Disney | ABC Studios at The Ranch

Draft Environmental Impact Report

Volume IV

SCH No. 2010011010
County Project No. TR071216-(5)
Plan Amendment No. 200900010
Zone Change No. 200900012
Vesting Tentative Tract Map No. 071216
Conditional Use Permit No. 200900126
Oak Tree Permit No. 200900041
Parking Permit No. 201000002
Environmental Review No. 200900112

Lead Agency:
County of Los Angeles
Department of Regional Planning
Impact Analysis Section
320 West Temple Street, Room 1348
Los Angeles, California 90012

May 2012

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320 West Temple Street, Room 1348
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May 2012

Prepared By:

matrix environmental

6701 Center Drive West, Suite 900
Los Angeles, California 90045

TABLE OF CONTENTS

Page

VOLUME I

I. INTRODUCTION I-1

II. EXECUTIVE SUMMARY II-1

III. ENVIRONMENTAL SETTING III-1

IV. PROJECT DESCRIPTION IV-1

V. ENVIRONMENTAL IMPACT ANALYSIS V.A-1
- A. Geotechnical Hazards V.A-1
- B. Flood Hazards V.B-1
- C. Noise V.C-1
- D. Water Quality V.D-1
- E.1 Air Resources—Air Quality V.E.1-1
- E.2 Air Resources—Global Climate Change V.E.2-1
- F. Biological Resources V.F-1
- G. Cultural and Paleontological Resources V.G-1
- H. Agricultural and Forestry Resources V.H-1

VOLUME II

- I. Visual Qualities V.I-1
- J. Traffic, Access, and Parking V.J-1
- K.1 Public Services—Law Enforcement V.K.1-1
- K.2 Public Services—Fire Protection V.K.2-1
- L.1 Utilities and Service Systems—Water Supply V.L.1-1
- L.2 Utilities and Service Systems—Wastewater/Sewage Disposal V.L.2-1
- L.3 Utilities and Service Systems—Solid Waste V.L.3-1
- L.4 Utilities and Service Systems—Energy V.L.4-1
- M. Environmental Safety/Fire Hazards V.M-1
- N. Land Use V.N-1

VI. PROJECT ALTERNATIVES VI-1
- A. Alternative 1: No Project/No Build VI-16
- B. Alternative 2: Development in Accordance with Existing Plans VI-27
- C. Alternative 3: Reduced Program VI-46

Page

D. Alternative 4: Alternative Design with Reduced Program VI-64
E. Environmentally Superior Alternative VI-83

VII. OTHER ENVIRONMENTAL CONSIDERATIONS VII-1

VIII. LIST OF PREPARERS VIII-1

IX. REFERENCES IX-1

X. ACRONYMS AND ABBREVIATIONS X-1

LIST OF APPENDICES

VOLUME III

Appendix A NOP/Initial Study/NOP Comment Letters

Appendix B.1 Preliminary Geotechnical Report

Appendix B.2 Preliminary Geotechnical Report

VOLUME IV

Appendix C Drainage Concept/SUSMP/LID Plan

VOLUME V

Appendix C Drainage Concept/SUSMP/LID Plan (Continued)
(Sediment Transport Analyses)

VOLUME VI

Appendix D Noise Worksheets

Appendix E.1 Air Quality Worksheets

Appendix E.2 GHG Worksheets

Appendix F.1 Biological Resources Assessment

Appendix F.2 Biological Resources Assessment Supplement

Appendix F.3 Biological Resources Assessment Addendum

Appendix F.4 County Oak Tree Report

Appendix F.5 City Oak Tree Report

Appendix F.6 Oak Tree and Woodland Mitigation and Monitoring Plan

Appendix F.7 Jurisdictional Waters Report

Appendix F.8 Preliminary Fuel Modification Plan

Appendix F.9 Wildlife Impacts Analysis

Appendix F.10 Sensitive Species Surveys

Appendix F.11 Habitat Mitigation and Monitoring Plan

VOLUME VII

Appendix G.1 Historic Resources Assessment

Appendix G.2 Archaeological and Paleontological Resources Assessment

Appendix G.3 Supplement to Archaeological and Paleontological Resources Assessment

Appendix H.1 Design Guidelines

Appendix H.2 Light Memo

VOLUME VIII

Appendix I Traffic Study

VOLUME IX

Appendix J.1 Los Angeles County Sheriff's Department and California Highway Patrol Correspondence

Appendix J.2 Los Angeles County Fire Department Correspondence

Appendix K.1 Water Supply Assessment

Appendix K.2 Water Report

Appendix K.3 Sewer Report

Appendix K.4 Sewer Area Study

Appendix K.5 Dry Utilities Report

Appendix L.1 Environmental Records Search I

Appendix L.2 Environmental Records Search II

Appendix L.3 Soil Sampling Analytical Report

Appendix M Sunnyvale Analysis

LIST OF FIGURES

Figure		Page
III-1	Location of Related Projects	III-42
IV-1	Regional and Local Vicinity Map	IV-2
IV-2	Aerial Photograph of Golden Oak Ranch	IV-4
IV-3	Existing Uses	IV-6
IV-4	Proposed Uses	IV-11
IV-5	Proposed Uses Outside of Golden Oak Ranch	IV-12
IV-6	Conceptual Site Plan—Soundstage Option	IV-14
IV-7	Conceptual Site Plan—Studio Office Option	IV-16
IV-8	Site Circulation—Soundstage Option	IV-25
IV-9	Site Circulation—Studio Office Option	IV-26
IV-10	Landscaping Concept—Soundstage Option	IV-29
IV-11	Landscaping Concept—Studio Office Option	IV-30
IV-12	Proposed Trail	IV-34
IV-13	Temporary Construction Road	IV-47
IV-14	Retaining Walls—Soundstage Option	IV-49
IV-15	Retaining Walls—Studio Office Option	IV-50
IV-16	Tract Map	IV-53
IV-17	Exhibit “A” Map	IV-55
V.A-1	Regional Faults in Southern California	V.A-6
V.A-2	Seismic Hazard Zone Map	V.A-9
V.A-3	Project Grading Plan	V.A-19
V.A-4	Grading Profiles	V.A-20
V.A-5	Water Tank Grading Plan	V.A-21
V.A-6	Conditional Parking Areas Grading Plan	V.A-22
V.A-7	Proposed Placerita Canyon Connector Trail	V.A-23

Figure **Page**

V.B-1 Existing Drainage Conditions V.B-4
V.B-2 Existing Floodplain Map V.B-7
V.B-3 Conceptual Drainage Conditions and Facilities V.B-15
V.B-4 Post-Project Floodplain Map V.B-28
V.B-5 Debris Basins V.B-33
V.C-1 Noise Measurement Locations V.C-16
V.E.1-1 SCAQMD Source Receptor Areas V.E.1-17
V.E.1-2 MATES III Total Cancer Risk for Project Area V.E.1-20
V.E.1-3 Air Quality Sensitive Receptors Locations V.E.1-21
V.F-1 Plant Communities and Jurisdictional Features—Development Area V.F-17
V.F-2 Plant Communities and Jurisdictional Features—Water Tank Area and Trail Area V.F-18
V.F-3 Plant Communities—Conditional Parking Areas and Potential Mobile Home Relocation Areas V.F-19
V.F-4 Plant Communities—Off-Site Infrastructure Improvement Areas (Southwest of Development Area) V.F-20
V.F-5 Plant Communities—Off-Site Infrastructure Improvement Areas and SR-14 Interchange Improvements (Southwest of Development Area) V.F-21
V.F-6 Plant Communities—Off-Site Infrastructure Improvement Areas (West of Development Area) V.F-22
V.F-7 Plant Communities—Off-Site Infrastructure Improvement Areas (West of Development Area) V.F-23
V.F-8 Plant Communities—Off-Site Infrastructure Improvement Areas (West of Development Area) V.F-24
V.F-9 Plant Communities—Off-Site Infrastructure Improvement Areas and SR-14 Interchange Improvements (North of Development Area) V.F-25
V.F-10 Plant Communities—Off-Site Infrastructure Improvement Areas (North of Development Area) V.F-26
V.F-11 Plant Communities—Off-Site Infrastructure Improvement Areas (North and West of Development Area) V.F-27
V.F-12 California Gnatcatcher Final Designated Critical Habitat V.F-37

Figure **Page**

V.F-13 Oak Tree Map (On-Site) V.F-41
V.F-14 Oak Tree Map (Off-Site) V.F-43
V.F-15 Impacts to Plant Communities and Jurisdictional Features—Development Area V.F-65
V.F-16 Impacts to Plant Communities and Jurisdictional Features—Water Tank Area and Trail Area V.F-66
V.F-17 Impacts to Oak Trees V.F-73
V.F-18 Oak Tree Assessment—Trail Area V.F-75
V.F-19 Potential Oak Woodland Expansion and Restoration Areas V.F-79
V.F-20 Impacts to Jurisdictional Features (With Site Development Plan) V.F-82
V.F-21 Impacts to Jurisdictional Features—Drainage B Detail V.F-83
V.F-22 Impacts to Jurisdictional Features—Water Tank Area and Trail Area Detail V.F-84
V.F-23 Placerita Creek Restoration Plan V.F-85
V.I-1 Photo Location Map V.I-4
V.I-2 Photographs of Project Site and Surrounding Area V.I-5
V.I-3 Existing and Proposed Views—SR-14 NB Off-Ramp V.I-6
V.I-4 Existing and Proposed Views—SR-14 NB V.I-7
V.I-5 Existing and Proposed Views—Placerita Canyon Road V.I-8
V.I-6 Existing and Proposed Views—SR-14 SB On-Ramp V.I-9
V.I-7 Existing and Proposed Views—Placerita Canyon Road V.I-10
V.I-8 Conceptual Rendering of Project Main Entrance V.I-24
V.I-9 Conceptual Rendering of Proposed Soundstages V.I-25
V.I-10 Conceptual Rendering of Proposed Plaza V.I-26
V.I-11 Conceptual Rendering of Creek View V.I-27
V.I-12 Conceptual Rendering of Aerial View of Project V.I-28
V.J-1 Existing Conditions (2010) Peak-Hour Levels of Service V.J-5
V.J-2 Proposed Parking Plan—Soundstage Option V.J-24
V.J-3 Alternative Parking Plan—Studio Office Option V.J-25

Figure **Page**

V.J-4 Existing plus Ambient Growth Conditions (2020) Peak-Hour Levels of Service V.J-31

V.J-5 Project Trip Distribution V.J-33

V.J-6 Existing plus Ambient Growth plus Project Conditions (Soundstage and Studio Office Options)—Peak-Hour Levels of Service V.J-35

V.J-7 Existing plus Ambient Growth plus Project with Mitigation (Soundstage and Studio Office Options)—Peak-Hour Levels of Service V.J-65

V.J-8 Existing plus Ambient Growth plus Project with Mitigation plus Related Projects with Cumulative Mitigation (Soundstage and Studio Office Options)—Peak-Hour Levels of Service V.J-72

V.K.1-1 Law Enforcement Stations Within the Project Vicinity V.K.1-2

V.K.2-1 Existing and Proposed Fire Stations Within the Project Vicinity V.K.2-2

V.K.2-2 Preliminary Fuel Modification Plan V.K.2-14

V.L.1-1 Proposed Off-Site Water Improvements V.L.1-23

V.L.1-2 Proposed On-Site Water Improvements V.L.1-26

V.L.2-1 Proposed Off-Site Sewer Line—Oak Orchard Alignment V.L.2-7

V.L.2-2 Proposed On-Site Sewer System V.L.2-9

V.L.3-1 County of Los Angeles Landfills V.L.3-3

V.N-1 Applicable and Proposed Area Plan Designations V.N-3

V.N-2 Existing and Proposed Zoning Designations V.N-4

LIST OF TABLES

Table		Page
II-1	Summary of Environmental Impacts, Project Design Features, Mitigation Measures, and Resulting Levels of Significance	II-9
III-1	List of Related Projects	III-41
IV-1	Project Buildout—Soundstage Option	IV-15
IV-2	Project Buildout—Studio Office Option	IV-17
V.C-1	Typical Noise Levels	V.C-2
V.C-2	Land Use Compatibility for Community Noise Exposure	V.C-6
V.C-3	County of Los Angeles Exterior Noise Standards	V.C-8
V.C-4	County of Los Angeles Construction Noise Limits	V.C-10
V.C-5	City of Santa Clarita Exterior Noise Limits	V.C-11
V.C-6	FTA Vibration Impact Criteria—Typical Human Annoyance Levels	V.C-12
V.C-7	FTA Vibration Impact Criteria—Typical Levels for Building Damage	V.C-12
V.C-8	Caltrans Guidelines—Typical Vibration Annoyance Thresholds	V.C-13
V.C-9	Caltrans Guidelines—Typical Vibration Damage Thresholds	V.C-13
V.C-10	Measured Off-Site Ambient Noise Levels	V.C-17
V.C-11	Traffic Noise Model Calibration	V.C-18
V.C-12	Calculated Existing Roadway Traffic Noise Levels	V.C-19
V.C-13	Noise Levels Generated by Typical Construction Equipment	V.C-25
V.C-14	Construction Noise Impacts from On-Site Activities	V.C-26
V.C-15	Off-Site Roadway Traffic Noise Impacts—Soundstage Option	V.C-34
V.C-16	Off-Site Roadway Traffic Noise Impacts—Office Studio Option	V.C-34
V.C-17	Construction Vibration Impacts	V.C-44
V.C-18	Cumulative Off-Site Roadway Traffic Noise Impacts—Soundstages within Northern Portion of the Site Option	V.C-47
V.C-19	Cumulative Off-Site Roadway Traffic Noise Impacts—Studio Offices within Northern Portion of the Site Option	V.C-47

Table **Page**

V.E.1-1 Ambient Air Quality Standards V.E.1-3

V.E.1-2 Summary of Ambient Air Quality In the Project Vicinity V.E.1-18

V.E.1-3 Unmitigated Project—Estimate of Construction Emissions (Pounds per Day) V.E.1-37

V.E.1-4 Unmitigated Project—Maximum Ambient Construction Pollutant Impacts at the Closest Sensitive Receptors V.E.1-39

V.E.1-5 Unmitigated Project—Regional Operational Emissions (Pounds per Day) V.E.1-43

V.E.1-6 Unmitigated Project—Localized Operational Emissions (Pounds per Day) V.E.1-44

V.E.1-7 Local Area Carbon Monoxide Dispersion Analysis V.E.1-45

V.E.2-1 Global Warming Potentials V.E.2-3

V.E.2-2 California GHG Inventory (Million Metric Tons CO_2e) V.E.2-4

V.E.2-3 Construction Related Emissions with 2020 Mandates (Metric Tons of CO_2e) V.E.2-32

V.E.2-4 Annual GHG Emissions Summary (Metric Tons of CO_2e) V.E.2-33

V.F-1 Existing Plant Communities V.F-16

V.F-2 Tree Assessment Summary V.F-42

V.F-3 Temporary and Permanent Impacts to Plant Communities V.F-64

V.G-1 Alterations to Ranch Resources V.G-26

V.J-1 Study Intersection Summary and Existing (2010) Levels of Service V.J-4

V.J-2 Existing Plus Ambient Growth Conditions, Both without and with Soundstage Option (2020) Intersection V/C and Levels of Service V.J-30

V.J-3 Soundstage Option Trip Generation V.J-32

V.J-4 Existing Plus Ambient Growth Conditions, Both without and with Studio Office Option (2020) Intersection V/C and Levels of Service V.J-34

V.J-5 Studio Office Option Trip Generation V.J-36

V.J-6 Caltrans Intersection Analysis—Soundstage and Studio Office Options V.J-39

V.J-7 Caltrans On-Ramp Analysis—Soundstage and Studio Office Options V.J-40

V.J-8 Caltrans Off-Ramp Analysis—Soundstage and Studio Office Options V.J-41

Table **Page**

V.J-9 CMP Intersection Analysis (Soundstage and Studio Office Options).....V.J-43

V.J-10 Future Conditions, Both without and with Soundstage Option (2020) Freeway Segment Levels of Service V.J-44

V.J-11 Future Conditions, Both without and with Studio Office Option (2020) Freeway Segment Levels of Service V.J-46

V.J-12 Soundstage Option Parking Code and Demand Requirements.....V.J-52

V.J-13 Studio Office Option Parking Code and Demand Requirements V.J-53

V.J-14 Existing Plus Ambient Growth Plus Project with Mitigation Plus Related Projects Conditions (Soundstage Option, 2020) Intersection Peak-Hour Levels of Service V.J-57

V.J-15 Existing Plus Ambient Growth Plus Project with Mitigation Plus Related Projects Conditions (Studio Office Option, 2020) Intersection Peak-Hour Levels of Service.....V.J-58

V.J-16 Existing Plus Ambient Growth Plus Project with Mitigation Conditions (Soundstage Option, 2020) Intersection Levels of Service V.J-64

V.J-17 Existing Plus Ambient Growth Plus Project with Mitigation Conditions (Studio Office Option, 2020) Intersection Levels of Service.....V.J-66

V.J-18 Existing Plus Ambient Growth Plus Project with Mitigation Conditions, with Related Projects (Soundstage and Studio Office Options, 2020) Access Analysis.....V.J-68

V.J-19 Existing Plus Ambient Growth Plus Project with Mitigation Plus Related Projects, with Cumulative Mitigation (Soundstage Option, 2020) Intersection Peak-Hour Levels of Service.....V.J-70

V.J-20 Existing Plus Ambient Growth Plus Project with Mitigation Plus Related Projects, with Cumulative Mitigation (Studio Office Option, 2020) Intersection Peak-Hour Levels of Service.....V.J-73

V.K.2-1 Existing and Proposed County Fire Department Stations Located In the Project Vicinity V.K.2-4

V.K.2-2 Fire and Paramedic Response Data for 2009..... V.K.2-5

V.L.1-1 Long-Term Water Available to CLWA for Average/Normal Years (2006 Reliability Report) V.L.1-8

V.L.1-2 Water Available to CLWA for Single- and Multiple-Dry Years (2006 Reliability Report) V.L.1-8

Table **Page**

V.L.1-3 Long-Term Water Available to CLWA for Average/Normal Years (2009 Draft Reliability Report) V.L.1-10

V.L.1-4 Water Available to CLWA for Single- and Multiple-Dry Years (2009 Draft Reliability Report) V.L.1-10

V.L.1-5 SWP Table A Supply Reliability (af) V.L.1-11

V.L.1-6 Historical Water Use for Newhall County Water District (Acre-Feet) (SCVWR, 2008) V.L.1-16

V.L.1-7 Past, Current, and Projected Water Demands (By Customer Type) Newhall County Water District V.L.1-18

V.L.1-8 CWLA Total Water Supply Vs. Estimated Demand (af) V.L.1-19

V.L.2-1 Project Wastewater Generation (Studio Office Option) V.L.2-13

V.L.3-1 Solid Waste Disposal and Estimated Remaining Capacity for Los Angeles County Landfills V.L.3-4

V.L.3-2 Solid Waste Disposal and Estimated Remaining Capacity for Out-Of-County Landfills V.L.3-7

V.L.3-3 Estimated Construction and Demolition Waste Generation V.L.3-17

V.L.3-4 Project Solid Waste Disposal V.L.3-19

V.L.3-5 Related Projects—Estimated Solid Waste Generation V.L.3-22

V.L.4-1 Estimated Project Electricity Usage (Soundstage Option) V.L.4-15

V.L.4-2 Estimated Project Natural Gas Usage (Soundstage Option) V.L.4-16

V.L.4-3 Related Projects' Electricity Usage V.L.4-20

V.L.4-4 Related Projects' Natural Gas Usage V.L.4-21

V.M-1 Hazardous Materials and Fire Hazards Regulatory Setting V.M-2

V.N-1 Project Consistency with the Los Angeles County General Plan V.N-37

V.N-2 Project Consistency with the 1990 Santa Clarita Valley Area Plan V.N-55

V.N-3 Project Consistency with SCAG RTP and Compass Growth Vision V.N-67

VI-1 Comparison of Land Uses Under the Alternatives VI-4

VI-2 Comparison of Impacts Associated with the Proposed Project and Impacts of the Alternatives VI-9

VI-3 Trip Generation of Project Alternatives (Year 2020) VI-21

Appendix C

Drainage Concept/SUSMP/LID Plan

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS
LAND DEVELOPMENT DIVISION
ENGINEERING AND SURVEY BRANCH
STORM DRAIN AND HYDROLOGY SECTION

TO: DAVID EVANS & ASSOCIATES
JLC ENGINEERING & CONSULTING

DATE 8/22/2011

Attention: Jeff Rupp, and Joe Castaneda

REVIEW OF DRAINAGE CONCEPT / SUSMP / LID PLAN – VOLUME I AND VOLUME II

TR NO. 71216
SUBMITTAL DATE 8/15/2011

We have reviewed your Drainage Concept / SUSMP / LID Plan.

[X] The Drainage Concept / SUSMP / LID Plan has been conceptually approved.

A1 **APPROVED BY** Lizbeth Calderón
LIZBETH CALDERON
(626) 458-4921

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS
DEVELOPMENT AND PERMITS TRACKING SYSTEM

DATE: 08/29/11 DPR4051
TIME: 12:57:09 PAGE 1
ROUTE TO: LD0000 REQUESTED BY: XXXXXXX

FEE RECEIPT

RECEIPT NUMBER: LD00000014012

THIS IS A RECEIPT FOR THE AMOUNT OF FEES COLLECTED AS LISTED BELOW. THE RECEIPT NUMBER, DATE AND AMOUNT VALIDATED HEREON HAS ALSO BEEN VALIDATED ON YOUR APPLICATION OR OTHER DOCUMENT AND HAS BECOME A PART OF THE RECORD OF THE COUNTY OF LOS ANGELES, FROM WHICH THIS RECEIPT MAY BE IDENTIFIED. PLEASE RETAIN THIS RECEIPT AS PROOF OF PAYMENT. ANY REQUEST FOR REFUND MUST REFERENCE THIS RECEIPT NUMBER.

DATE PAYMENT RECEIVED: 08/29/11 12:57:06
PROJ/APPL/IMPRV NBR: TR 071216
PROPERTY ADDRESS:
RELATED PROJECT: PJ 037932
PAYOR NAME: DISNEY WORLDWIDE SERVICES, INC.
ADDRESS: P.O. BOX 10120

LAKE BUENA VISTA, FL 32830
PHONE: EXTN:

FEE ITEM	FEE DESCRIPTION	STATISTICAL CODE	CALCULATION FACTOR	UNIT OF MEASURE	EXTENDED AMOUNT
AC	HYD-AFTER 3RD SUBMIT	B079293	10543.00	$	$1,054.30

TOTAL FEES PAID: $1,054.30

PAYMENT TYPE	REFERENCE	AMT TENDERED	CHANGE GIVEN	AMOUNT APPLIED
CHECK	008535020	$1,054.30	$0.00	$1,054.30

OFFICE: LD 0000 DRAWER: 04
CASHIER: DS

ITEMS WITH AN ASTERISK (*) WILL REQUIRE FURTHER DEPOSITS
WHENEVER ACTUAL COSTS EXCEED THE DEPOSIT AMOUNT
********** END OF REPORT **********

DAVID EVANS
AND ASSOCIATES INC.

April 25, 2012

VIA U.S. MAIL

Ms. Ashley Rogers
Matrix Environmental
6701 Center Drive, Suite 900
Los Angeles, CA 90045

Re: Disney | ABC Studios at The Ranch: Drainage Concept/SUSMP/LID Plan

Dear Ms. Rogers,

After the completion of the Drainage Concept/SUSMP/LID Plan for the above project and approval of the Drainage Concept/SUSMP/LID Plan by the County of Los Angeles Department of Public Works in August 2011, minor modifications to the project were made, including the increase in the Development Area from 56 acres to approximately 58 acres. The following are the minor modifications made to the project and the reasons the Drainage Concept/SUSMP/LID Plan analyses still support the updated project design:

(1) The elevation of the southern portion of the Development Area (i.e., south of Placerita Creek) was increased by approximately five feet to improve circulation through the Development Area. The vertical change was made uniformly across the southern portion of the Development Area. As a result, drainage patterns, flow lengths and drainage areas remain identical to those analyzed in the previous study. Since the vertical change did not change the hydrological characteristics of the southern portion of the Development Area, the prior analyses and conclusions remain valid;

(2) The footprint of the debris basins, the creek bank protection, and the creek access roads were modified slightly. To offset the impact of the five-foot vertical change in the southern portion of the Development Area, the debris basin invert was elevated five feet. This change did not impact the debris basin storage volume capacity. The updated cross section of the creek bank protection (see attached) was revised to show the soil cement sloped at 1:1 with an earthen fill at a 2:1 slope located on top of the soil cement. The hydraulic model evaluated the conveyance of Placerita Creek using a 2:1 finished surface. The finished surface in the hydraulic model is identical to the 2:1 earthen fill slope located on top of the soil cement. The revised access roads were located outside the conveyance limits of the hydraulic model previously prepared. As a result, the conclusions in the hydraulic model remain valid; and

(3) A debris desilting inlet may be constructed on the south side of Placerita Canyon Road to intercept potential debris flows from Subarea Off-site 3a. Based on the storage volume capacity of the inlet, the potential debris volume from area "Off-site 3A" can be stored within the inlet. Therefore, directing the debris from area "Off-site 3A" to a debris desilting inlet will not impact the conclusions in the report.

As indicated in Mitigation Measure B-1 in the Draft EIR, a final Hydrology and Hydraulic study based on final project design and plans and demonstrating impacts will remain less than significant will be submitted to County of Los Angeles Department of Public Works for review and approval.

