719	1.	*	2	0816	969	0.
1	0718	220	209.	*	1	1538	470	6.	*	1	2358	720	1.	*	2	0818	970	0.
1	0720	221	203.	*	1	1540	471	6.	*	2	0000	721	1.	*	2	0820	971	0.
1	0722	222	199.	*	1	1542	472	6.	*	2	0002	722	1.	*	2	0822	972	0.
1	0724	223	194.	*	1	1544	473	5.	*	2	0004	723	1.	*	2	0824	973	0.
1	0726	224	191.	*	1	1546	474	5.	*	2	0006	724	1.	*	2	0826	974	0.
1	0728	225	188.	*	1	1548	475	5.	*	2	0008	725	1.	*	2	0828	975	0.
1	0730	226	184.	*	1	1550	476	5.	*	2	0010	726	1.	*	2	0830	976	0.
1	0732	227	179.	*	1	1552	477	5.	*	2	0012	727	1.	*	2	0832	977	0.
1	0734	228	174.	*	1	1554	478	5.	*	2	0014	728	1.	*	2	0834	978	0.
1	0736	229	170.	*	1	1556	479	5.	*	2	0016	729	1.	*	2	0836	979	0.
1	0738	230	165.	*	1	1558	480	5.	*	2	0018	730	1.	*	2	0838	980	0.
1	0740	231	160.	*	1	1600	481	5.	*	2	0020	731	1.	*	2	0840	981	0.
1	0742	232	155.	*	1	1602	482	5.	*	2	0022	732	1.	*	2	0842	982	0.
1	0744	233	150.	*	1	1604	483	5.	*	2	0024	733	1.	*	2	0844	983	0.
1	0746	234	146.	*	1	1606	484	5.	*	2	0026	734	1.	*	2	0846	984	0.
1	0748	235	142.	*	1	1608	485	5.	*	2	0028	735	1.	*	2	0848	985	0.
1	0750	236	138.	*	1	1610	486	5.	*	2	0030	736	1.	*	2	0850	986	0.
1	0752	237	134.	*	1	1612	487	5.	*	2	0032	737	1.	*	2	0852	987	0.
1	0754	238	130.	*	1	1614	488	5.	*	2	0034	738	1.	*	2	0854	988	0.
1	0756	239	126.	*	1	1616	489	5.	*	2	0036	739	1.	*	2	0856	989	0.
1	0758	240	123.	*	1	1618	490	5.	*	2	0038	740	1.	*	2	0858	990	0.
1	0800	241	120.	*	1	1620	491	5.	*	2	0040	741	1.	*	2	0900	991	0.
1	0802	242	117.	*	1	1622	492	5.	*	2	0042	742	1.	*	2	0902	992	0.
1	0804	243	114.	*	1	1624	493	5.	*	2	0044	743	1.	*	2	0904	993	0.
1	0806	244	112.	*	1	1626	494	5.	*	2	0046	744	1.	*	2	0906	994	0.
1	0808	245	109.	*	1	1628	495	5.	*	2	0048	745	1.	*	2	0908	995	0.
1	0810	246	106.	*	1	1630	496	4.	*	2	0050	746	1.	*	2	0910	996	0.
1	0812	247	104.	*	1	1632	497	4.	*	2	0052	747	1.	*	2	0912	997	0.
1	0814	248	101.	*	1	1634	498	4.	*	2	0054	748	1.	*	2	0914	998	0.
1	0816	249	99.	*	1	1636	499	4.	*	2	0056	749	0.	*	2	0916	999	0.
1	0818	250	96.	*	1	1638	500	4.	*	2	0058	750	0.	*	2	0918	1000	0.
				*					*					*				

****

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	33.30-HR
+	(CFS)	(HR)					
			(CFS)				
+	581.	5.50		197.	53.	38.	38.
			(INCHES)	.582	.627	.628	.628
			(AC-FT)	98.	105.	106.	106.

CUMULATIVE AREA = 3.15 SQ MI



ORIGINAL PLATE RA-1
BY ENTELLUS FOR
GLENDALE/PEORIA ADMP UPDATE
FCDMC PROJECT NO 99-44

Wood, Patel & Associates, Inc.
2051 West Northern, Suite 100
Phoenix, Arizona 85021 (602) 335-8500

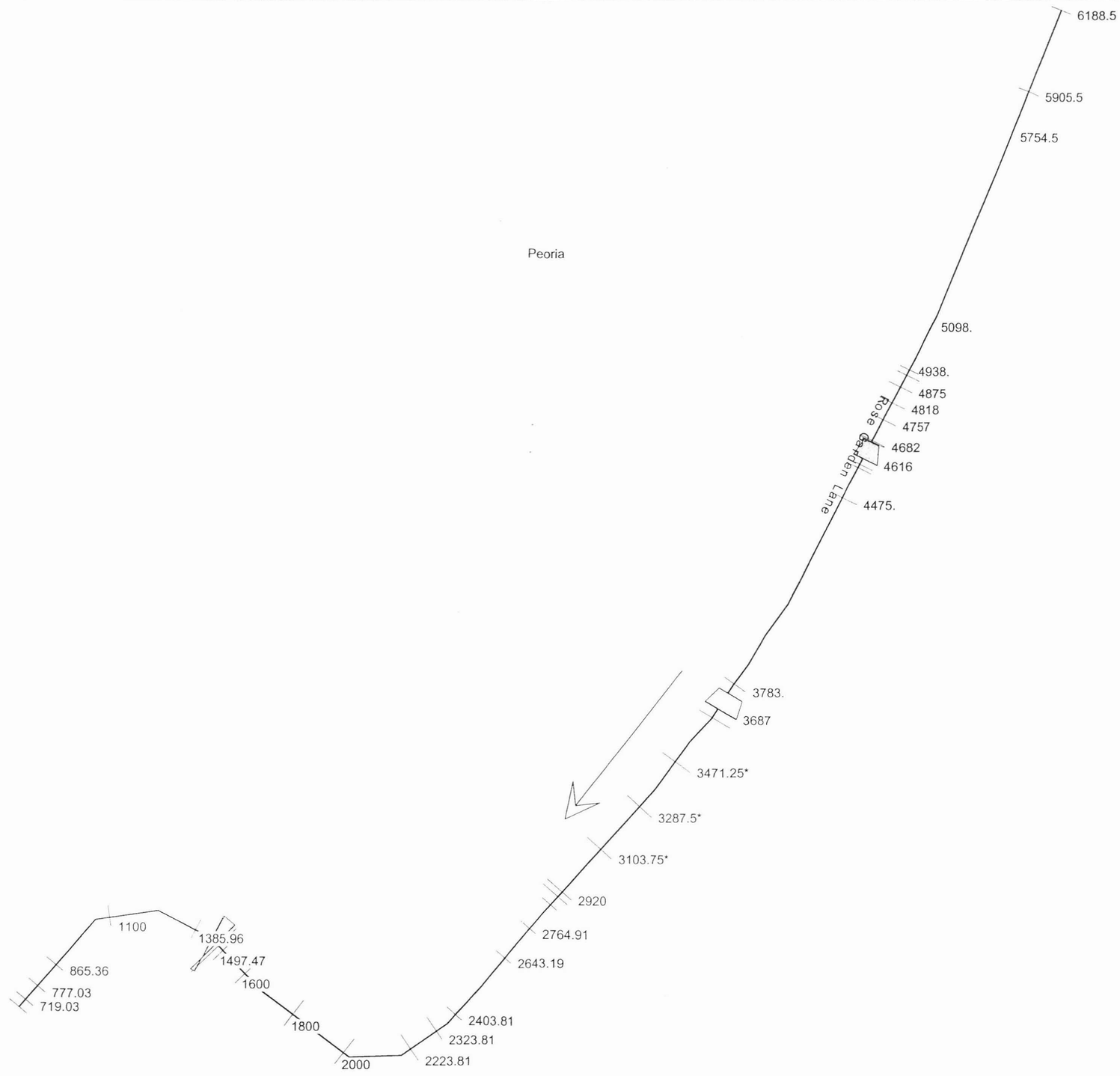
CONCEPT REFINEMENT STUDY
ROSE GARDEN LANE
DRAINAGE IMPROVEMENTS

PLATE 9

HEC-1 SCHEMATIC FOR
PREFERRED ALTERNATIVE

APPENDIX C

Hydraulic Analyses and Design Calculations


6188.5
5905.5
5754.5
Peoria
5098.
4938.
4875
4818
4757
4682
4616
4475.
Rose Garden Lane
3783.
3687
3471.25*
3287.5*
3103.75*
2920
2764.91
2643.19
2403.81
2323.81
2223.81
2000
1800
1600
1497.47
1385.96
1100
865.36
777.03
719.03

GIS data

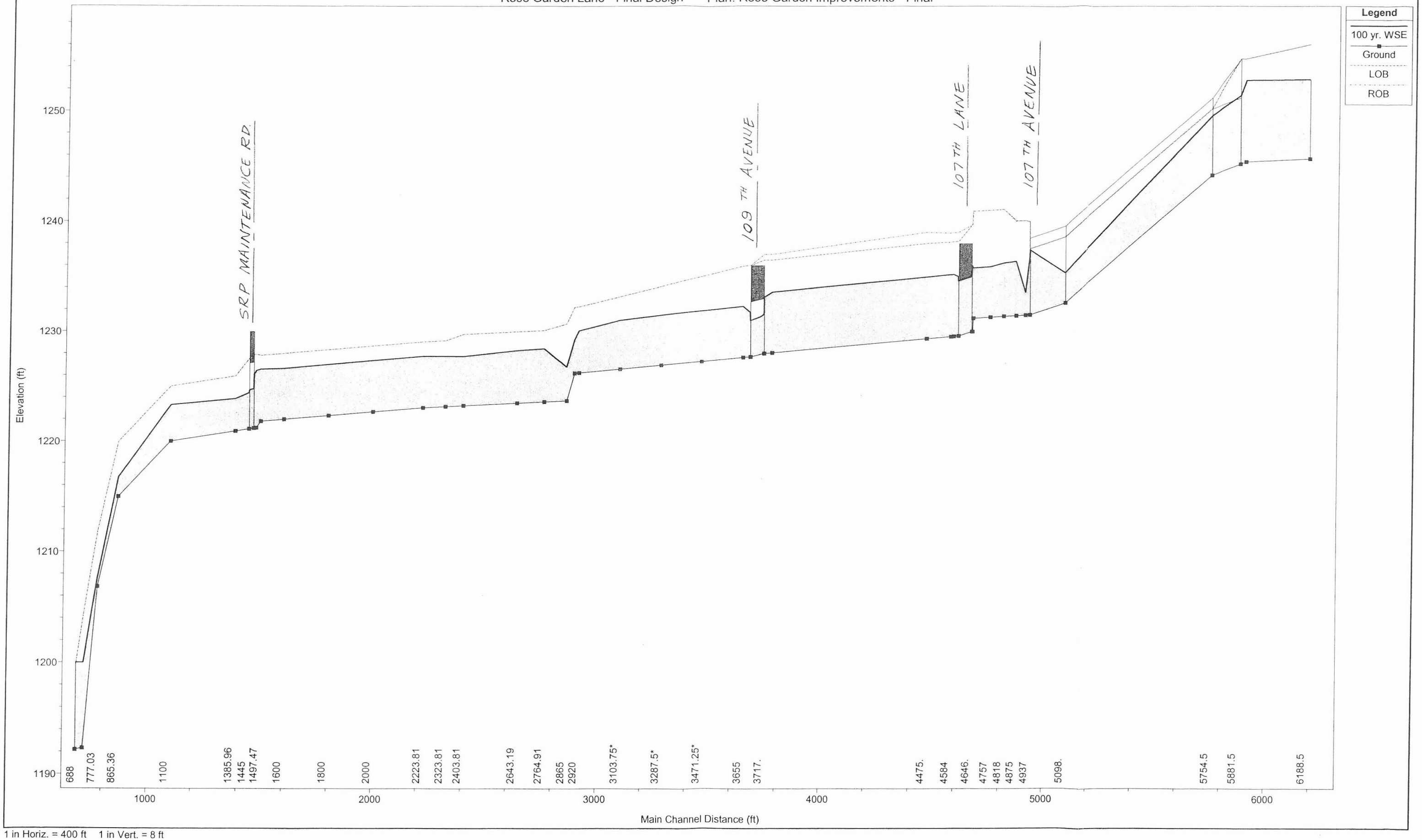
HEC-RAS Plan: RGL_Final River: Rose Garden Lane Reach: Peoria Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Peoria	688	PF 1	1193.00	1192.18	1200.00	1194.71	1200.13	0.000079	2.93	410.15	66.09	0.18
Peoria	719.03	PF 1	1193.00	1192.33	1200.00	1194.86	1200.14	0.000085	2.99	399.26	52.13	0.19
Peoria	777.03	PF 1	1193.00	1206.83	1207.68	1209.36	1218.91	0.094975	26.88	44.38	52.03	5.13
Peoria	865.36	PF 1	1193.00	1214.98	1216.76	1218.35	1222.98	0.022360	20.02	59.60	37.11	2.78
Peoria	1100	PF 1	1193.00	1220.00	1223.31	1223.37	1224.81	0.002620	9.84	121.19	43.24	1.04
Peoria	1385.96	PF 1	1193.00	1220.94	1223.88	1224.31	1225.87	0.003952	11.30	105.54	41.76	1.25
Peoria	1445	PF 1	1193.00	1221.14	1224.43	1224.43	1226.09	0.002792	10.34	115.41	35.10	1.00
Peoria	1446		Culvert									
Peoria	1467	PF 1	1193.00	1221.21	1226.11	1224.50	1226.86	0.000820	6.95	171.71	35.15	0.55
Peoria	1477	PF 1	1193.00	1221.24	1226.46		1226.89	0.000424	5.31	224.64	43.16	0.41
Peoria	1497.47	PF 1	1193.00	1221.83	1226.58		1226.91	0.000423	4.66	256.21	72.97	0.44
Peoria	1600	PF 1	1193.00	1222.00	1226.64		1227.00	0.001842	4.80	248.55	72.12	0.46
Peoria	1800	PF 1	1193.00	1222.34	1227.01		1227.36	0.001797	4.76	250.78	72.37	0.45
Peoria	2000	PF 1	1193.00	1222.68	1227.37		1227.72	0.001766	4.73	252.30	72.54	0.45
Peoria	2223.81	PF 1	1193.00	1223.06	1227.77		1228.11	0.001743	4.71	253.49	72.67	0.44
Peoria	2323.81	PF 1	1193.00	1223.16	1227.77		1228.58	0.007958	7.23	164.90	49.63	0.70
Peoria	2403.81	PF 1	1193.00	1223.24	1227.75		1228.93	0.001558	8.73	136.59	38.63	0.82
Peoria	2643.19	PF 1	1193.00	1223.48	1228.27		1229.28	0.001249	8.08	147.65	39.68	0.74
Peoria	2764.91	PF 1	1193.00	1223.60	1228.45	1227.59	1229.43	0.001195	7.95	149.97	39.89	0.72
Peoria	2865	PF 1	1193.00	1223.70	1226.79	1227.73	1229.89	0.006114	14.13	84.44	32.60	1.55
Peoria	2900	PF 1	1193.00	1226.22	1229.27	1229.27	1230.43	0.018195	8.63	138.24	60.54	1.01
Peoria	2920	PF 1	1193.00	1226.26	1230.08	1229.31	1230.71	0.007743	6.37	187.42	68.18	0.68
Peoria	3103.75*	PF 1	1193.00	1226.60	1231.05		1231.46	0.002399	5.14	232.15	74.40	0.51
Peoria	3287.5*	PF 1	1193.00	1226.95	1231.50		1231.88	0.002197	4.98	239.61	75.40	0.49
Peoria	3471.25*	PF 1	1193.00	1227.30	1231.91		1232.28	0.002088	4.89	244.11	76.00	0.48
Peoria	3655	PF 1	1193.00	1227.64	1232.29		1232.65	0.002006	4.82	247.65	76.43	0.47
Peoria	3687	PF 1	1193.00	1227.70	1231.74	1231.22	1233.06	0.009561	9.22	129.40	72.34	0.81
Peoria	3717.		Culvert									
Peoria	3748	PF 1	1193.00	1228.00	1233.12	1231.48	1233.94	0.000612	7.28	163.83	62.72	0.57
Peoria	3783.	PF 1	1193.00	1228.06	1233.59		1234.02	0.001980	5.25	227.15	60.14	0.48
Peoria	4475.	PF 1	1193.00	1229.35	1234.95		1235.37	0.001901	5.18	230.14	60.23	0.47
Peoria	4584	PF 1	1193.00	1229.54	1235.17		1235.57	0.001807	5.06	235.88	61.78	0.46
Peoria	4596	PF 1	1193.00	1229.58	1235.19		1235.59	0.001834	5.08	234.64	61.64	0.46
Peoria	4616	PF 1	1193.00	1229.60	1235.01	1233.10	1235.74	0.003634	6.90	172.97	64.43	0.52
Peoria	4646.		Culvert									
Peoria	4677.	PF 1	1193.00	1230.00	1235.49	1233.50	1236.21	0.000484	6.79	175.77	42.99	0.51
Peoria	4679	PF 1	1193.00	1230.02	1235.98		1236.25	0.000261	4.18	285.56	65.78	0.35
Peoria	4682	PF 1	1193.00	1231.22	1235.79		1236.34	0.000716	5.98	199.50	57.39	0.57
Peoria	4757	PF 1	1193.00	1231.31	1235.90		1236.45	0.004494	5.93	201.07	57.56	0.56
Peoria	4818	PF 1	1193.00	1231.39	1236.23		1236.71	0.003698	5.54	215.41	59.03	0.51
Peoria	4875	PF 1	1193.00	1231.44	1236.40	1235.29	1237.01	0.005971	6.30	189.33	59.74	0.58
Peoria	4918	PF 1	1193.00	1231.51	1233.59	1235.04	1238.64	0.114103	18.04	66.14	41.50	2.21

HEC-RAS Plan: RGL_Final River: Rose Garden Lane Reach: Peoria Profile: PF 1 (Continued)

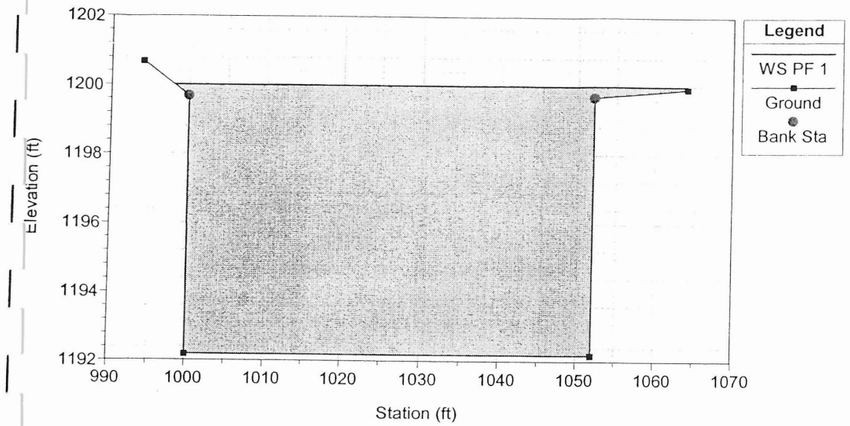
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Peoria	4937	PF 1	1193.00	1231.53	1236.89	1236.89	1239.55	0.016775	13.10	91.09	51.43	1.00
Peoria	4938.	PF 1	1123.00	1231.53	1237.45	1236.88	1239.63	0.040329	11.85	94.78	16.04	0.86
Peoria	5098.	PF 1	1123.00	1232.65	1235.37	1238.00	1245.68	0.026601	25.76	43.60	16.02	2.75
Peoria	5754.5	PF 1	1123.00	1244.20	1249.56	1249.56	1252.22	0.004335	13.08	85.86	16.04	1.00
Peoria	5881.5	PF 1	1123.00	1245.22	1251.38	1249.92	1252.81	0.003195	9.58	117.22		0.68
Peoria	5905.5	PF 1	1123.00	1245.41	1252.76		1252.95	0.000170	3.42	328.56	74.36	0.29
Peoria	6188.5	PF 1	1123.00	1245.69	1252.84	1249.63	1253.04	0.000771	3.59	312.99	72.56	0.30

Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final



1 in Horiz. = 400 ft 1 in Vert. = 8 ft

Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 688



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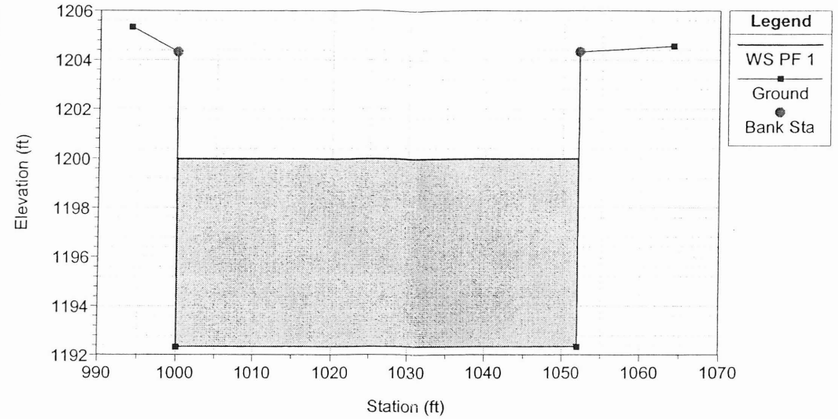

Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
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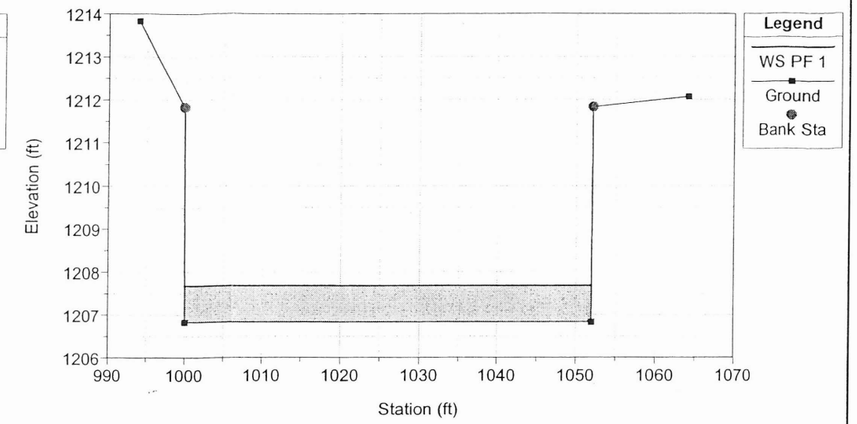

Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
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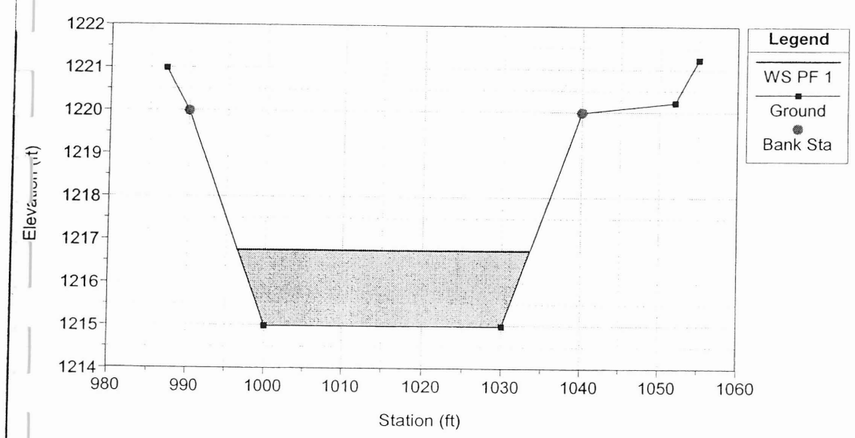

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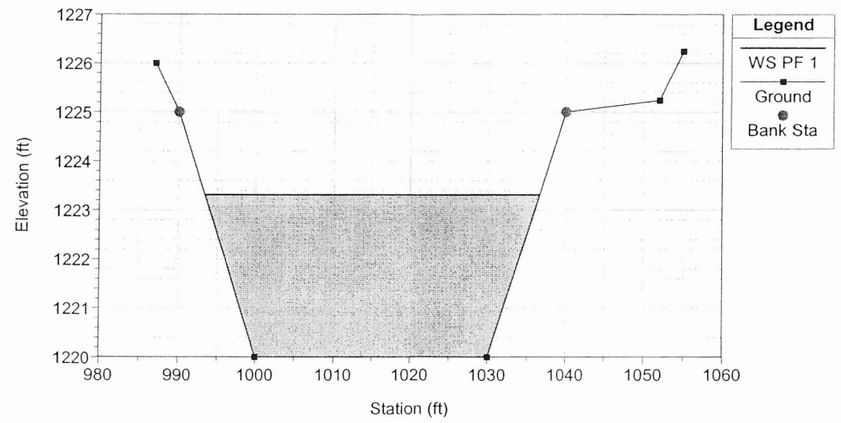

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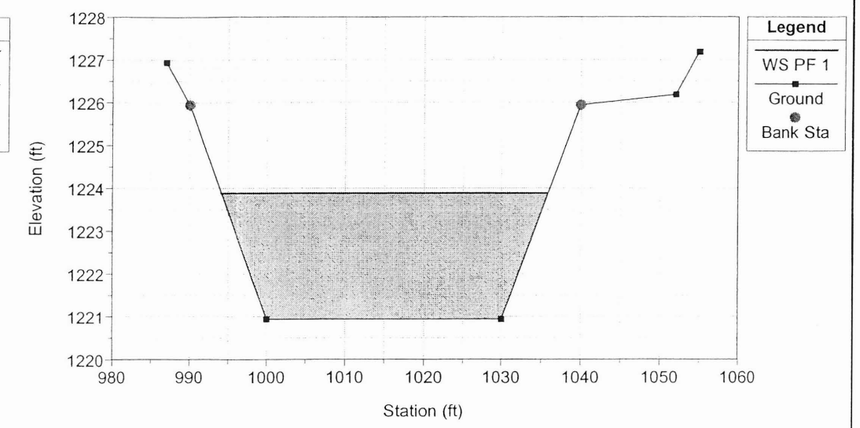

Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
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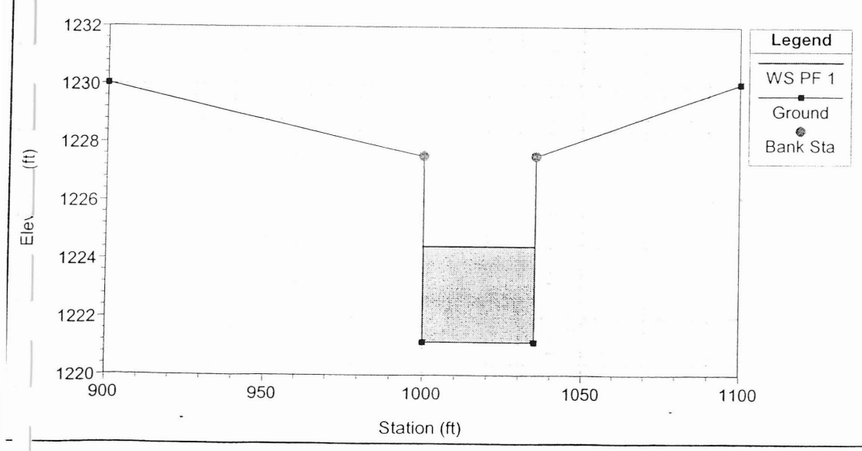

Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
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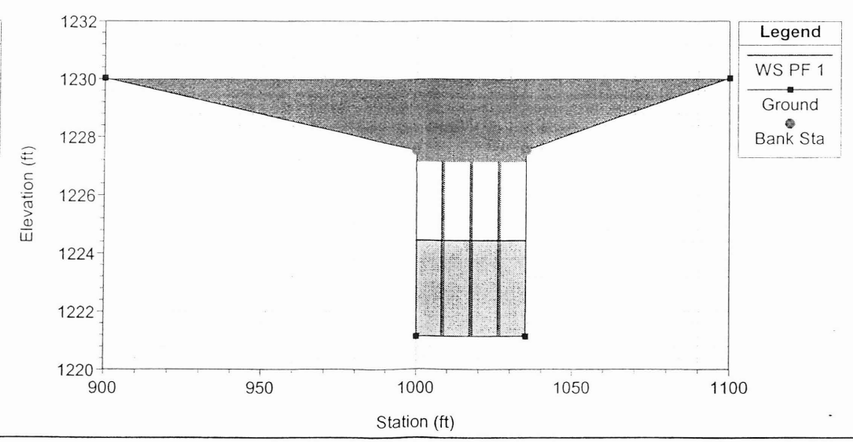

Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
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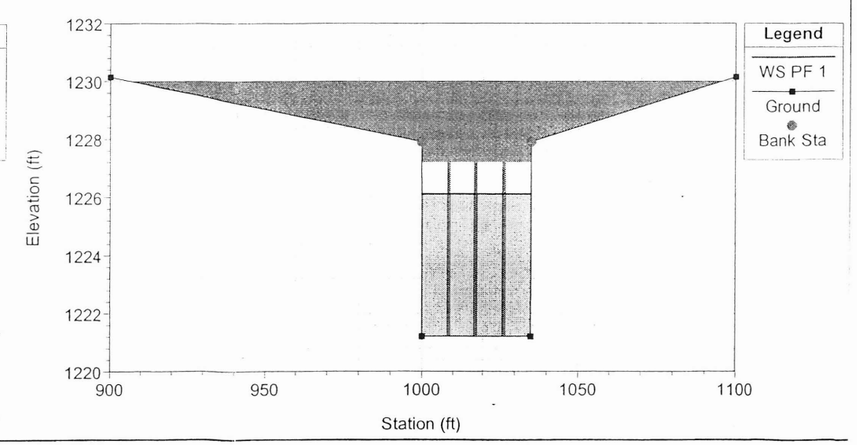

Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
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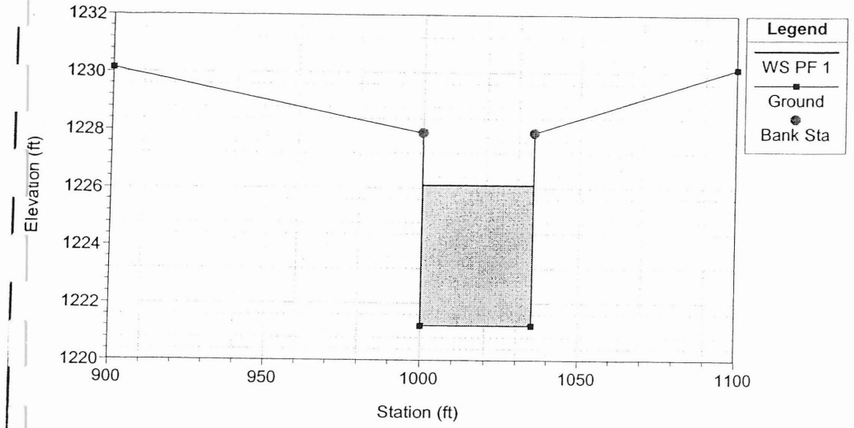

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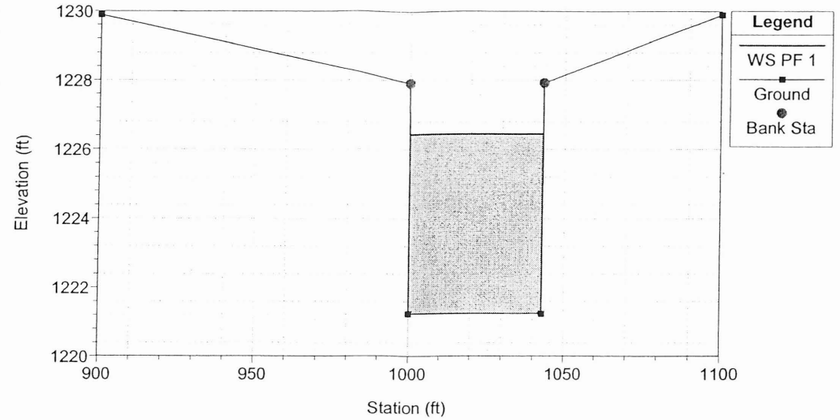

Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
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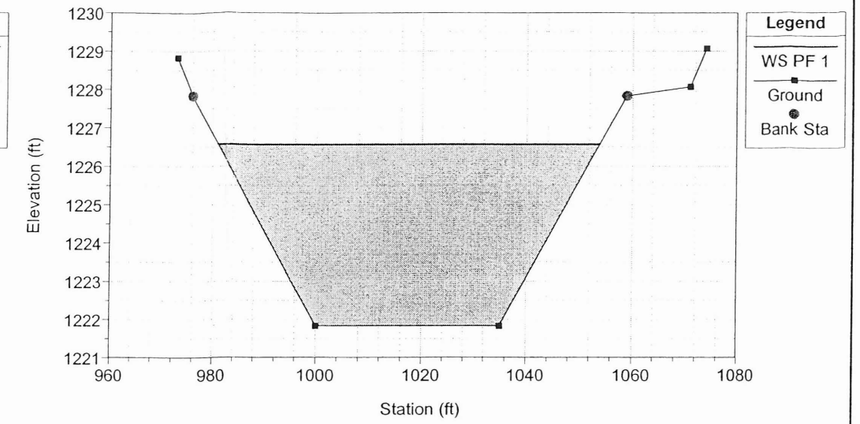
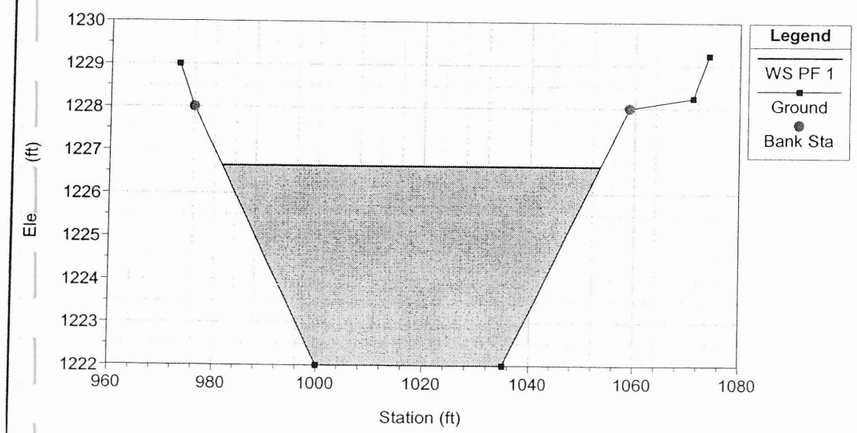
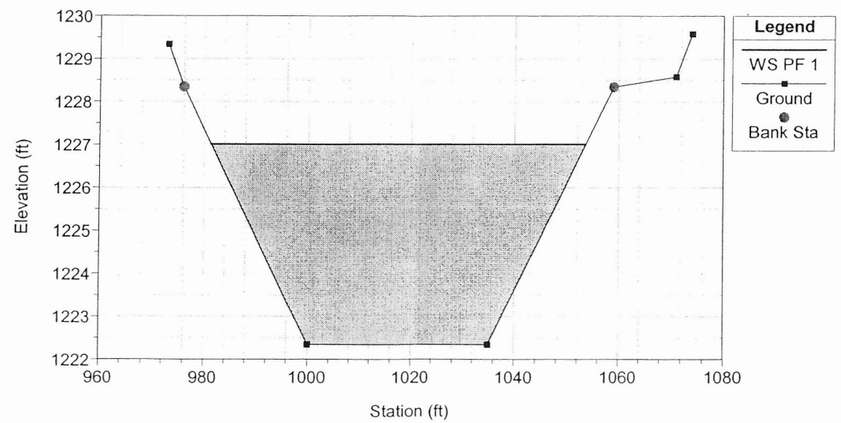


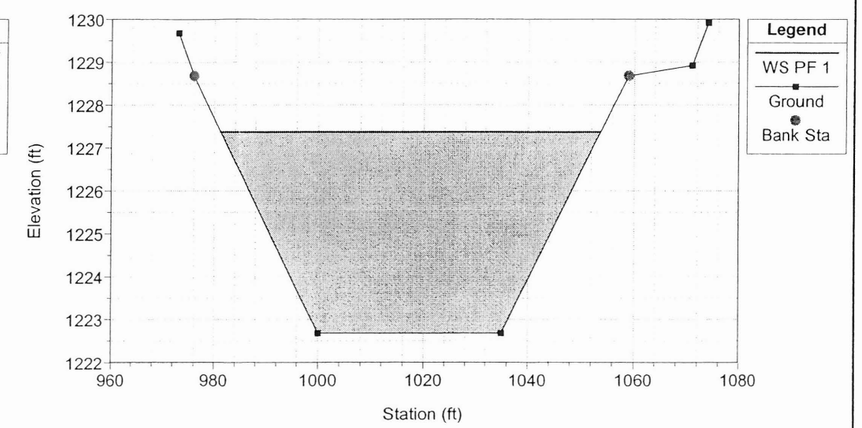
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 1600



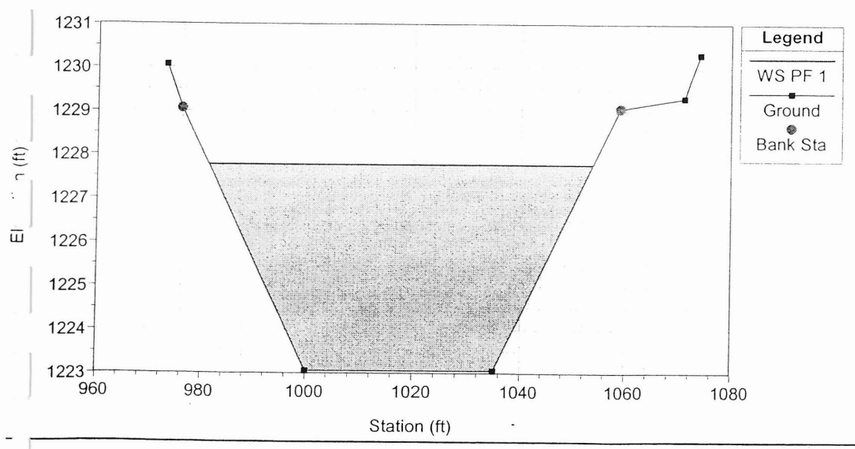
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 1800



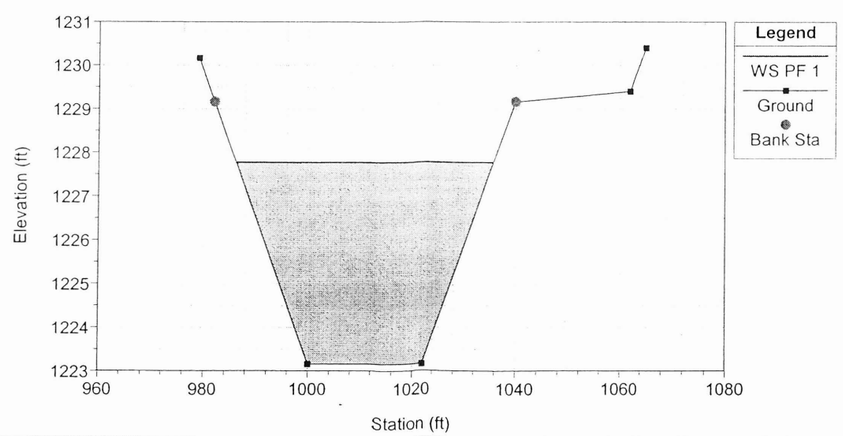
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 2000



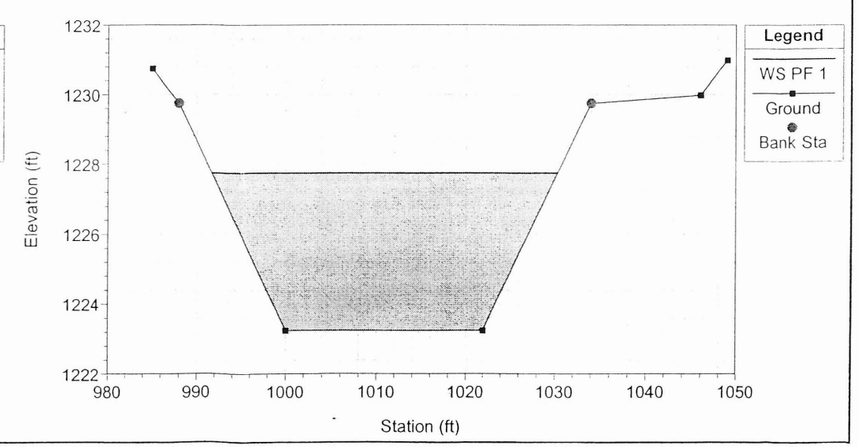
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 2223.81



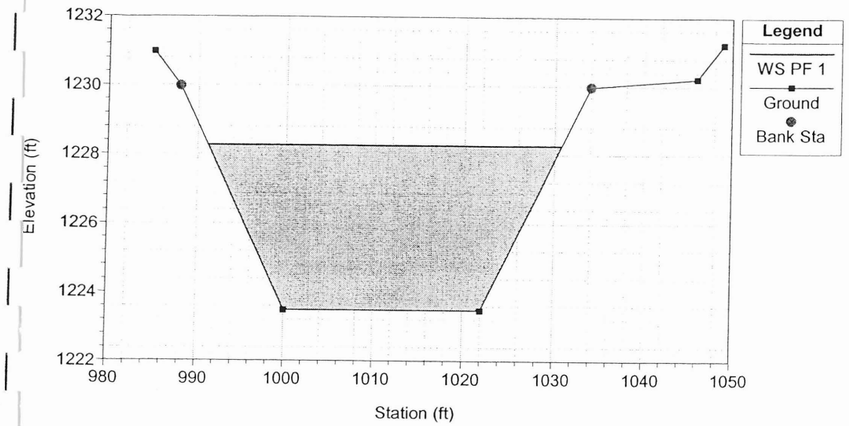
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 2323.81



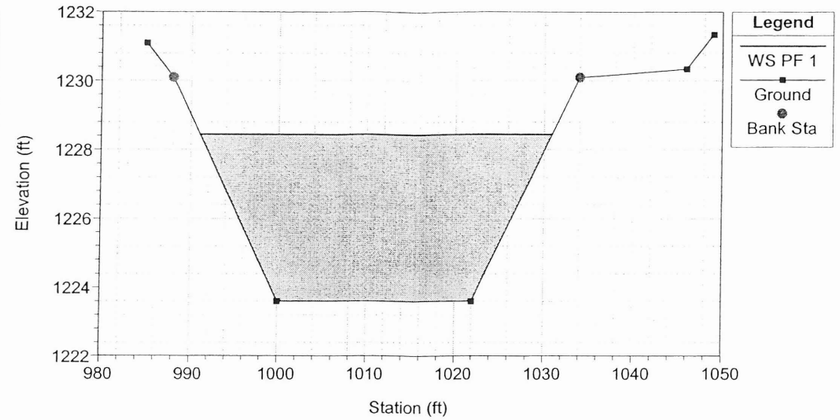
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 2403.81



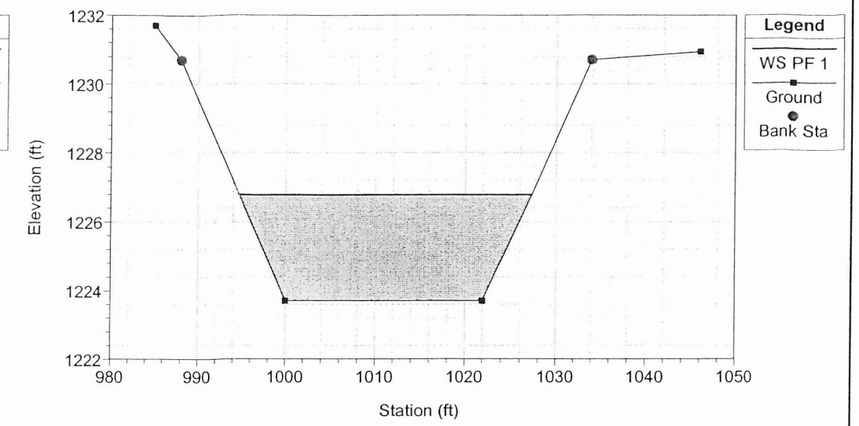
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 2643.19



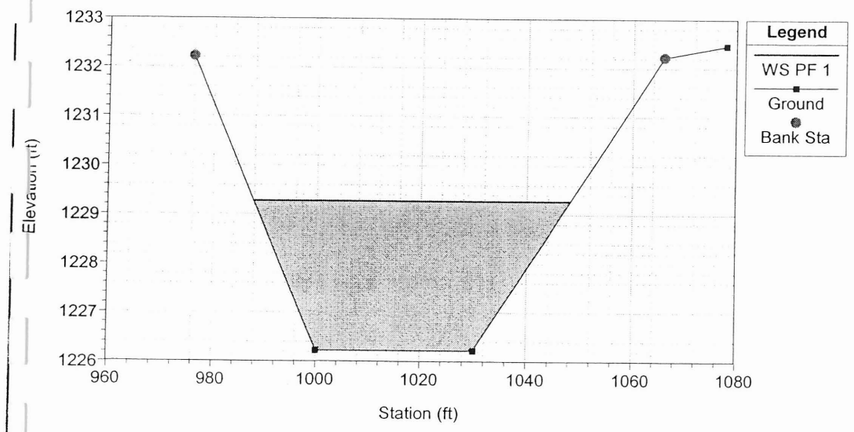
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 2764.91



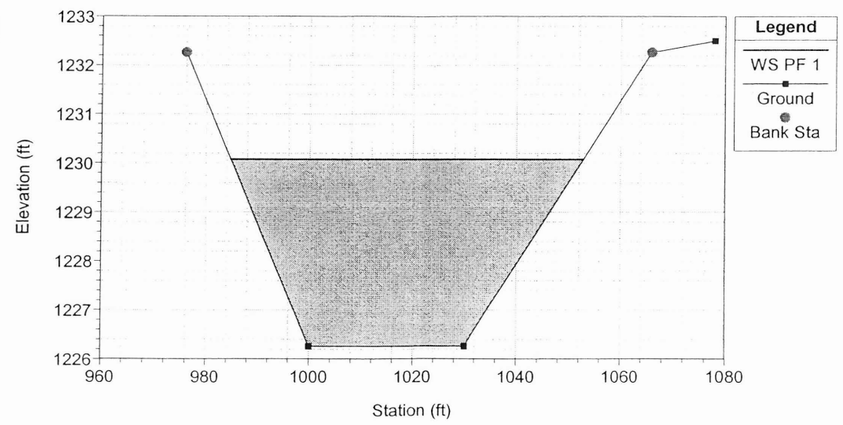
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 2865



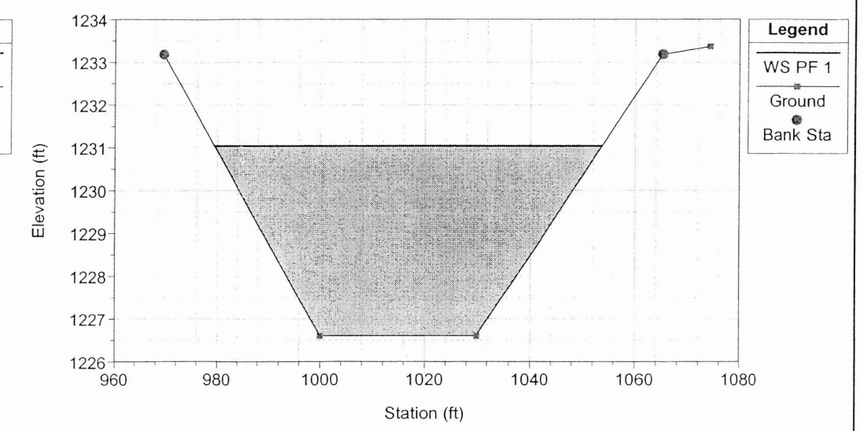
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 2900



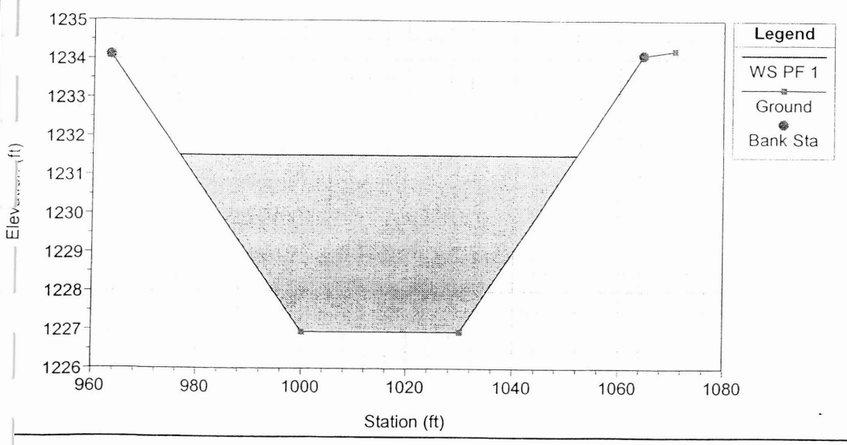
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 2920



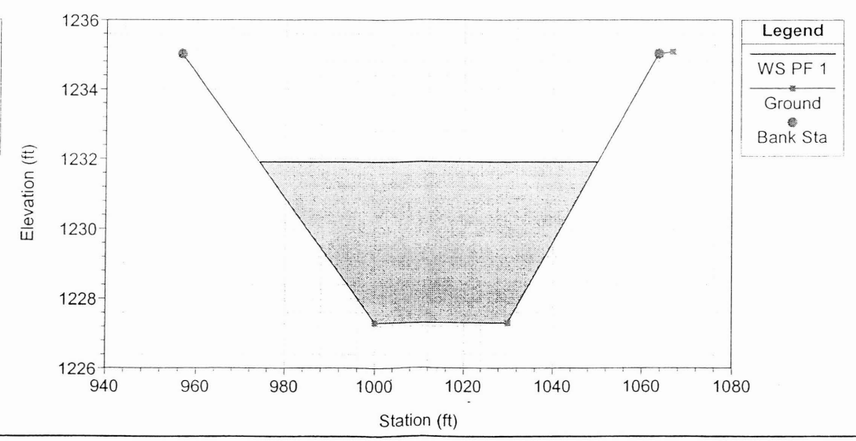
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 3103.75*



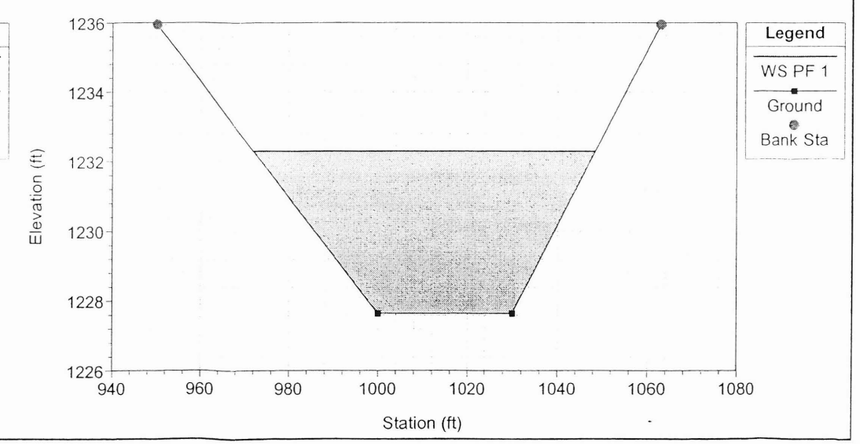
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 3287.5*



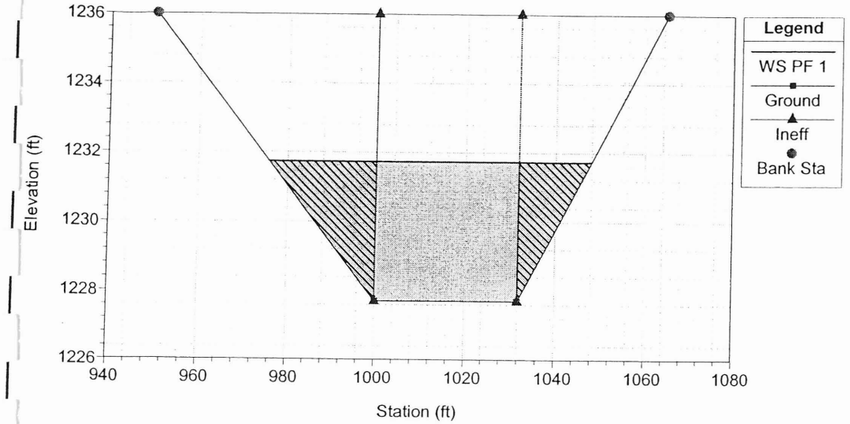
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 3471.25*



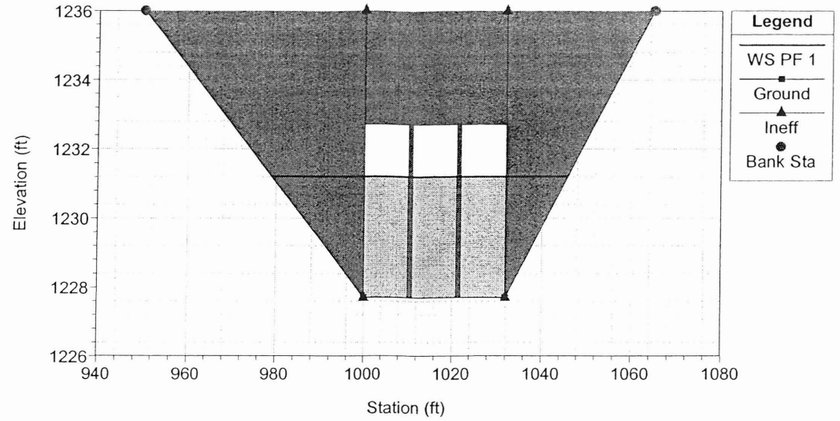
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 3655



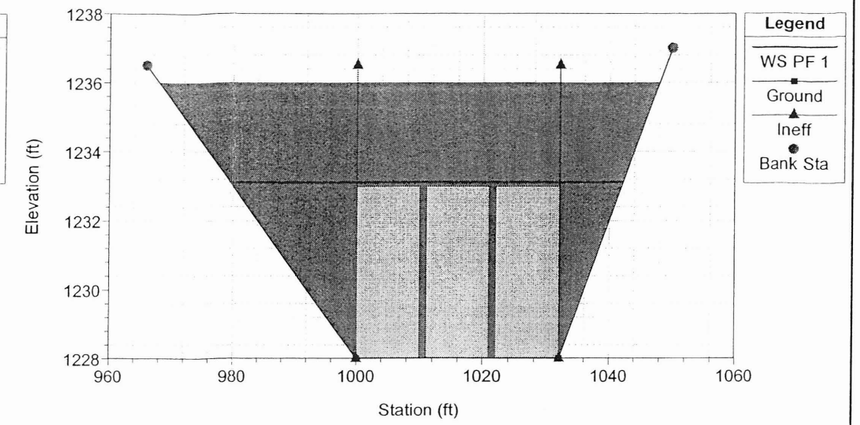
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 3687



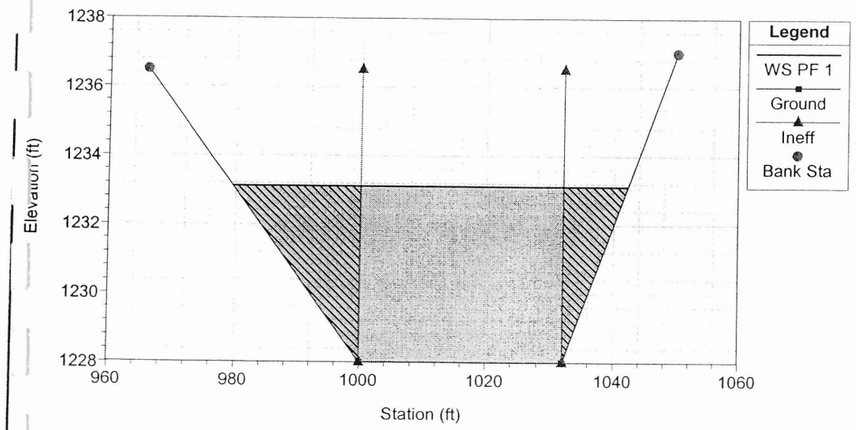
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 3717. Culv



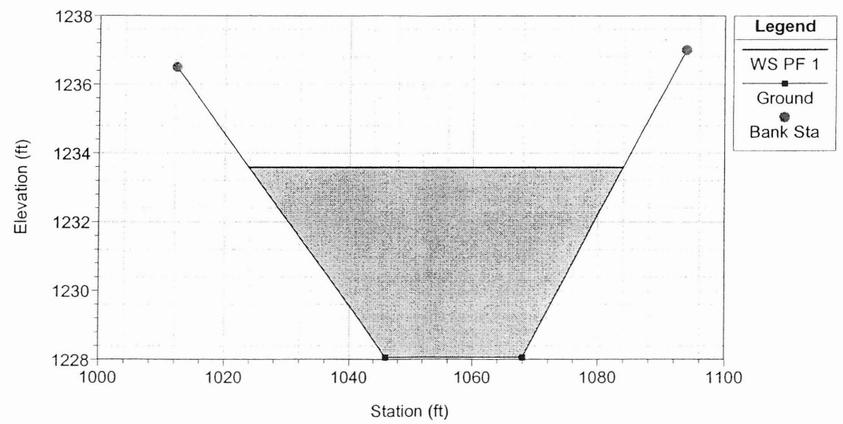
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 3717. Culv



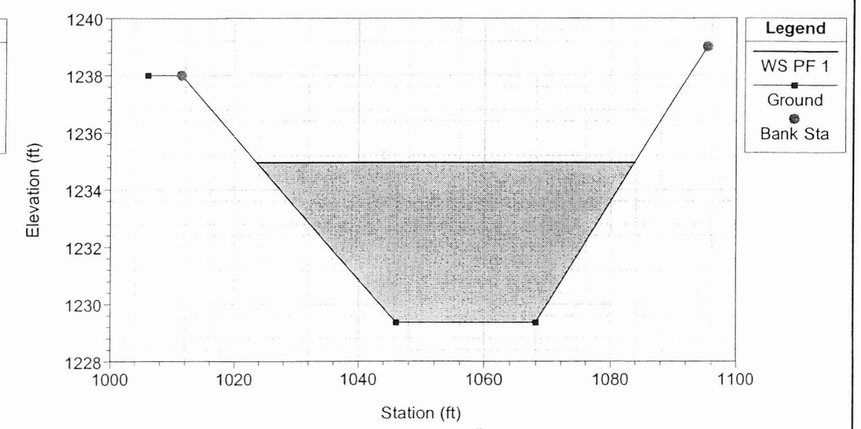
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 3748



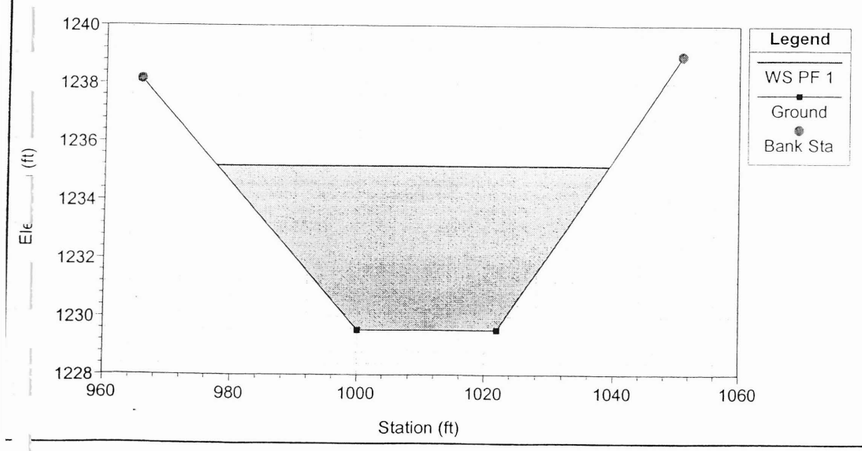
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 3783.



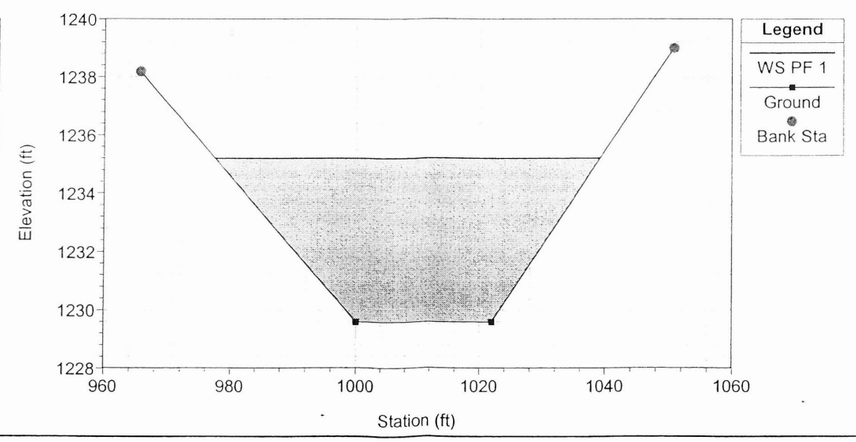
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 4475.



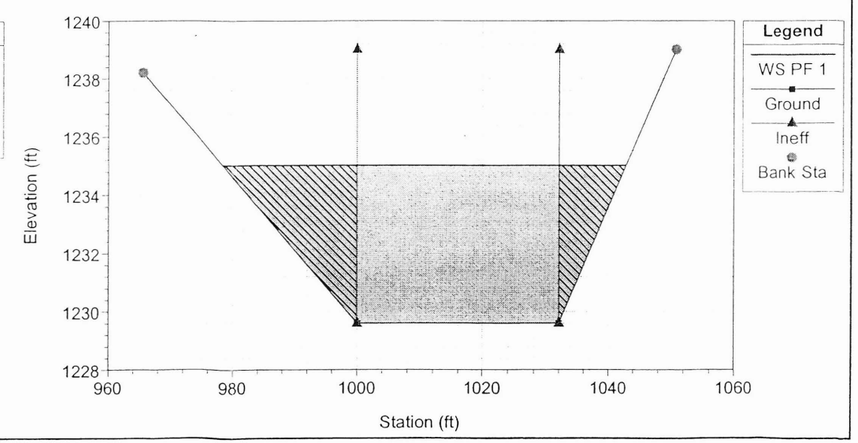
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 4584



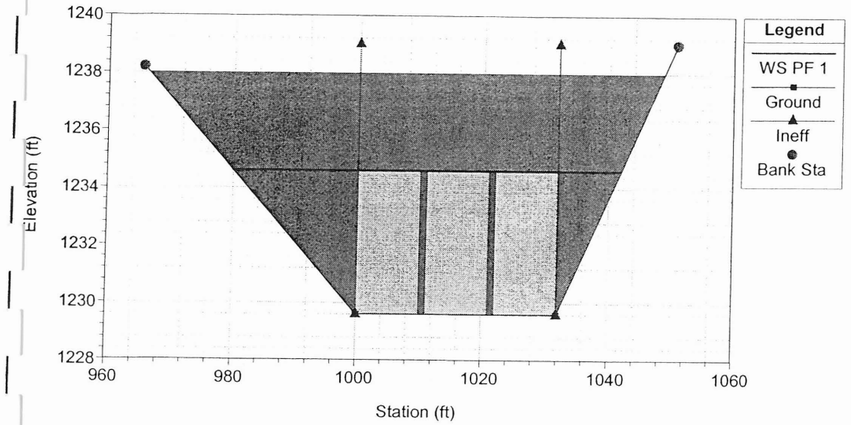
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 4596



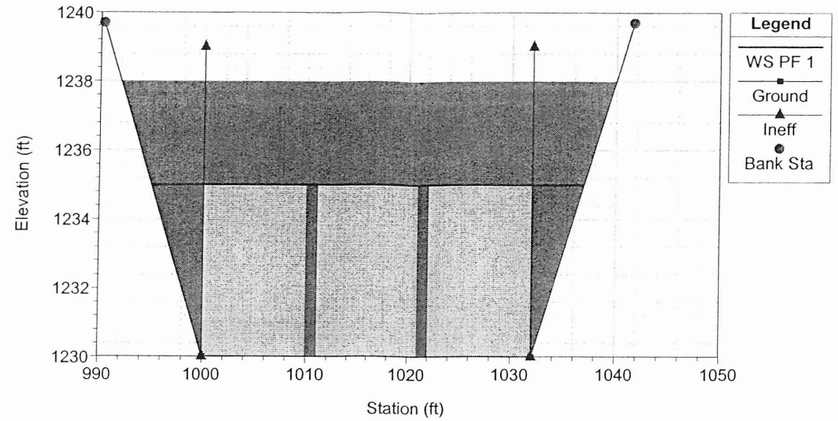
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 4616



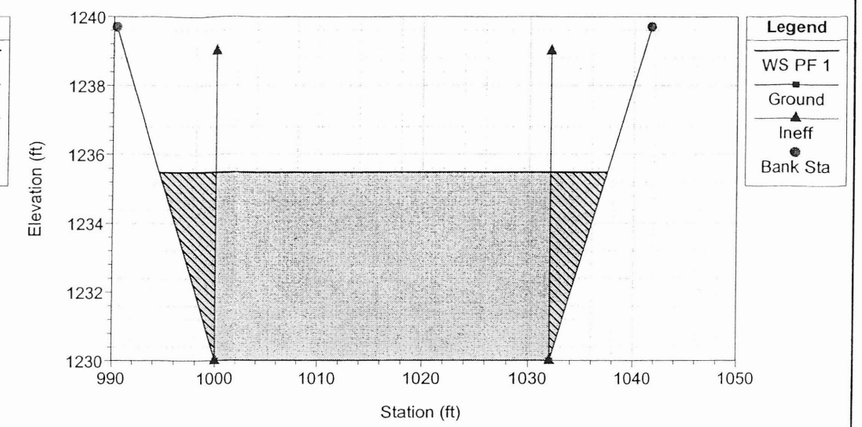
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 4646. Culv



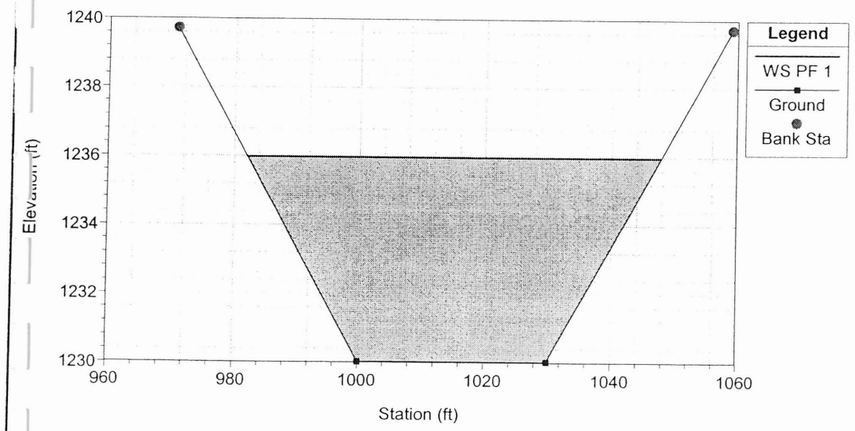
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 4646. Culv



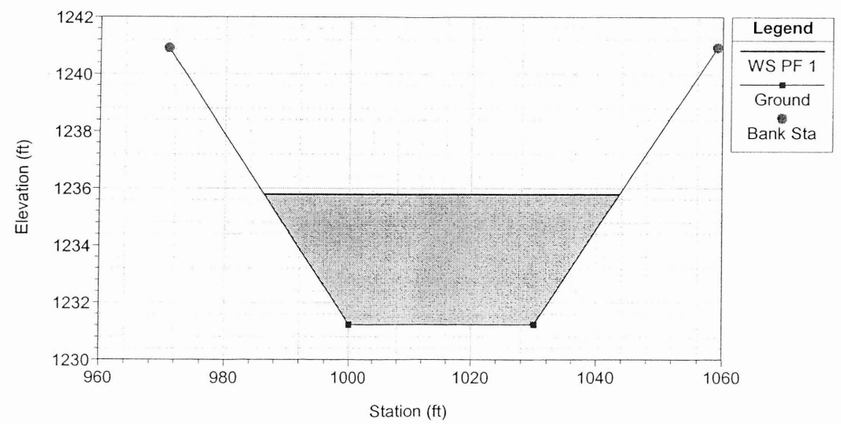
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 4677.