4200 Concours Suite 200 Ontario California 91764 Telephone: 909.481.5750 Facsimile: 909.481.5757

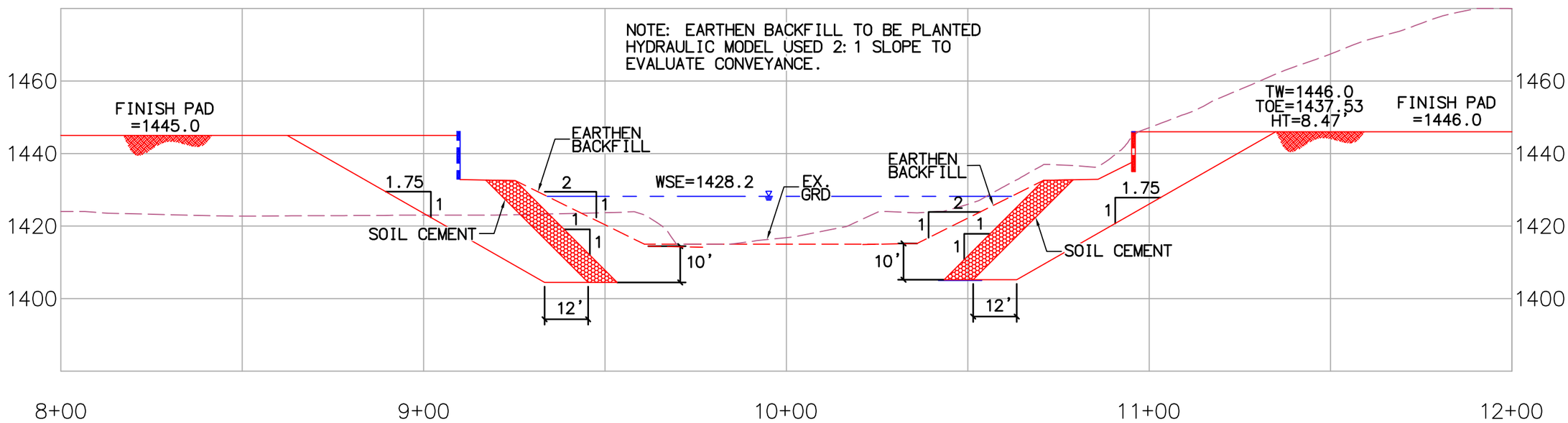
While the approved Drainage Concept/SUSMP/LID Plan may reflect slightly different project conditions than indicated in the Draft EIR, the modifications do not impact the conclusions in our report, and, with the mitigation measures set forth in the Draft EIR, impacts on the environment would remain less than significant.

Very truly yours,

Robert Bathke
David Evans & Associates

cc: Ms. Lizbeth Calderon
County of Los Angeles Department of Public Works
Ms. Christina Tran
County of Los Angeles Department of Regional Planning

TYPICAL CHANNEL SECTION



DRAINAGE CONCEPT / ~~HYDROLOGY STUDY~~ / SUSMP / LID PLAN – VOLUME 1 OF 2

FOR

VESTING TENTATIVE TRACT MAP 71216
DISNEY | ABC STUDIOS AT THE RANCH
NEWHALL, CALIFORNIA

PREPARED FOR:

MATRIX ENVIRONMENTAL
6701 CENTER DRIVE, SUITE 900
LOS ANGELES, CA 90045
PHONE: (424) 207-5333

PREPARED BY:

DAVID EVANS AND ASSOCIATES, INC.
4200 CONCOURS DR. SUITE 200
ONTARIO, CA 91764
(909) 481-5750

MARCH, 2010
NOVEMBER, 2010
MAY, 2011
MATE0000-0002

REVISED AUGUST, 2011

DAVID EVANS AND ASSOCIATES INC.

DRAINAGE CONCEPT / ~~HYDROLOGY STUDY~~ / SUSMP / LID PLAN - VOLUME 1 OF 2

FOR

VESTING TENTATIVE TRACT MAP 71216
DISNEY | ABC STUDIOS AT THE RANCH
NEWHALL, CALIFORNIA

PREPARED FOR:

MATRIX ENVIRONMENTAL
6701 CENTER DRIVE, SUITE 900
LOS ANGELES, CA 90045
PHONE: (424) 207-5333

PREPARED BY:

REGISTERED PROFESSIONAL ENGINEER
JEFFREY KARL RUPP
NO. 42868
Exp. 3/31/2012
CIVIL
STATE OF CALIFORNIA

Jeffrey Karl Rupp, P.E.

SUSMP / DRAINAGE CONCEPT / LID PLAN
APPROVED FOR DRAINAGE
APPROVED BY: Elizabeth Calderon RCE NO. C68328 DATE: 8/22/11
CHECKED BY: _____ DATE: _____
LAND DEVELOPMENT DIVISION
LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

DAVID EVANS AND ASSOCIATES, INC.
4200 CONCOURS DR. SUITE 200
ONTARIO, CA 91764
(909) 481-5750

TABLE OF CONTENTS

APPENDIX 1 HYDROLOGY AND WATER QUALITY STUDY

I. Introduction 1-2

II. Environmental Setting 1-3

III. Regulatory Framework 1-5

IV. Environmental Impacts 1-9

V. Cumulative Impacts 1-22

VI. Sub-Appendices

1-A. Methodology

1-B. Modified Rational Method for Existing Conditions

1-C. Hec-Ras Hydraulics

1-D. Floodplain Map

1-E. Modified Rational Method for Proposed Conditions

1-F. Hydraulics

1-G. Detention Basin Routing & Underground Storage Systems

1-H. Sediment Transport Analysis

APPENDIX 2 STANDARD URBAN STORMWATER MITIGATION PLAN (SUSMP)

I. Project Description

A. Project Background 2-1

B. Purpose and Scope 2-1

II. Site Characterization 2-2

III. Pollutants of Concern 2-3

IV. Hydrology

A. General Approach 2-5

B. Data Sources 2-5

C. Existing Conditions Results 2-7

D. Proposed Conditions Results 2-7

E. Baseline Hydrology Comparison 2-8

V. Best Management Practices

A. Site Design BMPs 2-10

B. Source Control BMPs 2-10

C. Treatment Control BMPs 2-11

VI. References 2-13

VII. Sub-Appendices 2-14

2-A: LACDPW Hydrology Data

2-B: SUSMP Project Site

2-C: SUSMP Calculations

2-D: Supplemental Information

APPENDIX 3 LOW IMPACT DEVELOPMENT – LID

I. Introduction 3-1

II. Effective Site Design Elements 3-1

III. LID Hydrologic Analysis 3-3

IV. LID Best Management Practices 3-5

APPENDIX 1 – HYDROLOGY AND WATER QUALITY STUDY

HYDROLOGY AND WATER QUALITY STUDY

FOR

VESTING TENTATIVE TRACT MAP 71216
DISNEY | ABC STUDIOS AT THE RANCH
NEWHALL, CALIFORNIA

PREPARED FOR:

MATRIX ENVIRONMENTAL
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DAVID EVANS AND ASSOCIATES, INC.
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I. INTRODUCTION

This study analyzes the potential hydrology and water quality issues associated with Disney | ABC Studios at The Ranch (Proposed Project), a motion picture and television studio to be located on 56 acres (Development Area) in the westernmost portion of the 890-acre Golden Oak Ranch (Ranch) in the unincorporated Santa Clarita Valley area of Los Angeles County. The Proposed Project also includes a request for approval of Vesting Tentative Tract Map No. 71216.

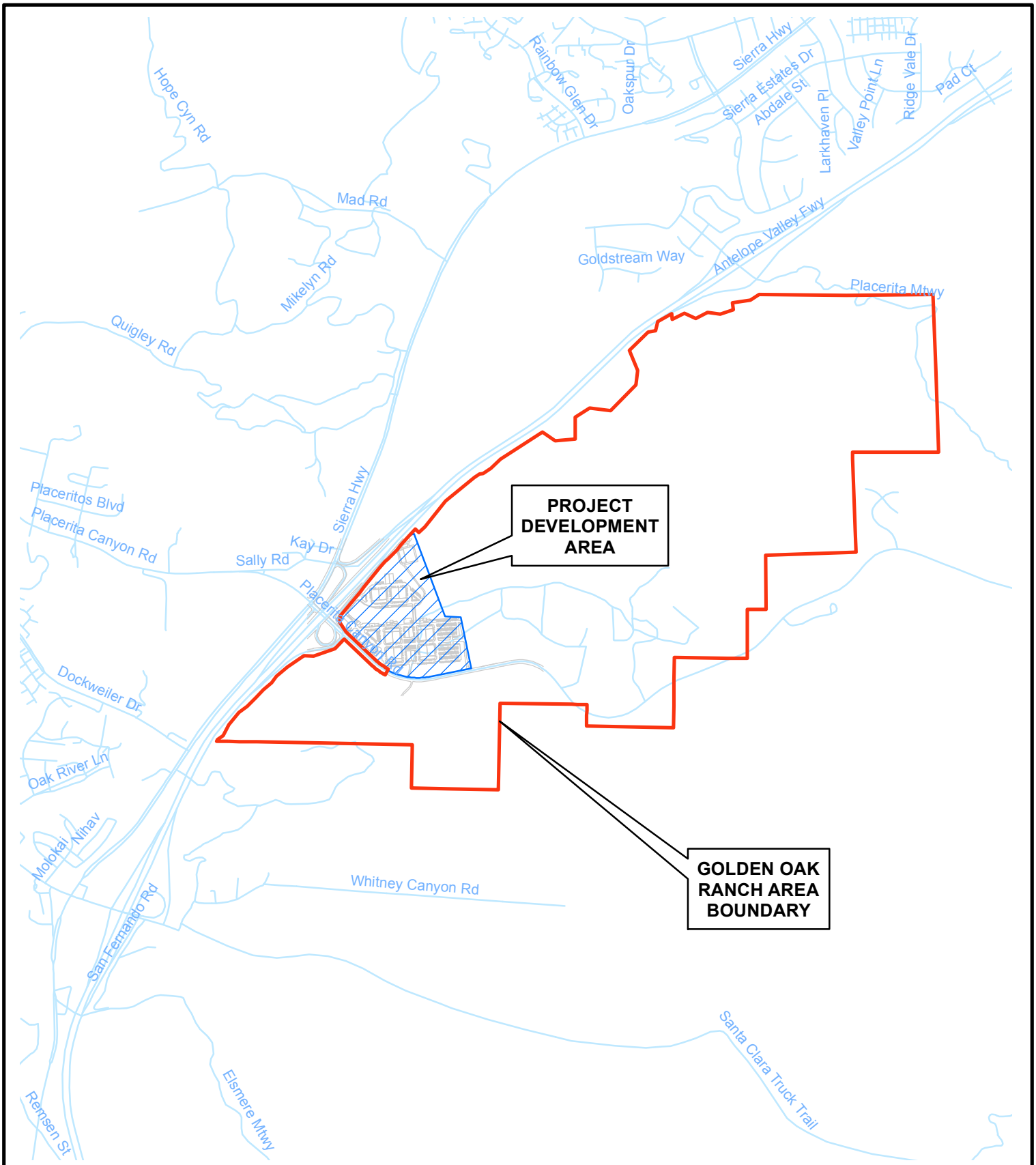
The Development Area is generally bounded by State Route 14 (SR-14) to the west, Placerita Canyon Road to the south and mostly undeveloped land to the north and east. Over 23 acres of the 56-acre Development Area consist of two large, mostly barren fill pads that were formed when Caltrans deposited dirt and gravel from grading during the construction of SR-14 in the early 1970s. These two fill pads are separated by Placerita Creek, which extends in an east-west direction across the Development Area. The Development Area is currently used for filming-related uses, including construction of large filming sets, ancillary agriculture uses and associated parking. See Figure 1, Vicinity and Location.

The grading for the Proposed Project would lower the elevation of the northern fill pad and the northern portion of the southern fill pad. In addition, fill soils would be placed to the east of the existing southern pad to provide for relatively flat building areas.

The northern portion of the Development Area would contain an electrical substation, four soundstages, production offices and two mills for set construction. An alternative development option for this area would provide for studio offices and the substation instead of the four soundstages with production offices and two mills. The southern portion would contain eight soundstages, production offices, four mills, six writer/producer bungalows, an administration building, a commissary building, a warehouse, a central utility plant, and a surface parking lot to the east of the soundstages.

At the request of the Newhall County Water District, the water supplier for the Development Area, the Proposed Project also would include the construction of an approximately 2,000,000-gallon water tank and associated water line on the Ranch south of Placerita Canyon Road. The construction of the water tank and associated water line would include improvements to an existing dirt road leading from Placerita Canyon Road to the water tank, including paving of the road for all-weather access at the request of Newhall County Water District.

This study describes the existing drainage characteristics of the site and the surrounding portion of Placerita Canyon, analyzes the water quality conditions of groundwater and local surface water in the vicinity of the site and evaluates the Proposed Project's potential impacts to these water resources. The impact analysis is based, in part, on the data provided in this Hydrology and Water Quality Study and the Standard Urban



2,000 0 Feet

FIGURE 1

DISNEY | ABC STUDIOS

AT THE RANCH

VICINITY AND LOCATION

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Stormwater Mitigation Plan (SUSMP) prepared by David Evans and Associates, Inc (See Appendix 2 herein).

Numerous federal, state, regional, and local laws, rules, regulations, plans, ordinances, and policies define the framework for regulating hydrology and water quality in the vicinity of the Proposed Project. This study also focuses on the hydrology and water quality requirements applicable to the Proposed Project. This analysis assumes the Proposed Project would follow National Pollutant Discharge Elimination System (NPDES) permit requirements and Los Angeles Basin Plan guidelines, as described in Section III, "Regulatory Framework."

II. ENVIRONMENTAL SETTING

Local Topography and Off-Site Drainage

The Proposed Project site is located within the southeastern part of the Upper Santa Clara River Watershed region. The Upper Santa Clara River Watershed consists of the portion of the Santa Clara River Watershed located within Los Angeles County. The major bodies of water in the region include the Santa Clara River and its tributaries. The principal tributaries are Castaic Creek, San Francisquito Creek, Bouquet Creek, and the South Fork of the Santa Clara River.

The Proposed Project site is situated at the bottom of Placerita Canyon, which runs generally east to west with relatively steep hillsides and ridgelines to the north and south measuring approximately 600 feet in height. The bottom of the canyon is relatively flat, with topography descending gently toward the west. Placerita Canyon includes an ephemeral stream, Placerita Creek, which runs through the Development Area, and receives intermittent surface flows only during, and immediately after, periods of intense precipitation.

The existing tributary area of Placerita Creek upstream of SR-14 is a watershed of approximately six square miles. See Sub Basin Exhibit, Sub-Appendix 1-B. Placerita Creek flows east to west into the South Fork of the Santa Clara River.

Off-site stormwater runoff flows in a generally south to north direction toward Placerita Creek. There are three major watersheds south of Placerita Canyon Road (Off-1a, Off-2a, and Off-3a), from which runoff flows onto the Development Area through a 24" CMP pipe and two cattle crossing culverts located under Placerita Canyon Road. These cattle crossings are six feet by seven feet arch-type corrugated metal structures that cross under Placerita Canyon Road and these flows are routed to a small ephemeral drainage that traverses the Development Area. The Caltrans drainage system at the intersection of SR-14 and Placerita Canyon Road collects runoff from Placerita Canyon Road, SR-14 and the northbound off-ramp, which are located to the southwest and west of the Development Area, and discharges it to Placerita Creek through a 48" corrugated metal pipe that traverses the Development Area. There are five minor watersheds north of the

Development Area (Off-4a, Off-5a, Off-6a, Off-11a, and Off-12a), from which runoff flows to the southwest toward Placerita Creek. See Drainage Map, Off-Site Conditions.

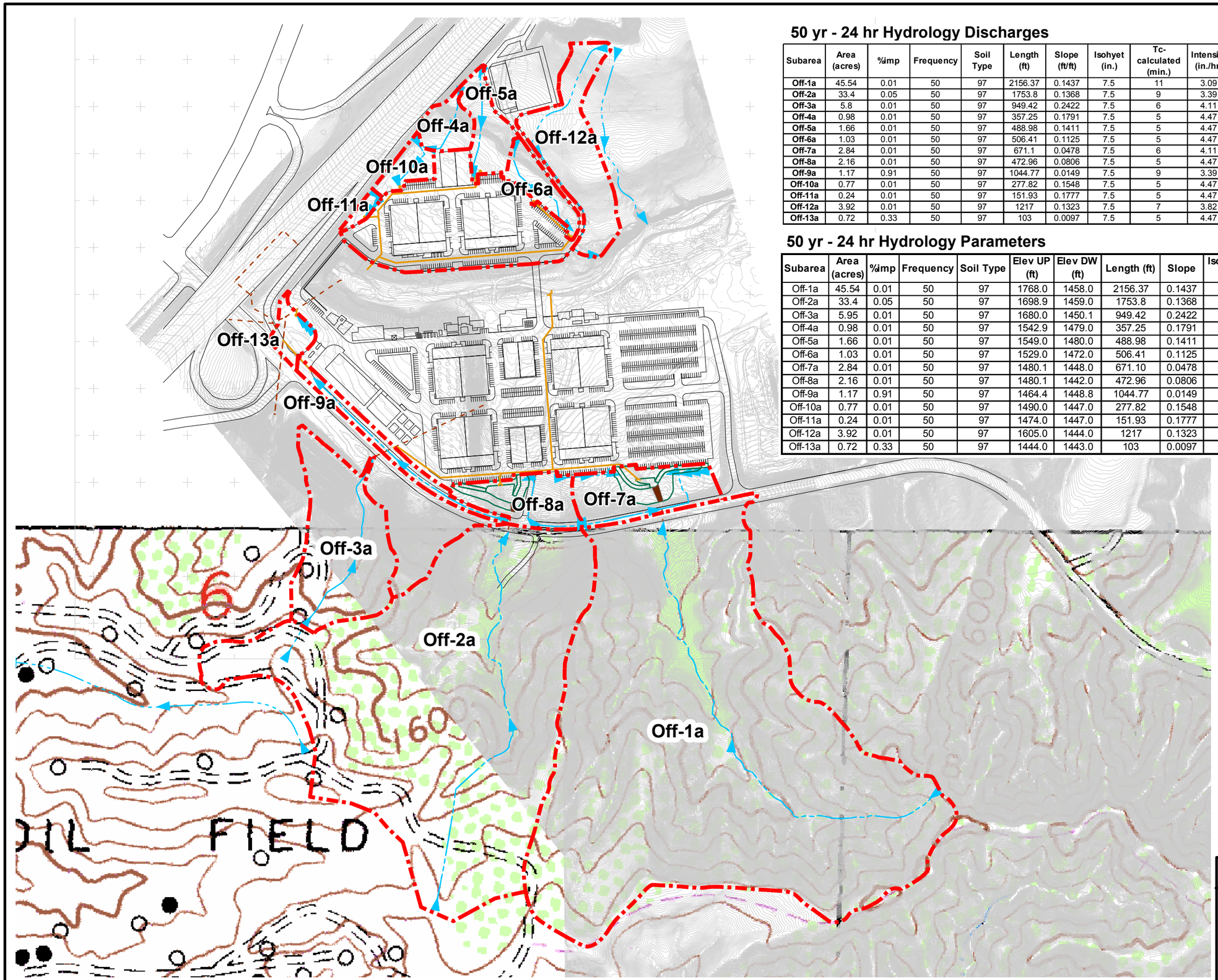
Surface Water and On-Site Drainage

The Development Area is comprised of approximately 56 acres in the westernmost portion of the Ranch, a substantial portion of which is located on two large, mostly barren fill pads. The Development Area is used currently for filming-related uses, including the construction of large filming sets, ancillary agricultural uses and associated parking. Current and past irrigation sources are from existing water wells within the Ranch. The approximate amount of groundwater used each year is reported to the State Water Resources Control Board.

The northern portion of the Development Area, the area north of Placerita Creek, comprises approximately 16 acres and is bordered by SR-14 on the northwest, Placerita Creek on the south, and generally undeveloped hillsides on the northeast. Within that area, the northern fill pad is approximately 8 acres in size with an average elevation of 1,476 feet above mean sea level (MSL) and steep, gravelly slopes that descend to Placerita Creek. The pad drains in a southwest direction to a low point on the pad and then discharges to Placerita Creek via a concrete-lined v-ditch. The remaining area of the northern portion of the Development Area outside of the northern fill pad is approximately 8 acres with a maximum elevation of 1,567 feet above MSL and drains to Placerita Creek. The northern fill pad and the remaining northern area of the Development Area are undeveloped with an imperviousness rate of approximately 1%. Pre-development discharge from the northern fill pad is estimated at 17 cubic feet per second (cfs).

The southern portion of the Development Area, the area south of Placerita Creek, comprises approximately 25.6 acres bordered by Placerita Creek on the north, Placerita Canyon Road on the south, SR-14 on the west, and the main entrance road to the Ranch on the east. The southern fill pad is approximately 11.6 acres in size with an elevation of approximately 1,456 feet above MSL and steep gravelly slopes that descend to Placerita Creek on the northern side. There is an approximate 60-foot drop along the east side of the southern fill pad to the remaining southern portion of the Development Area. The southern fill pad drains to a low point located at the southwest corner of the pad and then drains into a CMP riser in which it is conveyed via an underground 36-inch drain pipe to Placerita Creek. The remaining southern portion of the Development Area (approximately 14 acres) drains as sheet flow northerly toward Placerita Creek. This southern area is mostly undeveloped, other than the Ranch Foreman's mobile home and an uninhabited structure, with an imperviousness rate of about 1%. Pre-development discharge is estimated at 48 cfs.

Placerita Creek, with an area of approximately 14.4 acres, completes the remaining 56 acres of the Development Area.



50 yr - 24 hr Hydrology Discharges

Subarea	Area (acres)	%imp	Frequency	Soil Type	Length (ft)	Slope (ft/ft)	Isohyet (in.)	Tc-calculated (min.)	Intensity (in./hr)	Cu	Cd	Flow rate (cfs)	Fire Factor	Burned flow rate (cfs)	Volume (acre-ft)	Debris (cy)
Off-1a	45.54	0.01	50	97	2156.37	0.1437	7.5	11	3.09	0.73	0.73	102.72	0.34	107.83	6.91	9968
Off-2a	33.4	0.05	50	97	1753.8	0.1368	7.5	9	3.39	0.75	0.76	86.05	0.34	89.69	5.66	4281
Off-3a	5.8	0.01	50	97	949.42	0.2422	7.5	6	4.11	0.77	0.77	18.36	0.34	19.12	0.88	743
Off-4a	0.98	0.01	50	97	357.25	0.1791	7.5	5	4.47	0.78	0.78	3.42	0.34	N/A	0.15	N/A
Off-5a	1.66	0.01	50	97	488.98	0.1411	7.5	5	4.47	0.78	0.78	5.79	0.34	N/A	0.25	N/A
Off-6a	1.03	0.01	50	97	506.41	0.1125	7.5	5	4.47	0.78	0.78	3.59	0.34	N/A	0.16	N/A
Off-7a	2.84	0.01	50	97	671.1	0.0478	7.5	6	4.11	0.77	0.77	8.99	0.34	9.36	0.43	73
Off-8a	2.16	0.01	50	97	472.96	0.0806	7.5	5	4.47	0.78	0.78	7.53	0.34	7.83	0.33	56
Off-9a	1.17	0.91	50	97	1044.77	0.0149	7.5	9	3.39	0.75	0.89	3.53	0.34	n/a	0.61	30
Off-10a	0.77	0.01	50	97	277.82	0.1548	7.5	5	4.47	0.78	0.78	2.68	0.34	2.79	0.12	31
Off-11a	0.24	0.01	50	97	151.93	0.1777	7.5	5	4.47	0.78	0.78	0.84	0.34	N/A	0.04	N/A
Off-12a	3.92	0.01	50	97	1217	0.1323	7.5	7	3.82	0.76	0.76	11.38	0.34	N/A	0.61	N/A
Off-13a	0.72	0.33	50	97	103	0.0097	7.5	5	4.47	0.78	0.82	2.64	0.34	n/a	0.2	N/A

50 yr - 24 hr Hydrology Parameters

Subarea	Area (acres)	%imp	Frequency	Soil Type	Elev UP (ft)	Elev DW (ft)	Length (ft)	Slope	Isohyet (in)	Fire Factor	DPA	Bulking Factor	DP Rate (CY/MI^2)	DP RATE (CY/AC)
Off-1a	45.54	0.01	50	97	1768.0	1458.0	2156.37	0.1437	7.5	0.34	3	1.62	140000	219
Off-2a	33.4	0.05	50	97	1698.9	1459.0	1753.8	0.1368	7.5	0.34	5	1.47	82000	128
Off-3a	5.95	0.01	50	97	1680.0	1450.1	949.42	0.2422	7.5	0.34	5	1.47	82000	128
Off-4a	0.98	0.01	50	97	1542.9	1479.0	357.25	0.1791	7.5	0.34	5	1.47	82000	128
Off-5a	1.66	0.01	50	97	1549.0	1480.0	488.98	0.1411	7.5	0.34	5	1.47	82000	128
Off-6a	1.03	0.01	50	97	1529.0	1472.0	506.41	0.1125	7.5	0.34	5	1.47	82000	128
Off-7a	2.84	0.01	50	97	1480.1	1448.0	671.10	0.0478	7.5	0.34	9	1.27	16500	26
Off-8a	2.16	0.01	50	97	1480.1	1442.0	472.96	0.0806	7.5	0.34	9	1.27	16500	26
Off-9a	1.17	0.91	50	97	1464.4	1448.8	1044.77	0.0149	7.5	0.34	9	1.27	16500	26
Off-10a	0.77	0.01	50	97	1490.0	1447.0	277.82	0.1548	7.5	0.34	5	1.47	82000	128
Off-11a	0.24	0.01	50	97	1474.0	1447.0	151.93	0.1777	7.5	0.34	5	1.47	82000	128
Off-12a	3.92	0.01	50	97	1605.0	1444.0	1217	0.1323	7.5	0.34	5	1.47	82000	128
Off-13a	0.72	0.33	50	97	1444.0	1443.0	103	0.0097	7.5	0.34	9	1.27	82000	26

0 400 800 Feet

Legend

- Tributary Offsite Boundary
- Proposed Storm Drain-Offsite Flows
- Debris Basins
- Offsite Flows
- Existing Storm Drain - Off-site Flows

FIGURE 2

HYDROLOGY MAP
DISNEY | ABC STUDIOS
AT THE RANCH
OFF-SITE CONDITIONS

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Given the current absence of construction and low imperviousness rate within the Development Area, there is currently no formal treatment Best Management Practices (BMPs) within the Development Area.