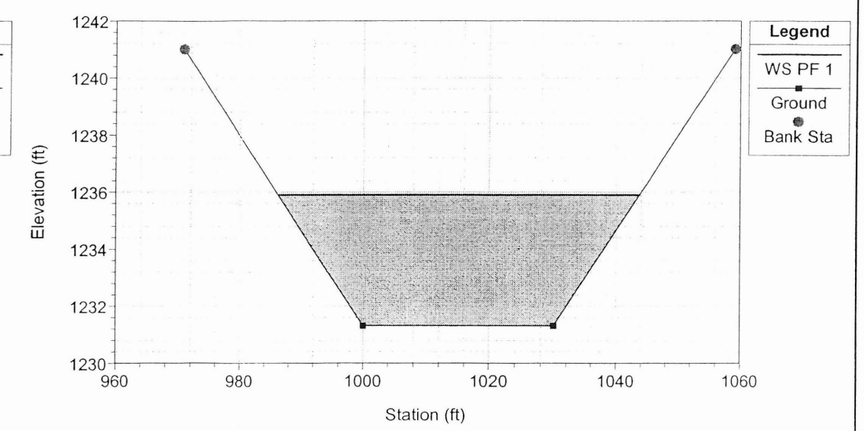
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 4679



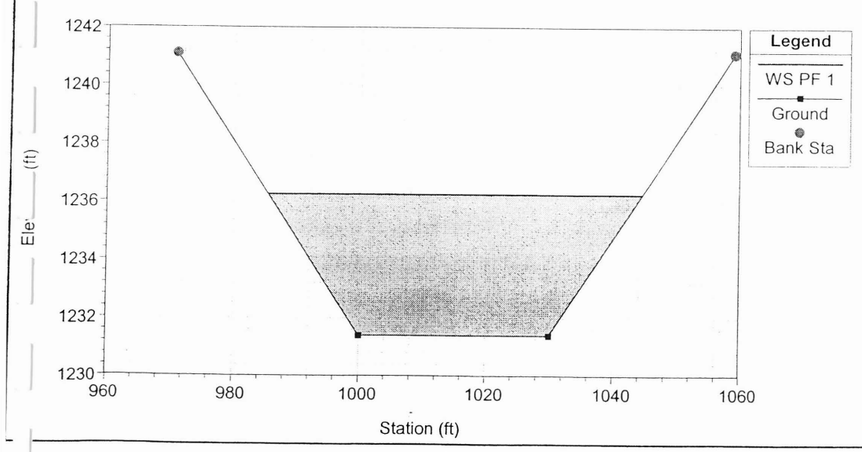
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 4682



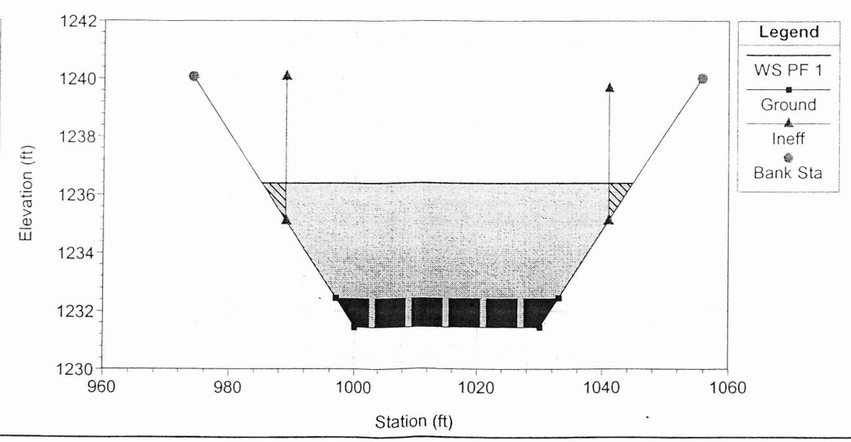
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 4757



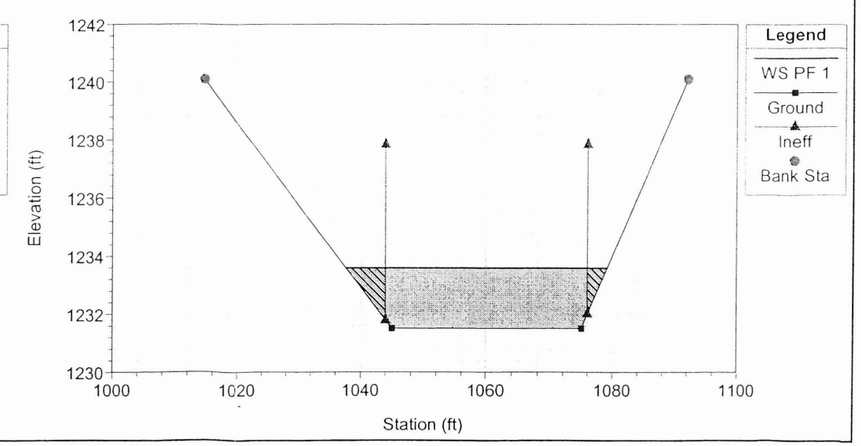
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 4818



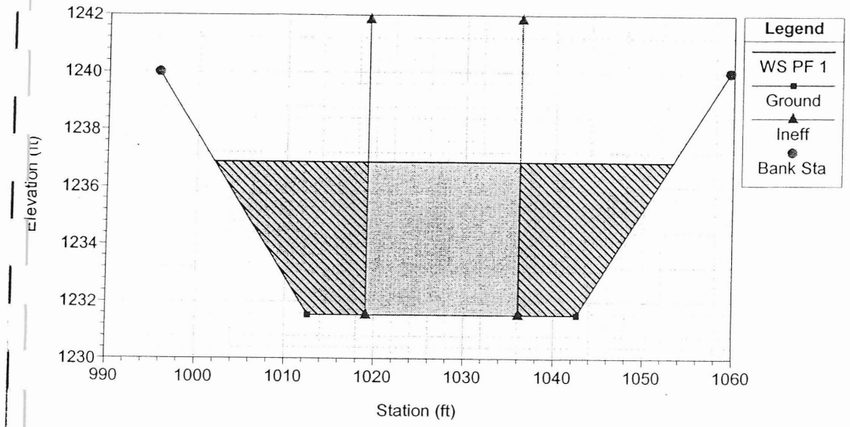
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 4875 Elevated plunge pool lip w/ drain slots



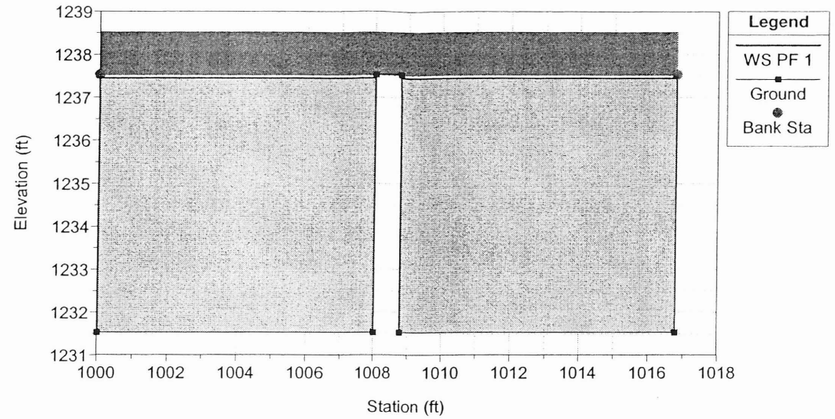
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 4918



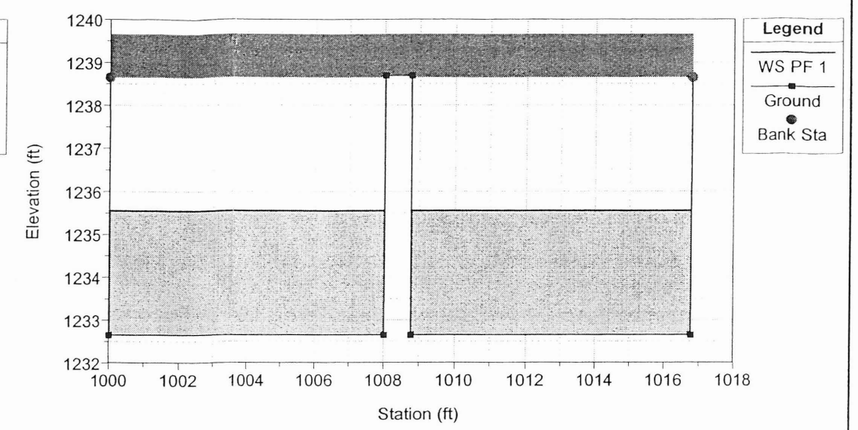
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 4937



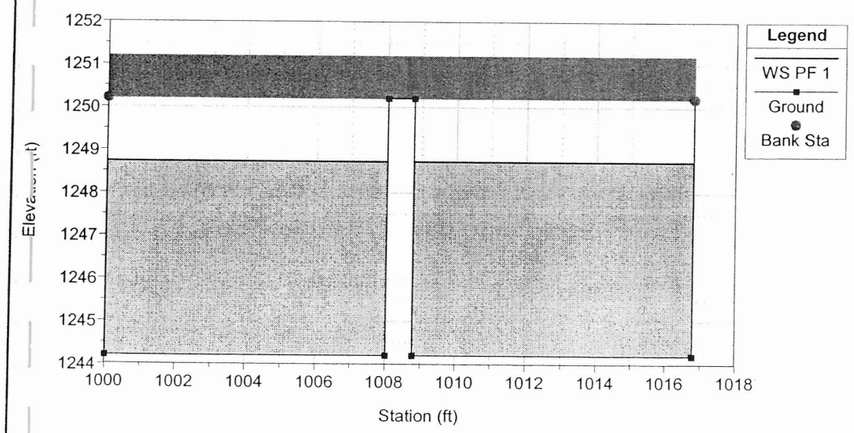
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 4938. True culvert lengths are not reflected by the river stationing d



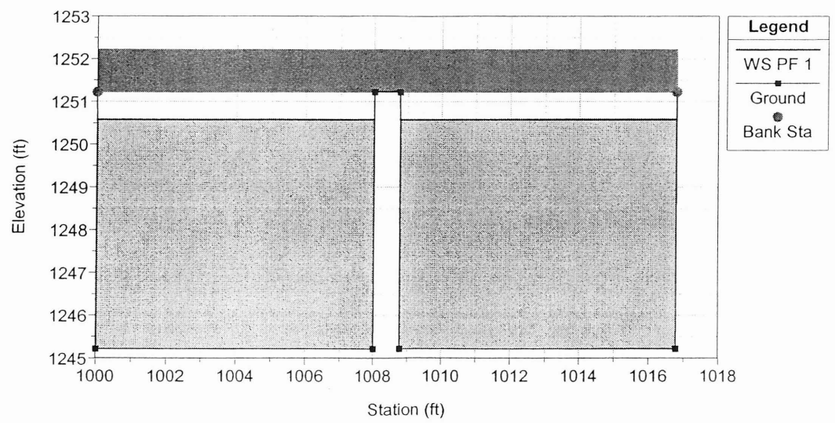
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 5098. True culvert lengths are not reflected by the river stationing d



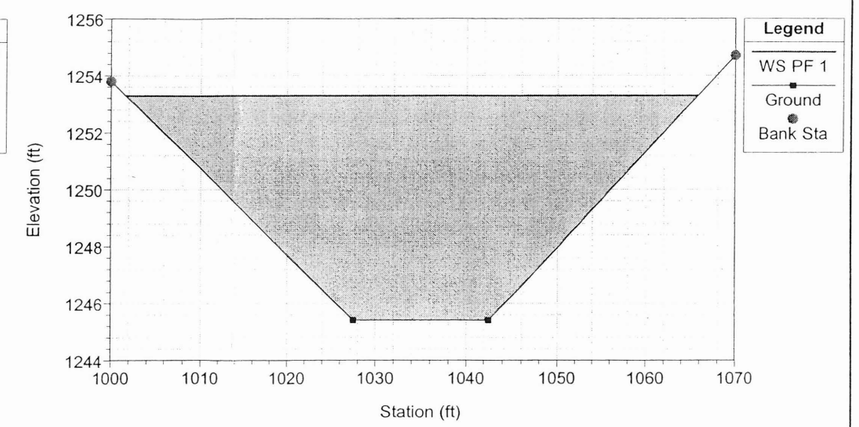
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 5754.5



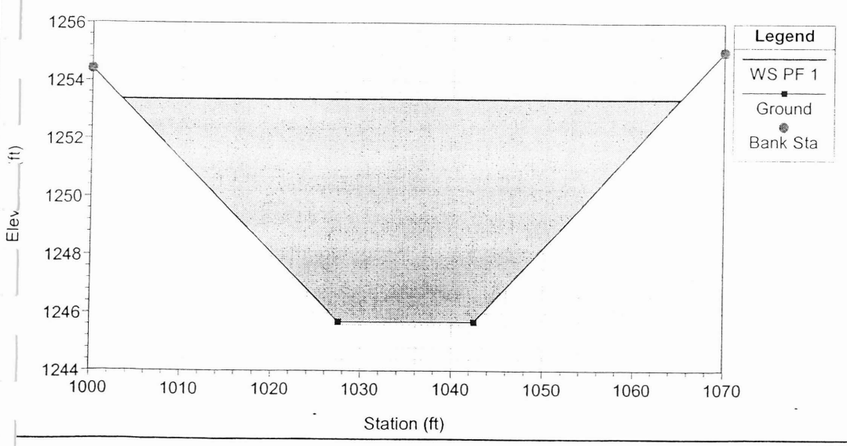
Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 5881.5 True culvert lengths are not reflected by the river stationing d



Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 5905.5



Rose Garden Lane - Final Design Plan: Rose Garden Improvements - Final
RS = 6188.5



Rose Garden Lane Drainage Improvements
Final Channel Design

W/P Job # 042161
8/28/2007

River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Freeboard Prov. LT (ft)	Top of Bank Elev. Left	Freeboard Prov. RT (ft)	Top of Bank Elev. Right	Freeboard Reqd (ft)	Excess Freeboard (lt)	Excess Freeboard (rt)	Left Ch Depth	Right Ch Depth	Max Ch Depth
Future Proposed Channel by Camino A Lago									Future Proposed Channel by Camino A Lago								Future Proposed Channel by Camino A Lago			
6188.5	1123	1245.69	1252.84	1249.63	1253.04	0.000771	3.59	312.99	72.56	0.3	3.16	1256	3.16	1256	1.8	1.3	1.3	10.31	10.31	10.31
5905.5	1123	1245.41	1252.76		1252.95	0.00017	3.42	328.56	74.36	0.29	1.94	1254.7	1.94	1254.7	1.9	0.1	0.1	9.29	9.29	9.29
5881.5	1123	1245.22	1251.38	1249.92	1252.81	0.003195	9.58	117.22	20.48	0.68	-0.16	1251.22	-0.16	1251.22	1.9	Box Culvert	Box Culvert	6	6	6
5754.5	1123	1244.2	1249.56	1249.56	1252.22	0.004335	13.08	85.86	16.04	1	0.64	1250.2	0.64	1250.2	2.0	Box Culvert	Box Culvert	6	6	6
5098	1123	1232.65	1235.37	1238	1245.68	0.026601	25.76	43.6	16.02	2.75	3.28	1238.65	3.28	1238.65	3.3	Box Culvert	Box Culvert	6	6	6
4938	1123	1231.53	1237.45	1236.88	1239.63	0.040329	11.85	94.78	16.04	0.86	0.07	1237.52	0.07	1237.52	2.0	Box Culvert	Box Culvert	5.99	5.99	5.99
4937	1193	1231.53	1236.89	1236.89	1239.55	0.016775	13.1	91.09	51.43	1	3.11	1240	3.11	1240	2.0	1.1	1.1	8.47	8.47	8.47
4918	1193	1231.51	1233.59	1235.04	1238.64	0.114103	18.04	66.14	41.5	2.21	6.5	1240.09	6.5	1240.09	1.8	4.7	4.7	8.58	8.58	8.58
4875	1193	1231.44	1236.4	1235.29	1237.01	0.005971	6.3	189.33	59.74	0.58	3.67	1240.07	3.6	1240	1.4	2.3	2.2	8.63	8.56	8.63
4818	1193	1231.39	1236.23		1236.71	0.003698	5.54	215.41	59.03	0.51	4.86	1241.09	4.86	1241.09	1.3	3.5	3.5	9.7	9.7	9.7
4757	1193	1231.31	1235.9		1236.45	0.004494	5.93	201.07	57.56	0.56	5.11	1241.01	5.11	1241.01	1.3	3.8	3.8	9.7	9.7	9.7
4682	1193	1231.22	1235.79		1236.34	0.000716	5.98	199.5	57.39	0.57	5.13	1240.92	5.13	1240.92	1.3	3.9	3.9	9.7	9.7	9.7
4679	1193	1230.02	1235.98		1236.25	0.000261	4.18	285.56	65.78	0.35	3.74	1239.72	3.74	1239.72	1.6	2.2	2.2	9.7	9.7	9.7
4677	1193	1230	1235.49	1233.5	1236.21	0.000484	6.79	175.77	42.99	0.51	4.21	1239.7	4.21	1239.7	1.6	2.7	2.7	9.7	9.7	9.7
4646	Culvert					107th Ln. 3-10x5 RCBC														
4616	1193	1229.6	1235.01	1233.1	1235.74	0.003634	6.9	172.97	64.43	0.52	3.19	1238.2	3.99	1239	1.5	1.7	2.5	8.6	9.4	9.4
4596	1193	1229.58	1235.19		1235.59	0.001834	5.08	234.64	61.64	0.46	2.99	1238.18	3.79	1238.98	1.5	1.5	2.3	8.6	9.4	9.4
4584	1193	1229.54	1235.17		1235.57	0.001807	5.06	235.88	61.78	0.46	2.97	1238.14	3.77	1238.94	1.5	1.5	2.3	8.6	9.4	9.4
4475	1193	1229.35	1234.95		1235.37	0.001901	5.18	230.14	60.23	0.47	3.05	1238	4.05	1239	1.5	1.5	2.5	8.65	9.65	9.65
3783	1193	1228.06	1233.59		1234.02	0.00198	5.25	227.15	60.14	0.48	2.91	1236.5	3.41	1237	1.5	1.4	1.9	8.44	8.94	8.94
3748	1193	1228	1233.12	1231.48	1233.94	0.000612	7.28	163.83	62.72	0.57	3.38	1236.5	3.88	1237	1.5	1.9	2.4	8.5	9	9
3717	Culvert					109th Ave. 3-10x5 RCBC														
3687	1193	1227.7	1231.74	1231.22	1233.06	0.009561	9.22	129.4	72.34	0.81	4.26	1236	4.26	1236	1.3	2.9	2.9	8.3	8.3	8.3
3655	1193	1227.64	1232.29		1232.65	0.002006	4.82	247.65	76.43	0.47	3.65	1235.94	3.65	1235.94	1.3	2.4	2.4	8.3	8.3	8.3
3471.25*	1193	1227.3	1231.91		1232.28	0.002088	4.89	244.11	76	0.48	3.11	1235.02	3.11	1235.02	1.2	1.9	1.9	7.72	7.72	7.72
3287.5*	1193	1226.95	1231.5		1231.88	0.002197	4.98	239.61	75.4	0.49	2.6	1234.1	2.6	1234.1	1.2	1.4	1.4	7.15	7.15	7.15
3103.75*	1193	1226.6	1231.05		1231.46	0.002399	5.14	232.15	74.4	0.51	2.13	1233.18	2.13	1233.18	1.2	0.9	0.9	6.58	6.58	6.58
2920	1193	1226.26	1230.08	1229.31	1230.71	0.007743	6.37	187.42	68.18	0.68	2.18	1232.26	2.18	1232.26	1.1	1.1	1.1	6	6	6
2900	1193	1226.22	1229.27	1229.27	1230.43	0.018195	8.63	138.24	60.54	1.01	2.95	1232.22	2.95	1232.22	1.1	1.9	1.9	6	6	6
2865	1193	1223.7	1226.79	1227.73	1229.89	0.006114	14.13	84.44	32.6	1.55	3.91	1230.7	3.91	1230.7	1.5	2.4	2.4	7	7	7
2764.91	1193	1223.6	1228.45	1227.59	1229.43	0.001195	7.95	149.97	39.89	0.72	1.65	1230.1	1.65	1230.1	1.5	0.2	0.2	6.5	6.5	6.5
2643.19	1193	1223.48	1228.27		1229.28	0.001249	8.08	147.65	39.68	0.74	1.71	1229.98	1.71	1229.98	1.4	0.3	0.3	6.5	6.5	6.5
2403.81	1193	1223.24	1227.75		1228.93	0.001558	8.73	136.59	38.63	0.82	1.99	1229.74	1.99	1229.74	1.4	0.6	0.6	6.5	6.5	6.5
2323.81	1193	1223.16	1227.77		1228.58	0.007958	7.23	164.9	49.63	0.7	1.39	1229.16	1.39	1229.16	1.4	0.0	0.0	6	6	6
2223.81	1193	1223.06	1227.77		1228.11	0.001743	4.71	253.49	72.67	0.44	1.29	1229.06	1.29	1229.06	1.3	0.0	0.0	6	6	6
2000	1193	1222.68	1227.37		1227.72	0.001766	4.73	252.3	72.54	0.45	1.31	1228.68	1.31	1228.68	1.3	0.1	0.1	6	6	6
1800	1193	1222.34	1227.01		1227.36	0.001797	4.76	250.78	72.37	0.45	1.33	1228.34	1.33	1228.34	1.3	0.1	0.1	6	6	6
1600	1193	1222	1226.64		1227	0.001842	4.8	248.55	72.12	0.46	1.36	1228	1.36	1228	1.3	0.1	0.1	6	6	6
1497.47	1193	1221.83	1226.58		1226.91	0.000423	4.66	256.21	72.97	0.44	1.25	1227.83	1.25	1227.83	1.3	0.0	0.0	6	6	6
1477	1193	1221.24	1226.46		1226.89	0.000424	5.31	224.64	43.16	0.41	1.46	1227.92	1.46	1227.92	1.4	0.0	0.0	6.68	6.68	6.68
1467	1193	1221.21	1226.11	1224.5	1226.86	0.00082	6.95	171.71	35.15	0.55	1.79	1227.9	1.79	1227.9	1.4	0.4	0.4	6.69	6.69	6.69
1446	Culvert					SRP Maintenance Road 4-8x6 RCBC														
1445	1193	1221.14	1224.43	1224.43	1226.09	0.002792	10.34	115.41	35.1	1	3.1	1227.53	3.1	1227.53	1.2	1.9	1.9	6.39	6.39	6.39
1385.96	1193	1220.94	1223.88	1224.31	1225.87	0.003952	11.3	105.54	41.76	1.25	2.06	1225.94	2.06	1225.94	1.2	0.8	0.8	5	5	5
1100	1193	1220	1223.31	1223.37	1224.81	0.00262	9.84	121.19	43.24	1.04	1.69	1225	1.69	1225	1.2	0.5	0.5	5	5	5
865.36	1193	1214.98	1216.76	1218.35	1222.98	0.02236	20.02	59.6	37.11	2.78	3.22	1219.98	3.22	1219.98	2.0	1.2	1.2	5	5	5
777.03	1193	1206.83	1207.68	1209.36	1218.91	0.094975	26.88	44.38	52.03	5.13	4.15	1211.83	4.15	1211.83	3.0	1.1	1.1	5	5	5
719.03	1193	1192.33	1200	1194.86	1200.14	0.000085	2.99	399.26	52.13	0.19	4.33	1204.33	4.33	1204.33	2.0	2.4	2.4	12	12	12
688	1193	1192.18	1200	1194.71	1200.13	0.000079	2.93	410.15	66.09	0.18	-0.32	1199.68	-0.32	1199.68	2.0	N/A	N/A	7.5	7.5	7.5

Based on HEC RAS Model: w:\2004 Projects\042161-RoseGarden\Hydraulics\Final Design\HECRAS\RGL_Final.prj
* 2-8'x6' Box Section under RGL / 107th Ave.

PROJECT ROSE GARDEN LANE NO.
CALC'D BY ABM CHK'D BY DAV
SHEET 1 OF DATE 3/29/06

USBR TYPE II DISSIPATER BASIN

USING GUIDELINES FROM HEC-14.

FROM FLOWMASTER:

$Q = 1193$ cfs $\quad Y_1 = 0.64'$

$F = 7.96$

CHUTE BLOCKS

W_1 (WIDTH) $= W_2$ (SPACING) $= H_1$ (HEIGHT) $= Y_1 \cong 0.63$

$\therefore$ USE $W_1 = W_2 = H_1 = 8''$

NUMBER OF CHUTE BLOCKS (N_c)

$N_c = W/2W_1 = 52/2(.67) = 38.8$ BLOCKS

- USE 39 BLOCKS W/ SIDE SPACES $= 52 - [(39+38).67]/2 = .205'$ $\cong 2\frac{1}{2}''$

HEIGHT OF JUMP

FIND Y_2 W/ $Y_1 = .64'$ & $F = 7.96$

$$Y_2 = C_1 Y_1 \left(\sqrt{1+8F^2} - 1\right)/2$$

$$= 1.1(.64)\left(\sqrt{1+8(7.96)^2} - 1\right)/2$$

$$Y_2 = 7.58'$$

FROM FIG VII-D-2, MINIMUM TAILWATER DEPTH

$TW_{min}/Y_1 = 9.8$

$\therefore TW_{min} = 9.8(0.64) = 6.27'$

PROJECT RGL - PHASE I NO.

CALC'D BY ABM CHK'D BY

SHEET 2 OF DATE 3/29/06

NOTE: FOR THE INITIAL PORTION OF SPILLWAY USE, THE DESIGN TAILWATER WILL NOT BE ACHIEVED. IT IMPOSES COST AND MAINTENANCE PROBLEMS TO DEPRESS THE BASIN POOL FOR THIS SHORT TIME PERIOD OF FUNCTION. THEREFORE MUST PROVIDE SILL CUTOFF WALL AND ROCK RIPRAP EROSION PROTECTION.

USING FIG VII - D-3

LENGTH OF JUMP FLOOR (L_B)

$L_B / y_2 = 4.13$

$\therefore L_B = 4.13(7.58) = 31.3 \approx$ 31 FT.

DENTATED SILL

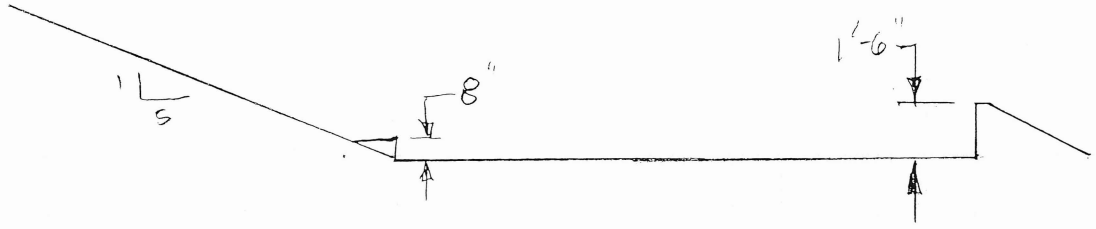
$h_2 = 0.2 y_2 = 0.2(7.58) = 1.52' =$ 1'-6" OK

$W_3 = W_4 = 0.15\, y_2 = 0.15(7.58) = 1.14'$ ... TRY 1'-3"

$N_s = 52'/1.25 = 41.6$ W/ 1'-2" BLOCKS - 44.57

OF SILL BLOCKS W/ 1'-4" BLOCKS - 39

$\therefore$ 20 BLOCKS + 19 SPACES (1-4")



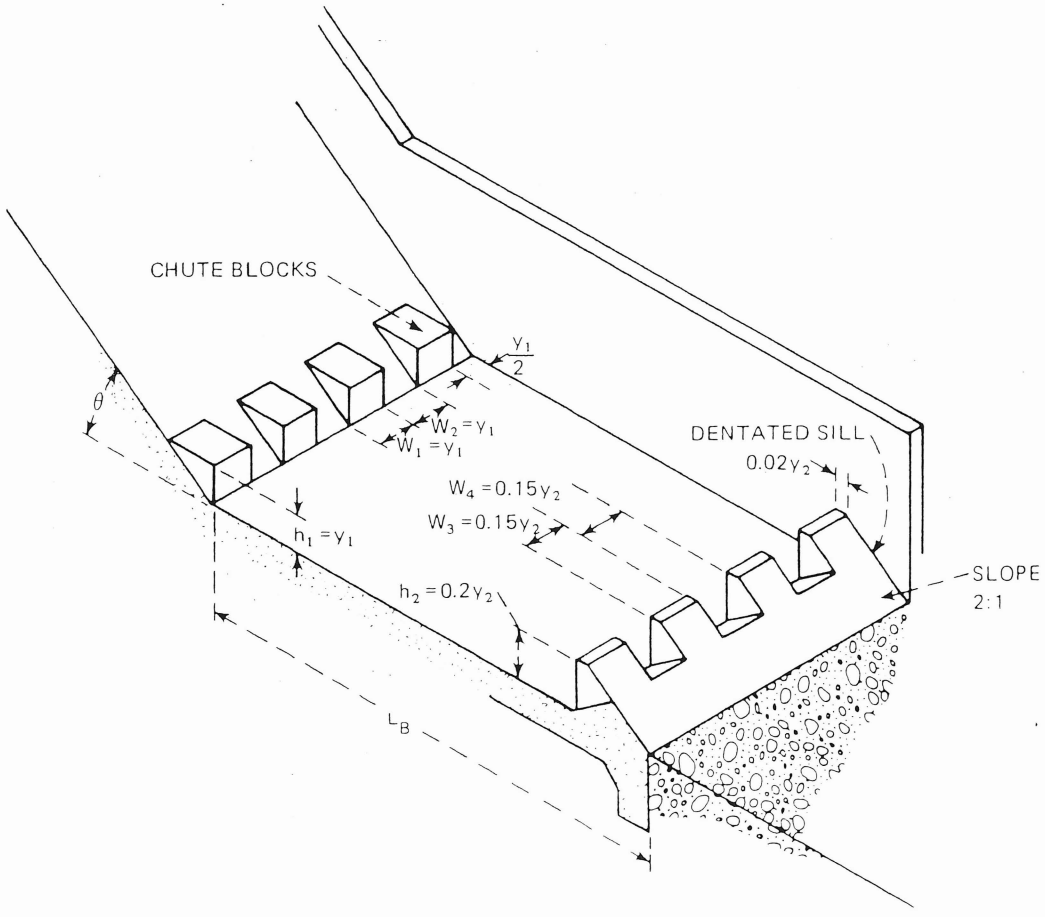


FIGURE VII – D-1 USBR TYPE II BASIN

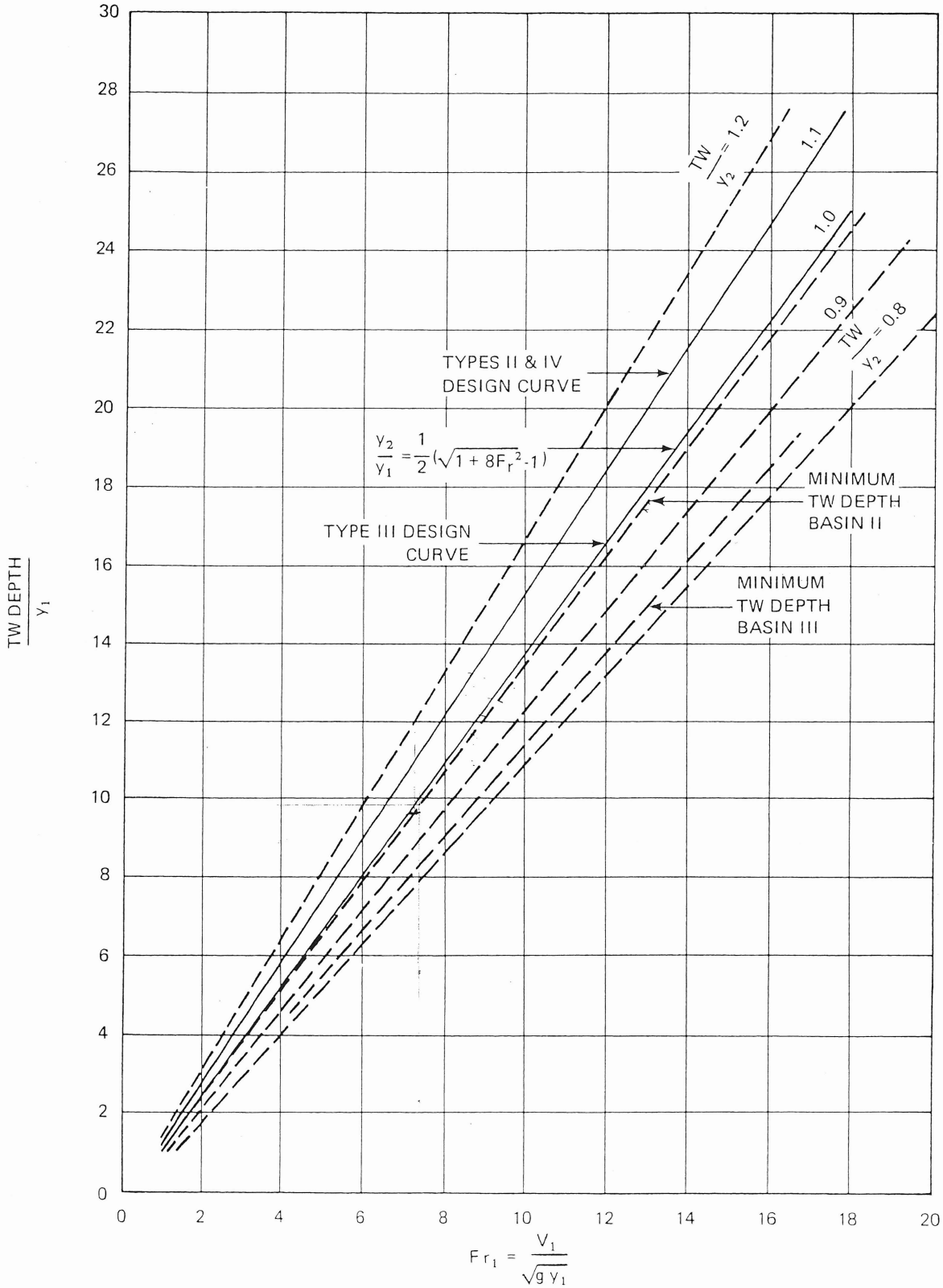


FIGURE VII - D - 2 TAIL WATER DEPTH (BASIN II, III & IV)

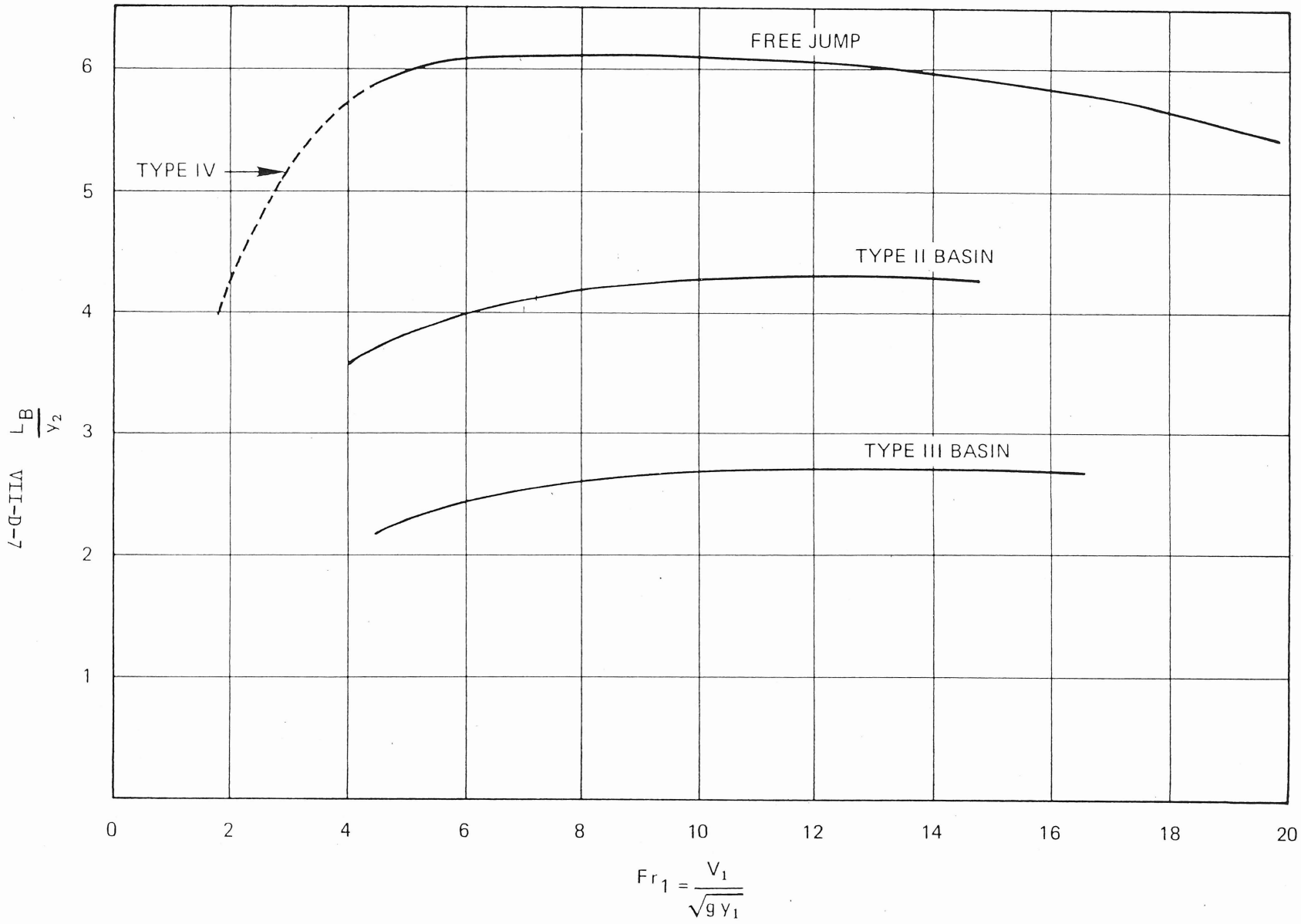


FIGURE VII - D - 3. LENGTH OF JUMP ON HORIZONTAL FLOOR

Worksheet for Rectangular Channel - USBR Type II

Project Description		
Flow Element:	Rectangular Channel	
Friction Method:	Manning Formula	
Solve For:	Normal Depth	

Input Data		
Roughness Coefficient:	0.015	
Channel Slope:	0.25000	ft/ft
Bottom Width:	52.00	ft
Discharge:	1193.00	ft^3/s

Results		
Normal Depth:	0.64	ft
Flow Area:	33.10	ft^2
Wetted Perimeter:	53.27	ft
Top Width:	52.00	ft
Critical Depth:	2.54	ft
Critical Slope:	0.00272	ft/ft
Velocity:	36.04	ft/s
Velocity Head:	20.19	ft
Specific Energy:	20.82	ft
Froude Number:	7.96	
Flow Type:	Supercritical	

GVF Input Data		
Downstream Depth:	0.00	ft
Length:	0.00	ft
Number Of Steps:	0	

GVF Output Data		
Upstream Depth:	0.00	ft
Profile Description:		
Profile Headloss:	0.00	ft
Downstream Velocity:	Infinity	ft/s
Upstream Velocity:	Infinity	ft/s
Normal Depth:	0.64	ft
Critical Depth:	2.54	ft
Channel Slope:	0.25000	ft/ft
Critical Slope:	0.00272	ft/ft

PROJECT ROSE GARDEN LANE No. 042161
CALC'D BY ABM CHK'D BY
SHEET 1 OF 3 DATE 8/22/06

BASIN INFLOW RIPRAP SIZING

USING FCDMC METHODOLOGY (HEC-11)
ASSUME ROCK SPECIFIC GRAVITY = 2.6

$$\therefore C_{SG} = \frac{2.12}{(2.6-1)^{1.5}} = 1.048$$

FOR STABILITY FACTOR OF 1.1 :

$$C_{SF} = \left(\frac{1.1}{1.2}\right)^{1.5} = 0.878$$

BANK ANGLE CORRECTION FACTOR K_1 :

$$K_1 = \left[1 - \frac{\sin^2\theta}{\sin^2\phi}\right]^{0.5}$$

W/ SIDE SLOPES = 5:1 , $\theta = 11.31°$
ASSUMING ANGULAR 18" ROCK, $\phi = 41.5°$ (FIG. 6.8)

$$\therefore K_1 = \left[1 - \frac{\sin^2 11.3°}{\sin^2 41.5°}\right]^{0.5} = 0.955$$

FROM FLOWMASTER W/ Q = 1190 cfs (WORST CASE)

$V_{AVG} = 10.56$ fps , $D = 1.07'$

$$d_{50} = \left[\frac{0.001\,V^3}{D^{0.5}\,K_1^{1.5}}\right] C_{SG} \cdot C_{SF}$$

$$d_{50} = \left[\frac{0.001(10.56)^3}{(1.07)^{0.5}(0.955)^{1.5}}\right](1.048)(0.878)$$

$d_{50} = 1.12$ FT.

USE $d_{50} = 18"$, 3' THICK

Worksheet for River Low Flow Channel Capacity

Project Description		
Flow Element:	Trapezoidal Channel	
Friction Method:	Manning Formula	
Solve For:	Discharge	

Input Data		
Roughness Coefficient:	0.045	
Channel Slope:	0.00280	ft/ft
Normal Depth:	4.00	ft
Left Side Slope:	3.60	ft/ft (H:V)
Right Side Slope:	40.00	ft/ft (H:V)
Bottom Width:	15.00	ft

Results		
Discharge:	1190.47	ft^3/s
Flow Area:	408.80	ft^2
Wetted Perimeter:	190.00	ft
Top Width:	189.40	ft
Critical Depth:	2.52	ft
Critical Slope:	0.02640	ft/ft
Velocity:	2.91	ft/s
Velocity Head:	0.13	ft
Specific Energy:	4.13	ft
Froude Number:	0.35	
Flow Type:	Subcritical	

GVF Input Data		
Downstream Depth:	0.00	ft
Length:	0.00	ft
Number Of Steps:	0	

GVF Output Data		
Upstream Depth:	0.00	ft
Profile Description:		
Headloss:	0.00	ft
Downstream Velocity:	Infinity	ft/s
Upstream Velocity:	Infinity	ft/s
Normal Depth:	4.00	ft
Critical Depth:	2.52	ft
Channel Slope:	0.00280	ft/ft

Worksheet for Rock River Infow Channel

Project Description		
Flow Element:	Trapezoidal Channel	
Friction Method:	Manning Formula	
Solve For:	Normal Depth	

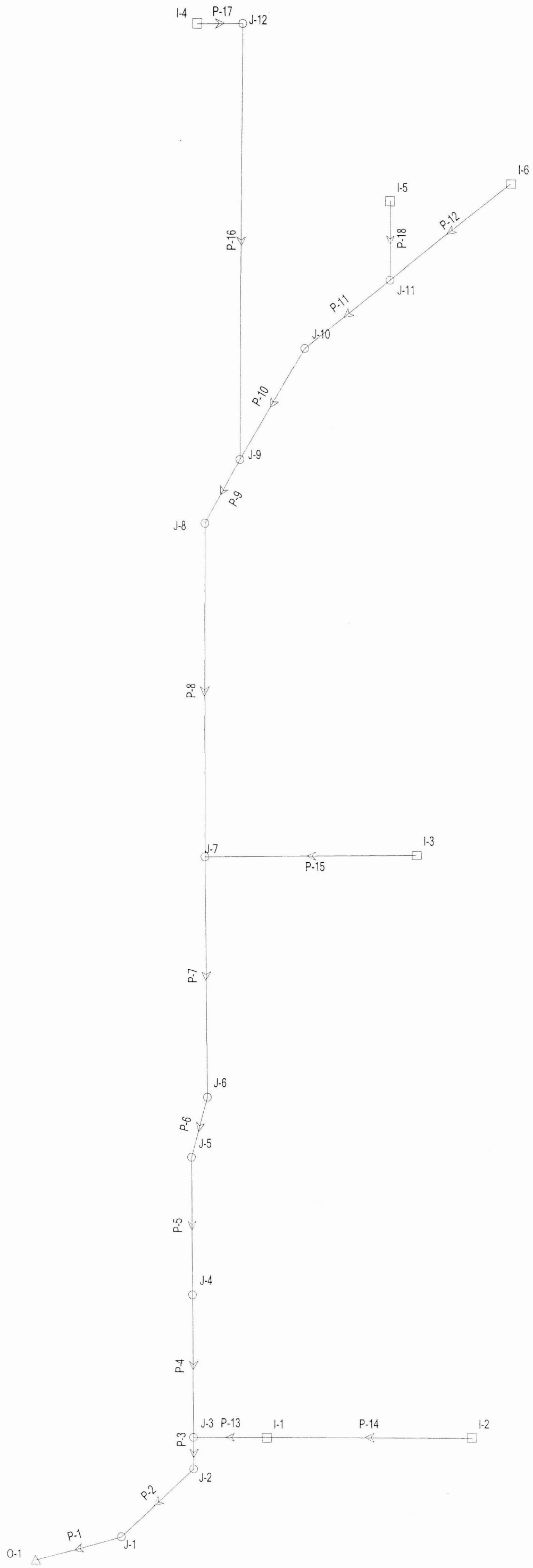
Input Data		
Roughness Coefficient:	0.045	
Channel Slope:	0.10000	ft/ft
Left Side Slope:	5.00	ft/ft (H:V)
Right Side Slope:	5.00	ft/ft (H:V)
Bottom Width:	100.00	ft
Discharge:	1190.00	ft^3/s

Results		
Normal Depth:	1.07	ft
Flow Area:	112.71	ft^2
Wetted Perimeter:	110.91	ft
Top Width:	110.70	ft
Critical Depth:	1.59	ft
Critical Slope:	0.02596	ft/ft
Velocity:	10.56	ft/s
Velocity Head:	1.73	ft
Specific Energy:	2.80	ft
Froude Number:	1.84	
Flow Type:	Supercritical	

GVF Input Data		
Downstream Depth:	0.00	ft
Length:	0.00	ft
Number Of Steps:	0	

GVF Output Data		
Upstream Depth:	0.00	ft
Profile Description:		
Headloss:	0.00	ft
Downstream Velocity:	Infinity	ft/s
Upstream Velocity:	Infinity	ft/s
Normal Depth:	1.07	ft
Critical Depth:	1.59	ft
Channel Slope:	0.10000	ft/ft

Scenario: Base



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Calculation Results Summary

==========
Scenario: Base

>>>> Info: Subsurface Network Rooted by: O-1
>>>> Info: Subsurface Analysis iterations: 1
>>>> Info: Convergence was achieved.

CALCULATION SUMMARY FOR SURFACE NETWORKS

Label	Inlet Type	Inlet	Total Intercepted Flow (cfs)	Total Bypassed Flow (cfs)	Capture Efficiency (%)	Gutter Spread (ft)	Gutter Depth (ft)
I-3	Generic Inlet	Generic Default 100%	0.00	0.00	100.0	0.00	0.00
I-4	Generic Inlet	Generic Default 100%	0.00	0.00	100.0	0.00	0.00
I-5	Generic Inlet	Generic Default 100%	0.00	0.00	100.0	0.00	0.00
I-6	Generic Inlet	Generic Default 100%	0.00	0.00	100.0	0.00	0.00
I-1	Generic Inlet	Generic Default 100%	0.00	0.00	100.0	0.00	0.00
I-2	Generic Inlet	Generic Default 100%	0.00	0.00	100.0	0.00	0.00

CALCULATION SUMMARY FOR SUBSURFACE NETWORK WITH ROOT: O-1

Label	Number of Sections	Section Size	Section Shape	Length (ft)	Total System Flow (cfs)	Average Velocity (ft/s)	Hydraulic Grade Upstream (ft)	Hydraulic Grade Downstream (ft)
P-1	1	8 x 4 ft	Box	34.25	298.00	9.31	1,236.55	1,236.40
P-2	1	8 x 4 ft	Box	33.91	298.00	9.31	1,236.98	1,236.82
P-3	1	8 x 4 ft	Box	16.86	298.00	9.31	1,237.32	1,237.25
P-13	1	30 inch	Circular	12.00	25.00	5.09	1,237.44	1,237.39
P-4	1	8 x 4 ft	Box	23.00	273.00	8.53	1,237.48	1,237.39
P-14	1	24 inch	Circular	64.00	4.00	8.86	1,237.45	1,237.44
P-5	1	8 x 4 ft	Box	75.09	273.00	8.53	1,237.76	1,237.48
P-6	1	8 x 4 ft	Box	21.00	273.00	8.53	1,237.90	1,237.82
P-7	1	8 x 4 ft	Box	143.91	273.00	8.53	1,238.49	1,237.94
P-8	1	8 x 4 ft	Box	194.83	259.00	11.86	1,238.70	1,238.55
P-15	1	24 inch	Circular	63.00	14.00	10.97	1,239.10	1,238.55
P-9	1	8 x 4 ft	Box	16.17	259.00	11.80	1,238.79	1,238.94
P-16	1	30 inch	Circular	150.00	14.00	5.55	1,239.02	1,238.87
P-10	1	8 x 4 ft	Box	38.83	245.00	11.69	1,238.90	1,238.87
P-17	1	30 inch	Circular	12.50	14.00	5.39	1,239.18	1,239.17
P-11	1	8 x 4 ft	Box	34.47	245.00	11.79	1,239.10	1,239.14
P-12	1	8 x 4 ft	Box	70.54	231.00	19.95	1,240.96	1,239.17
P-18	1	24 inch	Circular	8.00	14.00	15.14	1,238.96	1,239.17

Label	Total System Flow (cfs)	Ground Elevation (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)
O-1	298.00	1,238.00	1,236.40	1,236.40
J-1	298.00	1,241.00	1,236.82	1,236.55
J-2	298.00	1,240.50	1,237.25	1,236.98
J-3	298.00	1,240.50	1,237.39	1,237.32
I-1	25.00	1,241.00	1,237.44	1,237.44
J-4	273.00	1,241.00	1,237.48	1,237.48

I-2	4.00	1,241.25	1,237.71	1,237.45
J-5	273.00	1,241.00	1,237.82	1,237.76
J-6	273.00	1,241.00	1,237.94	1,237.90
J-7	273.00	1,240.50	1,238.55	1,238.49
J-8	259.00	1,241.30	1,238.94	1,238.70
I-3	14.00	1,241.26	1,239.70	1,239.10
J-9	259.00	1,241.30	1,238.87	1,238.79
J-12	14.00	1,241.50	1,239.17	1,239.02
J-10	245.00	1,241.86	1,239.14	1,238.90
I-4	14.00	1,241.60	1,239.33	1,239.18
J-11	245.00	1,241.35	1,239.17	1,239.10
I-6	231.00	1,243.00	1,242.44	1,240.96
I-5	14.00	1,241.50	1,239.56	1,238.96

==========
Completed: 08/27/2007 04:39:04 PM

Scenario: Base

Combined Pipe\Node Report

Label	Upstream Node	Downstream Node	Length (ft)	Upstream Inlet Area (acres)	Upstream Inlet Rational Coefficient	Upstream Inlet CA (acres)	Upstream Calculated System CA (acres)	Upstream Inlet Rational Flow (cfs)	Section Size	Full Capacity (cfs)	Average Velocity (ft/s)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Constructed Slope (ft/ft)
P-1	J-1	O-1	34.25	N/A	N/A	N/A	0.00	N/A	8 x 4 ft	393.41	9.31	1,231.97	1,231.70	0.007883
P-2	J-2	J-1	33.91	N/A	N/A	N/A	0.00	N/A	8 x 4 ft	387.99	9.31	1,232.23	1,231.97	0.007667
P-3	J-3	J-2	16.86	N/A	N/A	N/A	0.00	N/A	8 x 4 ft	389.08	9.31	1,232.36	1,232.23	0.007711
P-4	J-4	J-3	23.00	N/A	N/A	N/A	0.00	N/A	8 x 4 ft	391.98	8.53	1,232.54	1,232.36	0.007826
P-5	J-5	J-4	75.09	N/A	N/A	N/A	0.00	N/A	8 x 4 ft	392.76	8.53	1,233.13	1,232.54	0.007857
P-6	J-6	J-5	21.00	N/A	N/A	N/A	0.00	N/A	8 x 4 ft	385.55	8.53	1,233.29	1,233.13	0.007571
P-7	J-7	J-6	143.91	N/A	N/A	N/A	0.00	N/A	8 x 4 ft	391.07	8.53	1,234.41	1,233.29	0.007790
P-8	J-8	J-7	194.83	N/A	N/A	N/A	0.00	N/A	8 x 4 ft	332.94	11.86	1,235.51	1,234.41	0.005646
P-9	J-9	J-8	16.17	N/A	N/A	N/A	0.00	N/A	8 x 4 ft	330.57	11.80	1,235.60	1,235.51	0.005566
P-10	J-10	J-9	38.83	N/A	N/A	N/A	0.00	N/A	8 x 4 ft	333.52	11.69	1,235.82	1,235.60	0.005666
P-11	J-11	J-10	34.47	N/A	N/A	N/A	0.00	N/A	8 x 4 ft	337.51	11.79	1,236.02	1,235.82	0.005802
P-12	I-6	J-11	70.54	0.00	0.00	0.00	0.00	0.00	8 x 4 ft	742.35	19.95	1,238.00	1,236.02	0.028069
P-13	I-1	J-3	12.00	0.00	0.00	0.00	0.00	0.00	30 inch	84.55	5.09	1,233.62	1,233.11	0.042500
P-14	I-2	I-1	64.00	0.00	0.00	0.00	0.00	0.00	24 inch	45.07	8.86	1,236.75	1,234.21	0.039687
P-15	I-3	J-7	63.00	0.00	0.00	0.00	0.00	0.00	24 inch	37.05	10.97	1,237.75	1,236.06	0.026825
P-16	J-12	J-9	150.00	N/A	N/A	N/A	0.00	N/A	30 inch	27.00	5.55	1,236.85	1,236.20	0.004333
P-17	I-4	J-12	12.50	0.00	0.00	0.00	0.00	0.00	30 inch	25.94	5.39	1,237.00	1,236.95	0.004000
P-18	I-5	J-11	8.00	0.00	0.00	0.00	0.00	0.00	24 inch	57.67	15.14	1,237.61	1,237.09	0.065000

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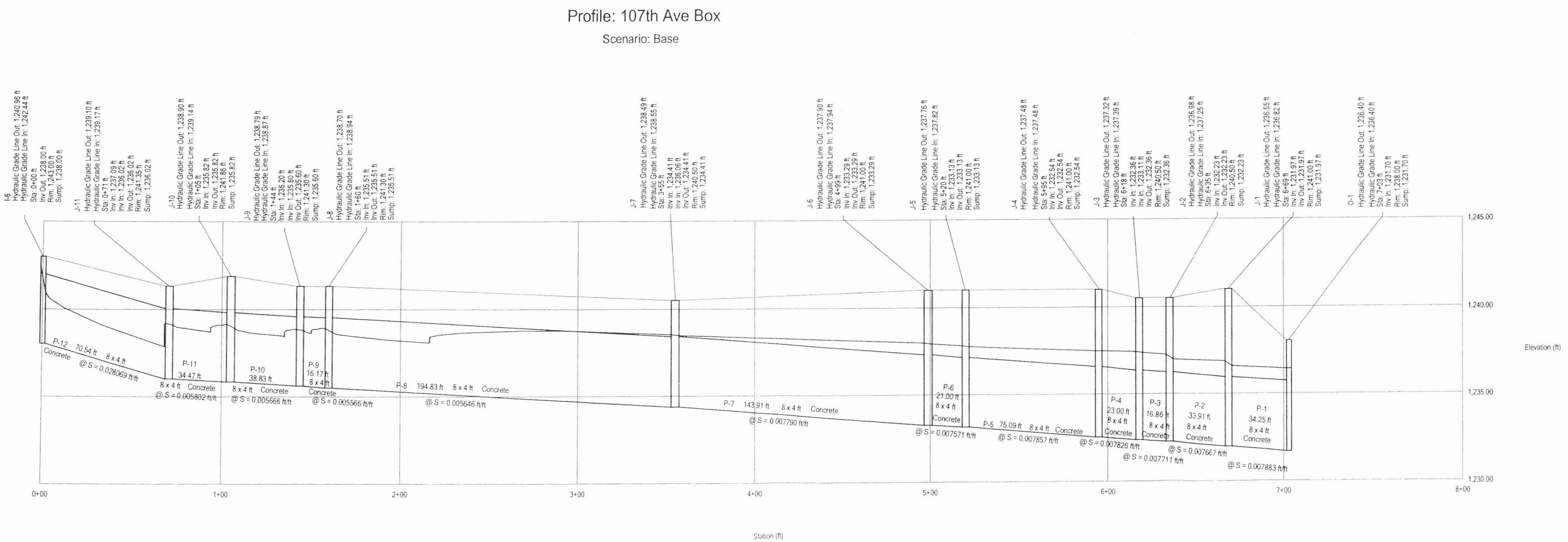
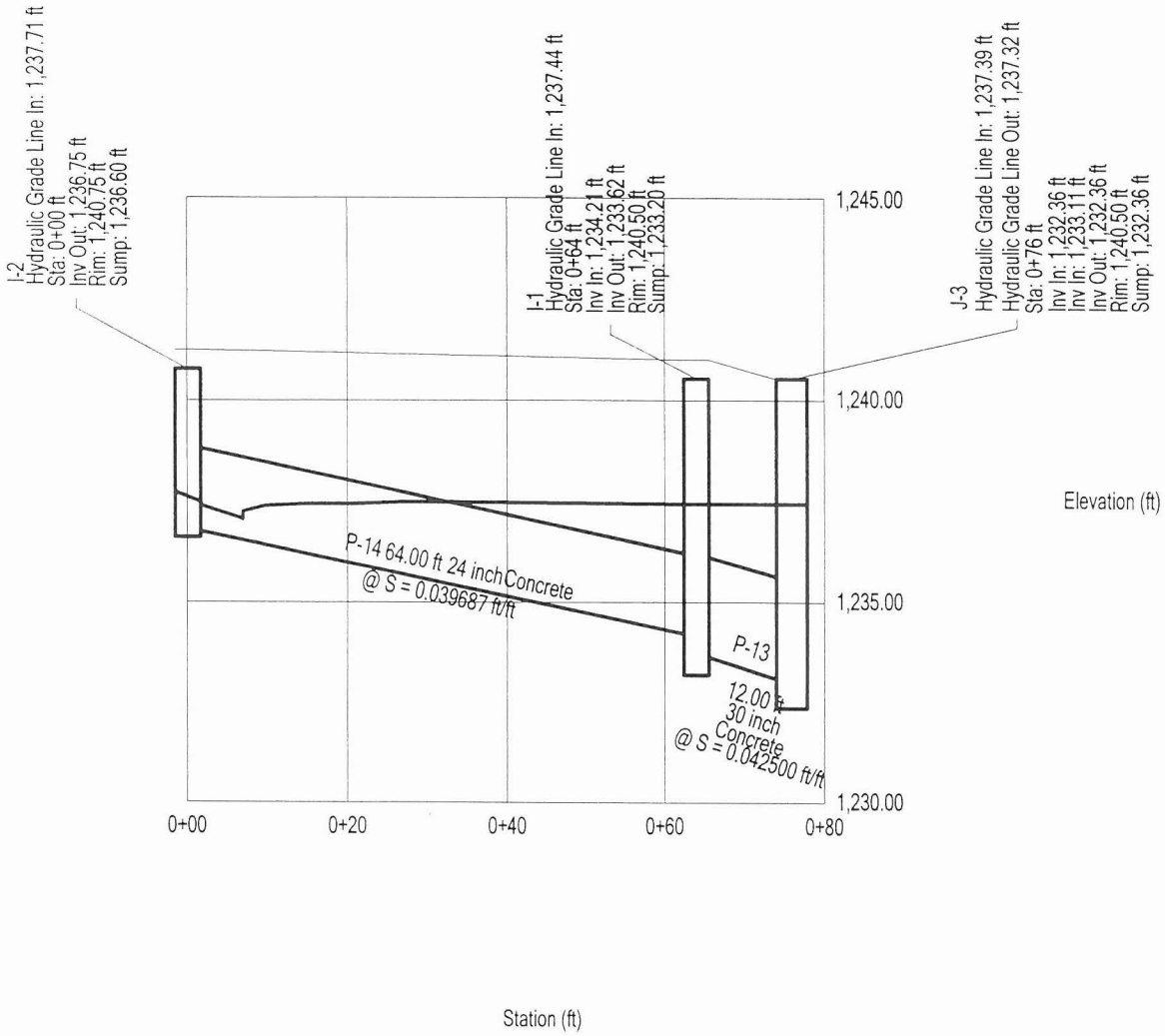
Profile
Scenario: Base



Profile
Scenario: Base

Profile: Storm Drain A

Scenario: Base



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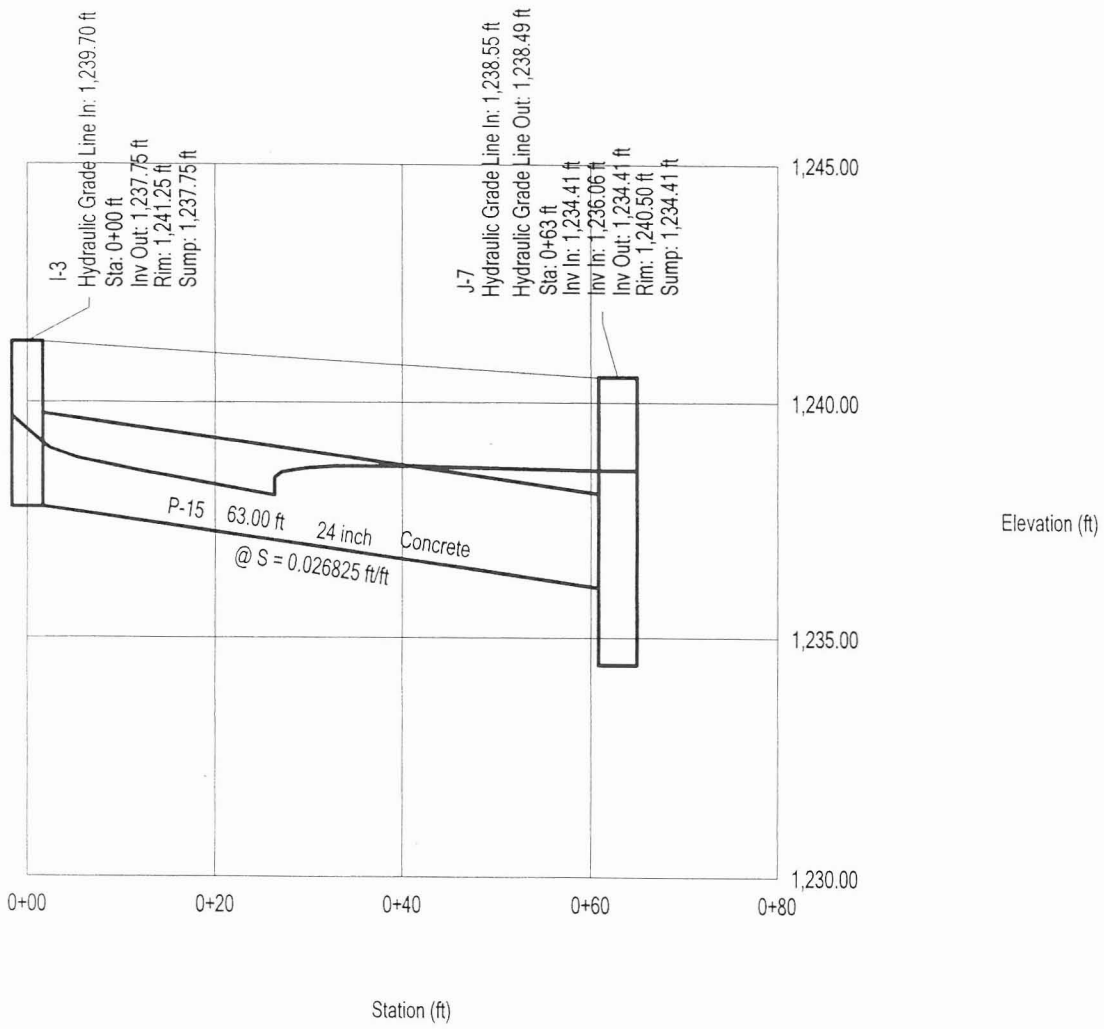
Profile: Storm Drain B

Scenario: Base



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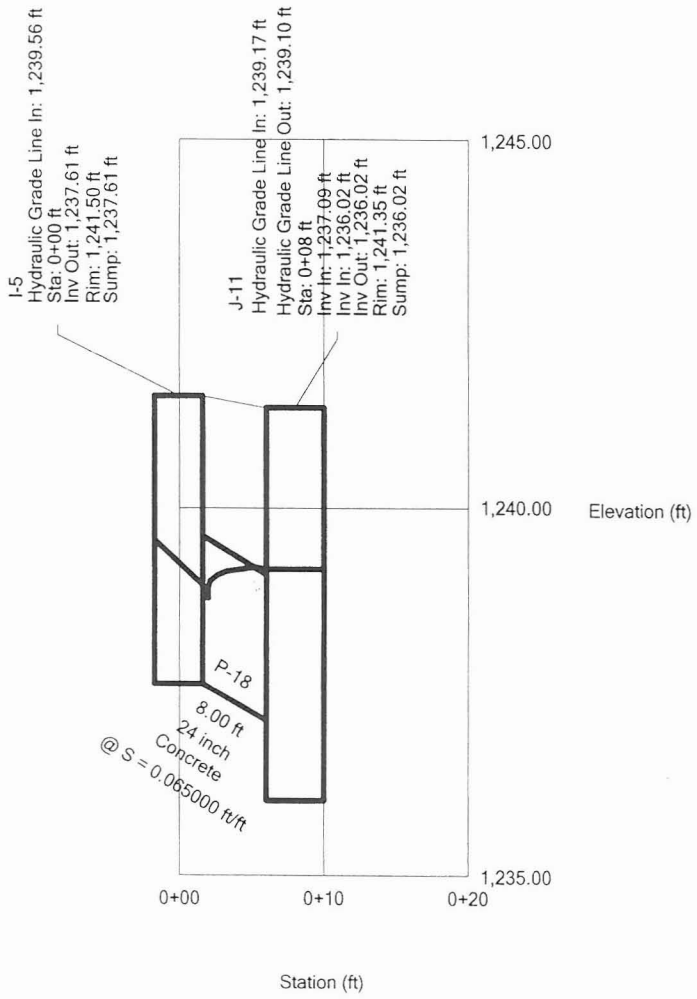
Profile
Scenario: Base