Groundwater

The Proposed Project site is located within the Santa Clara River Valley Groundwater Basin, East Sub basin. The Santa Clara River Valley Groundwater Basin encompasses an area of approximately 103 square miles. It is bordered by the Piru Mountains on the north, by impervious rocks of the Modelo and lower Saugus Formations on the west, by the San Gabriel Mountains on the south and east, and by the Santa Susana Mountains on the south. It is drained by the Santa Clara River, Bouquet Creek, and Castaic Creek.

Groundwater in the vicinity of the Proposed Project tends to flow east to west, although cones of depression from groundwater pumping and mounding from irrigation can alter flow patterns over time. Based on soil boring tests performed on the Proposed Project site, perched alluvial groundwater was encountered at depths of 61 to 79 feet below the southern fill pad, at a depth of 71.5 feet below the northern fill pad, and at depths of 11.5 to 16 feet below ground surface in the low lying areas east of the southern fill pad. All construction activity would occur at least ten feet above groundwater. Accordingly, construction dewatering would not be required.

Flooding

The Federal Emergency Management Agency (FEMA) is responsible for identifying and delineating flood hazard zones. Based on the most current FEMA map for the Proposed Project site (Flood Insurance Rate Map 06037C0840 F, Panel 840, effective September 2008), portions of the Proposed Project site fall within Zone A. See Figure 3 Floodplain Boundary Pre-Development Condition. Zone A is defined as areas with a 1% annual chance of flooding and is the base floodplain mapped by approximate methods. Because detailed analyses are not performed for such areas, no depths or base flood elevations are shown.

III. REGULATORY FRAMEWORK

Regulatory Background

<u>Federal Regulations</u>

The federal Clean Water Act (CWA) Section 401, as amended in 1972, regulates the discharges of pollutants into water bodies from point and non-point sources. The CWA established minimum national water quality goals and created the National Pollutant Discharge Elimination System (NPDES) permit system to regulate the quality of discharged water. Discharges of pollutants to waters of the United States from any point source are prohibited, unless the discharge is in compliance with a NPDES permit.

The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Board (RWQCB) are the primary state/regional agencies responsible for implementing the CWA and the state's Porter-Cologne Water Quality Act and regulating the activities and factors that affect or have the potential to affect water quality in the state. Federal regulations issued in November 1990 and revised in 2003 expanded the original scope of the NPDES program to include permitting of stormwater discharges from construction sites that disturb areas larger than one acre.

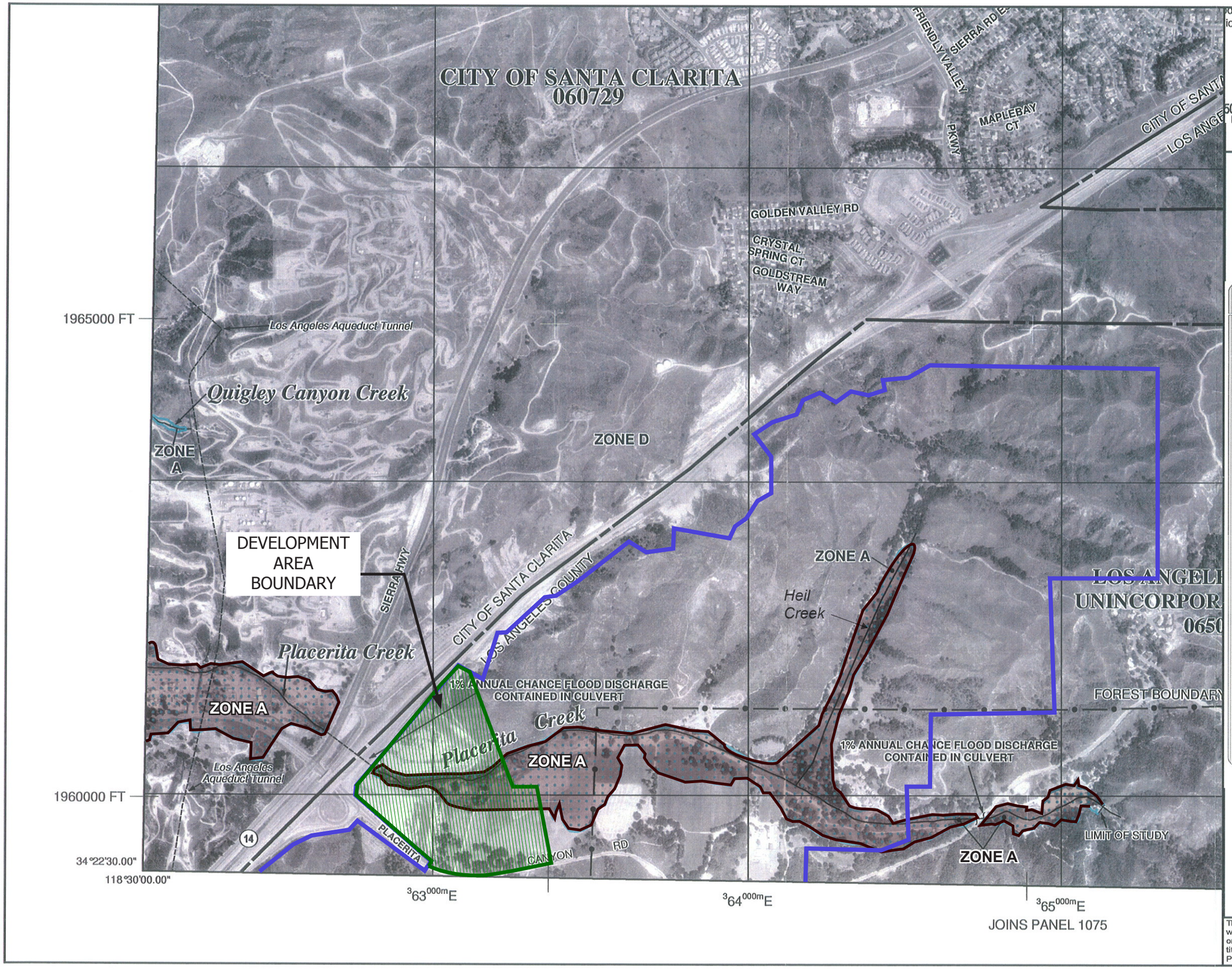
The CWA also requires states to adopt water quality standards for water bodies that have designated "beneficial uses". Water quality standards define the goals for a water body by designating its uses, setting criteria to protect those uses and establishing provisions to protect water bodies from pollutants. Water quality criteria must be adopted to protect designated uses, including numeric pollutant concentrations and/or narrative statements that represent the quality of water that is necessary to support beneficial use. If the designated beneficial uses of a water body are compromised by certain concentrations of listed pollutants, section 303(d) of the Clean Water Act requires that the water body be listed as "impaired." Once a water body has been deemed impaired, a Total Maximum Daily Load (TMDL) must be developed for each water quality pollutant that is causing the impairment.

Flooding Potential – Federal Emergency Management Agency (FEMA)

In 1968, Congress passed the National Flood Insurance Act, which created the National Flood Insurance Program (NFIP). The Federal Emergency Management Agency (FEMA) administers the NFIP. The intent of this program is to reduce future flood damage through community floodplain management ordinances and to provide protection for property owners against potential losses through an insurance mechanism that requires a premium to be paid for the protection. Through this program, hydrologic analyses are conducted to determine the magnitude of flood risk that exists in various communities throughout the country. FEMA identifies flood zones, that is, areas subject to flooding, through Flood Insurance Rate Maps (FIRMs). The standard for flood protection established by FEMA, and used by CEQA guidelines, is the 1-in-100 annual exceedance probability (AEP), commonly referred to as the 100-year flood event.

On a state level, the Flood Plain Management Act, encourages the sound development of land subject to recurring flooding, so that such areas as developed with economically-feasible flood control measures in place to prevent human and economic losses caused by excessive flooding. The State of California encourages the local governments to implement effective land use regulations to accomplish floodplain management.

Since October 1990, the County of Los Angeles has been a voluntary participant in NFIP of FEMA. As a participant, the County is responsible for the regulation of development in special flood hazard areas within the County. As a compliance requirement of the NFIP, the County enforces regulations on developments within flood hazard zones to ensure that buildings are erected at a safe elevation to prevent potential damage to property.



d insurance is available in this community, contact your
ional Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0840F

FIRM

FLOOD INSURANCE RATE MAP

LOS ANGELES COUNTY, CALIFORNIA

AND INCORPORATED AREAS

PANEL 840 OF 2350

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LOS ANGELES COUNTY	065043	0840	F
SANTA CLARITA, CITY OF	060729	0840	F

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
06037C0840F

EFFECTIVE DATE
SEPTEMBER 26, 2008

Federal Emergency Management Agency

FIGURE 3

DISNEY | ABC STUDIOS AT THE RANCH
FLOOD PLAIN BOUNDARY
PRE-DEVELOPMENT CONDITION

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

State Regulations

The Porter-Cologne Water Quality Control Act of 1969 established the principal state program for water quality control. The Porter-Cologne Act also authorizes the SWRCB to implement the provisions of the federal CWA. This Act also divides the state into nine RWQCB areas. Each RWQCB implements and enforces the provisions of the Porter-Cologne Act and the CWA, subject to policy guidance and review by the SWRCB.

In the state of California, the Federal NPDES program is administered by each RWQCB. The Proposed Project site is located in Region 4, which is under the jurisdiction of the Los Angeles Regional Water Control Board (LARWQCB). Individual permits are issued for certain defined discharge sources while non-point source runoff from construction sites and urban development are regulated under a series of general permits. The SWRCB issues NPDES stormwater permits for general construction activities. The LARWQCB enforces the NPDES program for the State of California within its jurisdiction.

Coverage under the Construction General Permit is accomplished by completing and filing a Notice of Intent with the SWRCB and by preparing and implementing a Storm Water Pollution Prevention Plan (SWPPP) prior to grading. The primary objective of the SWPPP is to identify and maintain Best Management Practices (BMPs) to reduce or eliminate pollutants in stormwater discharges from a construction site. The SWPPP must include BMPs to be implemented to protect stormwater runoff during construction.

Local (County) Regulations

Stormwater runoff and pollution regulations are controlled pursuant to Los Angeles County Code section 12.80 (Stormwater and Pollution Runoff Control). The purpose of section 12.80 is to protect the health and safety of the residents of the County by protecting the beneficial uses, marine habitats, and ecosystems of receiving waters within the County from pollutants carried by stormwater and non-stormwater discharges. The intent of this chapter is to enhance and protect the water quality of the receiving waters of the County and the United States. Section 12.80 applies to the discharge, deposit and disposal of any stormwater and/or runoff to the storm drain system and/or receiving waters within any unincorporated area covered by a NPDES municipal stormwater permit.

Drainage and flood control structures and improvements in Los Angeles County are subject to review and approval by the Los Angeles County Department of Public Works (LACDPW). The methodology and assumptions used in evaluating surface hydrology for the Proposed Project are consistent with the LACDPW's *Hydrology Manual*. The LACDPW will review and approve plans for improvements to County-owned facilities.

On October 7, 2008, the Los Angeles County Board of Supervisors approved the Low Impact Development (LID) Ordinance. Chapter 12.84 of the County Code requires the use of LID principles in development projects. LID encourages site sustainability and smart growth in a manner that respects and preserves the characteristics of the County's

watersheds, drainage paths, water supplies and natural resources. LID builds on conventional design strategies by using every softscape and hardscape surface in the development to perform a beneficial hydrologic function by retaining, detaining, storing, changing the timing of, or filtering stormwater and urban runoff. LID encompasses the use of structural devices, engineered systems, vegetated natural designs, and education in order to distribute stormwater and urban runoff across a development site.

Over the past decade, LID has emerged along with technologies and practices that allow a sustainable storm water management strategy to control stormwater and urban runoff at the source rather than centralized, end-of-pipe controls. LID relies on an integrated system of decentralized, small-scale control measures. These measures range from site design practices to technology driven LID BMPs. The underlying principle of LID is that undeveloped land does not present a stormwater runoff or pollution problem. The evolved natural hydrology of any given site manages water in the most efficient manner. This most often translates to high rates of infiltration, vegetative interception, and evapotranspiration.

LID attempts to offset the effects of development and changes in land cover by preserving or mimicking natural hydrology. It is a source control option that minimizes stormwater pollution by recognizing that the greatest efficiencies are gained by minimizing stormwater runoff generation. This is a process that begins with the functional conservation of watershed resources, thus reducing the impacts of development, and then using innovative management practices to meet the stormwater objective. Site preservation practices coupled with small-scale BMPs that rely on the environmental services of vegetation and soils or systems that mimic these services comprise the control approach of LID. These practices, taken in the aggregate, limit the observed hydromodification on a developed site and present a more comprehensive and beneficial control approach.

To appropriately implement LID, it is important to assess its role in water quality protection. LID is one part of a toolkit that can be used to better manage natural resources and limit the pollution delivered to waterways. It is not independent of watershed planning. To gain optimal benefits, LID must be integrated with appropriate land use programs. LID, by itself, will not deliver the water quality outcomes desired; yet, it does provide enhanced stormwater treatment and mitigate excess volume and flow rates. However, if not integrated in a comprehensive fashion, LID techniques can end up as a series of uncoordinated innovative BMPs that have limited water quality benefits.

LID is a comprehensive development and design technique that strives to preserve or restore predevelopment hydrology and water quality through a series of small-scale, decentralized, natural and engineered controls at or near the point where the stormwater is generated. The objective is to disperse LID devices uniformly across a site to minimize runoff and to prevent storm drain systems from being overwhelmed by stormwater.

Surface Water Hydrology and Quality

Water Quality Mitigation Plan and BMPs

LARWQCB regulations require projects to implement a Standard Urban Storm Water Mitigation Plan (SUSMP) during the operational life of a project to ensure that stormwater pollution is addressed by incorporating BMP features into the design of the project. Developers must incorporate appropriate BMPs per SUSMP requirements into the project design to effectively prohibit non-stormwater discharges and reduce pollutant discharge from stormwater conveyance systems to the maximum extent practicable. This plan defines water quality design standards to ensure that stormwater runoff is managed for water quality concerns, and to ensure that pollutants carried by stormwater are confined and not delivered to waterways. Project applicants are required to select source control and treatment control BMPs from the list approved by the LARWQCB to include in the SUSMP. In combination, these treatment control BMPs must be sufficiently designed and constructed to treat or filter the first 0.75-inch of stormwater runoff from a storm event.

Water Quality Control Requirements for Construction Activities

For stormwater discharges associated with construction activities, federal regulations allow two permitting options, Individual Permits and General Permits.

The SCWRCB uses a single statewide General Permit for construction-related storm water discharges. As discussed above, this Construction General Permit requires dischargers where construction activity disturbs one acre or more to:

(1) Develop and implement a SWPPP that specifies BMPs to be employed: (1) on the construction site to prevent all construction materials that may be sources of pollution from contacting stormwater and to prevent all products of erosion from moving off-site into receiving waters, and (2) on the developed site throughout the life of the project to minimize the discharge of urban pollutants into receiving waters;

(2) Eliminate or reduce non-stormwater discharges to storm drain systems and other waters of the nation, using Source Control Measures approved by the County;

(3) Install permanent treatment control devices; and

(4) Enter into an agreement with the permitting agency to maintain and perform inspections of all permanent stormwater pollution prevention devices.

Groundwater

In accordance with the Porter-Cologne Water Quality Control Act and the CWA Amendments of 1972, the SWRCB delegates the responsibility for protection of water quality in watershed basins throughout the state to the various Regional Water Quality Control Boards. Accordingly, the LARWQCB established a Basin Water Quality Plan known as the Basin Plan to preserve and enhance water quality and to protect the beneficial uses of all regional waters. This document designates beneficial uses of water bodies, sets water quality objectives to protect those uses, addresses localized water quality problems and sets forth a plan to protect water quality. General discharge permits issued by the LARWQCB under the Basin Plan are used to regulate polluted stormwater runoff, treated groundwater, non-hazardous soil disposal, and other discharges. The Basin Plan incorporates by reference all applicable State and Regional Board plans and policies and other pertinent water quality policies and regulations.

IV. ENVIRONMENTAL IMPACTS

Hydrology

The Proposed Project would alter the site from disturbed but mostly pervious areas to developed surfaces with substantial impervious features (buildings, paved areas, parking and roadways). Post-development pervious areas will include landscaped areas and detention features. Altering the land from the current pervious soils to large areas of impervious buildings, parking lots and driveways would increase the stormwater runoff generated on the Proposed Project site.

Stormwater runoff in the area of the Proposed Project site is under the jurisdiction of the Los Angeles County Department of Public Works (LACDPW). As previously described, the existing drainage system on the Proposed Project site uses a combination of surface sheetflow and underground piping to Placerita Creek. The drains, however, were designed for agricultural runoff and flows from SR-14, which are conveyed to Placerita Creek and then flow through an existing 20-foot culvert under SR-14. The existing drainage patterns on the Proposed Project site and related storm drain facilities are depicted in Figure 4, Existing Drainage Conditions and Facilities.

To prevent downstream flooding and prevent impacts to water quality in Placerita Creek, the Proposed Project would involve the construction of a system of detention basins to control the amount of stormwater discharged into Placerita Creek. The detention basins would be designed and sized such that the amount of runoff to the creek following completion of the Proposed Project would remain unchanged from existing conditions.

0 125 250 500 Feet

LEGEND

- Concrete V-ditch
- Storm Drain - Existing
- Development Boundary Area

NOTE: Project Proposed Development Area and Layout shown for reference only

FIGURE 4

DISNEY | ABC STUDIOS AT THE RANCH

EXISTING DRAINAGE CONDITIONS AND FACILITIES

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The Proposed Project's drainage system would manage stormwater flows generated on-site and intercept and convey off-site or through-site flows as described below.

Flooding and Related Hazards

The County prepared a floodway analysis for Placerita Creek upstream of the Antelope Valley Freeway which was adopted by the Board of Supervisors on October 22, 1985 per ordinance No. 85-0169. A copy of the floodway map is in sub-appendix 1A. The study assumed a Q of 7,880 CFS just upstream of the Antelope Valley Freeway and assumed a Manning's "n" value of 0.06. This discharge was developed based on methodology used prior to adoption of the new Hydrology Manual, and, according to County personnel, is based on historical flood records and is conservative. As discussed below a map revision would be required prior to construction of the project.

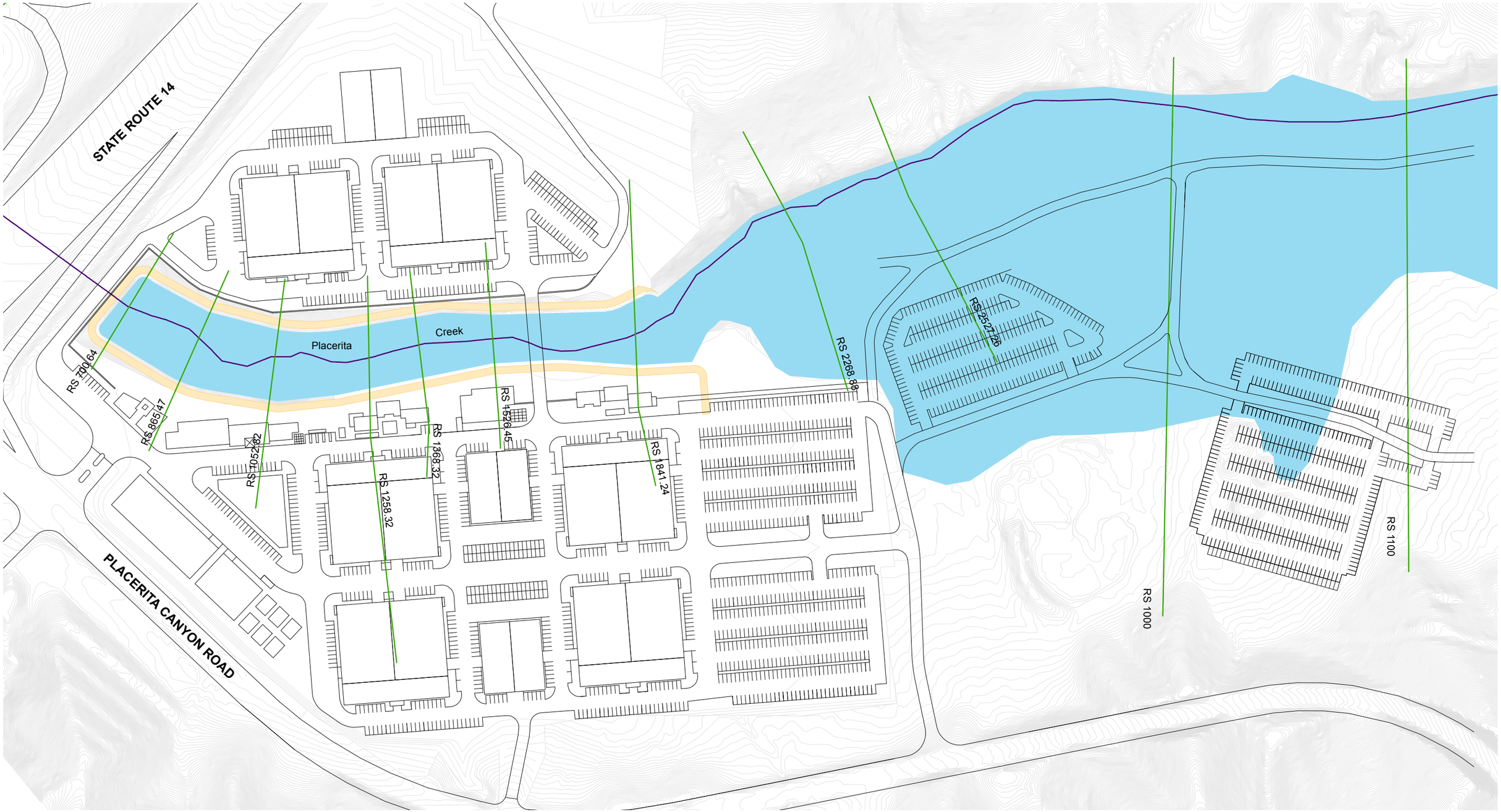
As previously discussed, FEMA has mapped potential flood zones according to varying levels of flood risk. Based on the FIRM for the Project area, portions of the Proposed Project site and surrounding area are designated as flood Zone A and considered high risk areas with a one percent annual chance of flooding (i.e., 100-year flood zone). Because detailed analyses are not performed for such areas, no depths or base flood elevations are shown within these zones.

Most of the Placerita Creek area is not susceptible to regional flood hazards. However, the floodplain within the Proposed Project site, which runs along the creek and extends to the south from about 100 to 1000 feet in width, is designated within the 100-year flood hazard zone, as mapped by FEMA. See Figure 3, Floodplain Boundary Pre-Development Condition.

The Proposed Project's site grading would alter the floodplain boundary due to changes in the finished grade that would be necessary to ensure all new buildings would be located outside of the 100-year flood zone. In addition, a portion of the LADWP transmission corridor along Placerita Creek, which would contain a surface parking area for the Proposed Project and which is currently within the 100-year flood zone, would be raised so that it would be out of the floodplain.

Additionally, two conditional parking areas east of the Development Area and the LADWP transmission corridor would be constructed if LADWP were to require removal of the surface parking lots within the LADWP transmission corridor. If that were to occur, these two conditional areas would maintain similar drainage patterns to the existing conditions and would contain vegetated drainage swales around the parking areas. The eastern and western conditional parking areas would be paved with porous pavement so no increase in peak flows would occur. The conditional parking areas also would be constructed outside of the LACDPW 50 year revised floodway.

Prior to construction of the Proposed Project, the Applicant would obtain a Conditional Letter of Map Revision (CLOMR) from FEMA to the satisfaction of LACDPW for the



0 100 200 Feet

	Floodplain Area* (Ac)
Existing Conditions	40.75
Proposed Conditions	29.06
Difference	11.69

* From Culvert to River Station 1100

LEGEND

- Water Surface Profile Cross Sections
- Placerita Creek
- Floodplain-Proposed
- Access Road

FIGURE 5

DISNEY | ABC STUDIOS
AT THE RANCH
FLOODPLAIN BOUNDARY
POST-DEVELOPMENT
CONDITION

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P:\MMATE00000002\0600\INFO\0670\Reports\Drainage Report\Final Drainage Report 05-26-2011\Revised Conditional Lots\FIGURE 5 Post Development.mxd

proposed encroachment into Zone A per the Flood Insurance Rate Map. See Figure 5, Floodplain Boundary Post-Development.

Construction of the Proposed Project would result in additional impervious surfaces that would reduce water absorption and increase surface runoff and velocities. A drainage concept plan has been prepared to meet LACDPW requirements. All surface runoff would be collected by a series of curb opening inlets and conveyed by the drainage network to points of discharge at Placerita Creek. The system would be sized and designed to attenuate peak runoff flows occurring under developed conditions to levels at or below flows presently generated at the Proposed Project site, such that no additional off-site downstream flooding would occur.

With regard to on-site flooding conditions, the current average water surface elevation in Placerita Creek during a 10-year storm event is below the elevations found within the Development Area. Moreover, after grading, the Development Area would not be located within a FEMA 100-year floodplain. As shown on Figure 5, the floodplain traversing the Development Area would be generally contained within Placerita Creek and the increase in the floodplain contour would occur upstream within undeveloped land on the Ranch so the change in the floodplain contour would not affect any structures. A FEMA approved CLOMR would be required prior to approval of grading plans.

Accordingly, the Proposed Project's structures would lie outside the floodplain for Placerita Creek and would not be subject to inundation. Therefore, no significant impact associated with on-site flooding would result from build out of the Proposed Project.

There are no major levees or dams near the Proposed Project site that would expose people or structures to significant risk of loss because of flooding from these sources.

The Proposed Project site is not near a large body of water that could potentially create seiches during seismic activity. A seiche is typically a concern with lakes and reservoirs in seismically active areas. Areas located along the shoreline of a lake or reservoir can be susceptible to inundation by a seiche. The existing ponds within the Ranch are not large enough to pose a risk of seiches.

The Pacific Ocean, which could produce tsunamis, is located too far from the Proposed Project site to pose a tsunami risk to the Proposed Project.

On-site Drainage

The Proposed Project would result in an increase in impervious surfaces. Currently undeveloped areas would become almost completely impervious with the addition of the proposed buildings, paved roads and parking areas. The increase in impervious area would have a direct impact on the amount of runoff generated on-site. Consequently, flow rates would be higher than current conditions.

Through a combination of sheet flow, concentrated drainage swales, localized catch basin inlets and storm drain pipes, all storm runoff from the Proposed Project site eventually would reach Placerita Creek.

The Hydrology Study performs a 50-year hydrology analysis based on LACDPW methodology. A summary of the hydrologic analysis is included in Table 1 below.

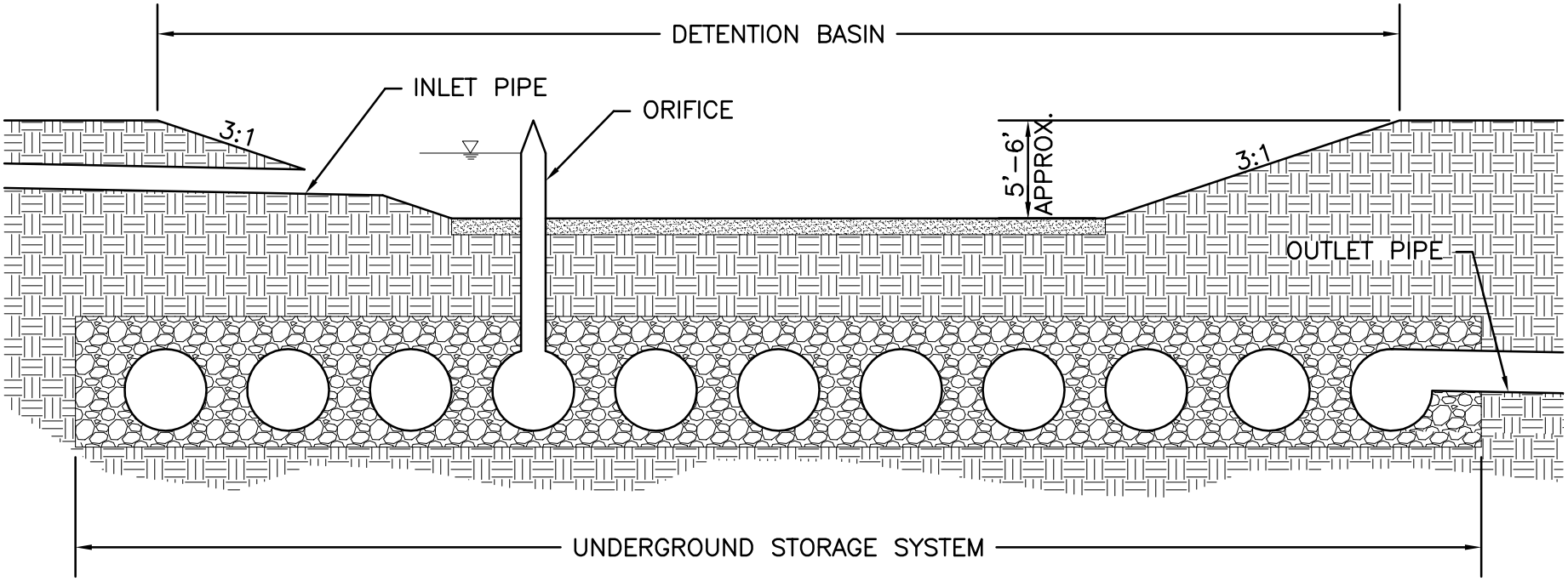
Table 1 – Summary of Existing and Proposed Hydrology

	Existing Condition (cfs)	**Proposed Condition** (cfs)	**Difference** (cfs)
North Pad	29.53	34.59	5.06
South Pad	48.71	64.66	15.95
Total	**78.24**	**99.25**	**21.01**

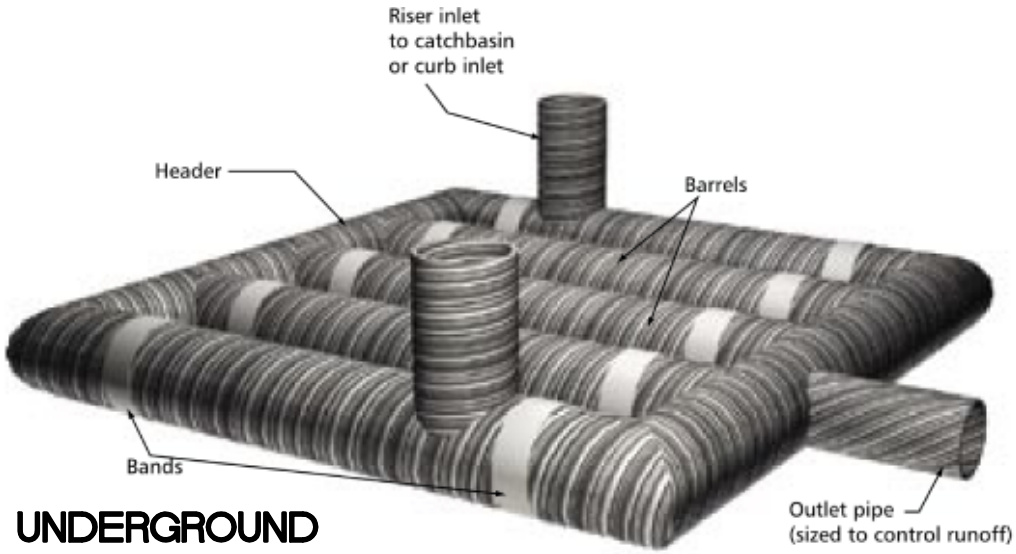
The hydrology analysis indicates that the total clear flow runoff contributing to the existing watercourse would increase by approximately 21 cfs. This increase can be attributed to the increase in imperviousness of the Proposed Project site due to the addition of buildings, driveways, storm drains, and hardscape.

As a result of the limitations on discharge of peak storm flows, on-site detention of storm flows would be required. On-site detention can be accomplished by a variety of methods, which include detention basins, depressing parking areas or streets to act as detention areas, underground storage in vaults, or enlarged storm drain pipes. All of these methods require undersizing of the inlets or pipes that would discharge to Placerita Creek in order to restrict flow.

The northern portion of the Proposed Project site, north of Placerita Creek, would generate runoff of 35 cfs. Half of the northern portion of the Proposed Project site would be drained to the southeastern corner to a detention basin system and the other half would drain to the southwest to a second detention basin system. The detention basin systems would be composed of a vegetated aboveground portion and an underground detention system consisting of a 60-inch diameter perforated corrugated metal pipe (CMP). The estimated total volume capacity provided both above and below ground will be approximately 5.23 acre-feet. This volume capacity exceeds the required volume capacity of 3.58 acre-feet, which is based on maintaining the existing 50-year peak flow rate. As a result, there would be no impact to the peak flow runoff as compared to pre-development conditions.



SECTION VIEW



UNDERGROUND STORAGE SYSTEM

FIGURE 6

DISNEY|ABC STUDIOS
AT THE RANCH
UNDERGROUND CMP
DETENTION SYSTEM
OR APPROVED EQUIVALENT

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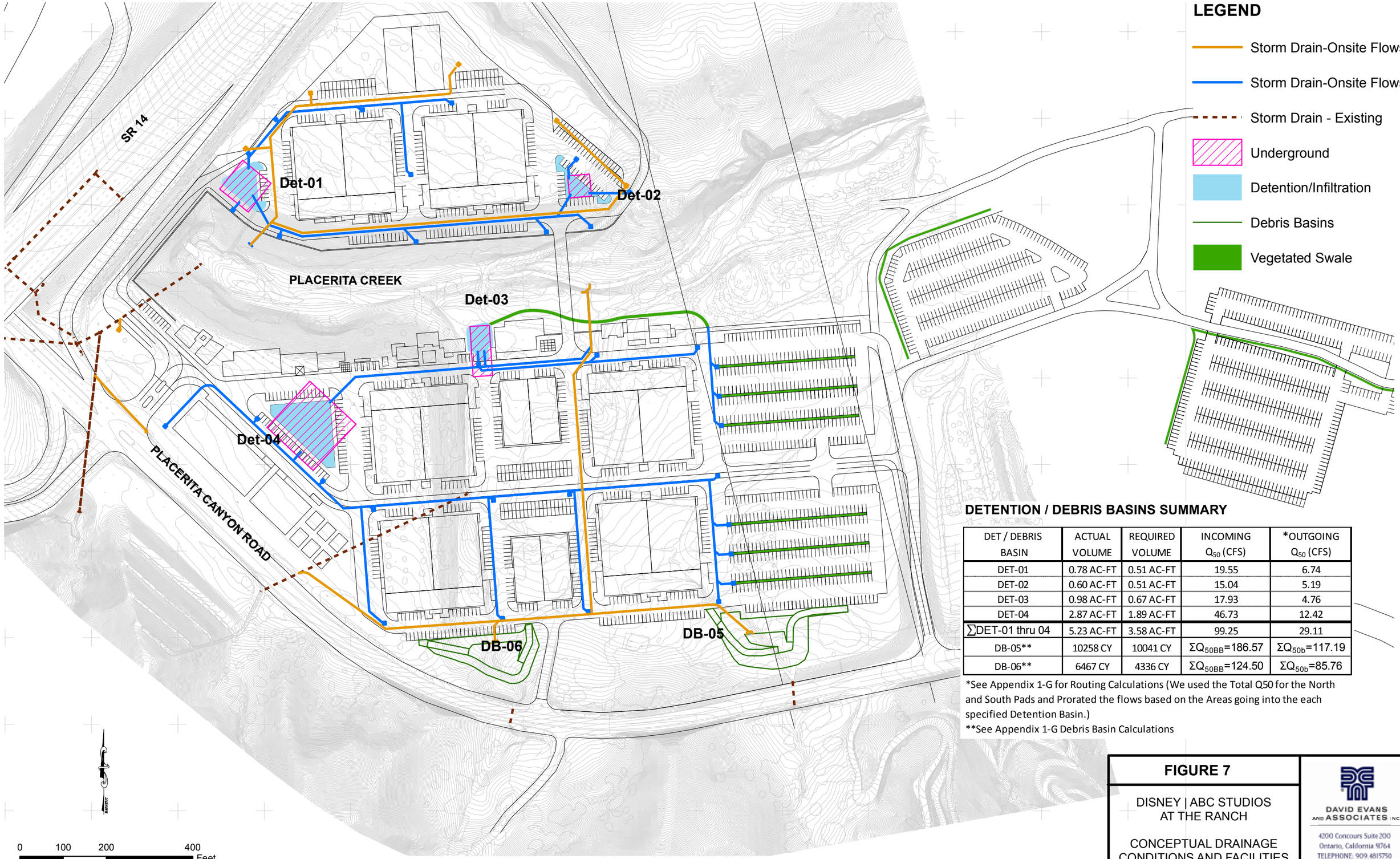

DETENTION / DEBRIS BASINS SUMMARY

DET / DEBRIS BASIN	ACTUAL VOLUME	REQUIRED VOLUME	INCOMING Q_{50} (CFS)	*OUTGOING Q_{50} (CFS)
DET-01	0.78 AC-FT	0.51 AC-FT	19.55	6.74
DET-02	0.60 AC-FT	0.51 AC-FT	15.04	5.19
DET-03	0.98 AC-FT	0.67 AC-FT	17.93	4.76
DET-04	2.87 AC-FT	1.89 AC-FT	46.73	12.42
∑DET-01 thru 04	5.23 AC-FT	3.58 AC-FT	99.25	29.11
DB-05**	10258 CY	10041 CY	ΣQ_{50BB}=186.57	ΣQ_{50b}=117.19
DB-06**	6467 CY	4336 CY	ΣQ_{50BB}=124.50	ΣQ_{50b}=85.76

*See Appendix 1-G for Routing Calculations (We used the Total Q50 for the North and South Pads and Prorated the flows based on the Areas going into the each specified Detention Basin.)

**See Appendix 1-G Debris Basin Calculations

FIGURE 7

DISNEY | ABC STUDIOS
AT THE RANCH

CONCEPTUAL DRAINAGE
CONDITIONS AND FACILITIES

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The southern portion of the Proposed Project site, south of Placerita Creek, would generate runoff of 65 cfs. The southern portion of the Proposed Project site would be drained northwest to a detention basin, a portion of which would be aboveground and vegetated. The underground detention system design would consist of a 72-inch diameter perforated CMP. The estimated total volume capacity provided by this underground detention system would be 5.23 acre-feet which would exceed the required volume capacity of 3.58 acre-feet. This is based on the total required volume of basins DET-01 + DET-02 + DET-03 + DET-04 (0.51+0.51+0.67+1.89 AC-Ft). These volumes were calculated in sub-appendix 1g, page 2-16. Note that the delta volumes between undeveloped and developed were calculated for the north area (1.02 AC-Ft) and the south area (2.56 AC-Ft). These volumes were then prorated based on the tributary area to each detention basin. The surface detention system overflow outlet would drain to Placerita Creek, and the perforated underground detention system would detain and infiltrate peak flows and the first flush before they would reach Placerita Creek or the groundwater basin. As a result, there would be no impact to the peak flow or water quality of runoff as compared to pre-development conditions. However, there would be a slight increase in the total volume of runoff. The volume calculations for the watershed are depicted in a table on sheet 100 for the various storm events. The percent increase in volume for the watershed is 3% or less depending on the storm frequency modeled. Thus, the increase in total volume runoff will not have a significant impact downstream.

Surface flows within the Development Area would be collected at grate inlets designed and located to maximize interception and then conveyed by a combination of surface gutters and underground lines to the on-site detention basins and underground CMP detention systems. The underground detention systems in the northern and southern portions of the Development Area would capture and detain stormwater flows and provide first flush treatment before either infiltrating back into the local groundwater basin or draining via outlets to Placerita Creek. See Figure 6, Underground CMP Detention System.

Stormwater runoff from the northern half of the proposed parking area under the LADWP transmission lines would be intercepted at landscaped islands between the parking rows, which would function as vegetated drainage swales. Surface flows would be directed to the west to underground drainage lines and then would be conveyed north to a vegetated drainage swale running longitudinally along the top of the southern slope embankment for Placerita Creek. This vegetated swale would incorporate stormwater treatment features and thus would function as a water quality BMP and would drain into a proposed on-site detention basin prior to discharge into Placerita Creek.

Stormwater runoff from the southern half of the proposed parking area under the LADWP transmission lines would be intercepted at landscaped islands between the parking rows, which would function as vegetated drainage swales. Surface flows would be directed to the west to underground drainage lines that would drain into the proposed on-site detention basin and underground CMP detention system.

A conceptual on-site storm drain system is shown in Figure 7, Conceptual Drainage Conditions and Facilities.

Off-site Drainage

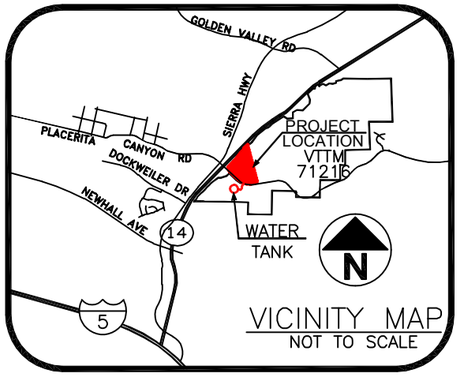
Off-site stormwater runoff that flows to the northern portion of the Development Area would be intercepted with drainage ditches and directed around that portion of the Proposed Project site south to Placerita Creek. Energy dissipaters/velocity reducers would be used at outlets in Placerita Creek.

Off-site flows from SR-14 immediately west of the Proposed Project site would continue to be routed to an existing 48-inch storm drain constructed by Caltrans and would drain to the north toward Placerita Creek. This existing 48-inch storm drain pipe runs under the southern fill pad and is deep enough so that it would not interfere with construction of the Proposed Project and would remain to handle off-site flows.

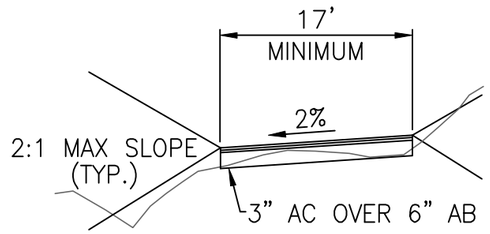
Off-site stormwater flows from the areas south of the Proposed Project site and Placerita Canyon Road currently cross under Placerita Canyon Road through existing culverts that convey flows north to Placerita Creek. These flows, along with the surface runoff from Placerita Canyon Road, would be intercepted by two proposed debris basins (DB-05 and DB-06). DB-05 and dDB-06 will provide treatment for the minor surface runoff coming off of Placerita Canyon Road. Stormwater from these two basins would then flow north in a proposed underground storm drain system through the Development Area to Placerita Creek. The Proposed Project would maintain existing patterns for off-site drainage as much as possible. Improvements to the north lane of Placerita Canyon Road depicted in the Traffic Report for the Proposed Project would increase the area of paving by less than 5000 square feet. This increased area is considered negligible and would have no impact to peak flows, volumes and water quality. Nevertheless, two inlets are proposed at the main entrance of the Proposed Project to collect the SUSMP flows generated by the improvements to Placerita Canyon Road prior to discharge to Placerita Creek via the 48-inch Caltrans storm drain, which currently collects flows from the area of the proposed pavement improvements to Placerita Canyon Road.

Mudflows

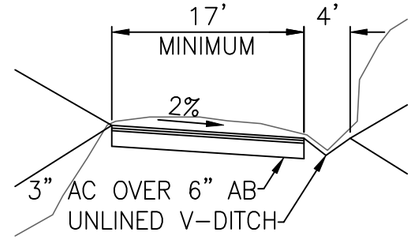
As previously indicated, the Proposed Project site and vicinity are within a canyon with steep canyons and ridges nearby. Because of this topography, certain areas within the vicinity of the Proposed Project may be subject to inundation by a mudflow. Mudflows, also known as debris flows, are shallow water-saturated landslides that travel rapidly down slopes carrying rocks, brush, and other debris. A mudflow occurs naturally as a result of heavy rainfall on a slope that contains loose soil or debris. Human activity can also induce a slide, such as when soil becomes saturated from a broken water pipe or when incorrect diversion of runoff concentrated from developed areas saturates soil. Recent forest fires can also contribute to the potential for mudflows. The loss of vegetation may result in destabilization of surface soil and an increase in velocity of surface water runoff, increasing the potential for mudflows. Mudflows predominantly occur in mountainous areas. The path of a mudflow is determined by local topography and will typically follow existing drainage patterns. Areas recently burned by wildfires are particularly susceptible to flash floods and debris flows during rainstorms. Just a short



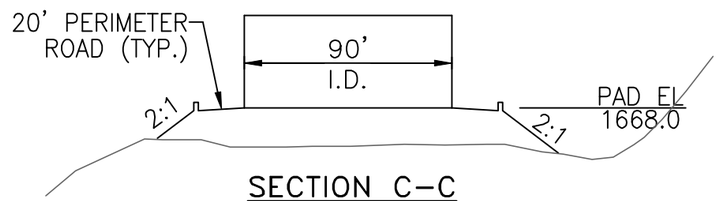
VICINITY MAP
NOT TO SCALE



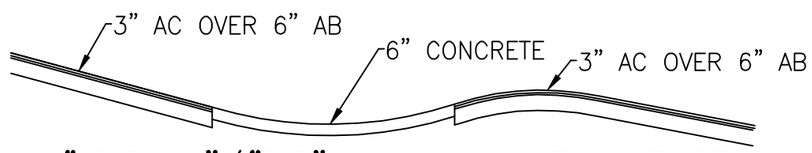
SECTION A–A
NTS



SECTION B–B
NTS



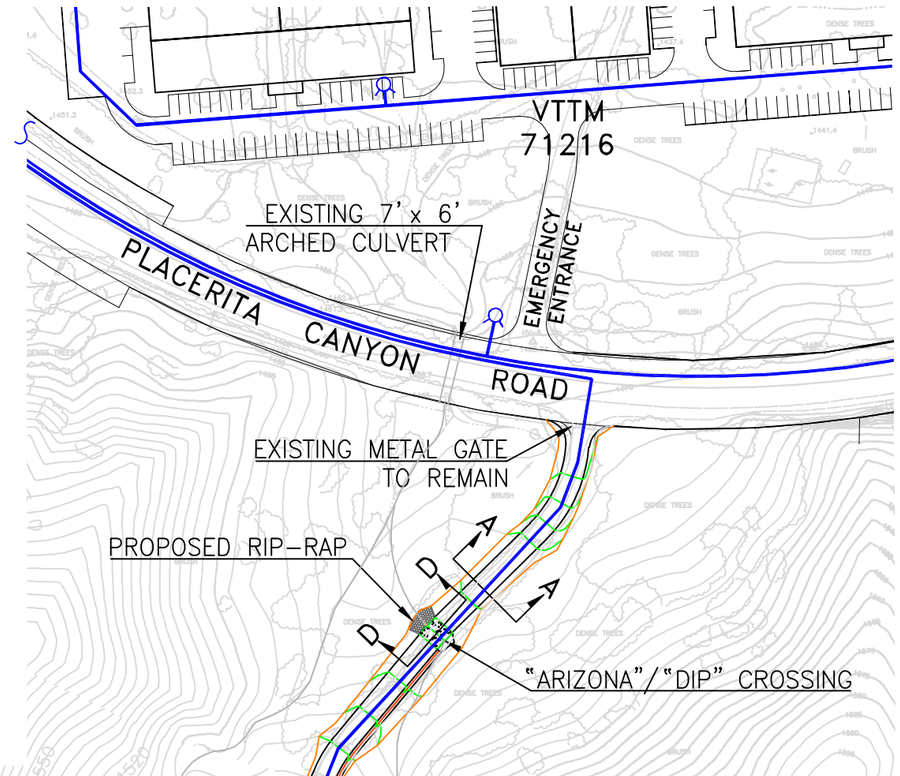
SECTION C–C
NTS

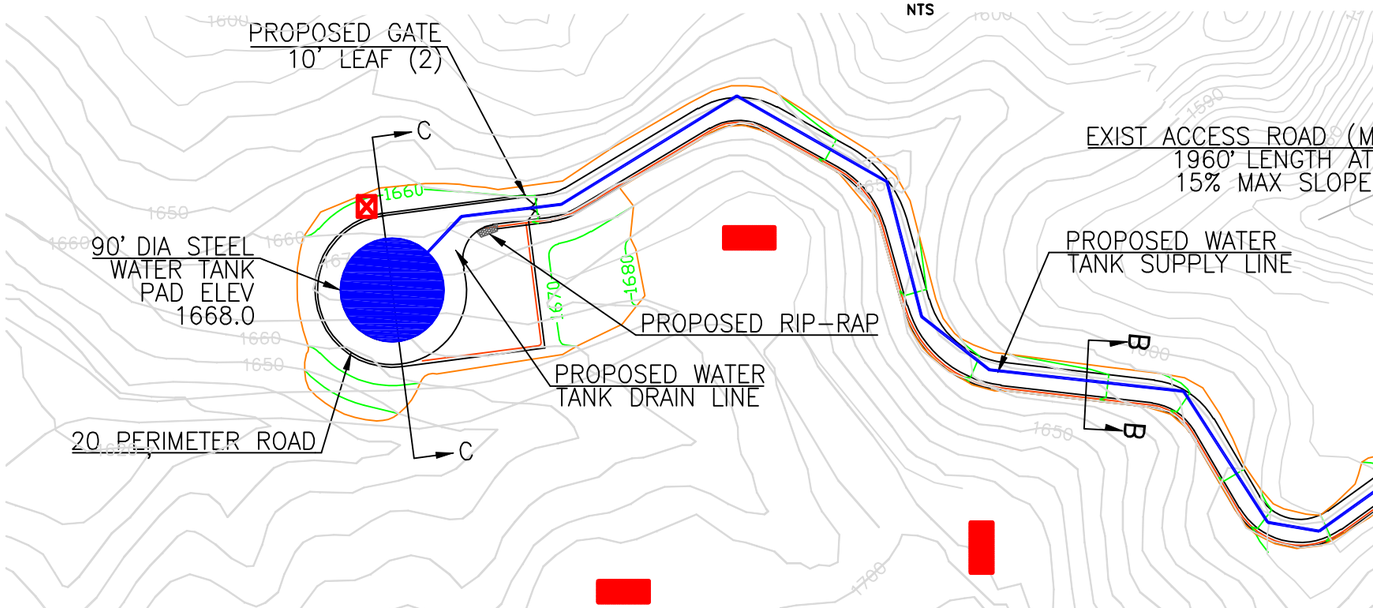


"ARIZONA"/"DIP" CROSSING WITH CUT–OFF WALLS ON EITHER SIDE
SECTION D–D
NTS

LEGEND

- W — PROPOSED WATER LINE
- 123 — PROPOSED CONTOUR
- PROPOSED DRAINAGE FLOWLINE
- PROPOSED CHAIN LINK FENCE
- GRADING LIMIT
- OPERATIONAL OIL WELL
- NON–OPERATIONAL OIL WELL