Profile: Storm Drain C

Scenario: Base



Title: 107th Ave. Box Culvert
w:\...\107th ave box culvert 8-23-07.stm
08/28/07 09:05:12 AM

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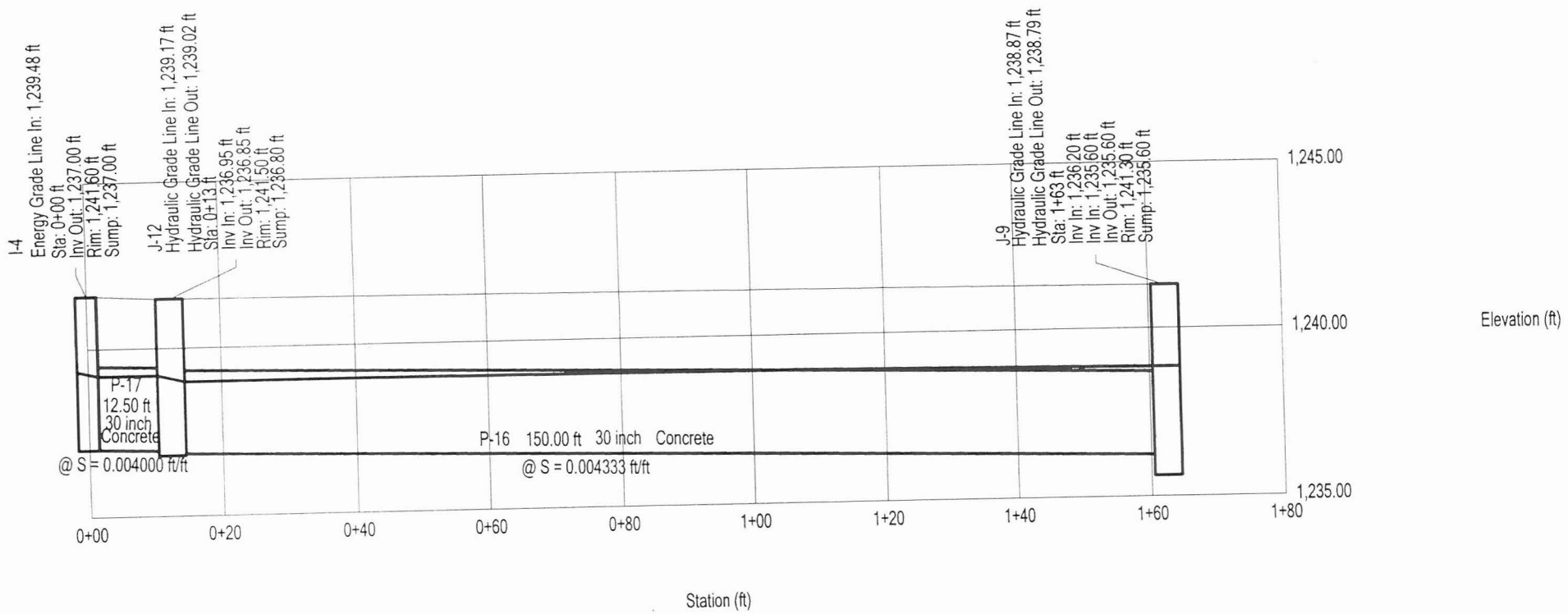
Project Engineer: George H. Amen Jr.
StormCAD v5.6 [05.06.012.00]

Profile: Storm Drain D

Scenario: Base



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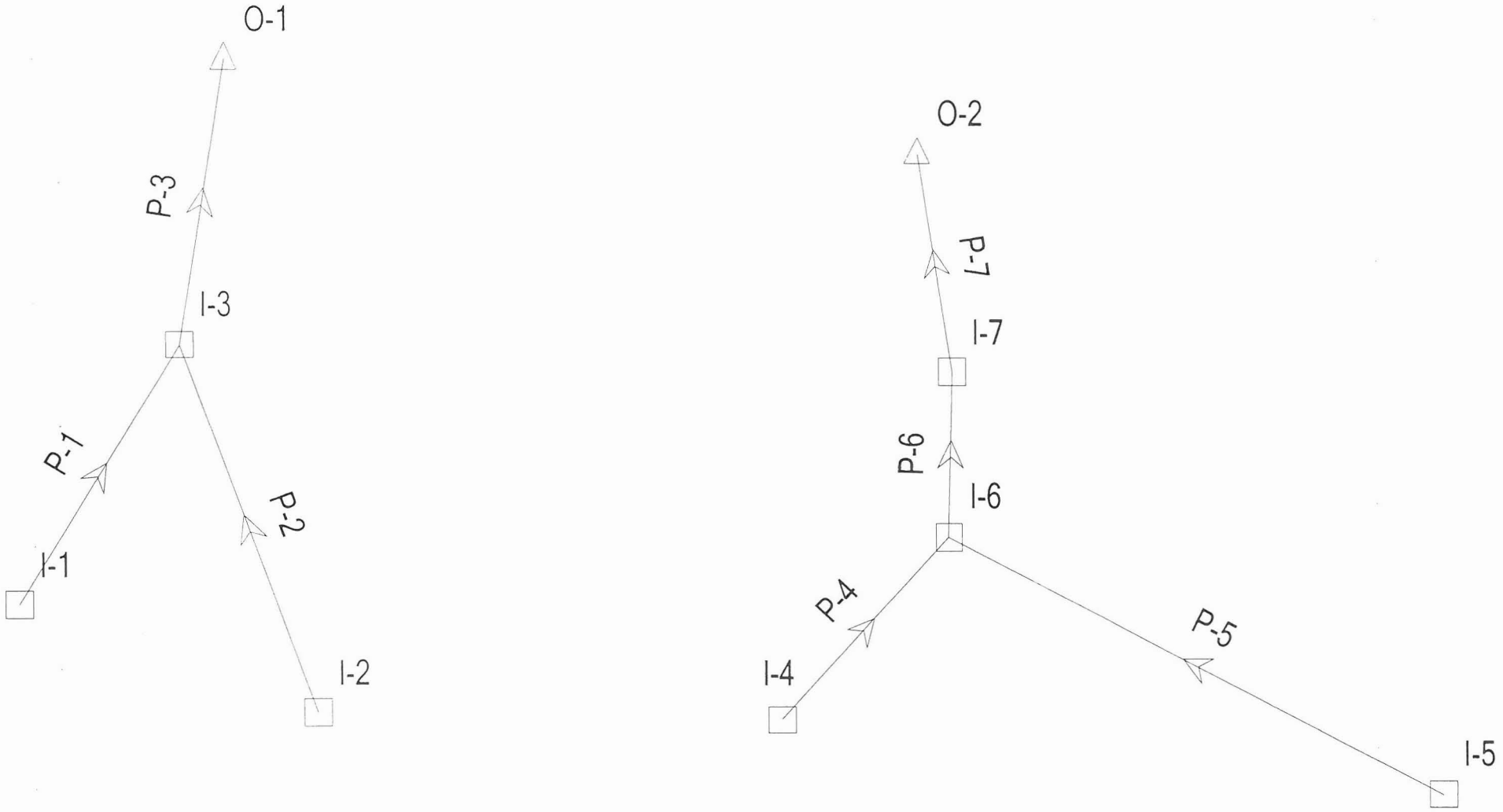
Scenario: 100yr-Known



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Scenario: 100yr-Known

Combined Pipe\Node Report

Label	Upstream Node	Downstream Node	Length (ft)	Section Size	Full Capacity (cfs)	Average Velocity (ft/s)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Constructed Slope (ft/ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Total Flow (cfs)	Downstream Cover (ft)
P-1	I-1	I-3	35.00	18 inch	9.72	5.70	1,237.00	1,236.70	0.008571	1,238.19	1,238.15	5.60	3.38
P-2	I-2	I-3	43.00	18 inch	16.03	8.98	1,237.70	1,236.70	0.023302	1,238.78	1,238.15	7.70	3.38
P-3	I-3	O-1	65.00	24 inch	45.86	12.62	1,236.67	1,234.00	0.041108	1,237.98	1,234.77	13.20	4.50
P-4	I-4	I-6	27.00	18 inch	10.11	5.60	1,237.66	1,237.41	0.009259	1,240.20	1,239.96	9.90	2.29
P-5	I-5	I-6	105.00	36 inch	156.75	21.17	1,242.00	1,236.20	0.055238	1,244.59	1,239.96	65.40	2.00
P-6	I-6	I-7	13.00	36 inch	76.04	12.21	1,235.92	1,235.75	0.013000	1,238.87	1,238.75	70.40	2.91
P-7	I-7	O-2	34.00	36 inch	75.87	12.24	1,235.71	1,235.27	0.012941	1,238.44	1,237.82	75.60	3.93

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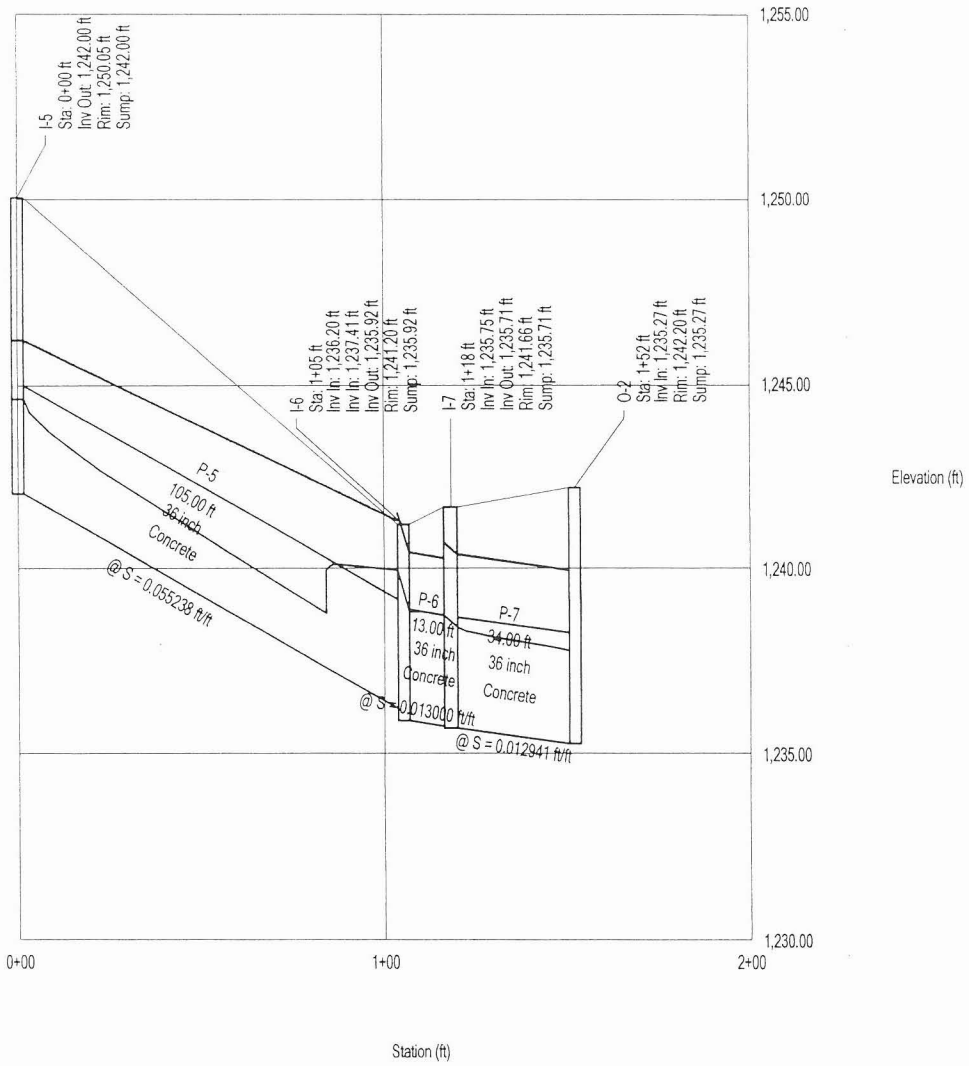
Profile
Scenario: 100yr-Known

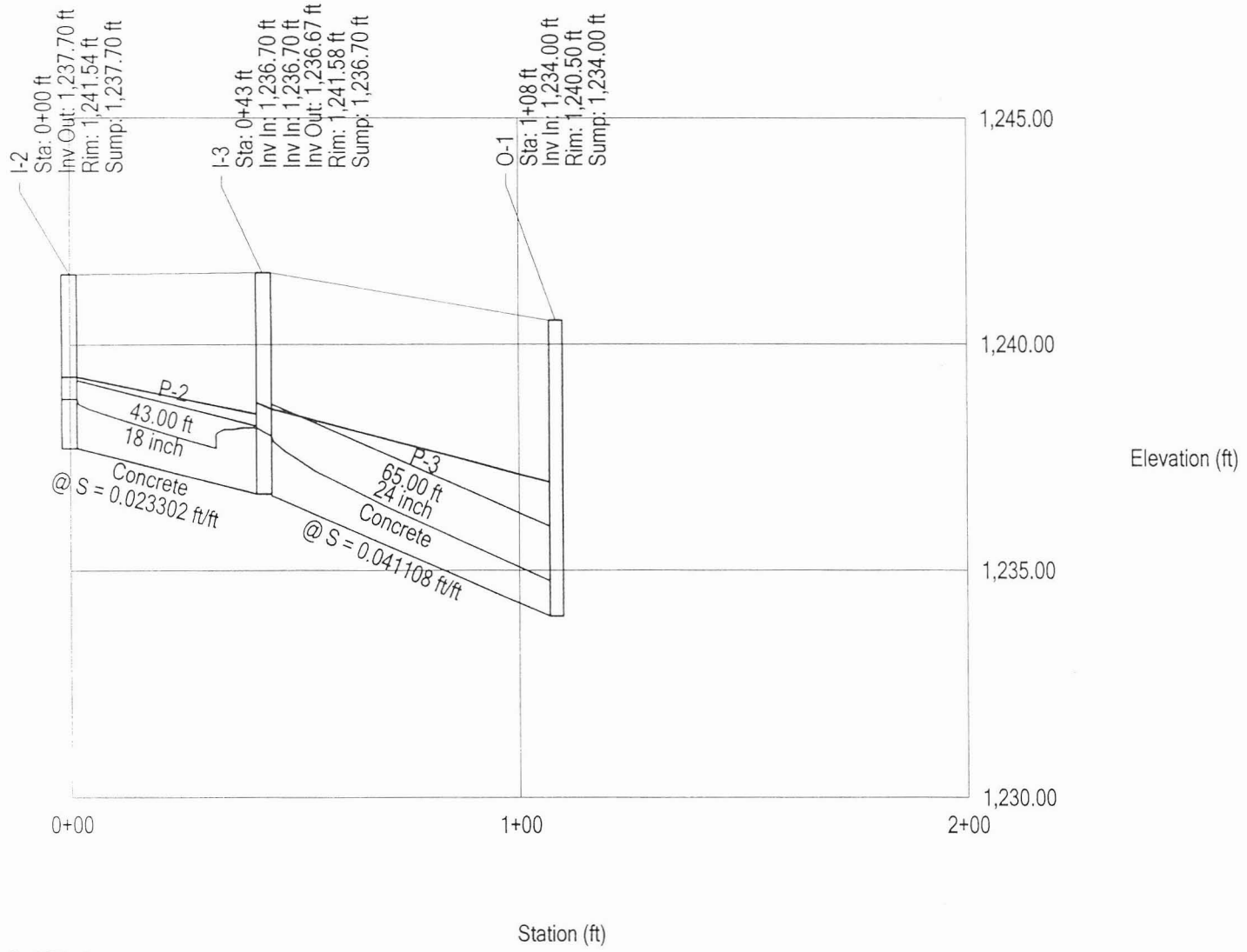
Profile: SD-G

Scenario: 100yr-Known



Profile: SD-I

Scenario: 100yr-Known



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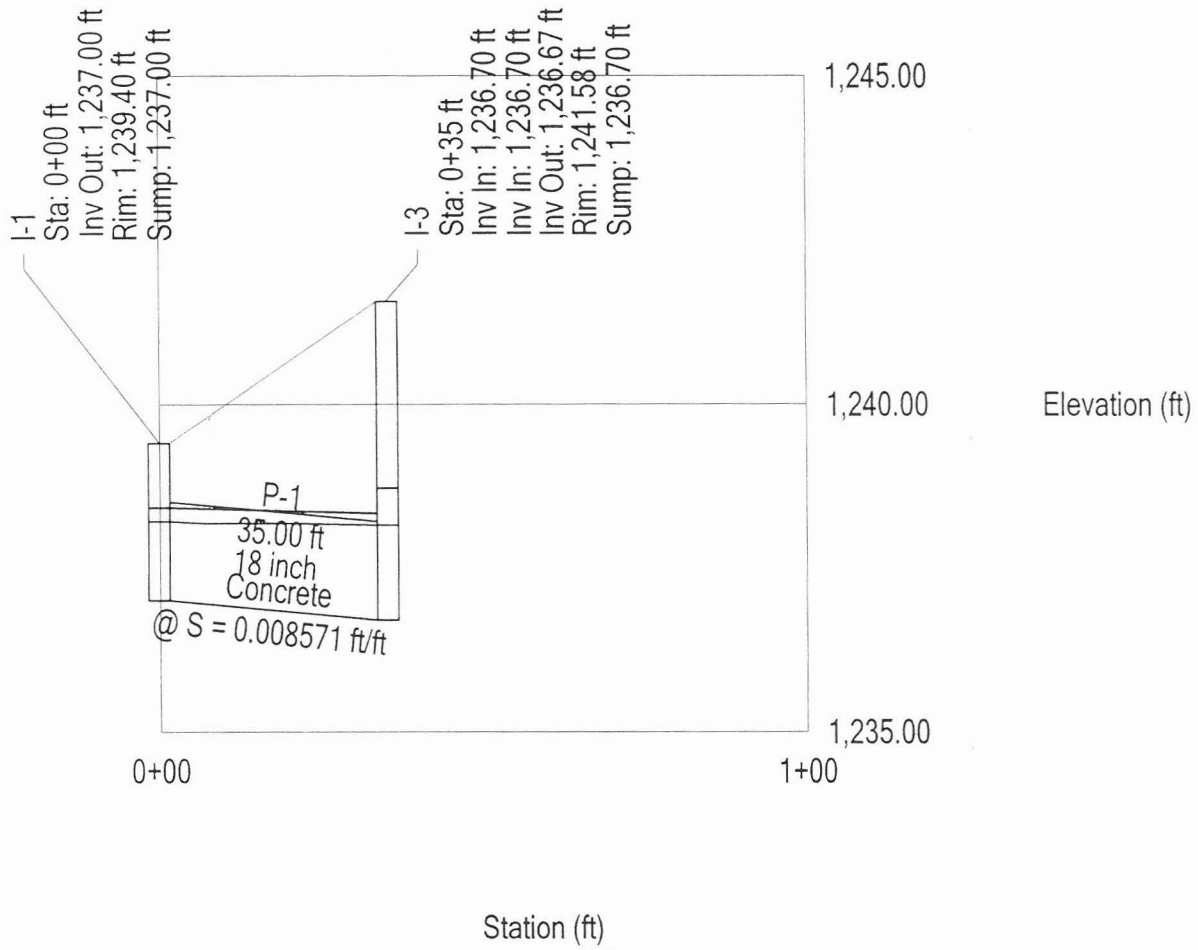
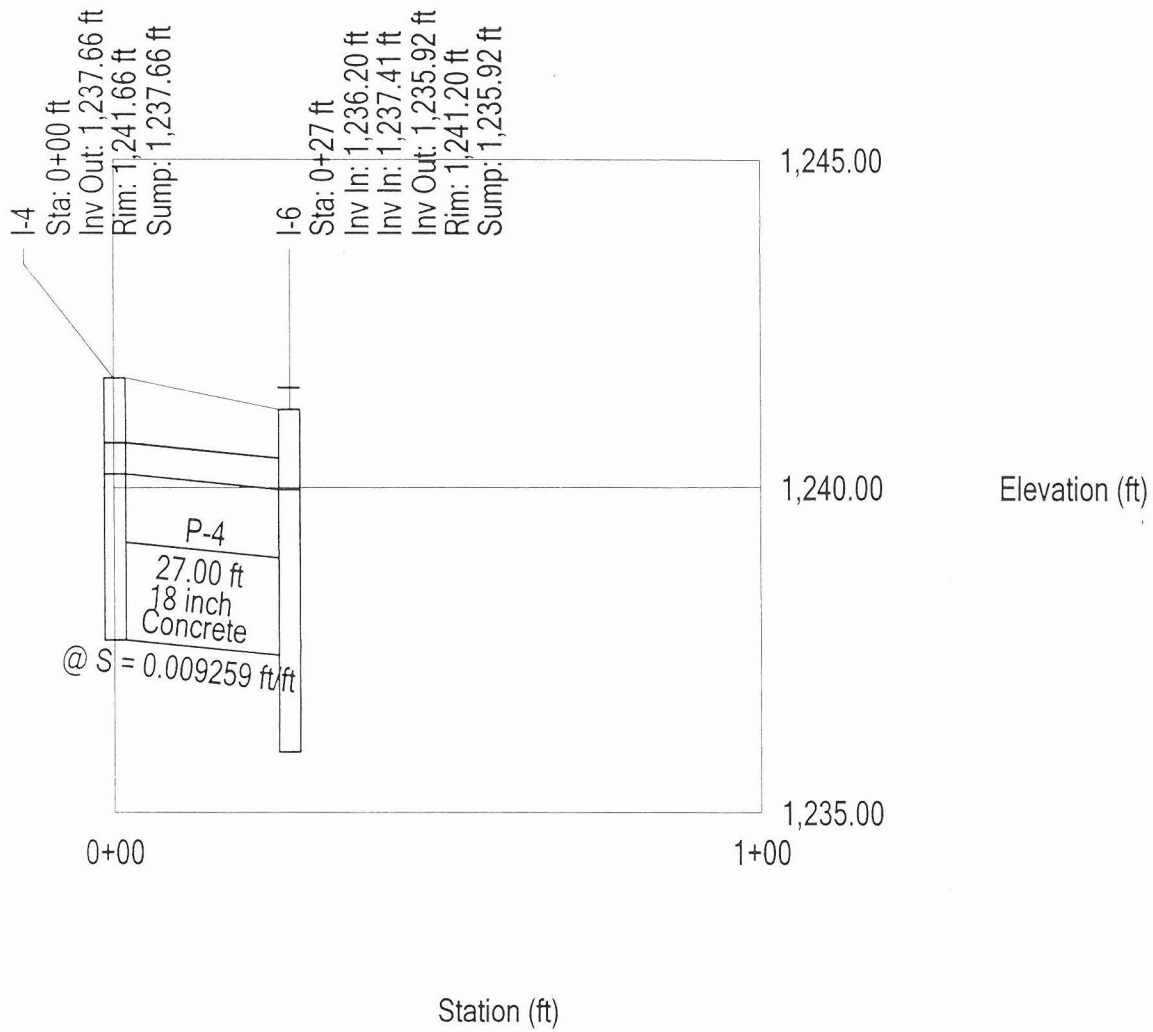
Profile: SD-H

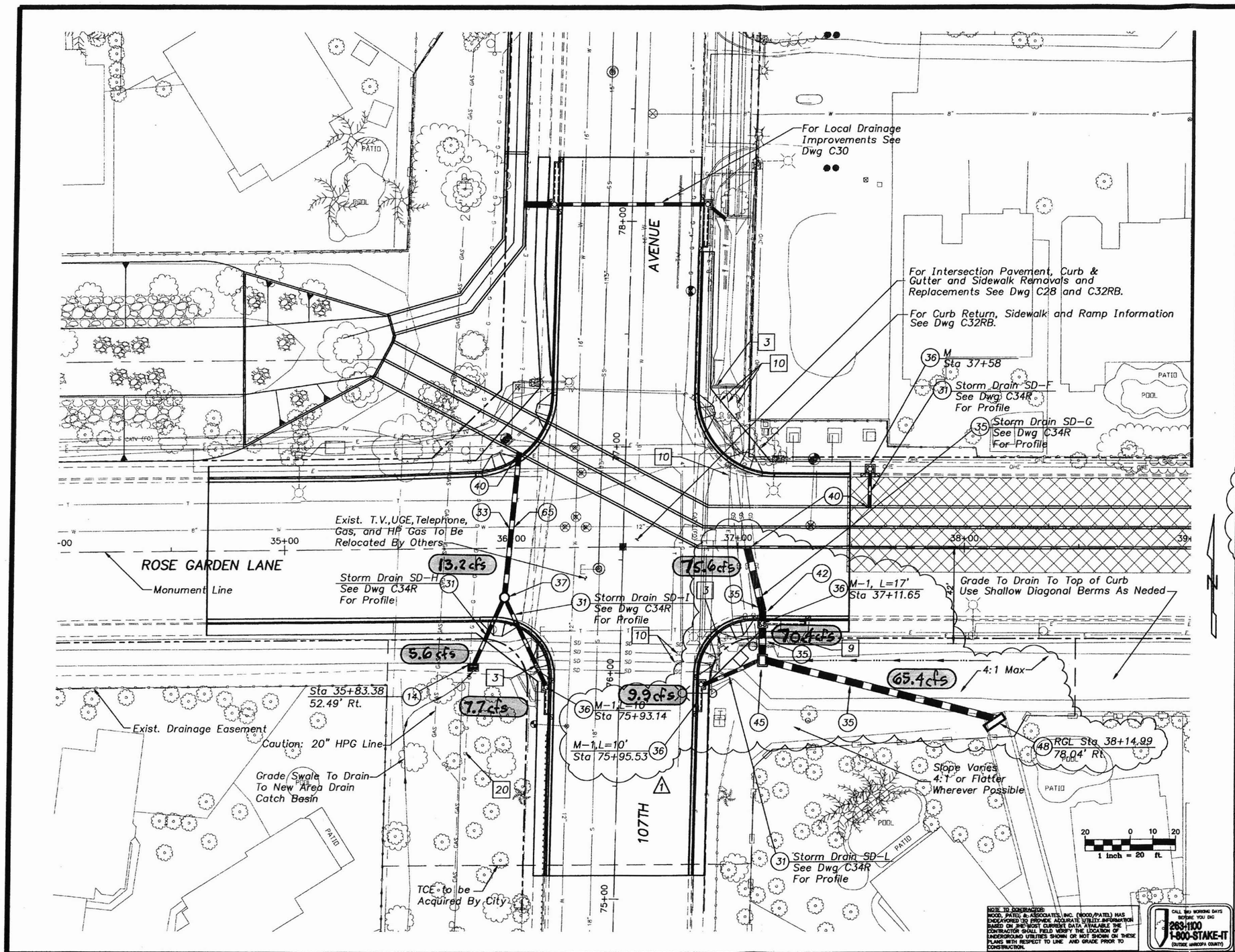
Scenario: 100yr-Known



Profile: SD-L

Scenario: 100yr-Known





REMOVE

3	Remove Exist. Headwall at North-East Corner of 107th Ave & RGL	(LS)
3	Remove Exist. Headwall at South-East & South-West Corners of 107th Ave & RGL	(LS)
9	Remove Exist. Scupper	(LS)
10	Remove Exist. 24" Storm Drains	(668 LF)
20	Exist. Abandoned 20" HP Gasline To Be Removed	(30 LF)

CONSTRUCT

14	Construct Area Drain Catch Basin Per ADOT Std Dtl C-15.80	(1 EA)
31	Install 18" RGRCP Storm Drain	(105 LF)
33	Install 24" RGRCP Storm Drain	(65 LF)
35	Install 36" RGRCP Storm Drain	(152 LF)
36	Install Type M Catch Basin Per City of Phoenix Std Dtl P1569-1, "L" Per Plan	(4 EA)
37	Construct Storm Drain Manhole Per MAG Std Dtl 520 & 522 (Pipe 48" Dia. or Smaller) Use 30" Frame and Cover Per MAG Std Dtl 424	(1 EA)
40	Connect Storm Drain into Box Culvert Per Pipe Penentration Detail on Dwg D6	
42	Construct Concrete Pipe Collar Per MAG Std Dtl 505	
45	Construct Type G Catch Basin Modified to Fit Double Frame and Grates Per MAG Std Dtl 540-2	(1 EA)
48	Construct Modfied Type C Catch Basin Per MAG Std Dtl 532; Opening Length L = 9', and S/W = 3'.	(1 EA)
65	Construct 8" D.I.P. Waterline Dip	(1 EA)

NO.	REVISION	BY	DATE
3			
2			
1	Storm Drain Revisions	ABM	05/08

CITY OF PEORIA
ENGINEERING DIVISION

ROSE GARDEN LANE
DRAINAGE IMPROVEMENTS
PEORIA PROJECT NO. SS-0203

	BY	DATE
DESIGNED	P. LOPEZ	4/07
DRAWN	R. NEIFFER	4/07
CHECKED	A. MORRICE	4/07

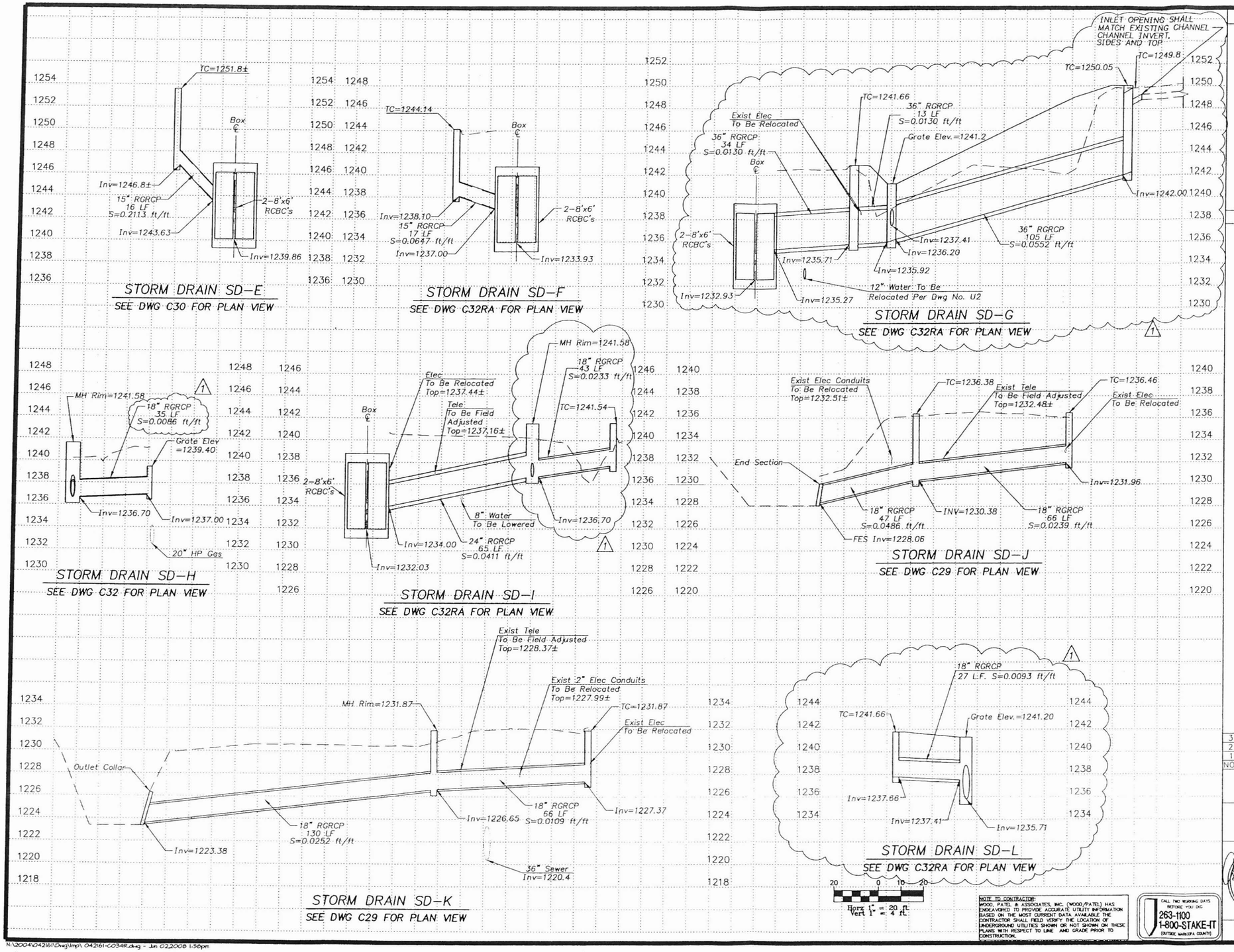
WOOD, PATEL & ASSOCIATES, INC.
2051 WEST NORTHERN AVENUE, SUITE 100
PHOENIX, ARIZONA (602) 335-8500

DRAWING NO. C32RA

LOCAL DRAINAGE IMPROVEMENTS ROSE GARDEN LANE/107th AVE

SHEET OF 46R

N:\2004\042161\Dwg\mp\ 042161-C032R.dwg - Jun 02,2008 2:20pm



NOTE TO CONTRACTOR:
WOOD, PATEL & ASSOCIATES, INC. (WOOD/PATEL) HAS ENDEAVORED TO PROVIDE ACCURATE UTILITY INFORMATION BASED ON THE MOST CURRENT DATA AVAILABLE. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF UNDERGROUND UTILITIES SHOWN OR NOT SHOWN ON THESE PLANS WITH RESPECT TO LINE AND GRADE PRIOR TO CONSTRUCTION.