EARTHWORK QUANTITIES

4050 CY RAW CUT
7560 CY RAW FILL

SCALE: NTS

FIGURE 7A

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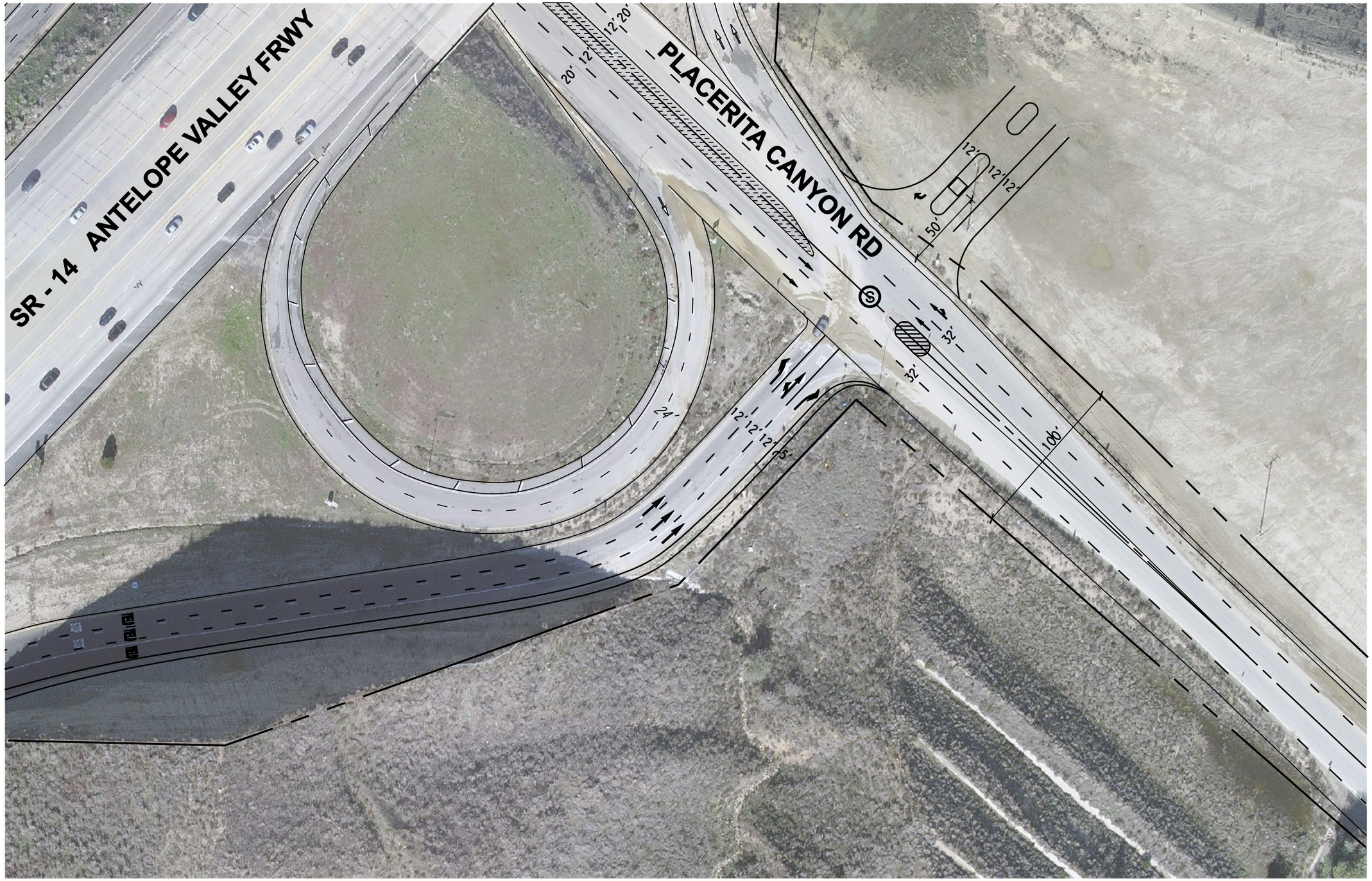
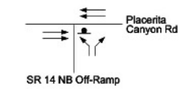
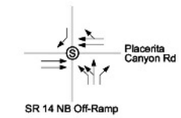
WATER TANK PAD & ACCESS ROAD



EXISTING CONDITIONS
(YEAR 2010)



PROJECT
CONDITIONS (YEAR 2020)



PROJECT
WITH MITIGATION
CONDITIONS (YEAR 2020)

Same as
Project Conditions

0 30' 60' 120'

GRAPHIC SCALE

FIGURE 7B

INTERSECTION #3
SR 14 NB OFF-RAMP
& PLACERITA CANYON RD

L E G E N D :

: EXIST. R/W	PROP. R/W:
: EXIST. STRIPING	PROP. STRIPING:
: EXIST. CURB	PROP. CURB:
: EXIST. TRAFFIC FLOW DIRECTION	PROP. TRAFFIC FLOW DIRECTION:
12' 12' 11' : EXIST. LANE DIMENSIONS	PROP. LANE DIMENSIONS: 12' 22' 11'
: EXIST. RAISED MEDIAN CONCRETE	PROP. RAISED MEDIAN CONCRETE:

FIGURE 7C
INTERSECTION #4
CURRENT RANCH MAIN ENTRANCE
& PLACERITA CANYON RD

L E G E N D :

: EXIST. R/W	PROP. R/W:
: EXIST. STRIPING	PROP. STRIPING:
: EXIST. CURB	PROP. CURB:
: EXIST. TRAFFIC FLOW DIRECTION	PROP. TRAFFIC FLOW DIRECTION:
12' 12' 11' : EXIST. LANE DIMENSIONS	PROP. LANE DIMENSIONS: 12' 22' 11'
: EXIST. RAISED MEDIAN CONCRETE	PROP. RAISED MEDIAN CONCRETE:

period of moderate rainfall on a burn scar can lead to flash floods and debris flows. Rainfall that is normally absorbed or intercepted by vegetation can run off almost instantly, causing creeks and drainage areas to flood much sooner during a storm and with more water than normal. Additionally, the soils in a burn scar are highly erodible, so flood waters can contain high amounts of mud, boulders, and vegetation. The powerful force of rushing water, soil, and rock, both within the burned area and downstream, can destroy culverts, bridges, roadways, and structures, and can place people at risk if care is not taken.

Any potential mudflows coming from areas south of Placerita Canyon Road toward the southern portion of the Development Area would be intercepted and placed in two proposed debris basins to be constructed on-site to contain the amount of debris estimated to be generated by each of the off-site watershed subareas to the south.

The off-site area associated with watersheds Off-1a is located in DPA-3, Debris Production Area 3 of the Santa Clara River Watershed, which yields a debris production rate of 140,000 cubic yards per square mile. The off-site areas associated with watersheds Off-2a, Off-3a, Off-4a, Off-5a, Off-6a, Off-11a and Off-12a are located in DPA-5, Debris Production Area 5 of the Santa Clara River Watershed, which yields a debris production rate of 82,000 cubic yards per square mile. The off-site areas associated with watersheds Off-7a, Off-8a, Off-9a and Off-10a are located in DPA-9, Debris Production Area 9 of the Santa Clara River Watershed, which yields a debris production rate of 16,500 cubic yards per square mile.

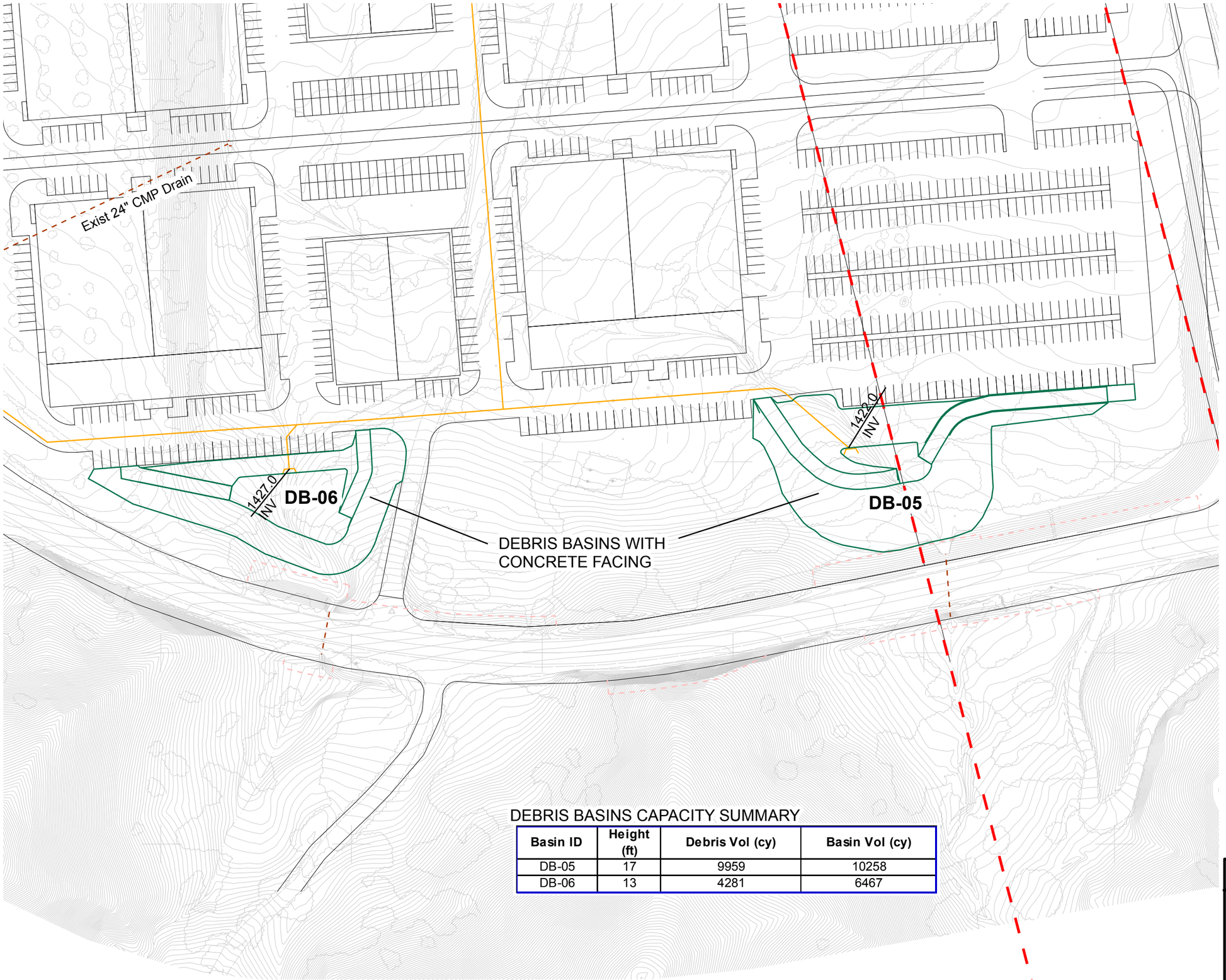
Debris Production in Proposed Debris Basin:
Santa Clara River Watershed, DPA-3, DPA-9 & DPA-5

Basin ID	Area Designation	Area (sq.miles)	Debris Production Rate (yd^3/sq.miles)	Debris (yd^3)
DB-05	Off-1a, Off-7a	0.0712, 0.0044	140000, 16500	10041
DB-06	Off-2a, Off-8a	0.0522, 0.0034	82000, 16500	4336

Proposed Debris Basin DB-05 would be a 20-foot deep basin with side slopes of 2:1 to allow for containment of 10,258 cubic yards of debris flows and runoff from Off-site 1a & Off-site 7a. Debris Basin DB-06 would be a 13-foot deep basin with side slopes of 2:1 and would be able to contain 6,367 cubic yards of debris flows and runoff from Off-site 2a & Off-site 8a. Off-site 3a is a much smaller area and does not empty into a debris basin. It runs directly into Placerita Creek via a 24-inch CMP pipe installed by Caltrans during construction of SR-14. The development will intercept the 24-inch CMP pipe and continue to carry the off-site 3a runoff into Placerita Creek. Figure 8, Debris Basins Plan, shows the locations of basins and drainage systems for the Proposed Project.

Surface Water Quality

Based on its construction and operational characteristics, the Proposed Project could have an adverse impact on surface water quality. The addition of impervious area, accumulation of oil and grease on the parking areas, and increase of runoff peaks would



DEBRIS BASINS CAPACITY SUMMARY

Basin ID	Height (ft)	Debris Vol (cy)	Basin Vol (cy)
DB-05	17	9959	10258
DB-06	13	4281	6467

MAGNETIC

0 50 100 200 Feet

Legend

- Debris Basins
- Existing Storm Drain - Off-site Flows
- Proposed Storm Drain - Off-site Flows
- DWP Right of Way
- Slope Maintenance Easement

FIGURE 8

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AT THE RANCH

DEBRIS BASINS

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all contribute to a potentially adverse impact on surface water quality when compared to pre-development conditions.

Applicants for development projects in the County have two major responsibilities under the County's NPDES Municipal Permit No. CAS614001. An applicant must submit and then implement a Standard Urban Stormwater Mitigation Plan (SUSMP) and must also prepare a Storm Water Pollution Prevention Plan (SWPPP) for all construction projects with disturbed areas greater than one acre. For projects greater than one acre, applicants also must file a Notice of Intent (NOI) to comply with the State Construction General Permit prior to issuance of a grading permit.

Standard Urban Stormwater Mitigation Plan (SUSMP)

The SUSMP would: 1) describe the routine and special post-construction BMPs to be used at the Proposed Project site, including both structural and non-structural BMPs; 2) describe responsibility of the initial implementation and long-term maintenance of the BMPs; 3) provide narrative with graphic materials as necessary to specify the locations of the structural BMPs; and 4) describe effective means to ensure the SUSMP is carried out by the Applicant and/or its future successors or assignees.

The SUSMP would identify potential and expected pollutants of concern that might be generated by the Proposed Project. Potential pollutants of concern include:

- Pathogens (viruses and bacteria);
- Heavy Metals;
- Nutrients;
- Pesticides;
- Organic Compounds;
- Sediments;
- Trash and Debris;
- Oxygen Demanding Substances; and
- Oil and Grease.

The receiving waters for the Proposed Project have been identified as Placerita Creek and the South Fork of the Santa Clara River which flow into Reach 6 of the Santa Clara River. The Santa Clara River (Reach 6) is listed as impaired for Chloride, Chlorpyrifos, Coliform, Diazinon, and Toxicity on the most recent State Clean Water Act Section CWA 303(d) list of impaired water bodies.

The following are pollutants the SUSMP would strive to mitigate with implementation of BMPs:

- Nutrients;
- Sediments;
- Oil and Grease; and
- Trash and Debris.

The 2002 CWA Section 303(d) List identifies the Total Maximum Daily Limit (TMDL) of Nutrients, Sediments, Oil, Grease, and Trash and Debris as medium to high priority, with Pesticide and Organic Compounds as very low priority. Therefore, the SUSMP would concentrate on mitigation of the impact of pollutants with a TMDL priority of medium to high.

Source Control BMPs

In accordance with the SUSMP, all of the following BMPs would be implemented for the Proposed Project.

Routine Non-Structural BMPs would include the following:

- Education for Property Owners, Tenants and Occupants;
- Activity Restrictions;
- Spill Contingency Plans;
- Employee Training Programs;
- Road Sweeping; and
- Catch Basin Inspections.

Routine Structural BMPs would include:

- Landscape Planning and Design;
- Roof Runoff Controls;
- Efficient Irrigation;
- Protection of Slopes and Channels;
- Storm Drain Signage;
- Inlet Trash Racks;
- Energy Dissipators; and
- Trash Storage Areas and Litter Control.

Treatment Control BMPs

Vegetated Swales: Vegetated swales are open, shallow channels with low-lying vegetation covering the side slopes and bottom that collect and slowly convey runoff flow to downstream discharge points. Vegetated swales provide pollutant removal through settling and filtration in the vegetation (usually grasses) lining the channels, provide the opportunity for stormwater volume reduction through infiltration and evapotranspiration, and reduce the flow velocity in addition to conveying stormwater runoff.

Detention Basins: Detention basins would serve as the main treatment control BMP for the Proposed Project. They would be designed to manage the increase in storm water runoff and to detain and slowly release the design volume of urban runoff, allowing particles and associated pollutants to settle and be removed. Cleanup would be conducted semiannually, especially during and after major rainfall events. The Applicant

and/or its successor or assignee would be responsible for cleanup and documenting maintenance.

The detention basins would be vegetated to allow infiltration. Turf management in the basin would ensure that pesticides would not contribute to water pollution. Energy dissipaters would be required to minimize erosion.

Underground Storage /Infiltration Systems: Underground detention systems serve as the storage and flow control for the Proposed Project. They would be designed to store the increase in storm water runoff and to detain and slowly release the design volume of urban runoff. The system is also designed to mitigate and infiltrate the difference in runoff between existing and post condition which will bring no environmental impact to the Placertia Canyon Creek.

Additionally, the basins must empty within a 72 hour period. Percolation testing will be conducted during construction in order to determine infiltration rates. However, in order to determine the approximate size of the underground storage basins during preliminary design we assumed a conservative range of infiltration rates and calculate the range in size of the underground storage basins based upon assumed infiltration rates. Therefore, we have assumed an infiltration rate of 1" in 24 hours, and 6" in 24 hours. Since the basins must empty in 72 hours after a storm and since there is a low flow outlet pipe in each basin we have two scenarios. In scenario 1 where we assume an infiltration rate of 1" in 24 hours the bottom of the basin can only be 3" below the invert in order to drain in 72 hours. In scenario 2 where we assume an infiltration rate of 6" in 24 hours the bottom of the basin can only be 18" below the invert in order to drain 72 hours. Figure 10 provides a range in size for the underground detention basins based upon the two infiltration rates. Infiltration calculations are provided in the Appendix 1-G of the report.

A detailed discussion of the Treatment Control BMPs is contained in the SUSMP, see Appendix 2.

<u>Operation and Maintenance</u>

Specific Operation and Maintenance (O&M) requirements for BMP features are briefly described as follows:

In order to minimize the potential for pollutants to enter receiving waters in stormwater runoff after construction of the Proposed Project, BMPs would be implemented to separate storm water from potential pollutants.

Parking Lot and Roadway Cleaning. Parking lots and internal roadways would be routinely maintained to effectively minimize nuisances and to keep internal roads and parking lots in safe condition. Cleaning would include vacuuming or sweeping of all parking lots, and internal roadways.

Parking Lot Runoff. Parking lot drainage points would be equipped with oil/water separators which would be maintained according to the manufacturer's requirements for maintenance.

Landscape Planning. Landscaped areas, buffers, and other vegetated areas would require weekly maintenance to control optimum height and prevent drain blockage. Pesticide and fertilizer use would occur in accordance with product instructions and be applied by a certified applicator.

Irrigation System. Maintenance of the irrigation systems within the Proposed Project site would be consistent with the County's water conservation ordinance. Systems would be periodically inspected to address overspray, broken sprinklers or other system failures.

Trash Storage Areas. Trash areas would be paved with impervious surfaces and designed not to allow runoff to percolate. Trash storage areas would be maintained routinely to effectively minimize nuisances.

Roof runoff control. Roof drain downspouts would drain to concrete gutters or would be directly connected to proposed on-site underground drain pipe system.

Storm Drain Inspection. All storm drain facilities, such as catch basins, pipes, drain inlets and channels, would be inspected and cleaned just prior to the rainy season.

Detention Basins. Cleanup would be accomplished and inspected before, during and after rainfall events. Basins would be serviced semiannually or following an extreme storm. Service would include cleaning the basins and maintaining the outlet structures.

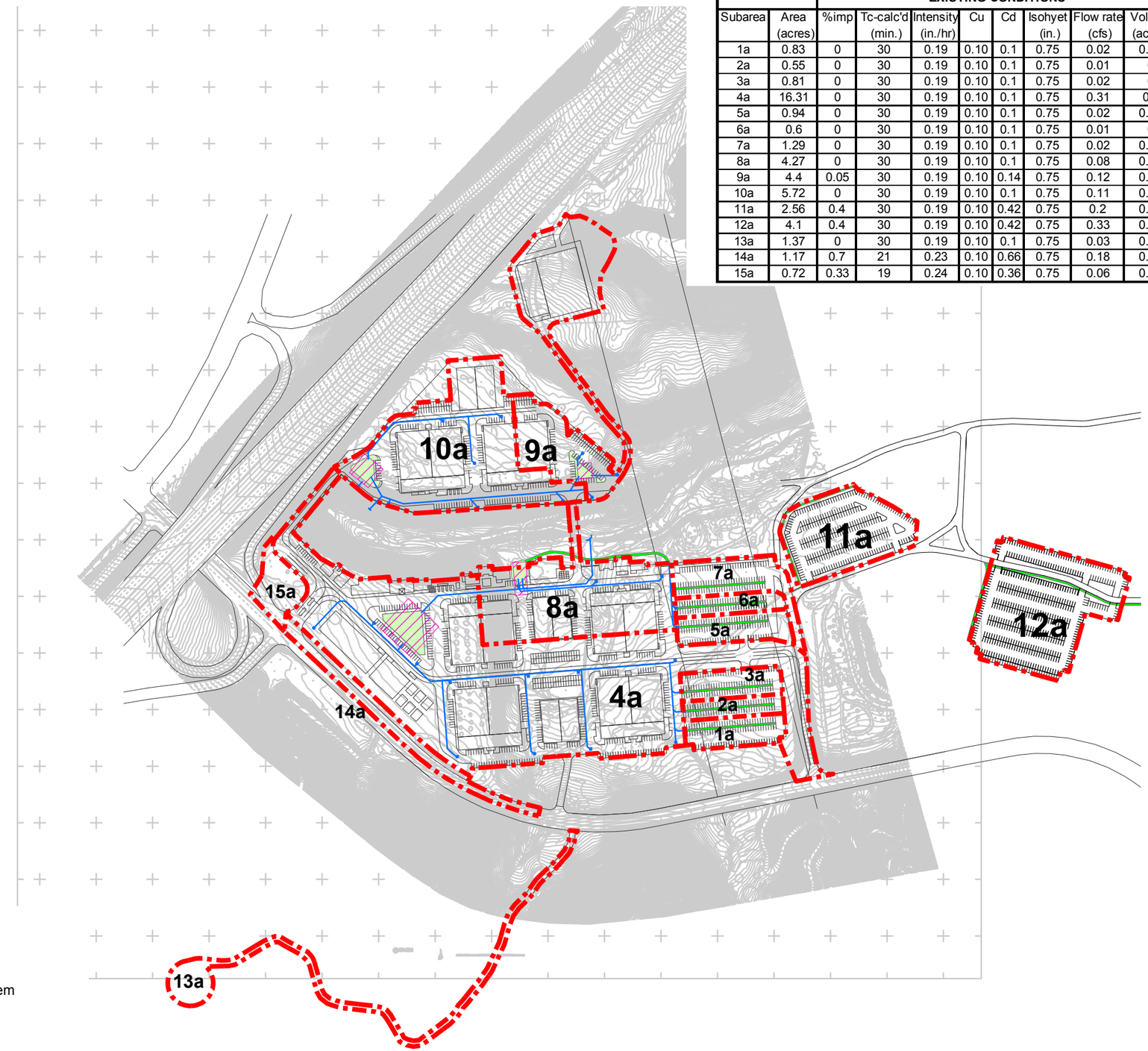
Other Reasonable BMPs. The Applicant would implement other good housekeeping and storage measures, as needed, to keep pollutants away from stormwater as outlined in the SUSMP.

A more detailed description is contained in the SUSMP, provided in Appendix 2.

<u>Storm Water Pollution Prevention Plan (SWPPP)</u>

The SWPPP would: 1) require implementation of BMPs to prevent a net increase in sediment load in stormwater discharges relative to preconstruction levels; 2) prohibit discharges of stormwater or non-stormwater at levels that would cause or contribute to an exceedance of any applicable water quality standard contained in the regional basin plan; 3) discuss in detail the BMPs for the Proposed Project's control of sediment and erosion, non-sediment pollutants, and potential pollutants in non-storm water discharges; 4) describe post-construction BMPs for the Proposed Project; 5) explain the monitoring and maintenance program for the project BMPs; 6) require reporting of violations to the RWQCB; and 7) list the parties responsible for the SWPPP implementation and BMP maintenance both during and after construction. Upon acceptance of the NOI by the

		EXISTING CONDITIONS								PROPOSED CONDITIONS								
Subarea	Area (acres)	%imp	Tc-calc'd (min.)	Intensity (in./hr)	Cu	Cd	Isohyet (in.)	Flow rate (cfs)	Volume (acre-ft)	%imp	Tc-calc'd (min.)	Intensity (in./hr)	Cu	Cd	Isohyet (in.)	Flow rate (cfs)	Volume (acre-ft)	Delta V (acre-ft)
1a	0.83	0	30	0.19	0.10	0.1	0.75	0.02	0.01	0.91	27	0.2	0.10	0.83	0.75	0.14	0.04	0.03
2a	0.55	0	30	0.19	0.10	0.1	0.75	0.01	0	0.91	27	0.2	0.10	0.83	0.75	0.09	0.03	0.03
3a	0.81	0	30	0.19	0.10	0.1	0.75	0.02	0	0.91	28	0.2	0.10	0.83	0.75	0.13	0.04	0.04
4a	16.31	0	30	0.19	0.10	0.1	0.75	0.31	0.1	0.91	30	0.19	0.10	0.83	0.75	2.57	0.84	0.74
5a	0.94	0	30	0.19	0.10	0.1	0.75	0.02	0.01	0.91	27	0.2	0.10	0.83	0.75	0.16	0.05	0.04
6a	0.6	0	30	0.19	0.10	0.1	0.75	0.01	0	0.91	27	0.2	0.10	0.83	0.75	0.1	0.03	0.03
7a	1.29	0	30	0.19	0.10	0.1	0.75	0.02	0.01	0.91	30	0.19	0.10	0.83	0.75	0.2	0.07	0.06
8a	4.27	0	30	0.19	0.10	0.1	0.75	0.08	0.03	0.91	30	0.19	0.10	0.83	0.75	0.67	0.22	0.19
9a	4.4	0.05	30	0.19	0.10	0.14	0.75	0.12	0.04	0.91	30	0.19	0.10	0.83	0.75	0.69	0.23	0.19
10a	5.72	0	30	0.19	0.10	0.1	0.75	0.11	0.04	0.91	30	0.19	0.10	0.83	0.75	0.9	0.29	0.25
11a	2.56	0.4	30	0.19	0.10	0.42	0.75	0.2	0.02	0.4	30	0.19	0.10	0.42	0.75	0.2	0.07	0.05
12a	4.1	0.4	30	0.19	0.10	0.42	0.75	0.33	0.03	0.4	30	0.19	0.10	0.42	0.75	0.33	0.11	0.08
13a	1.37	0	30	0.19	0.10	0.1	0.75	0.03	0.01	0.91	30	0.19	0.10	0.83	0.75	0.22	0.07	0.06
14a	1.17	0.7	21	0.23	0.10	0.66	0.75	0.18	0.05	0.85	19	0.24	0.10	0.78	0.75	0.22	0.06	0.01
15a	0.72	0.33	19	0.24	0.10	0.36	0.75	0.06	0.02	0.33	19	0.24	0.10	0.36	0.75	0.06	0.02	0



Legend

- Tributary Boundary
- Proposed Storm Drain System
- Vegetated Swale
- Underground Storage & Infiltration System
- Detention/Retention Basin

FIGURE 9

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AT THE RANCH

SUSMP/LID BMPs

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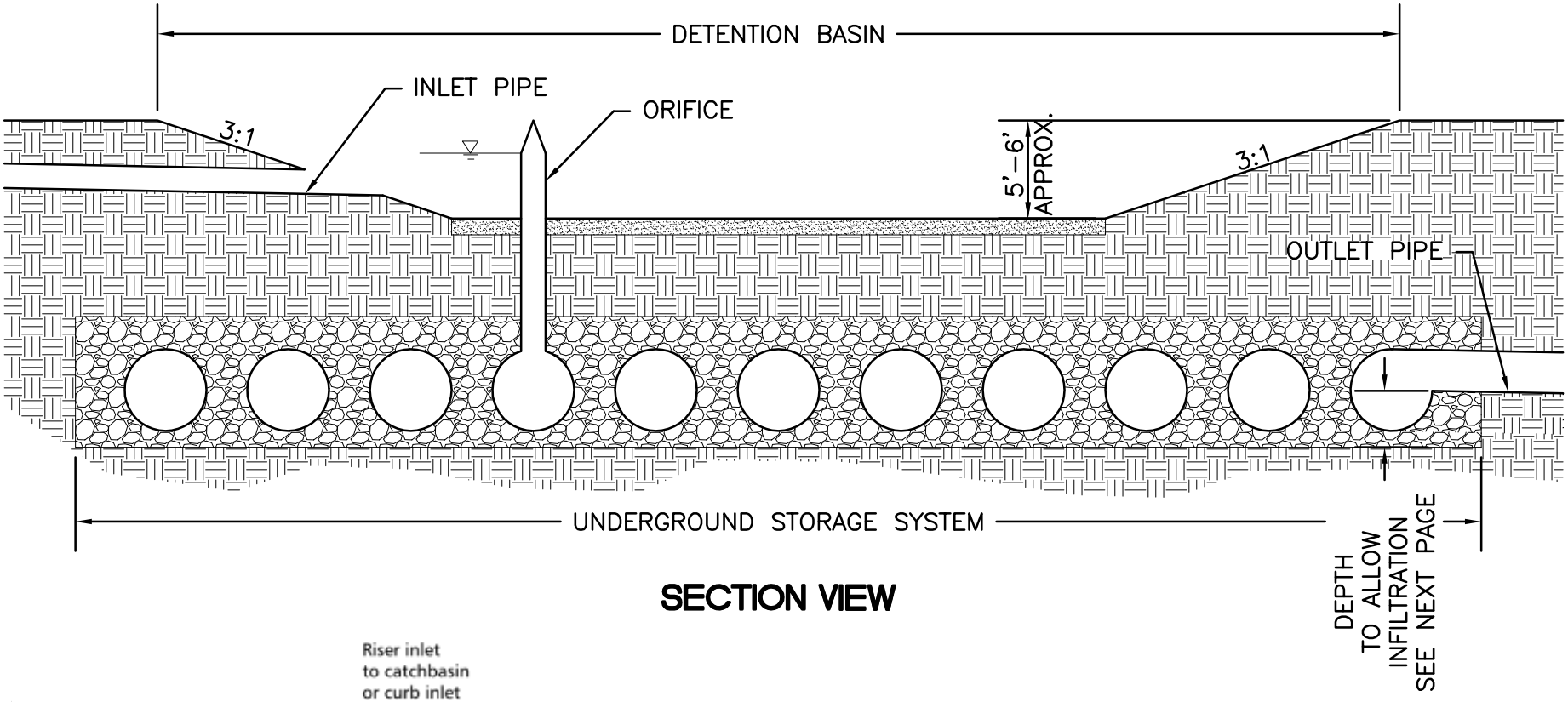
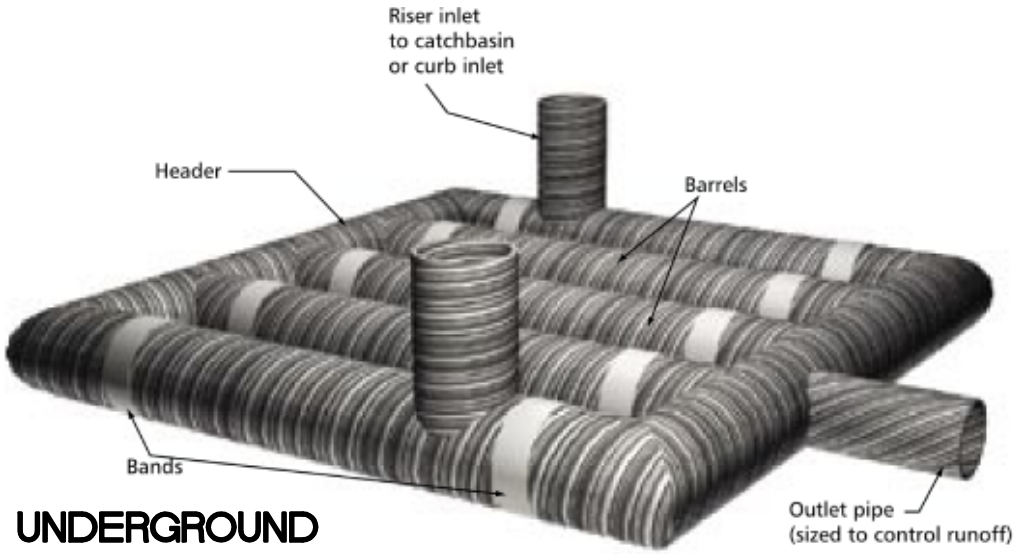


SECTION VIEW



UNDERGROUND STORAGE SYSTEM

FIGURE 9A

DISNEY|ABC STUDIOS
AT THE RANCH
UNDERGROUND CMP
DETENTION SYSTEM
OR APPROVED EQUIVALENT

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Subarea	Δ Volume (AC-FT)	Δ Volume to be Infiltrated (FT^3)	DEPTH 1" in 24hrs Infiltration rate@72 hrs (in)	DEPTH 6" in 24hrs Infiltration rate@72 hrs (in)	Required Area for 1" in 24hrs (FT^2)	Required Area for 6" in 24hrs (FT^2)
4a	0.74	32234	3	18	128938	21490
8a	0.22	9583	3	18	38333	6389
9a	0.19	8276	3	18	33106	5518
10a	0.29	12632	3	18	50530	8422

Note: See Appendix 1-G for Calculations

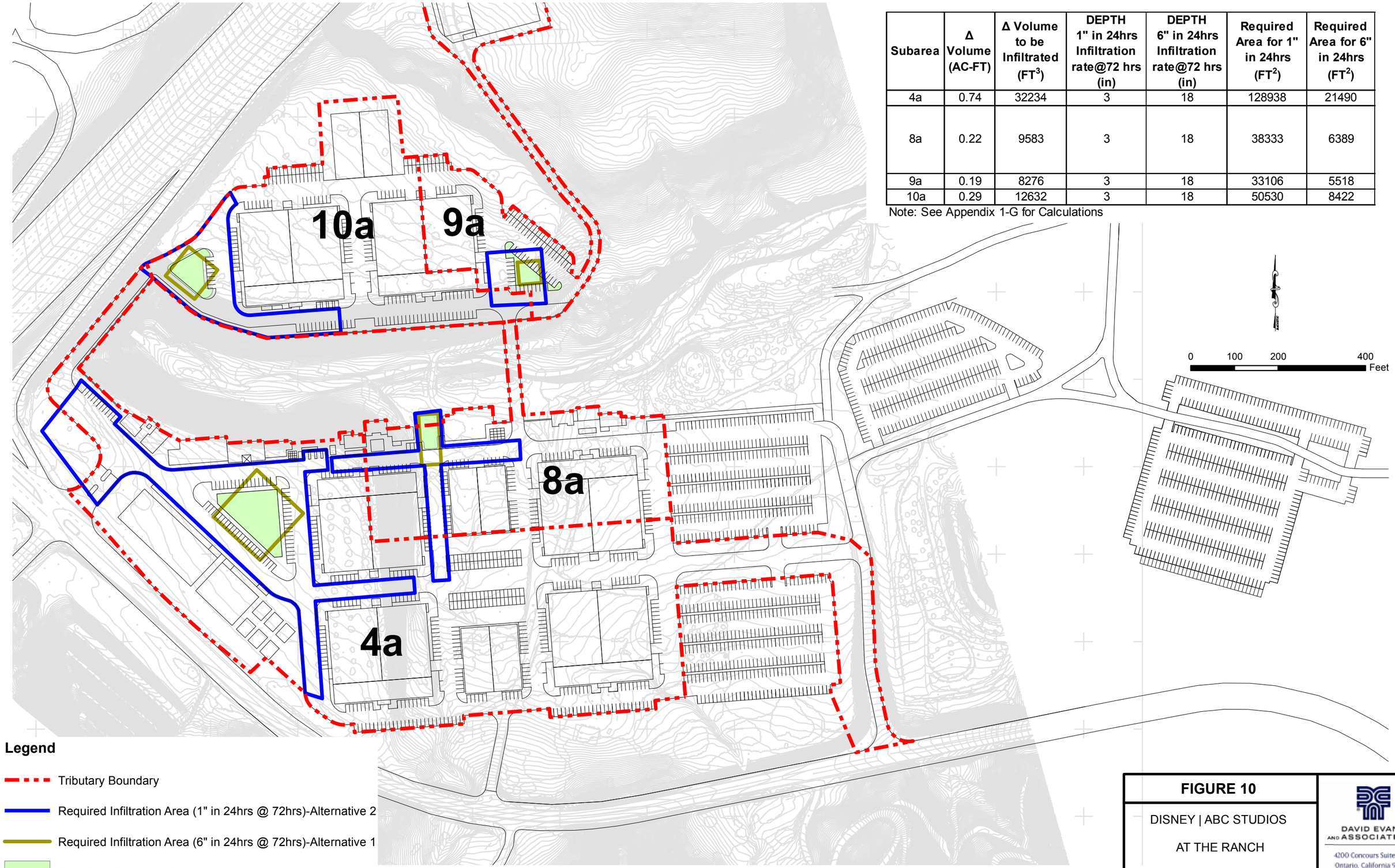

FIGURE 10

DISNEY | ABC STUDIOS

AT THE RANCH

INFILTRATION AREAS

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State Board, the Applicant would implement the SWPPP in compliance with the Construction General Permit.

The following BMPs would further document the construction SWPPP requirement and the types of measures that should be developed to protect stormwater flows during construction activities. The SWPPP would, at a minimum, address the following items:

Erosion control. Measures would be employed to prevent the movement of soil by wind or water during construction and might include watering and erecting physical barriers to the movement of soil particles.

Tracking of Soil. Measures would be employed to effectively minimize the tracking of soil by vehicles and might include gravel driveways, wheel washes and street sweeping.

Wastes and Cleanup. The SWPPP would address washout, cleanup and disposal related to debris, trash, concrete, asphalt, paint, coatings, solvents and other materials applicable to preparation and construction at the Proposed Project site.

Other Reasonable BMPs. The SWPPP would implement other BMPs, as needed, to keep pollutants away from stormwater. The SWPPP also would identify additional applicable measures taken during the storm season and when storms were anticipated.

Construction & Long Term Operations Impacts on Surface Water Quality

Specific measures would be incorporated into the SUSMP and the SWPPP for the Proposed Project. Implementation of these measures would ensure that the quality of stormwater runoff leaving the Proposed Project site would meet all regulatory standards and would maintain the beneficial uses of the surface water for the public and commerce. The County, as part of project approval and construction practice, would monitor compliance with these requirements. Based on the above, no significant impact is anticipated on surface water quality from construction and long-term operation of the Proposed Project.

Effective Site Design Elements for LID

The following site design elements are used to frame the approach in which LID deals with stormwater. These elements are addressed through a combination of BMPs.

1. Conserve natural areas, soils, and vegetation – protect areas outside grading limits, incorporate plants to suit soil and drainage conditions, incorporate planting schemes that replicate natural sites, use vegetative plantings and bioremediation techniques to neutralize soil contaminants.
2. Minimize disturbances to natural drainage patterns – minimize manicured lawns and annual beds as the dominant site elements.

3. Minimize and disconnect impervious surfaces – Reduce impervious areas by including landscaping and using pervious pavements where practicable. Reduce the amounts of "hydraulically" connected impervious areas by using downspouts directed toward vegetated areas and installing rain barrels and cisterns below downspouts.
4. Minimize soil compaction – Restrict compaction and grading to areas that will support structures as compacted soils suffer from reduced infiltration rates and limit root growth and plant survivability.
5. Disconnect impervious Surfaces – Direct runoff from impervious areas to pervious areas. Grade surface toward open space with infiltration capacity and infiltrate runoff a suitable distance from foundations.

LID BMPs

The Proposed Project would implement a series of BMPs to help mitigate impacts to surface water quality. The Low Impact Development Standards Manual, January 2009, and Manual for the Standard Urban Storm Water Mitigation Plan (SUSMP), September 2002, from the LACDPW were used in developing BMPs for the Proposed Project.

The Proposed Project plans to implement the following LID BMPs that would complement, or be a part of, the SUSMP BMPs described previously. Figure 9, SUSMP/LID BMPs plan, shows the locations of the proposed SUSMP and LID BMPs for the Proposed Project.

The LID BMPs are listed below as follows:

- *Downspout Connection - The proposed building downspouts would direct stormwater to the streets and storm drain system, which discharges into the on-site detention basins that have infiltration capacity (thus reducing stormwater-loads during precipitation events).
- *Vegetated Swale – As previously described in the SUSMP BMPs, these engineered, densely vegetated depressions retain and filter the first flush of runoff from impervious surfaces such as parking lots or streets.
- *Perforated underground detention system – Underground storage systems are designed to detain and infiltrate first flush before they would reach Placerita Creek.
- *Infiltration/Underground Storage Systems – These subsurface stormwater retention facilities are typically installed beneath permeable surfaces and can retain, filter, infiltrate, and alter runoff volume and timing. Infiltration trenches would be placed under the raised medians within the proposed parking lots. See page 1-18 for Underground Storage description.
- *Riparian buffers – Riparian buffers are undeveloped and vegetated land adjacent to a stream or water body. They help absorb stormwater runoff. They also maintain and improve water quality by protecting water resources from nonpoint pollutants, such as sediment, nutrients and pesticides from urban and agricultural

activities. The existing riparian barrier adjacent to Placerita Creek would be expanded with the Proposed Project after stabilization of the fill pad slopes.

*All of these BMP's promote infiltration and will be implemented first in accordance with the LA County LID Manual.

Groundwater Resources and Quality

The Proposed Project site is within the Santa Clara River Valley East Groundwater Sub basin. The East Groundwater Sub basin is the sole source of local groundwater for urban water supply in the City of Santa Clarita. Most of groundwater infiltration is in the form of winter-storm flow. However, the East Sub basin is also replenished by deep percolation of agricultural land, urban irrigation, and percolation from septic tanks and leaches field systems, and treated effluent from water reclamation plants.

Natural or soft bottom drainage channels and wide natural floodways and flood plains maximize the groundwater recharge and help to replenish the aquifers. Placerita Creek, a soft bottom stream, and the generally undeveloped nature in the vicinity of the Proposed Project allow unencumbered infiltration of precipitation to the subsurface and provide an opportunity for groundwater recharge.

The existing land uses and facilities on the Ranch east of the Development Area use well water as the water supply and would continue to do so after construction of the Proposed Project. Local groundwater would not be used for domestic water supply for the Proposed Project.

Mitigation Measures and Project Features

Although the hydrology will not change, the final hydraulics will need to be revised and modeled when the final construction documents are prepared. The proposed drainage system would be designed and engineered to ensure that post-development peak flows from the Proposed Project site would not exceed the peak flow currently exiting the site, or otherwise negatively impact Placerita Creek. LACDPW must approve the final hydraulics study prior to issuance of a grading permit issuance or approval of a final map for the Proposed Project, whichever occurs first.

As described above, Proposed Project plans would incorporate detention basins and storm drain facilities sufficient to capture, treat, and convey Proposed Project storm water flows to Placerita Creek such that runoff rates and volumes as well as water quality would be comparable to or better than existing conditions, as demonstrated to the satisfaction of the LACDPW prior to issuance of grading permits for the Proposed Project.

The following Proposed Project features would be implemented to comply with regulatory requirements:

Slope/Surface Protection Systems

- Cut and fill slopes would be constructed no steeper than 1:2 (vertical/horizontal). All slopes would be stabilized following Los Angeles County Standard Erosion Control policy.

- Design Pollution Prevention BMPs, such as concentrated flow conveyance systems, protection/velocity dissipation devices, and slope surface protection, would be employed.

- The existing vegetation would be protected to the maximum extent practicable. New slopes would be treated with erosion control materials.

- Retaining walls would be incorporated into the Proposed Project's design to reduce the steepness of slopes and/or to shorten slopes.

- Existing slopes would be disturbed only when necessary.

- Cut and fill areas would be minimized to reduce slope lengths.

- Benches or terraces would be provided on high cut and fill slopes to reduce the concentration of flows.

- Slopes would be rounded and shaped to reduce concentrated flows.

- The reconstructed slopes to Placerita Creek would be stabilized with soil cement and include a slope stabilization access road at the top of the slope stabilization. This access road would extend under the bridge, however, the bridge would span Placerita Creek so there would be no hard surfaces within Placerita Creek and the creek would be revegetated after temporary impacts to stabilize the slopes.

- The Proposed Project would contain three drainage line outlets with headwalls or flared end sections with rock slope protection. These devices generally would be located along the Placerita Creek embankments to maintain the historic drainage patterns, but the outlet drains would be above the water surface elevation of the County floodway.

Concentrated Flow Conveyance Systems

Other new conveyance systems would include curb and gutter, a storm drain system, catch basins, manholes, asphalt-lined dikes, detention basin surface ponds, underground detention/infiltration chamber devices, and debris basins.

V. CUMULATIVE IMPACTS

The geographic boundary for the cumulative hydrology and water quality analysis is the Placerita Canyon area. Build-out of the area around the Proposed Project site through development of other related projects would incrementally add to changes in the Placerita Creek watershed and impact both surface water runoff volumes and the quality of surface waters. The effect of any individual project would most likely be less than significant.

VI. SUB-APPENDICES

SUB-APPENDIX 1-A.

METHODOLOGY

MODIFIED RATIONAL LOSS CALCULATIONS

Los Angeles County uses the Modified Rational Method (MODRAT) for computation of runoff and storm volumes. MODRAT uses a runoff coefficient that is a function of the rainfall intensity. The runoff coefficient reflects the fraction of rainfall that does not infiltrate and is based on the rainfall intensity for a given time period.

MODRAT uses the following equation at each time step:

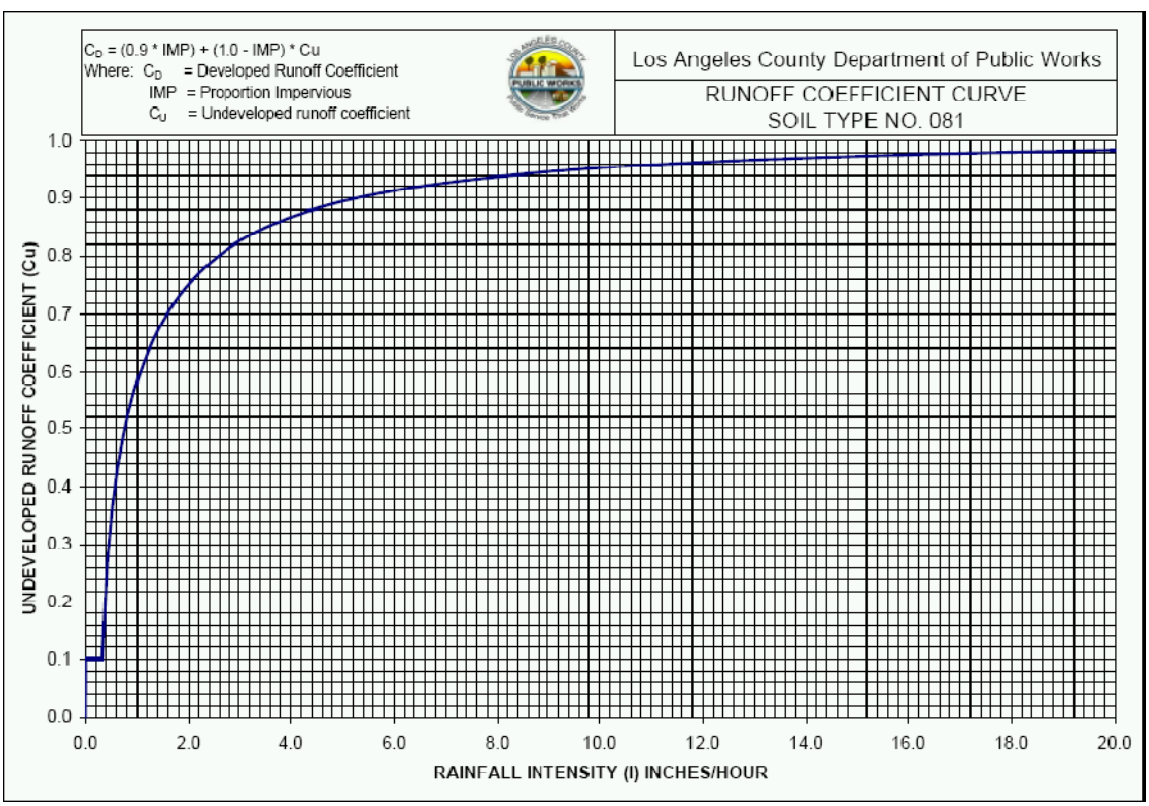
$Q = C * I * A$

Where: Q = Volumetric flow rate in cfs

C = Runoff coefficient, dimensionless
I = Rainfall intensity at a given point in time in inches/hour
A = Watershed area in acres

Undeveloped Runoff Coefficient (Cu)

MODRAT uses runoff coefficient curves to model the runoff response of the soil to changing intensity. The 179 undeveloped runoff coefficient curves, plotted in Appendix C, correspond to different soil types within the County of Los Angeles. The following Figure shows the shape of a typical runoff coefficient curve.



Developed Soil Runoff Coefficient Curves (CD)

Each undeveloped runoff coefficient curve represents natural soil conditions. When precipitation occurs over a developed watershed, the rain falls on directly connected impervious areas and pervious areas. Runoff from pervious areas only occurs during heavy rainfall. Directly connected impervious areas always produce direct runoff. As impervious area increases, the amount of direct runoff increases. The runoff coefficient curve must be modified to match the developed condition. The next equation accounts for the effects of development based on the undeveloped runoff coefficient and the amount of impervious area.

$$Cd = (0.9 * IMP) + (1 - IMP) * Cu$$

Where:

Cd = Developed area runoff coefficient
IMP = Percent impervious
Cu = Undeveloped area runoff coefficient

The 0.9 in the equation represents the general assumption that no development is completely impervious. This assumption also accounts for initial abstraction losses in developed areas.