CALL TWO WORKING DAYS BEFORE YOU DIG
263-1100
1-800-STAKE-IT
(OUTSIDE MARICOPA COUNTY)

☐ REMOVE ☐

○ CONSTRUCT ○

NO.	REVISION	BY	DATE
3			
2			
1	STORM DRAIN REVISIONS	ABM	5/08

CITY OF PEORIA
ENGINEERING DIVISION

ROSE GARDEN LANE
DRAINAGE IMPROVEMENTS
PEORIA PROJECT NO. SS-0203

	BY	DATE
DESIGNED	P. LOPEZ	4/07
DRAWN	R. NEIFFER	4/07
CHECKED	A. MORRICE	4/07

Registered Professional Engineer (Civil) 36583 ALAN B. MORRICE ARIZONA, U.S.A.

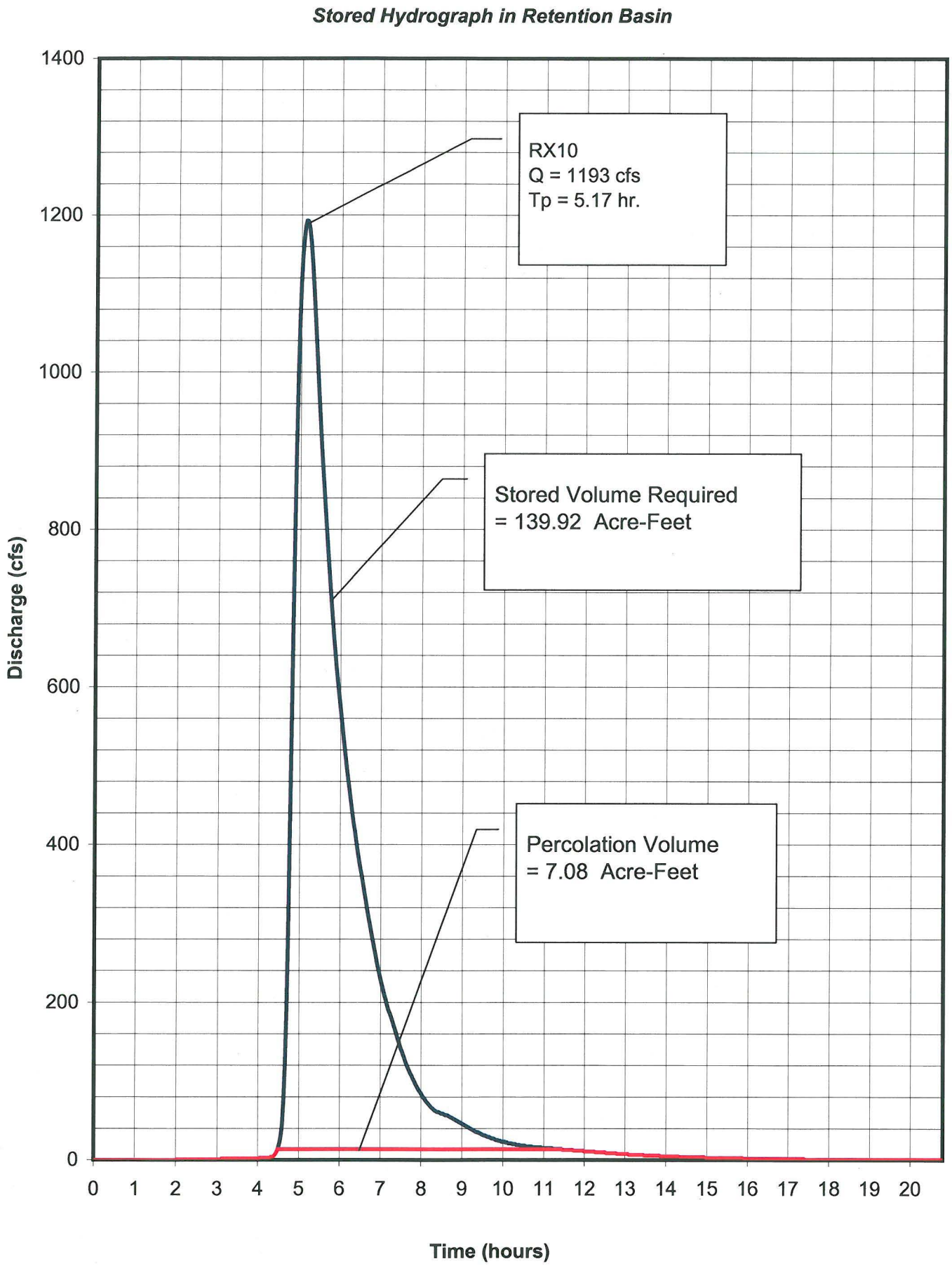
WOOD, PATEL & ASSOCIATES, INC.
2051 WEST NORTHERN AVENUE, SUITE 100
PHOENIX, ARIZONA (602) 335-8500

DRAWING NO. C34R

STORM DRAIN PROFILES
ROSE GARDEN LANE

SHEET OF 48R

N:\2004\042161\Dwg\Imp\042161-C034R.dwg - Jun 02 2008 1:56pm


Stored Hydrograph in Retention Basin
RX10
Q = 1193 cfs
Tp = 5.17 hr.
Stored Volume Required
= 139.92 Acre-Feet
Percolation Volume
= 7.08 Acre-Feet
Discharge (cfs)
Time (hours)
0
200
400
600
800
1000
1200
1400
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Ordinate	Time (minutes)	Time (hours)	Flow Rate (cfs)	Percolation	Difference	Stored Volume (CY)	Stored Volume (ac-ft)	Cummulative Volume (ac-ft)
0	0	0.00	0	0	0	0	0.00	0.00
1	2	0.03	0	0	0	0	0.00	0.00
2	4	0.07	0	0	0	0	0.00	0.00
3	6	0.10	0	0	0	0	0.00	0.00
4	8	0.13	0	0	0	0	0.00	0.00
5	10	0.17	0	0	0	0	0.00	0.00
6	12	0.20	0	0	0	0	0.00	0.00
7	14	0.23	0	0	0	0	0.00	0.00
8	16	0.27	0	0	0	0	0.00	0.00
9	18	0.30	0	0	0	0	0.00	0.00
10	20	0.33	0	0	0	0	0.00	0.00
11	22	0.37	0	0	0	0	0.00	0.00
12	24	0.40	0	0	0	0	0.00	0.00
13	26	0.43	0	0	0	0	0.00	0.00
14	28	0.47	0	0	0	0	0.00	0.00
15	30	0.50	0	0	0	0	0.00	0.00
16	32	0.53	0	0	0	0	0.00	0.00
17	34	0.57	0	0	0	0	0.00	0.00
18	36	0.60	0	0	0	0	0.00	0.00
19	38	0.63	0	0	0	0	0.00	0.00
20	40	0.67	0	0	0	0	0.00	0.00
21	42	0.70	0	0	0	0	0.00	0.00
22	44	0.73	0	0	0	0	0.00	0.00
23	46	0.77	0	0	0	0	0.00	0.00
24	48	0.80	0	0	0	0	0.00	0.00
25	50	0.83	0	0	0	0	0.00	0.00
26	52	0.87	0	0	0	0	0.00	0.00
27	54	0.90	0	0	0	0	0.00	0.00
28	56	0.93	0	0	0	0	0.00	0.00
29	58	0.97	0	0	0	0	0.00	0.00
30	60	1.00	0	0	0	0	0.00	0.00
31	62	1.03	0	0	0	0	0.00	0.00
32	64	1.07	0	0	0	0	0.00	0.00
33	66	1.10	0	0	0	0	0.00	0.00
34	68	1.13	0	0	0	0	0.00	0.00
35	70	1.17	0	0	0	0	0.00	0.00
36	72	1.20	0	0	0	0	0.00	0.00
37	74	1.23	0	0	0	0	0.00	0.00
38	76	1.27	0	0	0	0	0.00	0.00
39	78	1.30	0	0	0	0	0.00	0.00
40	80	1.33	0	0	0	0	0.00	0.00
41	82	1.37	0	0	0	0	0.00	0.00
42	84	1.40	0	0	0	0	0.00	0.00
43	86	1.43	0	0	0	0	0.00	0.00
44	88	1.47	0	0	0	0	0.00	0.00
45	90	1.50	0	0	0	0	0.00	0.00
46	92	1.53	0	0	0	0	0.00	0.00
47	94	1.57	0	0	0	0	0.00	0.00
48	96	1.60	0	0	0	0	0.00	0.00
49	98	1.63	0	0	0	0	0.00	0.00
50	100	1.67	0	0	0	0	0.00	0.00
51	102	1.70	0	0	0	0	0.00	0.00
52	104	1.73	0	0	0	0	0.00	0.00
53	106	1.77	0	0	0	0	0.00	0.00
54	108	1.80	0	0	0	0	0.00	0.00
55	110	1.83	0	0	0	0	0.00	0.00
56	112	1.87	0	0	0	0	0.00	0.00
57	114	1.90	0	0	0	0	0.00	0.00
58	116	1.93	0	0	0	0	0.00	0.00
59	118	1.97	0	0	0	0	0.00	0.00
60	120	2.00	0	0	0	0	0.00	0.00
61	122	2.03	1	1	0	0	0.00	0.00
62	124	2.07	1	1	0	0	0.00	0.00

Ordinate	Time (minutes)	Time (hours)	Flow Rate (cfs)	Percolation	Difference	Stored Volume (CY)	Stored Volume (ac-ft)	Cummulative Volume (ac-ft)
63	126	2.10	1	1	0	0	0.00	0.00
64	128	2.13	1	1	0	0	0.00	0.00
65	130	2.17	1	1	0	0	0.00	0.00
66	132	2.20	1	1	0	0	0.00	0.00
67	134	2.23	1	1	0	0	0.00	0.00
68	136	2.27	1	1	0	0	0.00	0.00
69	138	2.30	1	1	0	0	0.00	0.00
70	140	2.33	1	1	0	0	0.00	0.00
71	142	2.37	1	1	0	0	0.00	0.00
72	144	2.40	1	1	0	0	0.00	0.00
73	146	2.43	1	1	0	0	0.00	0.00
74	148	2.47	1	1	0	0	0.00	0.00
75	150	2.50	1	1	0	0	0.00	0.00
76	152	2.53	1	1	0	0	0.00	0.00
77	154	2.57	1	1	0	0	0.00	0.00
78	156	2.60	1	1	0	0	0.00	0.00
79	158	2.63	1	1	0	0	0.00	0.00
80	160	2.67	1	1	0	0	0.00	0.00
81	162	2.70	1	1	0	0	0.00	0.00
82	164	2.73	1	1	0	0	0.00	0.00
83	166	2.77	1	1	0	0	0.00	0.00
84	168	2.80	1	1	0	0	0.00	0.00
85	170	2.83	1	1	0	0	0.00	0.00
86	172	2.87	1	1	0	0	0.00	0.00
87	174	2.90	1	1	0	0	0.00	0.00
88	176	2.93	1	1	0	0	0.00	0.00
89	178	2.97	1	1	0	0	0.00	0.00
90	180	3.00	1	1	0	0	0.00	0.00
91	182	3.03	1	1	0	0	0.00	0.00
92	184	3.07	1	1	0	0	0.00	0.00
93	186	3.10	1	1	0	0	0.00	0.00
94	188	3.13	2	2	0	0	0.00	0.00
95	190	3.17	2	2	0	0	0.00	0.00
96	192	3.20	2	2	0	0	0.00	0.00
97	194	3.23	2	2	0	0	0.00	0.00
98	196	3.27	2	2	0	0	0.00	0.00
99	198	3.30	2	2	0	0	0.00	0.00
100	200	3.33	2	2	0	0	0.00	0.00
101	202	3.37	2	2	0	0	0.00	0.00
102	204	3.40	2	2	0	0	0.00	0.00
103	206	3.43	2	2	0	0	0.00	0.00
104	208	3.47	2	2	0	0	0.00	0.00
105	210	3.50	2	2	0	0	0.00	0.00
106	212	3.53	2	2	0	0	0.00	0.00
107	214	3.57	2	2	0	0	0.00	0.00
108	216	3.60	2	2	0	0	0.00	0.00
109	218	3.63	2	2	0	0	0.00	0.00
110	220	3.67	2	2	0	0	0.00	0.00
111	222	3.70	2	2	0	0	0.00	0.00
112	224	3.73	2	2	0	0	0.00	0.00
113	226	3.77	2	2	0	0	0.00	0.00
114	228	3.80	2	2	0	0	0.00	0.00
115	230	3.83	2	2	0	0	0.00	0.00
116	232	3.87	2	2	0	0	0.00	0.00
117	234	3.90	2	2	0	0	0.00	0.00
118	236	3.93	2	2	0	0	0.00	0.00
119	238	3.97	2	2	0	0	0.00	0.00
120	240	4.00	2	2	0	0	0.00	0.00
121	242	4.03	2	2	0	0	0.00	0.00
122	244	4.07	3	3	0	0	0.00	0.00
123	246	4.10	3	3	0	0	0.00	0.00
124	248	4.13	3	3	0	0	0.00	0.00
125	250	4.17	3	3	0	0	0.00	0.00

Ordinate	Time (minutes)	Time (hours)	Flow Rate (cfs)	Percolation	Difference	Stored Volume (CY)	Stored Volume (ac-ft)	Cummulative Volume (ac-ft)
126	252	4.20	3	3	0	0	0.00	0.00
127	254	4.23	3	3	0	0	0.00	0.00
128	256	4.27	3	3	0	0	0.00	0.00
129	258	4.30	3	3	0	0	0.00	0.00
130	260	4.33	4	4	0	0	0.00	0.00
131	262	4.37	4	4	0	0	0.00	0.00
132	264	4.40	5	5	0	0	0.00	0.00
133	266	4.43	7	7	0	0	0.00	0.00
134	268	4.47	10	10	0	0	0.00	0.00
135	270	4.50	14	13.9	0.1	6	0.00	0.00
136	272	4.53	21	13.9	7.1	432	0.01	0.01
137	274	4.57	31	13.9	17.1	1452	0.03	0.04
138	276	4.60	46	13.9	32.1	2952	0.07	0.11
139	278	4.63	79	13.9	65.1	5832	0.13	0.25
140	280	4.67	125	13.9	111.1	10572	0.24	0.49
141	282	4.70	194	13.9	180.1	17472	0.40	0.89
142	284	4.73	292	13.9	278.1	27492	0.63	1.52
143	286	4.77	419	13.9	405.1	40992	0.94	2.46
144	288	4.80	546	13.9	532.1	56232	1.29	3.75
145	290	4.83	679	13.9	665.1	71832	1.65	5.40
146	292	4.87	794	13.9	780.1	86712	1.99	7.39
147	294	4.90	903	13.9	889.1	100152	2.30	9.69
148	296	4.93	993	13.9	979.1	112092	2.57	12.26
149	298	4.97	1062	13.9	1048.1	121632	2.79	15.06
150	300	5.00	1113	13.9	1099.1	128832	2.96	18.01
151	302	5.03	1148	13.9	1134.1	133992	3.08	21.09
152	304	5.07	1170	13.9	1156.1	137412	3.15	24.24
153	306	5.10	1185	13.9	1171.1	139632	3.21	27.45
154	308	5.13	1193	13.9	1179.1	141012	3.24	30.69
155	310	5.17	1192	13.9	1178.1	141432	3.25	33.93
156	312	5.20	1182	13.9	1168.1	140772	3.23	37.17
157	314	5.23	1165	13.9	1151.1	139152	3.19	40.36
158	316	5.27	1142	13.9	1128.1	136752	3.14	43.50
159	318	5.30	1114	13.9	1100.1	133692	3.07	46.57
160	320	5.33	1083	13.9	1069.1	130152	2.99	49.56
161	322	5.37	1050	13.9	1036.1	126312	2.90	52.46
162	324	5.40	1017	13.9	1003.1	122352	2.81	55.27
163	326	5.43	983	13.9	969.1	118332	2.72	57.98
164	328	5.47	951	13.9	937.1	114372	2.63	60.61
165	330	5.50	919	13.9	905.1	110532	2.54	63.14
166	332	5.53	890	13.9	876.1	106872	2.45	65.60
167	334	5.57	864	13.9	850.1	103572	2.38	67.98
168	336	5.60	837	13.9	823.1	100392	2.30	70.28
169	338	5.63	810	13.9	796.1	97152	2.23	72.51
170	340	5.67	784	13.9	770.1	93972	2.16	74.67
171	342	5.70	758	13.9	744.1	90852	2.09	76.75
172	344	5.73	734	13.9	720.1	87852	2.02	78.77
173	346	5.77	710	13.9	696.1	84972	1.95	80.72
174	348	5.80	687	13.9	673.1	82152	1.89	82.61
175	350	5.83	665	13.9	651.1	79452	1.82	84.43
176	352	5.87	645	13.9	631.1	76932	1.77	86.20
177	354	5.90	625	13.9	611.1	74532	1.71	87.91
178	356	5.93	608	13.9	594.1	72312	1.66	89.57
179	358	5.97	592	13.9	578.1	70332	1.61	91.18
180	360	6.00	575	13.9	561.1	68352	1.57	92.75
181	362	6.03	559	13.9	545.1	66372	1.52	94.28
182	364	6.07	542	13.9	528.1	64392	1.48	95.75
183	366	6.10	526	13.9	512.1	62412	1.43	97.19
184	368	6.13	510	13.9	496.1	60492	1.39	98.58
185	370	6.17	495	13.9	481.1	58632	1.35	99.92
186	372	6.20	481	13.9	467.1	56892	1.31	101.23
187	374	6.23	468	13.9	454.1	55272	1.27	102.50
188	376	6.27	454	13.9	440.1	53652	1.23	103.73

Ordinate	Time (minutes)	Time (hours)	Flow Rate (cfs)	Percolation	Difference	Stored Volume (CY)	Stored Volume (ac-ft)	Cummulative Volume (ac-ft)
189	378	6.30	441	13.9	427.1	52032	1.19	104.92
190	380	6.33	428	13.9	414.1	50472	1.16	106.08
191	382	6.37	416	13.9	402.1	48972	1.12	107.21
192	384	6.40	403	13.9	389.1	47472	1.09	108.30
193	386	6.43	391	13.9	377.1	45972	1.06	109.35
194	388	6.47	380	13.9	366.1	44592	1.02	110.37
195	390	6.50	370	13.9	356.1	43332	0.99	111.37
196	392	6.53	361	13.9	347.1	42192	0.97	112.34
197	394	6.57	351	13.9	337.1	41052	0.94	113.28
198	396	6.60	340	13.9	326.1	39792	0.91	114.19
199	398	6.63	330	13.9	316.1	38532	0.88	115.08
200	400	6.67	319	13.9	305.1	37272	0.86	115.93
201	402	6.70	309	13.9	295.1	36012	0.83	116.76
202	404	6.73	300	13.9	286.1	34872	0.80	117.56
203	406	6.77	290	13.9	276.1	33732	0.77	118.34
204	408	6.80	281	13.9	267.1	32592	0.75	119.08
205	410	6.83	272	13.9	258.1	31512	0.72	119.81
206	412	6.87	263	13.9	249.1	30432	0.70	120.51
207	414	6.90	254	13.9	240.1	29352	0.67	121.18
208	416	6.93	246	13.9	232.1	28332	0.65	121.83
209	418	6.97	238	13.9	224.1	27372	0.63	122.46
210	420	7.00	230	13.9	216.1	26412	0.61	123.06
211	422	7.03	223	13.9	209.1	25512	0.59	123.65
212	424	7.07	216	13.9	202.1	24672	0.57	124.22
213	426	7.10	209	13.9	195.1	23832	0.55	124.76
214	428	7.13	203	13.9	189.1	23052	0.53	125.29
215	430	7.17	196	13.9	182.1	22272	0.51	125.80
216	432	7.20	190	13.9	176.1	21492	0.49	126.30
217	434	7.23	186	13.9	172.1	20892	0.48	126.78
218	436	7.27	181	13.9	167.1	20352	0.47	127.24
219	438	7.30	176	13.9	162.1	19752	0.45	127.70
220	440	7.33	170	13.9	156.1	19092	0.44	128.14
221	442	7.37	165	13.9	151.1	18432	0.42	128.56
222	444	7.40	159	13.9	145.1	17772	0.41	128.97
223	446	7.43	153	13.9	139.1	17052	0.39	129.36
224	448	7.47	148	13.9	134.1	16392	0.38	129.74
225	450	7.50	142	13.9	128.1	15732	0.36	130.10
226	452	7.53	137	13.9	123.1	15072	0.35	130.44
227	454	7.57	132	13.9	118.1	14472	0.33	130.77
228	456	7.60	127	13.9	113.1	13872	0.32	131.09
229	458	7.63	122	13.9	108.1	13272	0.30	131.40
230	460	7.67	118	13.9	104.1	12732	0.29	131.69
231	462	7.70	114	13.9	100.1	12252	0.28	131.97
232	464	7.73	110	13.9	96.1	11772	0.27	132.24
233	466	7.77	107	13.9	93.1	11352	0.26	132.50
234	468	7.80	103	13.9	89.1	10932	0.25	132.75
235	470	7.83	100	13.9	86.1	10512	0.24	132.99
236	472	7.87	96	13.9	82.1	10092	0.23	133.23
237	474	7.90	93	13.9	79.1	9672	0.22	133.45
238	476	7.93	90	13.9	76.1	9312	0.21	133.66
239	478	7.97	87	13.9	73.1	8952	0.21	133.87
240	480	8.00	85	13.9	71.1	8652	0.20	134.07
241	482	8.03	82	13.9	68.1	8352	0.19	134.26
242	484	8.07	79	13.9	65.1	7992	0.18	134.44
243	486	8.10	77	13.9	63.1	7692	0.18	134.62
244	488	8.13	74	13.9	60.1	7392	0.17	134.79
245	490	8.17	72	13.9	58.1	7092	0.16	134.95
246	492	8.20	70	13.9	56.1	6852	0.16	135.11
247	494	8.23	68	13.9	54.1	6612	0.15	135.26
248	496	8.27	66	13.9	52.1	6372	0.15	135.41
249	498	8.30	65	13.9	51.1	6192	0.14	135.55
250	500	8.33	63	13.9	49.1	6012	0.14	135.69
251	502	8.37	62	13.9	48.1	5832	0.13	135.82

Ordinate	Time (minutes)	Time (hours)	Flow Rate (cfs)	Percolation	Difference	Stored Volume (CY)	Stored Volume (ac-ft)	Cummulative Volume (ac-ft)
252	504	8.40	61	13.9	47.1	5712	0.13	135.95
253	506	8.43	61	13.9	47.1	5652	0.13	136.08
254	508	8.47	60	13.9	46.1	5592	0.13	136.21
255	510	8.50	59	13.9	45.1	5472	0.13	136.33
256	512	8.53	59	13.9	45.1	5412	0.12	136.46
257	514	8.57	58	13.9	44.1	5352	0.12	136.58
258	516	8.60	57	13.9	43.1	5232	0.12	136.70
259	518	8.63	57	13.9	43.1	5172	0.12	136.82
260	520	8.67	56	13.9	42.1	5112	0.12	136.94
261	522	8.70	55	13.9	41.1	4992	0.11	137.05
262	524	8.73	54	13.9	40.1	4872	0.11	137.16
263	526	8.77	53	13.9	39.1	4752	0.11	137.27
264	528	8.80	52	13.9	38.1	4632	0.11	137.38
265	530	8.83	51	13.9	37.1	4512	0.10	137.48
266	532	8.87	50	13.9	36.1	4392	0.10	137.58
267	534	8.90	49	13.9	35.1	4272	0.10	137.68
268	536	8.93	48	13.9	34.1	4152	0.10	137.78
269	538	8.97	47	13.9	33.1	4032	0.09	137.87
270	540	9.00	46	13.9	32.1	3912	0.09	137.96
271	542	9.03	45	13.9	31.1	3792	0.09	138.05
272	544	9.07	44	13.9	30.1	3672	0.08	138.13
273	546	9.10	43	13.9	29.1	3552	0.08	138.21
274	548	9.13	42	13.9	28.1	3432	0.08	138.29
275	550	9.17	41	13.9	27.1	3312	0.08	138.37
276	552	9.20	40	13.9	26.1	3192	0.07	138.44
277	554	9.23	39	13.9	25.1	3072	0.07	138.51
278	556	9.27	38	13.9	24.1	2952	0.07	138.58
279	558	9.30	37	13.9	23.1	2832	0.07	138.64
280	560	9.33	36	13.9	22.1	2712	0.06	138.71
281	562	9.37	35	13.9	21.1	2592	0.06	138.77
282	564	9.40	35	13.9	21.1	2532	0.06	138.82
283	566	9.43	34	13.9	20.1	2472	0.06	138.88
284	568	9.47	33	13.9	19.1	2352	0.05	138.94
285	570	9.50	32	13.9	18.1	2232	0.05	138.99
286	572	9.53	31	13.9	17.1	2112	0.05	139.03
287	574	9.57	31	13.9	17.1	2052	0.05	139.08
288	576	9.60	30	13.9	16.1	1992	0.05	139.13
289	578	9.63	29	13.9	15.1	1872	0.04	139.17
290	580	9.67	29	13.9	15.1	1812	0.04	139.21
291	582	9.70	28	13.9	14.1	1752	0.04	139.25
292	584	9.73	27	13.9	13.1	1632	0.04	139.29
293	586	9.77	27	13.9	13.1	1572	0.04	139.33
294	588	9.80	26	13.9	12.1	1512	0.03	139.36
295	590	9.83	25	13.9	11.1	1392	0.03	139.39
296	592	9.87	25	13.9	11.1	1332	0.03	139.42
297	594	9.90	24	13.9	10.1	1272	0.03	139.45
298	596	9.93	24	13.9	10.1	1212	0.03	139.48
299	598	9.97	23	13.9	9.1	1152	0.03	139.51
300	600	10.00	23	13.9	9.1	1092	0.03	139.53
301	602	10.03	23	13.9	9.1	1092	0.03	139.56
302	604	10.07	22	13.9	8.1	1032	0.02	139.58
303	606	10.10	22	13.9	8.1	972	0.02	139.60
304	608	10.13	21	13.9	7.1	912	0.02	139.62
305	610	10.17	21	13.9	7.1	852	0.02	139.64
306	612	10.20	21	13.9	7.1	852	0.02	139.66
307	614	10.23	20	13.9	6.1	792	0.02	139.68
308	616	10.27	20	13.9	6.1	732	0.02	139.70
309	618	10.30	20	13.9	6.1	732	0.02	139.71
310	620	10.33	19	13.9	5.1	672	0.02	139.73
311	622	10.37	19	13.9	5.1	612	0.01	139.74
312	624	10.40	19	13.9	5.1	612	0.01	139.76
313	626	10.43	18	13.9	4.1	552	0.01	139.77
314	628	10.47	18	13.9	4.1	492	0.01	139.78

Ordinate	Time (minutes)	Time (hours)	Flow Rate (cfs)	Percolation	Difference	Stored Volume (CY)	Stored Volume (ac-ft)	Cummulative Volume (ac-ft)
315	630	10.50	18	13.9	4.1	492	0.01	139.79
316	632	10.53	18	13.9	4.1	492	0.01	139.80
317	634	10.57	17	13.9	3.1	432	0.01	139.81
318	636	10.60	17	13.9	3.1	372	0.01	139.82
319	638	10.63	17	13.9	3.1	372	0.01	139.83
320	640	10.67	17	13.9	3.1	372	0.01	139.84
321	642	10.70	17	13.9	3.1	372	0.01	139.85
322	644	10.73	16	13.9	2.1	312	0.01	139.86
323	646	10.77	16	13.9	2.1	252	0.01	139.86
324	648	10.80	16	13.9	2.1	252	0.01	139.87
325	650	10.83	16	13.9	2.1	252	0.01	139.87
326	652	10.87	16	13.9	2.1	252	0.01	139.88
327	654	10.90	16	13.9	2.1	252	0.01	139.88
328	656	10.93	16	13.9	2.1	252	0.01	139.89
329	658	10.97	15	13.9	1.1	192	0.00	139.90
330	660	11.00	15	13.9	1.1	132	0.00	139.90
331	662	11.03	15	13.9	1.1	132	0.00	139.90
332	664	11.07	15	13.9	1.1	132	0.00	139.90
333	666	11.10	15	13.9	1.1	132	0.00	139.91
334	668	11.13	15	13.9	1.1	132	0.00	139.91
335	670	11.17	15	13.9	1.1	132	0.00	139.91
336	672	11.20	15	13.9	1.1	132	0.00	139.92
337	674	11.23	14	13.9	0.1	72	0.00	139.92
338	676	11.27	14	13.9	0.1	12	0.00	139.92
339	678	11.30	14	13.9	0.1	12	0.00	139.92
340	680	11.33	14	13.9	0.1	12	0.00	139.92
341	682	11.37	14	13.9	0.1	12	0.00	139.92
342	684	11.40	14	13.9	0.1	12	0.00	139.92
343	686	11.43	14	13.9	0.1	12	0.00	139.92
344	688	11.47	13	13	0	6	0.00	139.92
345	690	11.50	13	13	0	0	0.00	139.92
346	692	11.53	13	13	0	0	0.00	139.92
347	694	11.57	13	13	0	0	0.00	139.92
348	696	11.60	13	13	0	0	0.00	139.92
349	698	11.63	13	13	0	0	0.00	139.92
350	700	11.67	13	13	0	0	0.00	139.92
351	702	11.70	13	13	0	0	0.00	139.92
352	704	11.73	12	12	0	0	0.00	139.92
353	706	11.77	12	12	0	0	0.00	139.92
354	708	11.80	12	12	0	0	0.00	139.92
355	710	11.83	12	12	0	0	0.00	139.92
356	712	11.87	12	12	0	0	0.00	139.92
357	714	11.90	12	12	0	0	0.00	139.92
358	716	11.93	12	12	0	0	0.00	139.92
359	718	11.97	12	12	0	0	0.00	139.92
360	720	12.00	11	11	0	0	0.00	139.92
361	722	12.03	11	11	0	0	0.00	139.92
362	724	12.07	11	11	0	0	0.00	139.92
363	726	12.10	11	11	0	0	0.00	139.92
364	728	12.13	11	11	0	0	0.00	139.92
365	730	12.17	11	11	0	0	0.00	139.92
366	732	12.20	11	11	0	0	0.00	139.92
367	734	12.23	11	11	0	0	0.00	139.92
368	736	12.27	10	10	0	0	0.00	139.92
369	738	12.30	10	10	0	0	0.00	139.92
370	740	12.33	10	10	0	0	0.00	139.92
371	742	12.37	10	10	0	0	0.00	139.92
372	744	12.40	10	10	0	0	0.00	139.92
373	746	12.43	10	10	0	0	0.00	139.92
374	748	12.47	10	10	0	0	0.00	139.92
375	750	12.50	10	10	0	0	0.00	139.92
376	752	12.53	9	9	0	0	0.00	139.92
377	754	12.57	9	9	0	0	0.00	139.92

Ordinate	Time (minutes)	Time (hours)	Flow Rate (cfs)	Percolation	Difference	Stored Volume (CY)	Stored Volume (ac-ft)	Cummulative Volume (ac-ft)
378	756	12.60	9	9	0	0	0.00	139.92
379	758	12.63	9	9	0	0	0.00	139.92
380	760	12.67	9	9	0	0	0.00	139.92
381	762	12.70	9	9	0	0	0.00	139.92
382	764	12.73	9	9	0	0	0.00	139.92
383	766	12.77	9	9	0	0	0.00	139.92
384	768	12.80	8	8	0	0	0.00	139.92
385	770	12.83	8	8	0	0	0.00	139.92
386	772	12.87	8	8	0	0	0.00	139.92
387	774	12.90	8	8	0	0	0.00	139.92
388	776	12.93	8	8	0	0	0.00	139.92
389	778	12.97	8	8	0	0	0.00	139.92
390	780	13.00	8	8	0	0	0.00	139.92
391	782	13.03	8	8	0	0	0.00	139.92
392	784	13.07	8	8	0	0	0.00	139.92
393	786	13.10	7	7	0	0	0.00	139.92
394	788	13.13	7	7	0	0	0.00	139.92
395	790	13.17	7	7	0	0	0.00	139.92
396	792	13.20	7	7	0	0	0.00	139.92
397	794	13.23	7	7	0	0	0.00	139.92
398	796	13.27	7	7	0	0	0.00	139.92
399	798	13.30	7	7	0	0	0.00	139.92
400	800	13.33	7	7	0	0	0.00	139.92
401	802	13.37	7	7	0	0	0.00	139.92
402	804	13.40	7	7	0	0	0.00	139.92
403	806	13.43	7	7	0	0	0.00	139.92
404	808	13.47	6	6	0	0	0.00	139.92
405	810	13.50	6	6	0	0	0.00	139.92
406	812	13.53	6	6	0	0	0.00	139.92
407	814	13.57	6	6	0	0	0.00	139.92
408	816	13.60	6	6	0	0	0.00	139.92
409	818	13.63	6	6	0	0	0.00	139.92
410	820	13.67	6	6	0	0	0.00	139.92
411	822	13.70	6	6	0	0	0.00	139.92
412	824	13.73	6	6	0	0	0.00	139.92
413	826	13.77	6	6	0	0	0.00	139.92
414	828	13.80	6	6	0	0	0.00	139.92
415	830	13.83	6	6	0	0	0.00	139.92
416	832	13.87	5	5	0	0	0.00	139.92
417	834	13.90	5	5	0	0	0.00	139.92
418	836	13.93	5	5	0	0	0.00	139.92
419	838	13.97	5	5	0	0	0.00	139.92
420	840	14.00	5	5	0	0	0.00	139.92
421	842	14.03	5	5	0	0	0.00	139.92
422	844	14.07	5	5	0	0	0.00	139.92
423	846	14.10	5	5	0	0	0.00	139.92
424	848	14.13	5	5	0	0	0.00	139.92
425	850	14.17	5	5	0	0	0.00	139.92
426	852	14.20	5	5	0	0	0.00	139.92
427	854	14.23	5	5	0	0	0.00	139.92
428	856	14.27	5	5	0	0	0.00	139.92
429	858	14.30	5	5	0	0	0.00	139.92
430	860	14.33	4	4	0	0	0.00	139.92
431	862	14.37	4	4	0	0	0.00	139.92
432	864	14.40	4	4	0	0	0.00	139.92
433	866	14.43	4	4	0	0	0.00	139.92
434	868	14.47	4	4	0	0	0.00	139.92
435	870	14.50	4	4	0	0	0.00	139.92
436	872	14.53	4	4	0	0	0.00	139.92
437	874	14.57	4	4	0	0	0.00	139.92
438	876	14.60	4	4	0	0	0.00	139.92
439	878	14.63	4	4	0	0	0.00	139.92
440	880	14.67	4	4	0	0	0.00	139.92