Hydrology Model

A hydrological model of Placerita Creek in the area of the Proposed Project site was developed using the software Watershed Modeling System – WMS. Inputs for the model are Digital Elevation Models – DEM, generated from USGS quad sheets and supplied by the software's manufacturer. The watershed is digitally delineated in the software with the creation of basin outlets throughout the sub-basins. For this study the most downstream point of the watershed is the entrance of the culvert below SR-14 on the western side of the Proposed Project site.

Soil classification numbers are computed for each of the sub-basins by loading a shapefile from Los Angeles County Department of Public Works containing soil characteristics.

In the same manner, the percentage of imperviousness is computed from a shapefile containing land use information.

Rainfall is computed from a grid file with all the rainfall information for the County, and the rainfall distribution is computed from a file developed by the LACDPW for a 24-hour rainfall event.

Finally, the model computes the time of concentration for each of the sub-basins using a formula adopted by the LACDPW, which is built in the model and linked to GIS data capabilities.

FEMA FLOOD INSURANCE RATE MAP

The latest revised Flood Insurance Rate Map for the area was published by FEMA in September 2008. It shows portions of the Proposed Project site being flooded by the 1% annual chance, which is the 100-year discharge of 3,546 cfs. See the following: FIRM map and Page 126 of Flood Insurance Study Vol. 2 of 4 FEMA FIS no. 06037CV002A.

LOS ANGELES COUNTY FLOODWAY MAP

LACDPW has a floodway map, adopted by the Board of Supervisors on October 22, 1985, which shows a discharge of 7,880 cfs at the culvert under SR-14 on the western side of the Proposed Project site. This discharge was developed based on methodology used prior to adoption of the new Hydrology Manual, and, according to County personnel, is based on historical flood records and is conservative.

LACDPW staff has modeled the hydrology for the Proposed Project and provided sketches of the study showing more realistic discharge rates, approximately 5800 cfs for the burned and bulked flowrate. All Hec-Ras and floodplain calculations reflect the County's modeled discharge rate of 5,800 cfs.

FLOOD INSURANCE STUDY

LOS ANGELES COUNTY, CALIFORNIA

AND INCORPORATED AREAS

VOLUME 2 OF 4

Community Name	Community Number	Community Name	Community Number	Community Number	Community Name	Community Number	Community Name	Community Number
LOS ANGELES COUNTY, UNINCORPORATED AREAS	065043	DIAMOND BAR, CITY OF	060741	LAWNDALE, CITY OF*	060134	SAN DIMAS, CITY OF	060154
AGOURA HILLS, CITY OF	065072	DOWNEY, CITY OF	060645	LOMITA, CITY OF*	060135	SAN FERNANDO, CITY OF*	060628
ALHAMBRA, CITY OF*	060095	DUARTE, CITY OF	065026	LONG BEACH, CITY OF	060136	SAN GABRIEL, CITY OF*	065055
ARCADIA, CITY OF	065014	EL MONTE, CITY OF*	060658	LOS ANGELES, CITY OF	060137	SAN MARINO, CITY OF*	065057
ARTESIA, CITY OF*	060097	EL SEGUNDO, CITY OF	060118	LYNWOOD, CITY OF	060635	SANTA CLARITA, CITY OF	060729
AVALON, CITY OF	060098	GARDENA, CITY OF	060119	MALIBU, CITY OF	060745	SANTA FE SPRINGS, CITY OF	060158
AZUSA, CITY OF	065015	GLENDALE, CITY OF	065030	MANHATTAN BEACH, CITY OF	060138	SANTA MONICA, CITY OF	060159
BALDWIN PARK, CITY OF*	060100	GLENDORA, CITY OF	065031	MAYWOOD, CITY OF*	060651	SIERRA MADRE, CITY OF	065059
BELL GARDENS, CITY OF	060656	HAWAIIAN GARDENS, CITY OF*	065032	MONROVIA, CITY OF	065046	SIGNAL HILL, CITY OF*	060161
BELL, CITY OF*	060101	HAWTHORNE, CITY OF*	060123	MONTEBELLO, CITY OF	060141	SOUTH EL MONTE, CITY OF*	060162
BELLFLOWER, CITY OF	060102	HERMOSA BEACH, CITY OF	060124	MONTEREY PARK, CITY OF*	065047	SOUTH GATE, CITY OF	060163
BEVERLY HILLS, CITY OF*	060655	HIDDEN HILLS, CITY OF	060125	NORWALK, CITY OF	060652	SOUTH PASADENA, CITY OF*	065061
BRADBURY, CITY OF	065017	HUNTINGTON PARK, CITY OF*	060126	PALMDALE, CITY OF	060144	TEMPLE CITY, CITY OF	060653
BURBANK, CITY OF	065018	INDUSTRY, CITY OF	065035	PALOS VERDES ESTATES, CITY OF	060145	TORRANCE, CITY OF	060165
CALABASAS, CITY OF	060749	INGLEWOOD, CITY OF*	065036	PARAMOUNT, CITY OF	065049	VERNON, CITY OF*	060166
CARSON, CITY OF	060107	IRWINDALE, CITY OF*	060129	PASADENA, CITY OF	065050	WALNUT, CITY OF	065069
CERRITOS, CITY OF	060108	LA CANADA FLINTRIDGE, CITY OF	060669	PICO RIVERA, CITY OF	060148	WEST COVINA, CITY OF	060666
CLAREMONT, CITY OF	060109	LA HABRA HEIGHTS, CITY OF	060701	POMONA, CITY OF	060149	WEST HOLLYWOOD, CITY OF	060720
COMMERCE, CITY OF	060110	LA MIRADA, CITY OF	060131	RANCHO PALOS VERDES, CITY OF	060464	WESTLAKE VILLAGE, CITY OF	060744
COMPTON, CITY OF	060111	LA PUENTE, CITY OF*	065039	REDONDO BEACH, CITY OF	060150	WHITTIER, CITY OF	060169
COVINA, CITY OF	065024	LA VERNE, CITY OF	060133	ROLLING HILLS ESTATES, CITY OF*	065054		
CUDAHY, CITY OF	060657	LAKEWOOD, CITY OF	060130	ROLLING HILLS, CITY OF	060151		
CULVER CITY, CITY OF	060114	LANCASTER, CITY OF	060672	ROSEMEAD, CITY OF	060153		

*Non-floodprone communities

September 26, 2008

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
06037CV002A

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

Selected Flood Insurance Rate Map (FIRM) panels for the community contain information that was previously shown separately on the corresponding Flood Boundary and Floodway Map (FBFM) panels (e.g. floodways, cross sections). In addition, former flood hazard zone designations have been changed as follows:

Old Zone	New Zone
A1 through A30	AE
V1 through V30	VE
B	X (Shaded)
C	X (Unshaded)

Part or all of this FIS may be revised and republished at any time. In addition, part of this FIS may be revised by the Letter of Map Revision process, which does not involve republication or redistribution of the FIS. It is, therefore, the responsibility of the user to consult with community officials and to check the community repository to obtain the most current FIS components.

Initial Countywide FIS Effective Date: September 26, 2008

TABLE OF CONTENTS

Volume 1

		Page
1.0	**INTRODUCTION**	1
	1.1 Purpose of Study	1
	1.2 Authority and Acknowledgments	1
	1.3 Coordination	5
2.0	**AREA STUDIED**	20
	2.1 Scope of Study	20
	2.2 Community Description	46
	2.3 Principal Flood Problems	73
	2.4 Flood Protection Measures	87

Volume 2

3.0	**ENGINEERING METHODS**	96
	3.1 Hydrologic Analyses	96
	3.2 Hydraulic Analyses	152
	3.3 Vertical Datum	183
4.0	**FLOODPLAIN MANAGEMENT APPLICATIONS**	185
	4.1 Floodplain Boundaries	185
	4.2 Floodways	186
5.0	**INSURANCE APPLICATIONS**	192
6.0	**FLOOD INSURANCE RATE MAP**	193
7.0	**OTHER STUDIES**	193
8.0	**LOCATION OF DATA**	203
9.0	**BIBLIOGRAPHY AND REFERENCES**	203

TABLE OF CONTENTS (CONTINUED)

Volume 2

Page

FIGURES

Figure 1 - FLOODWAY SCHEMATIC 189

TABLES

Volume 1

Table 1 - CONTACTED AGENCIES 5

Table 2 - INITIAL AND FINAL CCO MEETINGS 15

Table 3 - FLOODING SOURCES STUDIED BY DETAILED METHODS 31

Table 4 - FLOODING SOURCES STUDIED BY APPROXIMATE METHODS 31

Table 5 - LETTERS OF MAP CHANGE 37

Volume 2

Table 6 - SUMMARY OF INFLOW VOLUMES 110

Table 7 - SUMMARY OF PEAK DISCHARGES 112

Table 8 - SUMMARY OF BREAKOUT DISCHARGES 147

Table 9 - SUMMARY OF ELEVATIONS 149

Table 10 - MANNING'S "n" VALUES 170

Table 11 - SUMMARY OF ELEVATIONS FOR WAVE RUNUP AND WAVE SETUP 172

Table 12 - LIST OF LEVEES REQUIRING FLOOD HAZARD REVISIONS 179

Table 13 – LIST OF CERTIFIED AND ACCREDITED LEVEES 182

Table 14 - STREAM CONVERSION FACTOR 183

Table 15 - FLOODWAY DATA 190

Table 16 - COMMUNINITY MAP HISTORY 194

TABLE OF CONTENTS (CONTINUED)

EXHIBITS

Volume 3

Exhibit 1 - Flood Profiles

Amargosa Creek	01P-03P
Anaverde Creek	04P-06P
Avalon Canyon	07P-10P
Big Rock Wash	11P-12P
Cheseboro Creek	13P-15P
Cold Creek	16P-21P
Dark Canyon	22P-23P
Dry Canyon	24P-33P
Escondido Canyon	34P-39P
Flow Along Empire Avenue	40P
Flowline No. 1	41P
Garapito Creek	42P-44P
Hacienda Creek	45P
Kagel Canyon	46P-47P
Kagel Canyon	48P-57P
Lake Street Overflow	58P
La Mirada Creek	59P-62P
Las Flores Canyon	63P-66P
Las Virgenes Creek	67P-77P
Liberty Canyon	78P-79P
Lindero Canyon above confluence with Medea Creek	80P-81P
Lindero Canyon above Lake Lindero	82P-87P
Lindero Canyon spillway at Lindero	88P
Little Rock Wash - Profile A	89P-92P
Little Rock Wash - Profile B	93P
Little Rock Wash - Profile C	94P
Lobo Canyon	95P-98P
Lockheed Drain Channel	99P-102P

TABLE OF CONTENTS (CONTINUED)

Exhibit 1 - Flood Profiles (continued)

Volume 4

Lopez Canyon Channel	103P-104P
Los Angeles River left overbank path 2	105P-108P
Los Angeles River right overbank path 1	109P-111P
Los Angeles River right overbank path 2	112P
Malibu Creek	113P-115P
Medea Creek	116P-127P
Medea Creek (above Ventura Freeway)	128P-129P
Mill Creek	130P-134P
North Overflow (A)	135P
North Overflow (B)	136P
Old Topanga Canyon	137P-142P
Overflow Area of Lockheed Drain Channel	143P
Overflow Area of Lockheed Storm Drain	144P
Palo Comando Creek	145P-150P
Ramirez Canyon	151P-156P
Rio Hondo River left overbank path 3	157P
Rio Hondo River left overbank path 5	158P-159P
Rio Hondo River left overbank path 6	160P
Rustic Canyon	161P-164P
Sand Canyon Creek	165P
Santa Maria Canyon	166P
Stokes Canyon	167P-170P
Topanga Canyon	171P-195P
Trancas Creek	196P
Triunfo Creek	197P-200P
Unnamed Canyon (Serra Retreat Area)	201P-202P
Upper Los Angeles River left overbank	203P
Weldon Canyon	204P-205P
Zuma Canyon	206P-213P

PUBLISHED SEPARATELY:

Flood Insurance Rate Map Index

Flood Insurance Rate Map

City of Vernon

The City of Vernon is identified as a non-flood prone community.

City of Walnut

Results of the mapping study were not previously summarized in the effective FIS report for the City of Walnut; therefore, no flood protection measures are provided.

City of West Covina

Results of the mapping study were not previously summarized in the effective FIS report for the City of West Covina; therefore, no flood protection measures are provided.

City of West Hollywood

The City of West Hollywood is currently protected by a series of small drainage channels and storm drain systems. Plans are underway to upgrade the flood protection measures exercised in West Hollywood. The Los Angeles County Flood Control District maintains the majority of the drainage system.

City of Westlake Village

Results of the mapping study were not previously summarized in the effective FIS report for the City of Westlake Village; therefore, no flood protection measures are provided.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the County, standard hydrologic and hydraulic modeling methodologies were used to determine the flood hazard data required for this FIS. Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 2-, 1-, or 0.2-percent annual chance period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 1-Percent Annual Chance flood (1-percent chance of annual exceedance) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the county at the time of completion of this FIS. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for the flooding sources studied in detail affecting the County.

Many of the incorporated community within, and the unincorporated areas of Los Angeles County, have a previously printed FIS report. The hydrologic analyses described in those reports have been compiled and are summarized below.

Because many of the communities affected by the Los Angeles River and its tributaries were removed from the regulatory floodplain based on completion of the Los Angeles County Drainage Area

(LACDA), the discussion in this FIS for numerous communities is based on the revised analyses conducted by the Corps of Engineers, and reviewed and certified by the USACE and FEMA, for that project. Information on the methods used to determine peak discharge-frequency relationships for the streams restudied as part of this countywide FIS is shown below.

Depending on the availability of hydrologic data, numerous different approaches were used throughout the County. These are discussed in the following paragraphs.

Los Angeles County

Antelope Valley (not including the communities of Lancaster and Palmdale).

The U.S. Army Corps of Engineers, Los Angeles District, developed discharge-frequency relationships for the Antelope Valley. The U.S. Army Corps of Engineers using the log-Pearson Type III frequency analysis computed the 1-percent annual chance peak flow rates for Little Rock Creek and Big Rock Creek. The gage for Little Rock Creek, located at Little Rock Reservoir, has operated since 1931 and records flow from a drainage area of approximately 48 square miles. The gage located at the mouth of Big Rock Creek has been operated since 1923 and records flow from a drainage area of approximately 23 square miles.

The remaining streams tributaries to the Antelope Valley are ungaged. Therefore, discharge-frequency curves were developed by the U.S. Army Corps of Engineers from the Little Rock Creek and Big Rock Creek curves. An average of the two curves was developed using standard deviation and average skew coefficient of the two gages. The U.S. Army Corps of Engineers Standard Project Flood peak discharge at the concentration points was used as the basis for transposing the frequency curves to ungaged streams.

For the summer peak discharges in the Antelope Valley desert region, the U.S. Army Corps of Engineers determined from gages on nine streams that the major events were independent with relatively short records. Therefore, the peak discharges were considered collectively as a single flood record representative of the region.

To develop a summer storm discharge-frequency curve at any ungaged location, the Standard Project Flood was used as the basis for transposing the frequency curves.

The Los Angeles County Flood Control District employed the U.S. Army Corps of Engineers study as a data base to develop yield-versus-area curves for the 10-, 2-, 1-, and 0.2-percent annual chance frequency flow rates for the concentration points. These curves were used to determine the peak flow rates for intermediate points along the major watercourses and for adjacent watersheds.

Santa Clarita Valley (not including the City of Santa Clarita)

Much of the hydrologic data for this portion of the County was also supplied by the U.S. Army Corps of Engineers. For watersheds greater than 20 square miles, the U.S. Army Corps of Engineers formula for the geometric mean flood was used to predict 1-percent annual chance frequency peak flow rates. For drainage areas less than 20 square miles, this formula was modified slightly to yield runoff values more closely related to observed values using engineering judgment. This modification was reviewed by the Los Angeles District office of the U.S. Army Corps of Engineers.

Malibu Area

Streams in the Malibu area that have Los Angeles County Flood Control District gage records sufficient for frequency analysis are Malibu Creek, Station F130-R; Zuma Creek, Station F53-R; and Topanga Canyon, Station F548-R. The peak flow rates were computed at these locations using log-Pearson Type

III frequency analysis. Following this analysis, the peak flow rates were also computed using the Regional Runoff Frequency Equations developed by the Los Angeles County Flood Control District. These regional runoff frequency equations were developed through the multiple-linear regression analysis of the peak flow data of 48 gaging stations in Los Angeles County. Comparison of the results obtained indicated that the log-Pearson Type III analysis of the stream gages in the Malibu area produced higher peak flow rates than the Regional Runoff Frequency Equations. Therefore, the ratio of the flow rates predicted by the two methods was computed at each gage. Flow rates were then computed for the remaining points in the watershed by multiplying the regional equation flow rate by the appropriate ratio. The ratio used was determined by comparing the watershed being analyzed to those analyzed by the log-Pearson Type III analysis to determine which one was most similar.

Los Angeles Basin

The remaining portions of unincorporated territory are located in the Los Angeles basin and were analyzed in conjunction with the incorporated cities on a drainage area basis. For streams with gages of sufficient length of reliable record, log-Pearson Type III analysis was used to determine 1-percent annual chance flood flow rates. The flow rates for the remaining streams were calculated by the Regional Runoff Frequency Equations developed by the District.

The flow rates used in the Los Angeles County study do not reflect the substantial amount of mud and debris flows which can be generated by a burned watershed. Therefore, it should be emphasized that the results of the study do not reflect the true degree of flood and mudflow hazard to the community.

Due to the configuration of the channels and overbanks, storage can cause floods to pond or break away from the channels resulting in an inverse discharge-drainage area relationship to exist along portions of Zuma, Ramirez, Escondido, Topanga, and Lobo Canyons, and Medea and Triunfo Creeks.

Analyses were carried out to establish the peak elevation-frequency relationships for each flooding source studied in detail.

Coastal flood hazard areas subject to inundation by the Pacific Ocean were determined on the basis of water-surface elevations established from regression relations defined by Thomas. These regression relations were defined as a practical method for establishing inundation elevations at any site along the southern California mainland coast. They were defined through analysis of water-surface elevations established for 125 locations in a complex and comprehensive model study by Tetra Tech, Inc.. The regression relations establish wave run-up and wave set-up elevations having 10-, 1-, and 0.02-percent chances of occurring in any year and are sometimes referred to as the 10-, 100-, and 500-year flood events, respectively.

Wave run-up elevations were used to determine flood hazard areas for sites along the open coast that are subject to direct assault by deep-water waves. Runup elevations range with location and local beach slope and were computed at 0.5-mile intervals, or more frequently in areas where the beach profile changes significantly over short distances. Areas with ground elevations 3.0 feet or more below the 1-percent annual chance wave run-up elevation are subject to velocity hazard.

Wave setup elevations determined from the regression equations on the basis of location along the coast were used to identify flood hazard areas along bays, coves, and areas sheltered from direct action of deep-water waves.

City of Agoura Hills

Streams in the Malibu area that have Los Angeles County Flood Control District gage records sufficient for frequency analysis are Malibu Creek, Station F130-R; Zuma Creek, Station F53-R; and Topanga

Canyon, Station F548-R. The peak flow rates were computed at these locations using log-Pearson Type III frequency analysis (U.S. Water Resources Council, March 1976). Following this analysis, the peak flow rates were also computed using the Regional Runoff Frequency Equations developed by the Los Angeles County Flood Control District (Los Angeles County Flood Control District, November 1977). These regional runoff frequency equations were developed through the multiple-linear regression analysis of the peak flow data of 48 gaging stations in Los Angeles County. Comparison of the results obtained indicated that the log-Pearson Type III analysis of the stream gages in the Malibu area produced higher peak flow rates than the Regional Runoff Frequency Equations. Therefore, the ratio of the flow rates predicted by the two methods was computed at each gage. Flow rates were then computed for the remaining points in the watershed by multiplying the regional equation flow rate by the appropriate ratio. The ratio used was determined by comparing the watershed being analyzed to those analyzed by the log-Pearson Type III analysis to determine which one was most similar.

The flow rates used in this study do not reflect the substantial amount of mud and debris flows which can be generated by a burned watershed. Therefore, it should be emphasized that the results of the study do not reflect the true degree of flood and mudflow hazard to the community.

The 1-percent annual chance flood discharges used for the 1998 revision to the Agoura Hills FIS were developed by the Los Angeles County Flood Control District (Los Angeles County, Construction Drawings PM 100203, September 6, 1979 and Construction Drawings PM 7982, August 17, 1979) and Simons, Li & Associates, Inc., using Los Angles County "Capital Flood" metholodgy (Simons, Li & Associates, Inc., October 7, 1992).

City of Avalon

There are no gaged streams in the Avalon watershed; therefore, regional run-off frequency equations developed by the Los Angeles County Flood Control District were used to calculate flow rates based on runoff frequency. These regional runoff frequency equations were developed through the multiple-linear regression analyses of the peak flow data of 48 stream gaging stations within the county. Runoff data from the 48 gaging stations were first analyzed to obtain peak flows of the selected recurrence intervals at the gage sites. These peak values were then regressed against a number of physical parameters of the drainage basins.

Two of the important parameters included in the regional runoff frequency equations are rainfall intensity and runoff coefficients.

Rainfall records maintained by the City of Avalon, Harbor Department, for the period from 1947 through 1973 were used in the rainfall analysis for this study. A log-Pearson probability distribution analysis of the rainfall records was used to arrive at the 2-percent annual chance flood, 24-hour amount. This value is 5.02 inches and is similar to rainfall in the J rainfall zone. The analysis indicated that the distribution of rainfall at the Avalon gage over a 24-hour period is similar to the J rainfall zone distribution; therefore, the J rainfall zone intensity-duration curves were used to arrive at the 2-percent annual chance flood, 1-hour duration intensity. This value is 0.75 inch per hour and was used in the regional runoff frequency equation.

The district categorized and experimentally established runoff coefficient graphs for numerous areas of homogeneous runoff characteristics. To apply the appropriate runoff coefficients for this study, it was first necessary to determine the characteristics of the watersheds tributary to Avalon.

The study contractor was provided with a Soil Conservation Survey map for the eastern end of Santa Catalina Island. The survey specifically covered the Avalon watershed area. Watershed areas were categorized by soil type, texture, permeability, effective depth, and erodibility.

Examination of the soil map indicates that the tributary watersheds are composed of medium texture topsoil of moderate to shallow effective depth, low to moderately low infiltration rates, and moderate erodibility. The runoff characteristics of these watersheds compare very closely with watersheds found on the county mainland along the Santa Monica Mountain Range. This area is described as rough, broken, and stony, nonagricultural land, and is classified as Soil Type No. 022, for which the study contractor has runoff coefficient graphs. The graph was used to obtain the runoff coefficient of 0.624 at a rainfall intensity of 2 inches per hour. This value was used in the regional runoff frequency equations. The rest of the parameters used in the regional run-off frequency equation were obtained from topographic maps and other information on file with the Los Angeles County Flood Control District, and are in accordance with standard practice.

Coastal flood hazard areas in Avalon were analyzed using a complex hydrodynamic model which considered the effects of storm generated waves/swells and their transformation due to shoaling, refraction and frictional dissipation. Limited fetch distances preclude the City of Avalon from being directly exposed to severe storm-induced surge flooding. Locally generated storm waves combined with astronomical tide is the major cause of flooding along coastal areas in the vicinity of Avalon. Analysis of wave effects included a statistical analysis of historical local wind data to obtain the 10-, 2-, 1-, and 0.2-percent annual chance floods maximum wind magnitudes. Wave characteristics were then computed for the various wind recurrence intervals. Using the methodology cited above, the wave runup and setup elevations were calculated based on the wave characteristics. The wave runup and setup elevations were then statistically combined with the astronomical tide to yield the final coastal flooding conditions.

Wave runup elevations were used to determine flood hazard areas for sites along the open coast that are subject to direct assault by deep-water waves. Runup elevations range with location and local beach slope. Areas with ground elevations 3.0 feet or more below the 1-perecent annual chance wave runup elevation are subject to velocity hazard.

Wave setup elevations, determined on the basis of location along the coast, were used to identify flood hazard areas along bays, coves, and areas sheltered from direct action of deep-water waves. For this study, no wave setup elevations are shown.

Cities of Bellflower, Carson, Compton, Downey, Gardena, Lakewood, Long Beach (flooding from terrestrial sources only), Lynwood, Paramount, Pico Rivera, Santa Fe Springs, South Gate, Whittier

Hydrologic data for the Los Angeles River and the Rio Hondo were obtained from the USACE. The basis of the hydrologic data was HEC-1 and HEC-5 computer models. The HEC-1 model was calibrated for each subbasin using observed flow data where applicable. In addition, frequency-discharge calculations were made to compare the USACE results. The results were based on statistical analysis of stream gage data obtained from the LACFCD. The data were analyzed using the criteria in Bulletin 17-B.

The 1-Percent Annual Chance breakout hydrology for the Los Angeles River lower reach and the Rio Hondo were also obtained from the USACE. The peak values given in the LACDA report were used for hydraulic calculations in the overbank areas.

The timing of the breakouts on the left levee of the Rio Hondo at Beverly Boulevard and Stewart and Gray Road and the left levee of the Los Angeles River at Fernwood Avenue (Century Freeway) was also considered in determining the peak flow rate in the left overbank downstream of the Century Freeway. The USACE has determined that the peaks on the Rio Hondo breakouts do not occur at the same time as the peak on the Los Angeles River breakout. Therefore, downstream of the Century Freeway, the peak flow rate in the left overbank from the Rio Hondo breakouts is not combined with the peak flow rate

from the breakout near the Century Freeway. Only the peak flow from the Los Angeles River breakout is used since it has a larger magnitude.