Ordinate	Time (minutes)	Time (hours)	Flow Rate (cfs)	Percolation	Difference	Stored Volume (CY)	Stored Volume (ac-ft)	Cummulative Volume (ac-ft)
441	882	14.70	4	4	0	0	0.00	139.92
442	884	14.73	4	4	0	0	0.00	139.92
443	886	14.77	4	4	0	0	0.00	139.92
444	888	14.80	4	4	0	0	0.00	139.92
445	890	14.83	4	4	0	0	0.00	139.92
446	892	14.87	4	4	0	0	0.00	139.92
447	894	14.90	4	4	0	0	0.00	139.92
448	896	14.93	4	4	0	0	0.00	139.92
449	898	14.97	3	3	0	0	0.00	139.92
450	900	15.00	3	3	0	0	0.00	139.92
451	902	15.03	3	3	0	0	0.00	139.92
452	904	15.07	3	3	0	0	0.00	139.92
453	906	15.10	3	3	0	0	0.00	139.92
454	908	15.13	3	3	0	0	0.00	139.92
455	910	15.17	3	3	0	0	0.00	139.92
456	912	15.20	3	3	0	0	0.00	139.92
457	914	15.23	3	3	0	0	0.00	139.92
458	916	15.27	3	3	0	0	0.00	139.92
459	918	15.30	3	3	0	0	0.00	139.92
460	920	15.33	3	3	0	0	0.00	139.92
461	922	15.37	3	3	0	0	0.00	139.92
462	924	15.40	3	3	0	0	0.00	139.92
463	926	15.43	3	3	0	0	0.00	139.92
464	928	15.47	3	3	0	0	0.00	139.92
465	930	15.50	3	3	0	0	0.00	139.92
466	932	15.53	3	3	0	0	0.00	139.92
467	934	15.57	3	3	0	0	0.00	139.92
468	936	15.60	3	3	0	0	0.00	139.92
469	938	15.63	3	3	0	0	0.00	139.92
470	940	15.67	3	3	0	0	0.00	139.92
471	942	15.70	3	3	0	0	0.00	139.92
472	944	15.73	3	3	0	0	0.00	139.92
473	946	15.77	3	3	0	0	0.00	139.92
474	948	15.80	3	3	0	0	0.00	139.92
475	950	15.83	3	3	0	0	0.00	139.92
476	952	15.87	3	3	0	0	0.00	139.92
477	954	15.90	2	2	0	0	0.00	139.92
478	956	15.93	2	2	0	0	0.00	139.92
479	958	15.97	2	2	0	0	0.00	139.92
480	960	16.00	2	2	0	0	0.00	139.92
481	962	16.03	2	2	0	0	0.00	139.92
482	964	16.07	2	2	0	0	0.00	139.92
483	966	16.10	2	2	0	0	0.00	139.92
484	968	16.13	2	2	0	0	0.00	139.92
485	970	16.17	2	2	0	0	0.00	139.92
486	972	16.20	2	2	0	0	0.00	139.92
487	974	16.23	2	2	0	0	0.00	139.92
488	976	16.27	2	2	0	0	0.00	139.92
489	978	16.30	2	2	0	0	0.00	139.92
490	980	16.33	2	2	0	0	0.00	139.92
491	982	16.37	2	2	0	0	0.00	139.92
492	984	16.40	2	2	0	0	0.00	139.92
493	986	16.43	2	2	0	0	0.00	139.92
494	988	16.47	2	2	0	0	0.00	139.92
495	990	16.50	2	2	0	0	0.00	139.92
496	992	16.53	2	2	0	0	0.00	139.92
497	994	16.57	2	2	0	0	0.00	139.92
498	996	16.60	2	2	0	0	0.00	139.92
499	998	16.63	2	2	0	0	0.00	139.92
500	1000	16.67	2	2	0	0	0.00	139.92
501	1002	16.70	2	2	0	0	0.00	139.92
502	1004	16.73	2	2	0	0	0.00	139.92
503	1006	16.77	2	2	0	0	0.00	139.92

Ordinate	Time (minutes)	Time (hours)	Flow Rate (cfs)	Percolation	Difference	Stored Volume (CY)	Stored Volume (ac-ft)	Cummulative Volume (ac-ft)
504	1008	16.80	2	2	0	0	0.00	139.92
505	1010	16.83	2	2	0	0	0.00	139.92
506	1012	16.87	2	2	0	0	0.00	139.92
507	1014	16.90	2	2	0	0	0.00	139.92
508	1016	16.93	2	2	0	0	0.00	139.92
509	1018	16.97	2	2	0	0	0.00	139.92
510	1020	17.00	2	2	0	0	0.00	139.92
511	1022	17.03	2	2	0	0	0.00	139.92
512	1024	17.07	2	2	0	0	0.00	139.92
513	1026	17.10	2	2	0	0	0.00	139.92
514	1028	17.13	2	2	0	0	0.00	139.92
515	1030	17.17	2	2	0	0	0.00	139.92
516	1032	17.20	2	2	0	0	0.00	139.92
517	1034	17.23	2	2	0	0	0.00	139.92
518	1036	17.27	2	2	0	0	0.00	139.92
519	1038	17.30	2	2	0	0	0.00	139.92
520	1040	17.33	2	2	0	0	0.00	139.92
521	1042	17.37	2	2	0	0	0.00	139.92
522	1044	17.40	2	2	0	0	0.00	139.92
523	1046	17.43	1	1	0	0	0.00	139.92
524	1048	17.47	1	1	0	0	0.00	139.92
525	1050	17.50	1	1	0	0	0.00	139.92
526	1052	17.53	1	1	0	0	0.00	139.92
527	1054	17.57	1	1	0	0	0.00	139.92
528	1056	17.60	1	1	0	0	0.00	139.92
529	1058	17.63	1	1	0	0	0.00	139.92
530	1060	17.67	1	1	0	0	0.00	139.92
531	1062	17.70	1	1	0	0	0.00	139.92
532	1064	17.73	1	1	0	0	0.00	139.92
533	1066	17.77	1	1	0	0	0.00	139.92
534	1068	17.80	1	1	0	0	0.00	139.92
535	1070	17.83	1	1	0	0	0.00	139.92
536	1072	17.87	1	1	0	0	0.00	139.92
537	1074	17.90	1	1	0	0	0.00	139.92
538	1076	17.93	1	1	0	0	0.00	139.92
539	1078	17.97	1	1	0	0	0.00	139.92
540	1080	18.00	1	1	0	0	0.00	139.92
541	1082	18.03	1	1	0	0	0.00	139.92
542	1084	18.07	1	1	0	0	0.00	139.92
543	1086	18.10	1	1	0	0	0.00	139.92
544	1088	18.13	1	1	0	0	0.00	139.92
545	1090	18.17	1	1	0	0	0.00	139.92
546	1092	18.20	1	1	0	0	0.00	139.92
547	1094	18.23	1	1	0	0	0.00	139.92
548	1096	18.27	1	1	0	0	0.00	139.92
549	1098	18.30	1	1	0	0	0.00	139.92
550	1100	18.33	1	1	0	0	0.00	139.92
551	1102	18.37	1	1	0	0	0.00	139.92
552	1104	18.40	1	1	0	0	0.00	139.92
553	1106	18.43	1	1	0	0	0.00	139.92
554	1108	18.47	1	1	0	0	0.00	139.92
555	1110	18.50	1	1	0	0	0.00	139.92
556	1112	18.53	1	1	0	0	0.00	139.92
557	1114	18.57	1	1	0	0	0.00	139.92
558	1116	18.60	1	1	0	0	0.00	139.92
559	1118	18.63	1	1	0	0	0.00	139.92
560	1120	18.67	1	1	0	0	0.00	139.92
561	1122	18.70	1	1	0	0	0.00	139.92
562	1124	18.73	1	1	0	0	0.00	139.92
563	1126	18.77	1	1	0	0	0.00	139.92
564	1128	18.80	1	1	0	0	0.00	139.92
565	1130	18.83	1	1	0	0	0.00	139.92
566	1132	18.87	1	1	0	0	0.00	139.92

Ordinate	Time (minutes)	Time (hours)	Flow Rate (cfs)	Percolation	Difference	Stored Volume (CY)	Stored Volume (ac-ft)	Cummulative Volume (ac-ft)
567	1134	18.90	1	1	0	0	0.00	139.92
568	1136	18.93	1	1	0	0	0.00	139.92
569	1138	18.97	1	1	0	0	0.00	139.92
570	1140	19.00	1	1	0	0	0.00	139.92
571	1142	19.03	1	1	0	0	0.00	139.92
572	1144	19.07	1	1	0	0	0.00	139.92
573	1146	19.10	1	1	0	0	0.00	139.92
574	1148	19.13	1	1	0	0	0.00	139.92
575	1150	19.17	1	1	0	0	0.00	139.92
576	1152	19.20	1	1	0	0	0.00	139.92
577	1154	19.23	1	1	0	0	0.00	139.92
578	1156	19.27	1	1	0	0	0.00	139.92
579	1158	19.30	1	1	0	0	0.00	139.92
580	1160	19.33	1	1	0	0	0.00	139.92
581	1162	19.37	1	1	0	0	0.00	139.92
582	1164	19.40	1	1	0	0	0.00	139.92
583	1166	19.43	1	1	0	0	0.00	139.92
584	1168	19.47	1	1	0	0	0.00	139.92
585	1170	19.50	1	1	0	0	0.00	139.92
586	1172	19.53	1	1	0	0	0.00	139.92
587	1174	19.57	1	1	0	0	0.00	139.92
588	1176	19.60	1	1	0	0	0.00	139.92
589	1178	19.63	1	1	0	0	0.00	139.92
590	1180	19.67	1	1	0	0	0.00	139.92
591	1182	19.70	1	1	0	0	0.00	139.92
592	1184	19.73	1	1	0	0	0.00	139.92
593	1186	19.77	1	1	0	0	0.00	139.92
594	1188	19.80	1	1	0	0	0.00	139.92
595	1190	19.83	1	1	0	0	0.00	139.92
596	1192	19.87	1	1	0	0	0.00	139.92
597	1194	19.90	1	1	0	0	0.00	139.92
598	1196	19.93	1	1	0	0	0.00	139.92
599	1198	19.97	1	1	0	0	0.00	139.92
600	1200	20.00	1	1	0	0	0.00	139.92
601	1202	20.03	1	1	0	0	0.00	139.92
602	1204	20.07	1	1	0	0	0.00	139.92
603	1206	20.10	1	1	0	0	0.00	139.92
604	1208	20.13	1	1	0	0	0.00	139.92
605	1210	20.17	1	1	0	0	0.00	139.92
606	1212	20.20	1	1	0	0	0.00	139.92
607	1214	20.23	1	1	0	0	0.00	139.92
608	1216	20.27	1	1	0	0	0.00	139.92
609	1218	20.30	1	1	0	0	0.00	139.92
610	1220	20.33	1	1	0	0	0.00	139.92
611	1222	20.37	1	1	0	0	0.00	139.92
612	1224	20.40	1	1	0	0	0.00	139.92
613	1226	20.43	1	1	0	0	0.00	139.92
614	1228	20.47	1	1	0	0	0.00	139.92
615	1230	20.50	1	1	0	0	0.00	139.92
616	1232	20.53	1	1	0	0	0.00	139.92
617	1234	20.57	1	1	0	0	0.00	139.92
618	1236	20.60	1	1	0	0	0.00	139.92
619	1238	20.63	1	1	0	0	0.00	139.92
620	1240	20.67	1	1	0	0	0.00	139.92
621	1242	20.70	1	1	0	0	0.00	139.92
622	1244	20.73	1	1	0	0	0.00	139.92
623	1246	20.77	1	1	0	0	0.00	139.92
624	1248	20.80	0	0	0	0	0.00	139.92

ESTIMATE OF RETENTION VOLUME PROVIDED

DETENTION BASIN-ROSE GARDEN LANE-042161				
STAGE	AREA		VOLUME	
	[ft^2]	[acres]	INC [acre-feet]	CUM [acre-feet]
1188.5	0	0	0.000	0.000
1191	438445	10.065	12.582	12.582
1192	557221	12.792	11.429	24.010
1200	748972	17.194	119.944	143.955

Total Volume Provided: 143.95 acre-feet
232,247 CY

ESTIMATE OF BASIN SEEPAGE

For soil conditions encountered at approximately elevation 1190 per Geotechnical Study Report prepared by Kleinfelder:

Soil Classification = Well Graded Gravel and Gravelly Sand

Assumed permeability = 0.0070 cm/sec
= 0.0768 feet/hour

For average basin area = 15 acres:

V = 15(0.0768)
= 1.15 acre-feet/hour
= 13.94 cfs

APPENDIX D

Miscellaneous Supporting Documentation

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT, CORPS OF ENGINEERS
ARIZONA-NEVADA AREA OFFICE
3636 NORTH CENTRAL AVENUE, SUITE 900
PHOENIX, ARIZONA 85012-1939

REPLY TO
ATTENTION OF

October 16, 2006

Office of the Chief
Regulatory Branch

Burton Charron
City of Peoria Engineering Department
8401 W Monroe Street
Peoria, Arizona 85345

File Number: 2006-00787-SDM

Dear Mr. Charron:

I am replying to your September 13, 2006 letter concerning your proposal to construct a stormwater channel in an unnamed tributary to the Agua Fria River at (Section 19, T4N, R1E), Peoria, Maricopa County, Arizona. Your proposal also includes the construction of an outfall basin, which will not result in the discharge of dredged/fill material into the Agua Fria River or its tributaries.

The Corps of Engineers has determined, under Section 404 of the Clean Water Act (33 U.S.C. 1344), that your proposed activity complies with the terms of Nationwide Permit No. 7, "Outfall Structures and Maintenance." You must comply with all terms and applicable conditions (regional, general, and 401 conditions) described in Enclosure 1 and complete the compliance statement (Enclosure 2).

Furthermore, you must comply with the following **Special Conditions**:

a) Any trees greater than 6 inches in diameter planned to be disturbed by construction shall be removed and replanted on-site or replaced in kind at a ratio of 1:1. Disturbed areas shall be reseeded using native plant species known to occur in the project vicinity. This will satisfy mitigation requirements for impacts expected from the proposed project.

b) Pursuant to 36 C.F.R. section 800.13, in the event of any discoveries during construction of either human remains, archeological deposits, or any other type of historic property, the Permittee shall notify the Corps' Archeology Staff within 24 hours (Steve Dibble at 213-452-3849, Pam Maxwell at 213-452-3877, or John Killeen at 213-452-3861). The Permittee shall immediately suspend all work in any area(s) where potential cultural resources are discovered. The Permittee shall not resume construction in the area surrounding the potential cultural resources until the Corps re-authorizes project construction, per 36 C.F.R. section 800.13.

c) The Permittee shall provide each contractor with written instructions to be reviewed by

all on-site supervisory construction personnel on the protection of cultural and ecological resources, including all agreed-to environmental stipulations for the project and all conditions required by this permit. The instructions shall also address federal and state laws regarding antiquities, plants, and wildlife; including collection, removal, and the importance of these resources and the purpose and necessity of protecting them.

This verification is valid until the nationwide permit(s) referenced above is modified, reissued, or revoked. All of the nationwide permits are scheduled to be modified, reissued, or revoked prior to March 18, 2007. It is incumbent upon you to remain informed of changes to the nationwide permits. We will issue a public notice when the nationwide permits are reissued. Furthermore, if you commence or are under contract to commence the authorized activity before the date that the relevant nationwide permit(s) is modified, reissued or revoked you will have twelve (12) months from the date of the modification, reissuance, or revocation of the nationwide permits to complete the activity under the present terms and conditions of the nationwide permits.

A nationwide permit does not grant any property rights or exclusive privileges. Also, it does not authorize any injury to the property or rights of others or authorize interference with any existing or proposed Federal project. Furthermore, it does not obviate the need to obtain other Federal, state, or local authorizations required by law.

Thank you for participating in our regulatory program. If you have questions, please contact Sallie D. McGuire at (602) 640-5385 x 221.

Sincerely,

"ORIGINAL SIGNED BY"

Cindy Lester, P.E.
Chief, Arizona Section
Regulatory Branch

Enclosures

Copies Furnished:
(With Enclosures)

Joy Lyndes
Sage Landscape Architecture & Environmental
2315 East Speedway Boulevard
Tucson, Arizona 85719-4730

U.S. ARMY CORPS OF ENGINEERS

CERTIFICATION OF COMPLIANCE WITH

Permit Number: 2006-00787-SDM

Date of Issuance: October 16, 2006

Name of Permittee:

Burton Charron
City of Peoria Engineering Department
8401 W Monroe Street
Peoria, Arizona 85345

Upon completion of the activity authorized by this permit, sign this certification and return it with an original signature to the following address:

U.S. Army Corps of Engineers
ATTENTION: Regulatory Branch (2006-00787-SDM)
3636 North Central Avenue Suite 900
Phoenix, Arizona 85012-1939

Please note that your permitted activity is subject to a compliance inspection by a Corps of Engineers' representative. If you fail to comply with this Nationwide permit you may be subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above referenced Nationwide permit has been completed in accordance with the terms and conditions of said permit.

_____ _____

Signature of Permittee Date

Enclosure 2

NATIONWIDE PERMIT NUMBER 7

"OUTFALL STRUCTURES AND MAINTENANCE"

US Army Corps of Engineers
Los Angeles District

Pursuant to Section 404 of the Clean Water Act (33 U.S.C. 1344) the U.S. Army Corps of Engineers published the "Final Notice of Issuance of Nationwide Permits" in the Federal Register (67 FR 2020) on January 15, 2002, and Corrections on February 13, 2002 (67 FR 6692) and February 25, 2002 (67 FR 8579). This Nationwide Permit is effective from March 18, 2002 to March 18, 2007 unless modified, reissued or revoked before that time. It is incumbent upon the permittee to remain informed of changes to the nationwide permits.

7. **Outfall Structures and Maintenance**: Activities related to:(i) construction of outfall structures and associated intake structures where the effluent from the outfall is authorized, conditionally authorized, or specifically exempted, or are otherwise in compliance with regulations issued under the National Pollutant Discharge Elimination System Program (Section 402 of the CWA), and

(ii) maintenance excavation, including dredging, to remove accumulated sediments blocking or restricting outfall and intake structures, accumulated sediments from small impoundments associated with outfall and intake structures, and accumulated sediments from canals associated with outfall and intake structures, provided that the activity meets all of the following criteria:

a. The permittee notifies the District Engineer in accordance with General Condition 13;

b. The amount of excavated or dredged material must be the minimum necessary to restore the outfalls, intakes, small impoundments, and canals to original design capacities and design configurations (i.e., depth and width);

c. The excavated or dredged material is deposited and retained at an upland site, unless otherwise approved by the District Engineer under separate authorization; and

d. Proper soil erosion and sediment control measures are used to minimize reentry of sediments into waters of the US.

The construction of intake structures is not authorized by this NWP, unless they are directly associated with an authorized outfall structure. For maintenance excavation and dredging to remove accumulated sediments, the notification must include information regarding the original design capacities and configurations of the facility and the presence of special aquatic sites (e.g., vegetated shallows) in the vicinity of the proposed work. (Sections 10 and 404)

401 Certification

Tribal waters	Certified - Fort Apache Reservation Individual Certification required. (All other Reservations)
Unique waters	Individual Certification required.
Other waters	Conditional Certification.

401 Conditions

1. The Permittee shall provide a copy of these State CWA 401 Conditions and permit specific conditions to all appropriate contractors and subcontractors. The applicant shall also post a copy of these conditions in a water resistant location at the construction site where it may be seen by the workers. If there are any substantive changes in the proposed project that may affect water quality, the applicant shall notify ADEQ. Failure to do so may result in the revocation of this Certification.
2. The Permittee is responsible for obtaining all other permits, certifications and licenses that may be required by federal, state or local authorities. Activities which may require other approvals include: construction activities disturbing greater than five acres of land [NPDES Stormwater Permit], use of reclaimed wastewater for dust control or irrigation [Reclaimed Water Permit], or dewatering of construction sites to a surface waterbody [NPDES Process Wastewater Permit].
3. Erosion control and/or bank protection features (e.g., silt fences, straw bales, rip-rap, or mulching) shall be used, where appropriate, to minimize channel or bank erosion and soil loss. These features shall be maintained, as necessary, during pre-construction and construction periods. Denuded areas shall be revegetated as soon as possible with native plants and seed.
4. Earthen fill placed in locations subject to scour shall contain not more than ten percent (10%) of particles finer than 0.25 mm diameter (passing a No. 60 sieve, on a dry weight basis).
5. Upon completion of construction, the work area shall be restored to maintain the stability of upstream and downstream segments of waters of the U.S. (WUS) with respect to erosion and sedimentation.

6. The Permittee is responsible for ensuring construction material and/or fill, placed within the ordinary high water mark (OHWM), is free from substances (including fines that may be associated with rip-rap material) that can cause or contribute to pollution of a surface water.
7. Debris (such as soil, silt, sand, rubbish, cement, asphalt, oil or petroleum products, organic materials, tires or batteries) derived from construction activities shall not be deposited at any site where it may be washed into W.U.S and shall be properly disposed of after completion of the work.
8. The Permittee shall have a spill containment plan to ensure that pollutants are contained, removed and properly disposed of. In addition, equipment maintenance shall be preformed at an upland site away from W.U.S.
9. Runoff and seepage from roadways, embankments, golf courses and other alterations of the natural environment into W.U.S. shall not cause a violation of Water Quality Standards.
10. Construction materials, including concrete, asphalt, and piping, shall consist of materials that do not leach pollutants into surface waters for compliance with General Condition 18 (Suitable Material). Activities shall be conducted and monitored to ensure that pollution from concrete formation and equipment washing does not drain into the washes.
11. At completion, all construction residues, equipment and non-native materials shall be removed from and properly disposed of outside the 100-year floodplain.
12. Stockpiles of construction materials shall be stored outside of jurisdictional water.
13. No discharge of process water, material processing residues, wastewater or other residual material is authorized within jurisdictional waters.
14. Flows shall be diverted around work operations or the work shall be performed during low water conditions when the area is naturally dewatered. When there is water flow within the construction area, construction activity shall cease and construction equipment shall be relocated outside the watercourse.

Tribal waters: all waters of the United States occurring on tribal lands.

Unique Water: a surface water that has been classified as an outstanding state resource water by the Director of ADEQ under R18-11-112(E). Please note that unique water designations are subject to change by rule. Current rules should be consulted at the time of application for an NWP. The following are classified as unique waters on non-tribal lands:

1. The West Fork of the Little Colorado River, above Government Springs;
2. Oak Creek, including the West Fork of Oak Creek;
3. Peoples Canyon Creek, tributary to the Santa Maria River;
4. Burro Creek, above its confluence with Boulder Creek;
5. Francis Creek, in Mohave and Yavapai counties;
6. Bonita Creek, tributary to the upper Gila River;
7. Cienega Creek, from confluence with Gardner Canyon and Spring Water Canyon at R18E T17S to USGS gaging station at 32°02'09" / 110°40'34", in Pima County;
8. Aravaipa Creek, from its confluence with Stowe Gulch to the downstream boundary of Aravaipa Canyon Wilderness Area;
9. Cave Creek and the South Fork of Cave Creek (Chircahua Mountains), from the headwaters to the Coronado National Forest boundary;
10. Buehman Canyon Creek, from its headwaters (Lat. 32°24'55.5" N, Long. 110°39'43.5"W) to approximately 9.8 miles downstream (Lat. 32°24'31.5" N, Long. 10°32'08" W);
11. Lee Valley Creek, from its headwaters to Lee Valley Reservoir;
12. Bear Wallow Creek, from its headwaters to the boundary of the San Carlos Indian Reservation;
13. North Fork of Bear Wallow Creek, from its headwaters to Bear Wallow Creek;
14. South Fork of Bear Wallow Creek, from its headwaters to Bear Wallow Creek;
15. Snake Creek, from its headwaters to its confluence with Black River;
17. Hay Creek, from its headwaters to its confluence with the West Fork of the Black River;
18. Stinky Creek, from the Fort Apache Indian Reservation boundary to its confluence with the West Fork of the Black River; and
19. KP Creek, from its headwaters to its confluence with the Blue River.

Other waters: all waters of the United States on non-tribal lands for which 401 Certification has not been specifically denied.

Nationwide Permit General Conditions

The following General Conditions must be followed in order for any authorization by an NWP to be valid:

1. **Navigation.** No activity may cause more than a minimal adverse effect on navigation.
2. **Proper Maintenance.** Any structure or fill authorized shall be properly maintained, including maintenance to ensure public safety.
3. **Soil Erosion and Sediment Controls.** Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.
4. **Aquatic Life Movements.** No activity may substantially disrupt the necessary life-cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. Culverts placed in streams must be installed to maintain low flow conditions.
5. **Equipment.** Heavy equipment working in wetlands must be placed on mats, or other measures must be taken to minimize soil disturbance.
6. **Regional and Case-By-Case Conditions.** The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state or tribe in its Section 401 Water Quality Certification and Coastal Zone Management Act consistency determination.
7. **Wild and Scenic Rivers.** No activity may occur in a component of the National Wild and Scenic River System; or in a river officially designated by Congress as a "study river" for possible inclusion in the system, while the river is in an official study status; unless the appropriate Federal agency, with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation, or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency in the area (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service).
8. **Tribal Rights.** No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.
9. **Water Quality.** (a) In certain states and tribal lands an individual 401 Water Quality Certification must be obtained or waived (See 33 CFR 330.4(c)).

(b) For NWPs 12, 14, 17, 18, 32, 39, 40, 42, 43, and 44, where the state or tribal 401 certification (either generically or individually) does not require or approve water quality management measures, the permittee must provide water quality management measures that will ensure that the authorized work does not result in more than minimal degradation of water quality (or the Corps determines that compliance with state or local standards, where applicable, will ensure no more than minimal adverse effect on water quality). An important component of water quality management includes stormwater management that minimizes degradation of the downstream aquatic system, including water quality (refer to General Condition 21 for stormwater management requirements). Another important component of water quality management is the establishment and maintenance of vegetated buffers next to open waters, including streams (refer to General Condition 19 for vegetated buffer requirements for the NWPs).

This condition is only applicable to projects that have the potential to affect water quality. While appropriate measures must be taken, in most cases it is not necessary to conduct detailed studies to identify such measures or to require monitoring.

10. **Coastal Zone Management.** In certain states, an individual state coastal zone management consistency concurrence must be obtained or waived (see 33 CFR 330.4(d)).
11. **Endangered Species.** (a) No activity is authorized under any NWP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will destroy or adversely modify the critical habitat of such species. Non-federal permittees shall notify the District Engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or is located in the designated critical habitat and shall not begin work on the activity until notified by the District Engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that may affect Federally-listed endangered or threatened species or designated critical habitat, the notification must include the name(s) of the endangered or threatened species that may be affected by the proposed work or that utilize the designated critical habitat that may be affected by the proposed work. As a result of formal or informal consultation with the FWS or NMFS the District Engineer may add species-specific regional endangered species conditions to the NWPs.

(b) Authorization of an activity by a NWP does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the USFWS or the NMFS, both lethal and non-lethal "takes" of protected species are in violation of the ESA. Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the USFWS and NMFS or their world wide web pages at http://www.fws.gov/r9endspp/endspp.html and http://www.nfms.gov/prot_res/overview/es.html respectively.

12. **Historic Properties.** No activity which may affect historic properties listed, or eligible for listing, in the National Register of Historic Places is authorized, until the District Engineer has complied with the provisions of 33 CFR Part 325, Appendix C. The prospective permittee must notify the District Engineer if the authorized activity may affect any historic properties listed, determined to be eligible, or which the prospective permittee has reason to believe may be eligible for listing on the National Register of Historic Places, and shall not begin the activity until notified by the District Engineer that the requirements of the National Historic Preservation Act have been satisfied and that the activity is authorized. Information on the location and existence of historic resources can be obtained from the State Historic Preservation Office and the National Register of Historic Places (see 33 CFR 330.4(g)). For activities that may affect historic properties listed in, or eligible for listing in, the National Register of Historic Places, the notification must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property.
13. **Notification.**

(a) Timing; where required by the terms of the NWP, the prospective permittee must notify the District Engineer with a preconstruction notification (PCN) as early as possible. The District Engineer must determine if the notification is complete within 30 days of the date of receipt and can request additional information necessary to make the PCN complete only once. However, if the prospective permittee does

not provide all of the requested information, then the District Engineer will notify the prospective permittee that the notification is still incomplete and the PCN review process will not commence until all of the requested information has been received by the District Engineer. The prospective permittee shall not begin the activity:

(1) Until notified in writing by the District Engineer that the activity may proceed under the NWP with any special conditions imposed by the District or Division Engineer; or

(2) If notified in writing by the District or Division Engineer that an Individual Permit is required; or

(3) Unless 45 days have passed from the District Engineer's receipt of the complete notification and the prospective permittee has not received written notice from the District or Division Engineer. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) Contents of Notification: The notification must be in writing and include the following information:

(1) Name, address and telephone numbers of the prospective permittee;

(2) Location of the proposed project;

(3) Brief description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause; any other NWP(s), Regional General Permit(s), or Individual Permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP (Sketches usually clarify the project and when provided result in a quicker decision.);

(4) For NWPs 7, 12, 14, 18, 21, 34, 38, 39, 40, 41, 42, and 43, the PCN must also include a delineation of affected special aquatic sites, including wetlands, vegetated shallows (e.g., submerged aquatic vegetation, seagrass beds), and riffle and pool complexes (see paragraph 13(f));

(5) For NWP 7 (Outfall Structures and Maintenance), the PCN must include information regarding the original design capacities and configurations of those areas of the facility where maintenance dredging or excavation is proposed;

(6) For NWP 14 (Linear Transportation Projects), The PCN must include a compensatory mitigation proposal to offset permanent losses of waters of the US and a statement describing how temporary losses of waters of the US will be minimized to the maximum extent practicable;

(7) For NWP 21 (Surface Coal Mining Activities), the PCN must include an Office of Surface Mining (OSM) or state-approved mitigation plan, if applicable. To be authorized by this NWP, the District Engineer must determine that the activity complies with the terms and conditions of the NWP and that the adverse environmental effects are minimal both individually and cumulatively and must notify the project sponsor of this determination in writing;

(8) For NWP 27 (Stream and Wetland Restoration Activities), the PCN must include documentation of the prior condition of the site that will be reverted by the permittee;

(9) For NWP 29 (Single-Family Housing), the PCN must also include:

(i) Any past use of this NWP by the Individual Permittee and/or the permittee's spouse;

(ii) A statement that the single-family housing activity is for a personal residence of the permittee;

(iii) A description of the entire parcel, including its size, and a delineation of wetlands. For the purpose of this NWP, parcels of land measuring ¼-acre or less will not require a formal on-site delineation. However, the applicant shall provide an indication of where the wetlands are and the amount of wetlands that exists on the property. For parcels greater than ¼-acre in size, formal wetland delineation must be prepared in accordance with the current method required by the Corps. (See paragraph 13(f));

(iv) A written description of all land (including, if available, legal descriptions) owned by the prospective permittee and/or the prospective permittee's spouse, within a one mile radius of the parcel, in any form of ownership (including any land owned as a partner, corporation, joint tenant, co-tenant, or as a tenant-by-the-entirety) and any land on which a purchase and sale agreement or other contract for sale or purchase has been executed;

(10) For NWP 31 (Maintenance of Existing Flood Control Facilities), the prospective permittee must either notify the District Engineer with a PCN prior to each maintenance activity or submit a five year (or less) maintenance plan. In addition, the PCN must include all of the following:

(i) Sufficient baseline information identifying the approved channel depths and configurations and existing facilities. Minor deviations are authorized, provided the approved flood control protection or drainage is not increased;

(ii) A delineation of any affected special aquatic sites, including wetlands; and,

(iii) Location of the dredged material disposal site;

(11) For NWP 33 (Temporary Construction, Access, and Dewatering), the PCN must also include a restoration plan of reasonable measures to avoid and minimize adverse effects to aquatic resources;

(12) For NWPs 39, 43 and 44, the PCN must also include a written statement to the District Engineer explaining how avoidance and minimization for losses of waters of the US were achieved on the project site;

(13) For NWP 39 and NWP 42, the PCN must include a compensatory mitigation proposal to offset losses of waters of the US or justification explaining why compensatory mitigation should not be required. For discharges that cause the loss of greater than 300 linear feet of an intermittent stream bed, to be authorized, the District Engineer must determine that the activity complies with the other terms and conditions of the NWP, determine adverse environmental effects are minimal both individually and cumulatively, and waive the limitation on stream impacts in writing before the permittee may proceed;

(14) For NWP 40 (Agricultural Activities), the PCN must include a compensatory mitigation proposal to offset losses of waters of the US. This NWP does not authorize the relocation of greater than 300 linear-feet of existing serviceable drainage ditches constructed in non-tidal streams unless, for drainage ditches constructed in intermittent non-tidal streams, the District Engineer waives this criterion in writing, and the District Engineer has determined that the project complies with all terms and conditions of this NWP, and that any adverse impacts of the project on the aquatic environment are minimal, both individually and cumulatively;

(15) For NWP 43 (Stormwater Management Facilities), the PCN must include, for the construction of new stormwater management facilities, a maintenance plan (in accordance with state and local requirements, if applicable) and a compensatory mitigation proposal to offset losses of waters of the US. For discharges that cause the loss of greater than 300 linear feet of an intermittent stream bed, to be authorized, the District Engineer must determine that the activity complies with the other terms and conditions of the NWP, determine adverse environmental effects are minimal both individually and cumulatively, and waive the limitation on stream impacts in writing before the permittee may proceed;

(16) For NWP 44 (Mining Activities), the PCN must include a description of all waters of the US adversely affected by the project, a description of measures taken to minimize adverse effects to waters of the US, a description of measures taken to comply with the criteria of

the NWP, and a reclamation plan (for all aggregate mining activities in isolated waters and non-tidal wetlands adjacent to headwaters and any hard rock/mineral mining activities);

(17) For activities that may adversely affect Federally-listed endangered or threatened species, the PCN must include the name(s) of those endangered or threatened species that may be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work; and

(18) For activities that may affect historic properties listed in, or eligible for listing in, the National Register of Historic Places, the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property.

(c) Form of Notification: The standard Individual Permit application form (Form ENG 4345) may be used as the notification but must clearly indicate that it is a PCN and must include all of the information required in (b) (1)-(18) of General Condition 13. A letter containing the requisite information may also be used.

(d) District Engineer's Decision: In reviewing the PCN for the proposed activity, the District Engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. The prospective permittee may submit a proposed mitigation plan with the PCN to expedite the process. The District Engineer will consider any proposed compensatory mitigation the applicant has included in the proposal in determining whether the net adverse environmental effects to the aquatic environment of the proposed work are minimal. If the District Engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse effects on the aquatic environment are minimal, after considering mitigation, the District Engineer will notify the permittee and include any conditions the District Engineer deems necessary. The District Engineer must approve any compensatory mitigation proposal before the permittee commences work. If the prospective permittee is required to submit a compensatory mitigation proposal with the PCN, the proposal may be either conceptual or detailed. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the District Engineer will expeditiously review the proposed compensatory mitigation plan. The District Engineer must review the plan within 45 days of receiving a complete PCN and determine whether the conceptual or specific proposed mitigation would ensure no more than minimal adverse effects on the aquatic environment. If the net adverse effects of the project on the aquatic environment (after consideration of the compensatory mitigation proposal) are determined by the District Engineer to be minimal, the District Engineer will provide a timely written response to the applicant. The response will state that the project can proceed under the terms and conditions of the NWP.

If the District Engineer determines that the adverse effects of the proposed work are more than minimal, then the District Engineer will notify the applicant either: (1) that the project does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an Individual Permit; (2) that the project is authorized under the NWP subject to the applicant's submission of a mitigation proposal that would reduce the adverse effects on the aquatic environment to the minimal level; or (3) that the project is authorized under the NWP with specific modifications or conditions. Where the District Engineer determines that mitigation is required to ensure no more than minimal adverse effects occur to the aquatic environment, the activity will be authorized within the 45-day PCN period. The authorization will include the necessary conceptual or specific mitigation or a requirement that the applicant submit a mitigation proposal that would reduce the adverse effects on the aquatic environment to the minimal level. When conceptual mitigation is included, or a mitigation plan is required under item (2) above, no work in waters of the US will occur until the District Engineer has approved a specific mitigation plan.

(e) Agency Coordination: The District Engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the project's adverse environmental effects to a minimal level.

For activities requiring notification to the District Engineer that result in the loss of greater than ½-acre of waters of the US, the District Engineer will provide immediately (e.g., via facsimile transmission, overnight mail, or other expeditious manner) a copy to the appropriate Federal or state offices (USFWS, state natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO), and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will then have 10 calendar days from the date the material is transmitted to telephone or fax the District Engineer notice that they intend to provide substantive, site-specific comments. If so contacted by an agency, the District Engineer will wait an additional 15 calendar days before making a decision on the notification. The District Engineer will fully consider agency comments received within the specified time frame, but will provide no response to the resource agency, except as provided below. The District Engineer will indicate in the administrative record associated with each notification that the resource agencies' concerns were considered. As required by Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act, the District Engineer will provide a response to NMFS within 30 days of receipt of any Essential Fish Habitat conservation recommendations. Applicants are encouraged to provide the Corps multiple copies of notifications to expedite agency notification.

(f) Wetland Delineations: Wetland delineations must be prepared in accordance with the current method required by the Corps (For NWP 29 see paragraph (b)(9)(iii) for parcels less than ¼-acre in size). The permittee may ask the Corps to delineate the special aquatic site. There may be some delay if the Corps does the delineation. Furthermore, the 45-day period will not start until the wetland delineation has been completed and submitted to the Corps, where appropriate.

14. Compliance Certification. Every permittee who has received NWP verification from the Corps will submit a signed certification regarding the completed work and any required mitigation. The certification will be forwarded by the Corps with the authorization letter and will include: (a) A statement that the authorized work was done in accordance with the Corps authorization, including any general or specific conditions;

(b) A statement that any required mitigation was completed in accordance with the permit conditions; and (c) The signature of the permittee certifying the completion of the work and mitigation.

15. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the US authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit (e.g. if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the US for the total project cannot exceed 1/3-acre).

16. Water Supply Intakes. No activity, including structures and work in navigable waters of the US or discharges of dredged or fill material, may occur in the proximity of a public water supply intake except where the activity is for repair of the public water supply intake structures or adjacent bank stabilization.

17. Shellfish Beds. No activity, including structures and work in navigable waters of the US or discharges of dredged or fill material, may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWP 4.

18. Suitable Material. No activity, including structures and work in navigable waters of the US or discharges of dredged or fill material, may consist of unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.) and material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the CWA).

19. Mitigation. The District Engineer will consider the factors discussed below when determining the acceptability of appropriate and practicable mitigation necessary to offset adverse effects on the aquatic environment that are more than minimal.

(a) The project must be designed and constructed to avoid and minimize adverse effects to waters of the US to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing or compensating) will be required to the extent necessary to ensure that the adverse effects to the aquatic environment are minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland impacts requiring a PCN, unless the District Engineer determines in writing that some other form of mitigation would be more environmentally appropriate and provides a project-specific waiver of this requirement. Consistent with National policy, the District Engineer will establish a preference for restoration of wetlands as compensatory mitigation, with preservation used only in exceptional circumstances.

(d) Compensatory mitigation (i.e., replacement or substitution of aquatic resources for those impacted) will not be used to increase the acreage losses allowed by the acreage limits of some of the NWPs. For example, ¼-acre of wetlands cannot be created to change a ¾-acre loss of wetlands to a ½-acre loss associated with NWP 39 verification. However, ½-acre of created wetlands can be used to reduce the impacts of a ½-acre loss of wetlands to the minimum impact level in order to meet the minimal impact requirement associated with NWPs.

(e) To be practicable, the mitigation must be available and capable of being done considering costs, existing technology, and logistics in light of the overall project purposes. Examples of mitigation that may be appropriate and practicable include, but are not limited to: reducing the size of the project; establishing and maintaining wetland or upland vegetated buffers to protect open waters such as streams; and replacing losses of aquatic resource functions and values by creating, restoring, enhancing, or preserving similar functions and values, preferably in the same watershed.

(f) Compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the establishment, maintenance, and legal protection (e.g., easements, deed restrictions) of vegetated buffers to open waters. In many cases, vegetated buffers will be the only compensatory mitigation required. Vegetated buffers should consist of native species. The width of the vegetated buffers required will address documented water quality or aquatic habitat loss concerns. Normally, the vegetated buffer will be 25 to 50 feet wide on each side of the stream, but the District Engineers may require slightly wider vegetated buffers to address documented water quality or habitat loss concerns. Where both wetlands and open waters exist on the project site, the Corps will determine the appropriate compensatory mitigation (e.g., stream buffers or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where vegetated buffers are determined to be the most appropriate form of compensatory mitigation, the District Engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland impacts.

(g) Compensatory mitigation proposals submitted with the "notification" may be either conceptual or detailed. If conceptual plans are approved under the verification, then the Corps will condition the verification to require detailed plans be submitted and approved by the Corps prior to construction of the authorized activity in waters of the US.

(h) Permittees may propose the use of mitigation banks, in-lieu fee arrangements or separate activity-specific compensatory mitigation. In all cases that require compensatory mitigation, the mitigation provisions will specify the party responsible for accomplishing and/or complying with the mitigation plan.

20. Spawning Areas. Activities, including structures and work in navigable waters of the US or discharges of dredged or fill material, in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., excavate, fill, or smother downstream by substantial turbidity) of an important spawning area are not authorized.

21. Management of Water Flows. To the maximum extent practicable, the activity must be designed to maintain preconstruction downstream flow conditions (e.g., location, capacity, and flow rates). Furthermore, the activity must not permanently restrict or impede the passage of normal or expected high flows (unless the primary purpose of the fill is to impound waters) and the structure or discharge of dredged or fill material must withstand expected high flows. The activity must, to the maximum extent practicable, provide for retaining excess flows from the site, provide for maintaining surface flow rates from the site similar to preconstruction conditions, and provide for not increasing water flows from the project site, relocating water, or redirecting water flow beyond preconstruction conditions. Stream channelizing will be reduced to the minimal amount necessary, and the activity must, to the maximum extent practicable, reduce adverse effects such as flooding or erosion downstream and upstream of the project site, unless the activity is part of a larger system designed to manage water flows. In most cases, it will not be a requirement to conduct detailed studies and monitoring of water flow.

This condition is only applicable to projects that have the potential to affect waterflows. While appropriate measures must be taken, it is not necessary to conduct detailed studies to identify such measures or require monitoring to ensure their effectiveness. Normally, the Corps will defer to state and local authorities regarding management of water flow.

22. Adverse Effects From Impoundments. If the activity creates an impoundment of water, adverse effects to the aquatic system due to the acceleration of the passage of water, and/or the restricting its flow shall be minimized to the maximum extent practicable. This includes structures and work in navigable waters of the US, or discharges of dredged or fill material.

23. Waterfowl Breeding Areas. Activities, including structures and work in navigable waters of the US or discharges of dredged or fill material, into breeding areas for migratory waterfowl must be avoided to the maximum extent practicable.

24. Removal of Temporary Fills. Any temporary fills must be removed in their entirety and the affected areas returned to their preexisting elevation.

25. Designated Critical Resource Waters. Critical resource waters include, NOAA-designated marine sanctuaries, National Estuarine Research Reserves, National Wild and Scenic Rivers, critical habitat for Federally listed threatened and endangered species, coral reefs, state natural heritage sites, and outstanding national resource waters

or other waters officially designated by a state as having particular environmental or ecological significance and identified by the District Engineer after notice and opportunity for public comment. The District Engineer may also designate additional critical resource waters after notice and opportunity for comment.

(a) Except as noted below, discharges of dredged or fill material into waters of the US are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, and 44 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters. Discharges of dredged or fill materials into waters of the US may be authorized by the above NWPs in National Wild and Scenic Rivers if the activity complies with General Condition 7. Further, such discharges may be authorized in designated critical habitat for Federally listed threatened or endangered species if the activity complies with General Condition 11 and the USFWS or the NMFS has concurred in a determination of compliance with this condition.

(b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38, notification is required in accordance with General Condition 13, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The District Engineer may authorize activities under these NWPs only after it is determined that the impacts to the critical resource waters will be no more than minimal.

26. Fills Within 100-Year Floodplains. For purposes of this General Condition, 100-year floodplains will be identified through the existing Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps or FEMA-approved local floodplain maps.

(a) Discharges in Floodplain; Below Headwaters. Discharges of dredged or fill material into waters of the US within the mapped 100-year floodplain, below headwaters (i.e. five cfs), resulting in permanent above-grade fills, are not authorized by NWPs 39, 40, 42, 43, and 44.

(b) Discharges in Floodway; Above Headwaters. Discharges of dredged or fill material into waters of the US within the FEMA or locally mapped floodway, resulting in permanent above-grade fills, are not authorized by NWPs 39, 40, 42, and 44.

(c) The permittee must comply with any applicable FEMA-approved state or local floodplain management requirements.

27. Construction Period. For activities that have not been verified by the Corps and the project was commenced or under contract to commence by the expiration date of the NWP (or modification or revocation date), the work must be completed within 12-months after such date (including any modification that affects the project). For activities that have been verified and the project was commenced or under contract to commence within the verification period, the work must be completed by the date determined by the Corps. For projects that have been verified by the Corps, an extension of a Corps approved completion date may requested. This request must be submitted at least one month before the previously approved completion date.

Section 10 Condition (Colorado River only). The permitee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

Further Information

1. District Engineers have authority to determine if an activity complies with the terms and conditions of an NWP.
2. NWPs do not obviate the need to obtain other Federal, state, or local permits, approvals, or authorizations required by law.
3. NWPs do not grant any property rights or exclusive privileges.
4. NWPs do not authorize any injury to the property or rights of others.
5. NWPs do not authorize interference with any existing or proposed Federal project.

Definitions

Best Management Practices (BMPs): BMPs are policies, practices, procedures, or structures implemented to mitigate the adverse environmental effects on surface water quality resulting from development. BMPs are categorized as structural or non-structural. A BMP policy may affect the limits on a development.

Compensatory Mitigation: For purposes of Section 10/404, compensatory mitigation is the restoration, creation, enhancement, or in exceptional circumstances, preservation of wetlands and/or other aquatic resources for the purpose of compensating for unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved.

Creation: The establishment of a wetland or other aquatic resource where one did not formerly exist.

Enhancement: Activities conducted in existing wetlands or other aquatic resources that increase one or more aquatic functions.

Ephemeral Stream: An ephemeral stream has flowing water only during and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

Farm Tract: A unit of contiguous land under one ownership that is operated as a farm or part of a farm.

Flood Fringe: That portion of the 100-year floodplain outside of the floodway (often referred to as "floodway fringe").

Floodway: The area regulated by Federal, state, or local requirements to provide for the discharge of the base flood so the cumulative increase in water surface elevation is no more than a designated amount (not to exceed one foot as set by the National Flood Insurance Program) within the 100-year floodplain.

Independent Utility: A test to determine what constitutes a single and complete project in the Corps regulatory program. A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. Phases of a project that would be constructed even if the other phases were not built can be considered as separate single and complete projects with independent utility.

Intermittent Stream: An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.

Loss of Waters of the US: Waters of the US that include the filled area and other waters that are permanently adversely affected by flooding, excavation, or drainage because of the regulated activity. Permanent adverse effects include permanent above-grade, at-grade, or below-grade

fills that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage of loss of waters of the US is the threshold measurement of the impact to existing waters for determining whether a project may qualify for an NWP; it is not a net threshold that is calculated after considering compensatory mitigation that may be used to offset losses of aquatic functions and values. The loss of stream bed includes the linear feet of stream bed that is filled or excavated. Impacts to ephemeral streams are not included in the linear foot measurement of loss of stream bed for the purpose of determining compliance with the linear foot limits of NWPs 39, 40, 42, and 43. Waters of the US temporarily filled, flooded, excavated, or drained, but restored to preconstruction contours and elevations after construction, are not included in the measurement of loss of waters of the US.

Non-tidal Wetland: A non-tidal wetland is a wetland (i.e., a water of the US) that is not subject to the ebb and flow of tidal waters. The definition of a wetland can be found at 33 CFR 328.3(b). Non-tidal wetlands contiguous to tidal waters are located landward of the high tide line (i.e., spring high tide line).

Open Water: An area that, during a year with normal patterns of precipitation, has standing or flowing water for sufficient duration to establish an ordinary high water mark. Aquatic vegetation within the area of standing or flowing water is either non-emergent, sparse, or absent. Vegetated shallows are considered to be open waters. The term "open water" includes rivers, streams, lakes, and ponds. For the purposes of the NWPs, this term does not include ephemeral waters.

Perennial Stream: A perennial stream has flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow.

Permanent Above-grade Fill: A discharge of dredged or fill material into waters of the US, including wetlands, that results in a substantial increase in ground elevation and permanently converts part or all of the waterbody to dry land. Structural fills authorized by NWPs 3, 25, 36, etc. are not included.

Preservation: The protection of ecologically important wetlands or other aquatic resources in perpetuity through the implementation of appropriate legal and physical mechanisms. Preservation may include protection of upland areas adjacent to wetlands as necessary to ensure protection and/or enhancement of the overall aquatic ecosystem.

Restoration: Re-establishment of wetland and/or other aquatic resource characteristics and function(s) at a site where they have ceased to exist, or exist in a substantially degraded state.

Riffle and Pool Complex: Riffle and pool complexes are special aquatic sites under the 404(b)(1) Guidelines. Riffle and pool complexes sometimes characterize steep gradient sections of streams. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a course substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. A slower stream velocity, a streaming flow, a smooth surface, and a finer substrate characterize pools.

Single and Complete Project: The term "single and complete project" is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers (see definition of independent utility). For linear projects, the "single and complete project" (i.e., a single and complete crossing) will apply to each crossing of a separate water of the US (i.e., a single waterbody) at that location. An exception is for linear projects crossing a single waterbody several times at separate and distant locations: each crossing is considered a single and complete project. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate waterbodies.

Stormwater Management: Stormwater management is the mechanism for controlling stormwater runoff for the purposes of reducing downstream erosion, water quality degradation, and flooding and mitigating the adverse effects of changes in land use on the aquatic environment.

Stormwater Management Facilities: Stormwater management facilities are those facilities, including but not limited to, stormwater retention and detention ponds and BMPs, which retain water for a period of time to control runoff and/or improve the quality (i.e., by reducing the concentration of nutrients, sediments, hazardous substances and other pollutants) of stormwater runoff.

Stream Bed: The substrate of the stream channel between the ordinary high water marks. The substrate may be bedrock or inorganic particles that range in size from clay to boulders. Wetlands contiguous to the stream bed, but outside of the ordinary high water marks, are not considered part of the stream bed.

Stream Channelization: The manipulation of a stream channel to increase the rate of water flow through the stream channel. Manipulation may include deepening, widening, straightening, armoring, or other activities that change the stream cross-section or other aspects of stream channel geometry to increase the rate of water flow through the stream channel. A channelized stream remains a water of the US, despite the modifications to increase the rate of water flow.

Tidal Wetland: A tidal wetland is a wetland (i.e., water of the US) that is inundated by tidal waters. The definitions of a wetland and tidal waters can be found at 33 CFR 328.3(b) and 33 CFR 328.3(f), respectively. Tidal waters rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by other waters, wind, or other effects. Tidal wetlands are located channelward of the high tide line (i.e., spring high tide line) and are inundated by tidal waters two times per lunar month, during spring high tides.

Vegetated Buffer: A vegetated upland or wetland area next to rivers, streams, lakes, or other open waters which separates the open water from developed areas, including agricultural land. Vegetated buffers provide a variety of aquatic habitat functions and values (e.g., aquatic habitat for fish and other aquatic organisms, moderation of water temperature changes, and detritus for aquatic food webs) and help improve or maintain local water quality. A vegetated buffer can be established by maintaining an existing vegetated area or planting native trees, shrubs, and herbaceous plants on land next to open-waters. Mowed lawns are not considered vegetated buffers because they provide little or no aquatic habitat functions and values. The establishment and maintenance of vegetated buffers is a method of compensatory mitigation that can be used in conjunction with the restoration, creation, enhancement, or preservation of aquatic habitats to ensure that activities authorized by NWPs result in minimal adverse effects to the aquatic environment. (See General Condition 19.)

Vegetated Shallows: Vegetated shallows are special aquatic sites under the 404(b)(1) Guidelines. They are areas that are permanently inundated and under normal circumstances have rooted aquatic vegetation, such as seagrasses in marine and estuarine systems and a variety of vascular rooted plants in freshwater systems.

Waterbody: A waterbody is any area that in a normal year has water flowing or standing above ground to the extent that evidence of an ordinary high water mark is established. Wetlands contiguous to the waterbody are considered part of the waterbody.

Nationwide Permit Regional Conditions

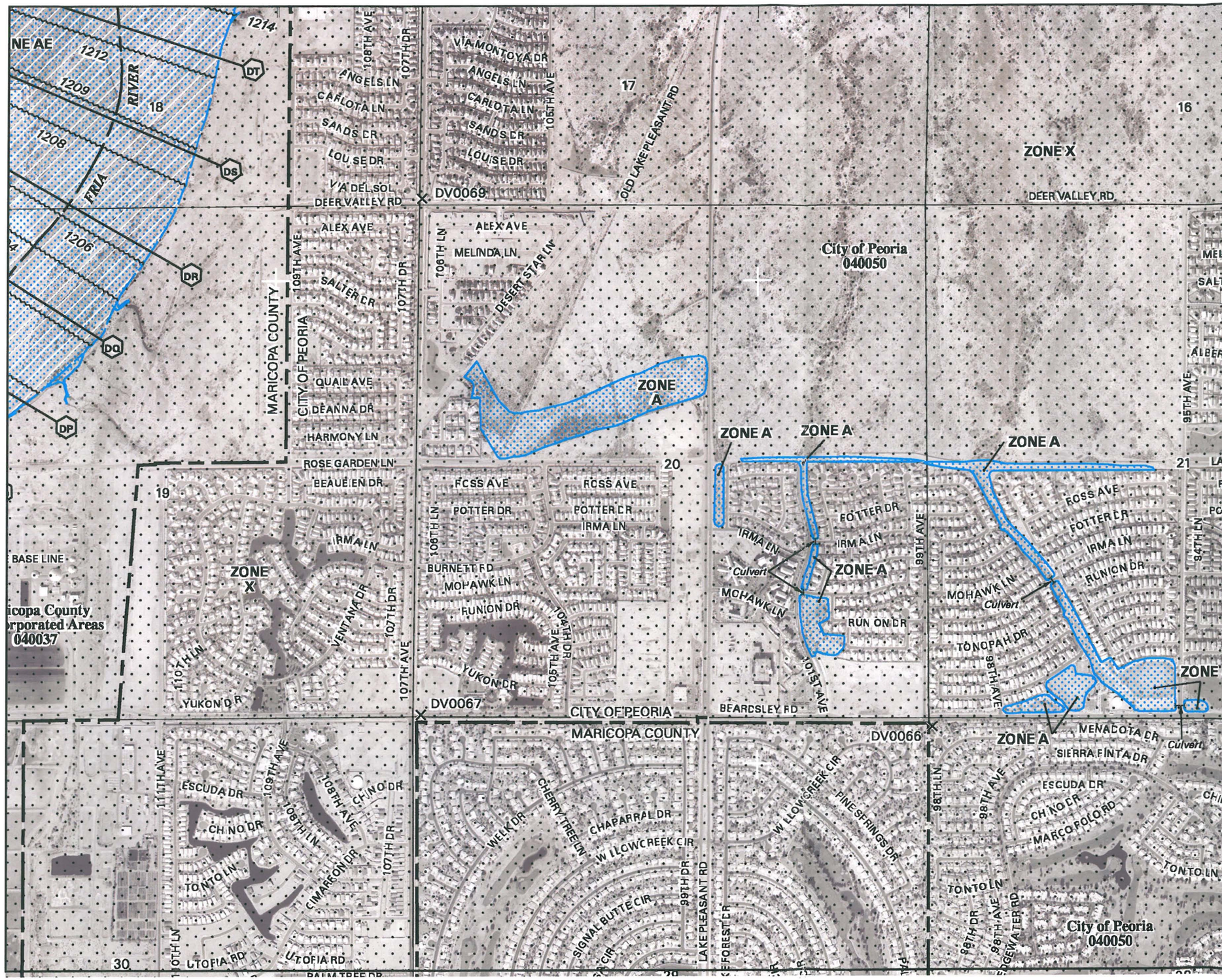
Of the nine regional conditions effective within the Los Angeles District of the Corps of Engineers, only three apply to projects within Arizona (2, 3, and 4). The remaining conditions apply to specific geographic areas, specific resources (vernal pools) or specific species (steelhead) in California.

The following regional conditions must be followed in order for any authorization by an NWP to be valid in the State of Arizona:

2. For the State of Arizona and the Mojave and Sonoran (Colorado) desert regions of California in Los Angeles District (generally north and east of the San Gabriel, San Bernardino, San Jacinto, and Santa Rosa mountain ranges, and south of Little Lake, Inyo County), no nationwide permit, except Nationwide Permits 1 (Aids to Navigation), 2 (Structures in Artificial Canals), 3 (Maintenance), 4 (Fish and Wildlife Harvesting, Enhancement, and Attraction Devices and Activities), 5 (Scientific Measurement Devices), 6 (Survey Activities), 9 (Structures in Fleeting and Anchorage Areas), 10 (Mooring Buoys), 11 (Temporary Recreational Structures), 20 (Oil Spill Cleanup), 22 (Removal of Vessels), 27 (Stream and Wetland Restoration Activities), 30 (Moist Soil Management for Wildlife), 31 (Maintenance of Existing Flood Control Projects), 32 (Completed Enforcement Actions), 35 (Maintenance Dredging of Existing Basins), 37 (Emergency Watershed Protection and Rehabilitation), and 38 (Cleanup of Hazardous and Toxic Waste), or other nationwide or regional general permits that specifically authorize maintenance of previously authorized structures or fill, can be used to authorize the discharge of dredged or fill material into a jurisdictional special aquatic site as defined at 40 CFR Part 230.40-45 (sanctuaries and refuges, wetlands, mudflats, vegetated shallows, coral reefs, and riffle-and-pool complexes).

3. For all projects proposed for authorization by nationwide or regional general permits where prior notification to the District Engineer is required, applicants must provide color photographs or color photocopies of the project area taken from representative points documented on a site map. Pre-project photographs and the site map would be provided with the permit application. Photographs should represent conditions typical or indicative of the resources before impacts.

4. Notification pursuant to general condition 13 shall be required for projects in all special aquatic sites as defined at 40 CFR Part 230.40-45 (sanctuaries and refuges, wetlands, mudflats, vegetated shallows, coral reefs, and riffle-and-pool complexes), and in all perennial watercourses or waterbodies in the State of Arizona and the Mojave and Sonoran (Colorado) desert regions of California in Los Angeles District (generally north and east of the San Gabriel, San Bernardino, San Jacinto, and Santa Rosa mountain ranges, and south of Little Lake, Inyo County), excluding the Colorado River from Davis Dam downstream to the north end of Topock and downstream of Imperial Dam.



MAP SCALE 1" = 1000'

0 1000 2000 FEET

0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1170H

FIRM

FLOOD INSURANCE RATE MAP

MARICOPA COUNTY, ARIZONA

AND INCORPORATED AREAS

PANEL 1170 OF 4350

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
EL MIRAGE, CITY OF	040041	1170	H
MARICOPA COUNTY	040037	1170	H
PEORIA, CITY OF	040050	1170	H
SURPRISE, CITY OF	040053	1170	H

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

04013C1170H

MAP REVISED

SEPTEMBER 30, 2005

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Federal Emergency Management Agency

Washington, D.C. 20472

SEP 20 2005

The Honorable John Keegan
Mayor, City of Peoria
8401 West Monroe Street
Peoria, AZ 85345-6560

Case No.: 04-09-1791V
Community: City of Peoria, AZ
Community No.: 040050
Effective Date: October 1, 2005
LOMC-VALID

Dear Mayor Keegan:

This letter revalidates the determinations for properties and/or structures in the referenced community as described in the Letters of Map Revision Based on Fill (LOMR-Fs) and Letters of Map Amendment (LOMAs) previously issued by the Department of Homeland Security's Federal Emergency Management Agency (FEMA) on the dates listed on the enclosed table. As of the effective date shown above, these LOMR-Fs and LOMAs will revise the effective National Flood Insurance Program (NFIP) map dated September 30, 2005, for the referenced community, and will remain in effect until superseded by a revision to the NFIP map panel on which the property is located. The FEMA case number, property identifier, NFIP map panel number, and current flood insurance zone for the revalidated LOMR-Fs and LOMAs are listed on the enclosed table.

Because these revalidated LOMR-Fs and LOMAs will not be printed or distributed to primary map users, such as local insurance agents and mortgage lenders, your community will serve as a repository for this new data. We encourage you to disseminate the information reflected by this letter throughout your community so that interested persons, such as property owners, local insurance agents, and mortgage lenders, may benefit from the information.

For information relating to LOMR-Fs or LOMAs not listed on the enclosed table or to obtain copies of previously issued LOMR-Fs and LOMAs, if needed, please contact our Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627).

Sincerely,

Doug Bellomo, P.E., CFM, Chief
Hazard Identification Section
Mitigation Division
Emergency Preparedness
and Response Directorate

Enclosure

cc: Community Map Repository

Mr. David Moody, P.E.
Floodplain Manager
City of Peoria

REVALIDATED LETTERS OF MAP CHANGE FOR **CITY OF PEORIA, ARIZONA**

COMMUNITY NO. : **040050** CASE NO. : 04-09-1791V

EFFECTIVE DATE : **OCTOBER 1, 2005**

CASE NO.	DATE ISSUED	IDENTIFIER	MAP PANEL NO.	NEW ZONE
98-09-711A	5/21/1998	WESTFIELD GARDENS III, LOTS 1-7, 54-78 & 98-105	04013C1630H	X
99-09-669A	4/28/1999	ROSE GARDEN, LOTS 9-12	04013C1170H	X
02-09-008A	10/24/2001	ARROWHEAD SHADOWS, LOT 53 -- 7526 WEST TUMBLEWOOD DRIVE	04013C1190H	X
04-09-1567A	10/25/2004	FLETCHER FARMS, PORTION OF SECTION 23, T4N, R4E, G.&.S.R.B.&M.	04013C1190H	X
05-09-0596A	4/18/2005	COPPER CREEK ESTATES, LOTS 12-13 & 19	04013C1180G	X

Federal Emergency Management Agency

Washington, D.C. 20472

OCT 11 2005

The Honorable John Keegan
Mayor, City of Peoria
8401 West Monroe Street
Peoria, AZ 85345-6560

Case No.: 06-09-0014X
Community: City of Peoria, AZ
Community No.: 040050
Effective Date: October 1, 2005
LOMC-VALID

Dear Mayor Keegan:

This letter reissues the determination for properties and/or structures in the referenced community as described in the Letters of Map Revision (LOMRs), Letter of Map Revision Based on Fill (LOMR-Fs), and Letters of Map Amendment (LOMAs) previously issued by the Federal Emergency Management Agency (FEMA) on the date(s) listed on the enclosed table. The table includes LOMRs, LOMR-Fs and/or LOMAs not included on the revalidation letter previously issued, dated September 20, 2005, Case Number 04-09-1791V. As of the effective date shown above, these LOMRs, LOMR-Fs, and LOMAs will revise the effective National Flood Insurance Program (NFIP) map dated September 30, 2005, and will remain in effect until superseded by a revision to the NFIP map panel on which the property is shown. The FEMA case number (when available), property identifier, NFIP map panel number, and current flood insurance zone for the revalidated LOMRs, LOMR-Fs, and LOMAs are listed on the enclosed table.

Because these revalidated LOMRs, LOMR-Fs, and LOMAs will not be printed or distributed to primary map users, such as local insurance agents and mortgage lenders, your community will serve as a repository for this new data. We encourage you to disseminate the information reflected by this letter throughout your community so that interested persons, such as property owners, local insurance agents, and mortgage lenders, may benefit from the information.

For information relating to LOMRs, LOMR-Fs, or LOMAs not listed on the enclosed table or to obtain copies of previously issued LOMRs, LOMR-Fs and LOMAs, if needed, please contact our Map Assistance Center, toll free, at 1-877-FEMA MAP (1-877-336-2627).

Sincerely,

Doug Bellomo, P.E., CFM, Chief
Hazard Identification Section
Mitigation Division
Emergency Preparedness
and Response Directorate

Enclosure

cc: Community Map Repository

Mr. David Moody, P.E.
Floodplain Manager
City of Peoria

REVALIDATED LETTERS OF MAP CHANGE FOR **CITY OF PEORIA, ARIZONA**

COMMUNITY NO. : **040050** CASE NO. : 06-09-0014X

EFFECTIVE DATE : **OCTOBER 1, 2005**

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05-09-0596A	4/18/2005	COPPER CREEK ESTATES, LOTS 12-13 & 19	04013C1180G	X
05-09-1090A	6/1/2005	8953 WEST CUSTER LANE, LOT 35 HARBOR SHORES	04013C1610J	X
05-09-1137P	9/27/2005	PADELFORD WASH - FROM CENTRAL ARIZONA PROJECT CANAL TO STATE ROUTE 74	04013C0710G 04013C0720G	Multiple