City of Burbank

Regional Runoff Frequency Equations developed by the Los Angeles County Flood Control District were used to calculate flow rates for the Burbank Western Flood Control Channel in the City of Burbank, based on runoff frequency for the ungaged flood sources. These Regional Runoff Frequency Equations were developed through the multiple-linear regression analyses of the peak flow data of 48 gaging stations operated by the Los Angeles County Flood Control District within Los Angeles County. Runoff data from these stations were first analyzed to obtain peak flows of the selected recurrence intervals at the gage sites. These peak values were then regressed against a number of physical parameters of the drainage basins.

The Los Angeles River Flood Control Channel, which traverses the city's southern corporate limits, and the Burbank Western Flood Control Channel are the only gaged streams in the Burbank study area. The 1-percent annual chance peak flow rate for the Los Angeles River Flood Control Channel was computed using the log-Pearson Type III frequency analysis, and discharges associated with this event were found to be contained within the channel within the City. One of the 48 gaging stations operated by the Los Angeles County Flood Control District within Los Angeles County is located at Tujunga Avenue on the Burbank Western Flood Control Channel. It has been operated since 1950 and has a drainage area of approximately 401 square miles. The gage records for this location were considered inaccurate for frequency analysis purposes because of the residential development that has occurred in the watershed over the past 20 years. Therefore, Regional Runoff Frequency Equations developed by the Los Angeles County Flood Control District were used to calculate flow rates based on runoff frequency, and 1-percent annual chance flood discharges were found to be contained within the channel.

The flow rates used in this study do not include the substantial amount of mud and debris flows which could be generated from a burned watershed.

For the January 20, 1999 revision, the USACE HEC-1 computer program (U.S. Department of the Army, Corps of Engineers, Hydrologic Engineering Center, September 1990) was used to establish peak discharges having recurrence intervals of 10- and 1-percent annual chance. The parameters used were developed based on site conditions and in accordance with the guidelines contained in Natural Resources Conservation Service (NRCS) (formerly the Soil Conservation Service) Technical Release No. 55, "Urban Hydrology For Small Watersheds" (U.S. Department of the Interior, 1976).

Drainage areas were delineated on U.S. Geological Survey (USGS) 7.5-minute series topographic maps at a scale of 1:24,000, with a contour interval of 40 feet (U.S. Department of the Interior, 1966, Photorevised 1972), of the area based on previous studies by the LACFCD (Los Angeles County Flood Control District, August 1982).

The NRCS dimensionless unit-hydrograph option within HEC-1 was used. Times of concentration and lag were determined using NRCS methodology and criteria. Losses were determined using the NRCS curve-number method, in accordance with Technical Release No. 55 guidelines. Land use was determined from City of Burbank mapping and field reconnaissance. A 24-hour nested balanced storm was used with precipitation values determined from statistics developed by the California Department of Water Resources (California Department of Water Resources, 1986) for the Burbank Valley Pump recording rain gage. The 1-percent annual chance precipitation for this gage ranged from 0.40 inch for 5 minutes to 1.51 inches for 1 hour to 7.44 inches for 24 hours.

Flows were routed and combined using the channel-storage (modified-Puts) and Muskingum-Cunge channel-routing methods within the HEC-1 model.Discharges were determined for 10- and 1- percent annual chance return periods. The 10-percent annual chance discharges were compared with discharges determined by the LACFCD and loss rates were adjusted so the discharges would agree within 1 to 5 percent. The 1-percent annual chance discharges within the channel are limited by channel capacity.

City of Culver City

The gaged streams tributary to Culver City are the Ballona Creek Channel and the Sawtelle-Westwood Storm Drain Channel. The 1-percent annual chance peak flow rates for these streams were computed using the log-Pearson Type III frequency analysis. The U.S. Army Corps of Engineers, Los Angeles District, performed the analysis of Ballona Creek Channel. The gage, located at Sawtelle Boulevard, has been operated since 1927 and records flows from a drainage area of approximately 89 square miles. The flow rates were modified due to cultural changes in the watershed (i.e., agricultural to urbanized). The study contractor performed frequency analysis for the gage on Sawtelle-Westwood Channel. The gage, located at Culver Boulevard, has been operated since 1951 and records flows from a drainage area of approximately 23 square miles. Benedict Canyon Channel is completely underground through Culver City.

The remaining streams tributary to Culver City are ungaged. Therefore, regional runoff frequency equations developed by the Los Angeles County Flood Control District were used to calculate flow rates based on runoff frequency. These regional runoff frequency equations were developed through the multiple linear regression analyses of the peak flow data of 48 stream gaging stations within Los Angeles County. Runoff data from the 48 gaging stations were first analyzed to obtain peak flows of the selected recurrence intervals at the gage sites. These peak values were then regressed against a number of physical parameters of the drainage basins.

As a result of these analyses, it was determined that the 1-percent annual chance flood discharges for Ballona Creek Channel, Sawtelle-Westwood Storm Drain Channel, Benedict Canyon Channel, and Centinela Creek Channel were contained in the channels except for Ballona Creek Channel in the vicinity of the northeast corporate limits near Washington Boulevard. The 0.2-percent annual chance flood event was not studied for channel segments that contain the 1-percent annual chance flood peak discharge.

City of La Mirada

There are no gaged streams in the watersheds tributary to La Mirada Creek; therefore, regional runoff frequency equations developed by the study contractor were used to calculate flow rates based on runoff frequency. These regional runoff frequency equations were developed through the multiple-linear regression analyses of the peak flow data of 48 stream gaging stations within Los Angeles County. Runoff data from the 48 gaging stations were first analyzed to obtain peak flows of the selected recurrence intervals at the gage sites. These peak values were then regressed against a number of physical parameters of the drainage basins.

City of Lancaster

The U.S. Army Corps of Engineers, Los Angeles District, developed discharge-frequency relationships for streams in the Antelope Valley and the City of Lancaster. The 1-percent annual chance peak flow rates for Little Rock Creek and Big Rock Creek were computed using log-Pearson Type III frequency analyses. The analysis for Little Rock Creek was based on the stream gage located at Little Rock Reservoir, south of the City of Palmdale, which has been in operation since 1931 and records streamflow from a drainage area of approximately 49 square miles. The gage located at the mouth of Big Rock

Creek, southwest of the City of Palmdale, has been in operation since 1923 and records flows from a drainage area of approximately 23 square miles.

Amargosa Creek, Amargosa Creek Tributary, and Portal Ridge Wash are ungaged. Therefore, discharge-frequency curves were developed by the U.S. Army Corps of Engineers from the Little Rock Creek and Big Rock Creek frequency curves. An average of the two curves was developed using standard deviation and average skew coefficient of the two gages. The U.S. Army Corps of Engineers Standard Project Flood peak discharge at the concentration points was used as the basis for transposing the frequency curves to ungaged streams originating in the San Gabriel Mountains.

For the summer peak discharges in the Antelope Valley desert region, the U.S. Army Corps of Engineers determined from the gages of nine streams that the major events were independent with relatively short gage records. Therefore, the peak discharges recorded at each of the gages were considered collectively as a single flood record representative of the region. To develop a summer storm discharge-frequency curve at any engaged location, the Standard Project Flood was used as the basis for transposing the frequency curves.

The Los Angeles County Flood Control District employed the U.S. Army Corps of Engineers study as a data base to develop yield versus area curves for the 10-, 2-, 1-, and 0.2-percent annual chance flow rates for the concentration points. These curves were used to determine the peak flow rates for intermediate points along the major watercourses and for adjacent watersheds.

City of Long Beach (Coastal Flooding only; terrestrial flooding covered under Cities of Bellflower, et al., above)

Coastal flooding in the City of Long Beach, as analyzed for the original study of the City, originates from San Pedro and Alamitos Bays. This flooding is attributed to the following mechanisms:

1. Swell runup from intense offshore winter storms in the Pacific
2. Tsunamis from the Aleutian-Alaskan and Peru-Chile Trenches
3. Runup from wind waves generated by landfalling storms
4. Swell runup from waves generated off Baja California by tropical cyclones
5. Effects of landfalling tropical cyclones

The influence of the astronomical tides on coastal flooding is also incorporated in each of the previously mentioned mechanisms. A flood producing event from any of these mechanisms is considered to occur with a random phase of the astronomical tide. Each of these mechanisms is considered to act alone, so that the joint occurrence of any combination of the above mechanisms in a flooding event is considered to be irrelevant to the determination of flood elevations with return periods of less than 0.02-percent annual chance.

For each mechanism, the frequency of occurrence of causative events, as well as the probability distribution of flood elevations at a given location due to the ensemble of events were determined using methods discussed in "Methodology for Coastal Flooding in Southern California." A brief outline follows.

Winter Swell

The statistics of flooding due to winter swell runup were determined using input data provided by the Navy Fleet Numerical Weather Center (FNWC). These input data consist of daily values of swell heights, periods, and directions at three deep water locations beyond the continental shelf bordering the study area. The data are inclusive from 1951 to 1974, and were computed by FNWC using input from ship observations, meteorological stations, and synoptic surface meteorological charts of the Pacific

Ocean. For the original study, the incoming swells provided by FNWC were classified into 12 direction sectors of 10 degrees band width each. (Exposure of the study area to winter swells was confined to a 120 degree band, from directions 220° to 340°T). Within each sector, 10 days of swell height and period values were selected from the 24 years of FNWC data to represent extreme flood producing days. The selection criteria were guided by Hunts formula for runup. The 120 days at each of the three deepwater stations were merged to obtain a master list of 161 extreme runup producing days. For each of 161 days, the input swell provided by FNWC was refracted across the continental shelf and converted to runup at selected locations in the study area. The techniques used and data required are described in Section 3.2. Of the 161 days, a number of groups of consecutive days could be identified.

Each such group of days is considered to represent one event only; the largest runup from each group of days was selected as the maximum runup for that event. As a result of refraction and island sheltering effects, a number of the input swells produced no significant runup at certain locations. Therefore, the number of extreme runup events is less than 161. The average number of events in the study area is approximately 40. For each location in the study area, the runup for the extreme events were fitted to a Weibull distribution to obtain a probability distribution of runup from winter swell. The Weibull distribution was found to be best suited for representing runup statistics. Because extreme winter swell runup lasts for at least one day, the maximum runup must be considered to USACExist with the maximum high tide.

Regarding the extreme runup values as a statistical sample only, the influence of the astronomical tides was included by convolving the probability distribution of runup with the probability distribution of daily "high tides. The latter was obtained from standard tide prediction procedures using the harmonic constants at the nearest available tide gage for which such data exists as supplied by the Tidal Prediction Branch of the National Oceanic and Atmospheric Administration. At each location, the frequency of occurrence of extreme events is determined by the number of runup values used in the Weibull curve fit. The number of years over which these occur is 24. The product of the frequency occurrence with the complement of cumulative probability distribution of the runup-plus-tide (convolved) distribution gives the exceedence frequency curve for flood elevations due to winter swell runup.

Tsunamis

Elevation-frequency curves for tsunami flooding were obtained from information supplied by the USACE's Waterways Experiment Station (WES). The use of the results of the WES study were directed by FEMA.

In the WES study, the statistics of tsunami elevations along the coastline were derived by synthesizing data on tsunami source intensities, source dimensions, and frequencies of occurrence along the Aleutian-Alaskan and Peru-Chile Trenches. As a result, 75 different tsunamis, each with a known frequency of occurrence, were generated and propagated across the Pacific Ocean using a numerical hydrodynamic model of tsunamis. At a number of locations in the study area, these 75 tsunami time signatures were each added to the tidal time signature at the nearest tide gage location for which harmonic constants for tide computations are available. One year of tidal signature was generated from the harmonic constants. A given tsunami signature was then combined with the tide signature and the maximum of tsunami plus tide for the combination recorded. To simulate the occurrence of the tsunami at random phases of the tide, the tsunami signature was repeatedly combined to the tide signature starting at random phases over the entire year of the tide signature. Each combination produces a maximum tsunami-plus tide elevation with a frequency of occurrence equal to the frequency of occurrence of the particular tsunami signature used, divided by the total number of such combinations for that particular tsunami. The process was repeated for all 75 tsunamis and the elevation frequency curve for tsunami flooding was thus established.

Wind Waves From Landfalling Storms

The source of data for wind waves is the same as that for winter swell, the FNWC (1951 through 1974) data. The stations for which daily height, period, and direction data are available are also the same as for winter swells. The FNWC wind-wave data are directly correlated to local wind speeds. For obtaining runup statistics, the FNWC daily wave data were converted to daily runup data using the method outlined in Section 3.2. The daily runup data were then fitted to a Weibull distribution and convolved with the tide in the same manner as for winter swells.

Tropical Cyclone Swell

Runup from swell generated by tropical cyclones off Baja California was computed using the techniques discussed in Section 3.2. To establish the statistics of hurricane swell runup, the following procedure was used. Data concerning tropical cyclone tracks were obtained from the National Climatic Center (NCC). The data comprise 12-hourly positions of eastern North Pacific tropical cyclones from 1949 to 1974. This was supplemented by data on tropical cyclone tracks from the period 1975 to 1978, as reported in the Monthly Weather Review.

Besides position data, storm intensities at each 12-hourly position are also given. The intensity classifications are based on estimated maximum wind speeds. The intensity categories are tropical depression (less than 35 knot winds), tropical storm (less than 65 knot winds), and hurricane (at least 65 knot winds). Storms with tropical depression status were considered to generate negligible swell and omitted from this study. Data on actual maximum wind speeds were available from the NCC only from 1973 to 1977. These were used as the basis for obtaining values to represent maximum wind speeds from each of the two intensity classifications associated with the track data. Data on storm radii were derived from North American Surface Weather Charts by analysis of pressure fields of tropical cyclones off Baja California. These were used to define typical radius of maximum winds for each of two relevant-intensity classes. For each tropical cyclone between 1949 and 1918, the hurricane wind waves were computed using the mean radius and maximum wind speeds established for each intensity class along with the track data. The swell and resultant runup were computed using the techniques described in Section 3.2. For each tropical cyclone and each location of interest in the study area, a time history of swell runup was determined. These were added to time histories of the local astronomical tide in a procedure analogous to that used in determining tsunami plus tide effects. The exceedence frequencies of tropical cyclone swell runup were computed in a manner similar to that used for tsunamis.

Landfalling Tropical Cyclones

The frequency of landfalling tropical cyclones in southern California is extremely low. During those years covered by the NCC tape of eastern North Pacific tropical cyclones (1949 to 1974), no tropical cyclone hit southern California. A longer period of record was used to estimate the frequency of an event such as the Long Beach 1939 storm. A study by Pyke was used to compile a list of landfalling tropical cyclones along the coast of southern California. The study was a result of extensive investigation of historical records such as precipitation and other weather and meteorological data. The study spanned the period from 1889 to 1977 and showed only 5 or 6 identifiable landfalling tropical cyclones, of which the 1939 Long Beach event was the strongest, and only one in the tropical storm category. The others were all weak tropical depressions (with maximum winds of less than 35 knots). The low frequency event, once in 105 years over approximately 360 miles of coastline, coupled with an impact diameter of approximately 60 miles, implies that for any given location, the return period of a landfalling tropical cyclone is about 600 years. Therefore, landfalling tropical cyclones were not considered in the original study.

At each location within the study area, the exceedence frequencies at a given elevation due to the various flood-producing mechanisms were summed to give the total exceedence frequency at the flood elevation.

City of Los Angeles

The following streams within the City of Los Angeles have Los Angeles County Flood Control District records sufficient for frequency analysis purposes: Aliso Creek, Station F152B-R, at Nordhoff Street; Big Tujunga Wash, Station F213-R, located 2 miles above the mouth of the canyon; Los Angeles River, Station F300-R, located at Tujunga Avenue and Station F57C-R, located at the confluence with Arroyo Seco; Sawtelle Channel, Station F301-R, located 141 feet upstream of Culver Boulevard; Ballona Creek, Station F38C-R, located 530 feet upstream of Sawtelle Boulevard; and Compton Creek, Station F37B-R, located at Greenleaf Boulevard. The 1-percent annual chance frequency peak flow rates for these streams were computed using the log-Pearson Type III frequency analyses.

The remaining streams in the Los Angeles study area are ungaged; therefore, regional runoff frequency equations developed by the Los Angeles County Flood Control District were used to calculate flow rates based on runoff frequency. These regional runoff frequency equations were developed through the multiple-linear regression analyses of the peak flow data of 48 stream-gaging stations within Los Angeles County. Runoff data from the 48 gaging stations were first analyzed to obtain peak flows of the selected recurrence intervals at the gage sites. These peak values were then regressed against a number of physical parameters of the drainage basins.

The flow rates used in the Los Angeles study do not include the substantial amount of mud and debris flows that could be generated from a burned watershed. Therefore, it should be-emphasized that the results of this study may not reflect the true degree of flood hazard in the community.

Coastal flood hazard areas subject to inundation by the Pacific Ocean were determined on the basis of water-surface elevations established from regression relations defined by Thomas. These regression relations were defined as a practical method for establishing inundation elevations at any site along the southern California mainland coast. They were defined through analysis of water-surface elevations established for 125 locations in a complex and comprehensive model study by Tetra Tech, Inc.. The regression relations establish wave runup and wave setup elevations that have 10-, 1-, and 0.02 –percent chances of occurring in any year and are sometimes referred to as the 10-, 100-, and 500-year flood events, respectively.

Wave runup elevations were used to determine flood hazard areas for sites along the open coast that are subject to direct assault by deep-water waves. Runup elevations range with location and local beach slope and were computed at 0.5-mile intervals, or more frequency in areas where the beach profile changes significantly over short distances. Areas with ground elevations 3.0 feet or more below the 1-percent annual chance wave runup elevation are subject to velocity hazard.

Wave setup elevations determined from the regression equations on the basis of location along the coast were used to identify flood hazard areas along bays, coves, and areas sheltered from direct action of deep-water waves.

City of Montebello

The only gaged stream in the Montebello study area is located on Drainage District Improvement No. 23, upstream of the Rio Hondo Channel. In the original study, this gage was found unsatisfactory for frequency analysis purposes due to diversions in the watershed, substantial residential development, and the effect of backwater from the Rio Hondo Channel. Therefore, Regional Runoff Frequency Equations developed by the LACFCD were used to calculate flow rates based on runoff frequency. These Regional Runoff Frequency Equations were developed through the multiple-linear regression analyses of the peak flow data of 48 stream gaging stations within Los Angeles County. Runoff data from the 48 gaging

stations were first analyzed by obtaining peak flows of the selected recurrence intervals at the gage sites. These peak values were then regressed against a number of physical parameters of the drainage basins.

The flow rates used in the original study do not include the substantial amount of mud and debris flow that could be generated from a burned watershed. Therefore, it should be emphasized that the results of the study do not reflect the mud and debris flow hazard in the community.

For the areas of the City of Montebello affected by the Los Angeles River/Rio Hondo system, hydrology was generated using the methodologies outlined in the section on the Cities of Bellflower, et al., above.

The timing of the breakouts on the left levee of the Rio Hondo at Beverly Boulevard and Stewart and Gray Road and the left levee of the Los Angeles River at Fernwood Avenue (Century Freeway) was also considered in determining the peak flow rate in the left overbank downstream of the Century Freeway. The USACE has determined that the peaks on the Rio Hondo breakouts do not occur at the same time as the peak on the Los Angeles River breakout. Therefore, downstream of the Century Freeway, the peak flow rate in the left overbank from the Rio Hondo breakouts is not combined with the peak flow rate from the breakout near the Century Freeway. Only the peak flow from the Los Angeles River breakout is used since it has a larger magnitude.

City of Palmdale

Discharge-frequency relationships for the City of Palmdale were developed by the USACE, Los Angeles District. In their study, the 1-percent annual chance peak flow rates for Little Rock Wash and Big Rock Wash were computed using the log-Pearson Type III frequency analysis. The gage located at Little Rock Reservoir, south of Palmdale, has operated since 1931 and records reflect flow from a drainage area of approximately 48 square miles. The gage located at the mouth of Big Rock Wash, southwest, has been operated since 1923 and records flows from a drainage area of approximately 23 square miles.

Amargosa Creek, Amargosa Creek Tributary, Anaverde Creek, and Anaverde Creek Tributary are ungaged. Therefore, discharge-frequency curves were developed by the USACE from Little Rock Wash and Big Rock Wash curves. An average of the two curves was developed using the standard deviation and average skew coefficient of the two gages. The USACE Standard Project Flood peak discharge at the concentration points was used as the basis for transposing the frequency curves to ungaged streams.

For the summer peak discharges in the Antelope Valley desert region, the USACE determined from gages on nine streams that the major events were independent with relatively short records. Therefore, the peak discharges were considered collectively as a single flood record representative of the region. To develop a summer storm discharge-frequency curve at any ungaged location, the Standard Project Flood was used as the basis for transposing the frequency curves.

The LACFCD used the USACE study as a data base to develop yield-versus-area curves for the 10-, 2-, 1-, and 0.2-percent annual chance flow rates for the concentration points. These curves were used to determine the peak flow rates for intermediate points along the major watercourses and for adjacent watersheds.

For the March 30, 1998 revision, the 1-percent annual chance discharges were calculated using regional regression equations developed by FEMA. The FEMA regression equation for the 1-percent annual chance discharges is:

$Q = 660\ A^{0.62}$;

where A is the total contributing watershed in square miles.

This equation was developed from data for 41 gaging stations in the South Lohonton-Colorado Desert (SLCD) region, as defined in the U.S. Geological Survey (USGS) Water Resources Investigations 77-21, "Magnitude and Frequency of Floods in California" (U.S. Department of the Interior, Geological Survey, June 1977). Anaverde Creek is in the SLCD region. The above equation is applicable for estimating flood discharges for Anaverde Creek because three gaging stations in the vicinity of Anaverde Creek were included in the regression analysis.

City of Redondo Beach

The watersheds of Redondo Beach are relatively small and there are no gaged streams in the study area. Therefore, the 1-percent annual chance peak flow rates were determined by use of the Los Angeles County Flood Control District Primary Regional Run-Off Frequency Equation for ungaged streams. Where 1-percent annual chance flood discharges exceeded the drain capacities, a field review and calculations of street capacities were made. At several locations, localized sumps were found where the existing drains do not adequately convey the 1-Percent Annual Chance flows or where drains do not exist. The excess flows create ponding conditions and the Los Angeles County Flood Control District Regional Normalized Hydrograph Equations were used to determine the volumes of ponding water. Where necessary, the volumes were reduced by reservoir routing the flows through the ponding areas.

The principal source of coastal flooding in Redondo Beach is from the Pacific Ocean and its landward intrusions such as Alamitos and Marina del Rey.

Coastal flooding is attributed to the following mechanisms:

6. Swell runup from intense offshore winter storms in the Pacific
7. Tsunamis from the Aleutian-Alaskan and Peru-Chile trenches
8. Runup from wind waves generated by landfalling storms
9. Swell runup from waves generated off Baja California by tropical cyclones
10. Effects of landfalling tropical cyclones

The influence of the astronomical tides on coastal flooding is also incorporated in each of the above mechanisms. A flood-producing event from any of the above mechanisms is considered to occur with a random phase of the astronomical tide. Each of the above mechanisms are considered to act alone. This is the joint occurrence of any combination of the above mechanisms in a flooding event is considered to be irrelevant to the determination of flood elevations with return periods of less than 0.2-percent annual chance.

For each mechanism, the frequency of occurrence of causative events as well as the probability distribution of flood elevations at a given location due to the ensemble of events was determined according to the methodology given in "Methodology for Coastal Flooding in Southern California." A brief outline of it is presented in the section on the City of Los Angeles, above.

City of Santa Clarita

Much of the hydrologic data used in this FIS study for the City of Santa Clarita was taken from a report prepared by the U.S. Army Corps of Engineers. For watersheds greater than 20 square miles, the USACE formula for the geometric mean flood was used to predict 1-percent annual chance peak flow rates. For drainage areas less than 20 square miles, this formula was modified slightly to yield runoff values more closely related to observed values and engineering judgment. This modification was reviewed by the Los Angeles District Office of the USACE.

City of Santa Fe Springs

Floods impacting the City of Santa Fe Springs are generated from watersheds on the southwesterly side of the Puente Hills, located to the north of Santa Fe Springs. The only gaged streams in the Santa Fe Springs study area are the San Gabriel River and Coyote Creek (both located outside the corporate limits). The 1-percent annual chance peak flow rates for these streams were computed using log-Pearson Type III frequency analyses.

The analysis of the San Gabriel River is based on the Los Angeles County Flood Control District Stream Gage No. F 262E-R, which is located approximately 1400 feet upstream of Florence Avenue near the western corporate limits. This gage has a drainage area of 216 square miles and 43 years of record. However, only the past 16 years of record were used for the frequency analysis, and they were compiled following completion of the Santa Fe and Whittier Narrows Dams, which are major flood control facilities located 15 miles and 5 miles upstream of the gage, respectively. The 1-percent annual chance peak discharge for the San Gabriel River at Florence Avenue was determined to be 13,000 cubic feet per second (cfs). The design capacity of the channel at this location is 19,000 cfs. Therefore, it was determined that no flooding from the San Gabriel River affects the city. The analysis for Coyote Creek - North Fork was based on the Los Angeles County Flood Control District Stream Gage No. 3208, which is located on the main branch of Coyote Creek at Centralia Street. This gage is located 4 miles downstream of Santa Fe Springs, has a drainage area of 110 square miles, and has 34 years of record. The 1-percent annual chance peak discharge is approximately 10,000 cfs as compared to design capacity of 42,000 cfs for Coyote Creek downstream of the City of Santa Fe Springs. It was also determined that no flooding from Coyote Creek and Coyote Creek - North Fork affect the city.

The remaining streams in the Santa Fe Springs study area are ungaged; therefore, regional runoff-frequency equations developed by the Los Angeles County Flood Control District were used to calculate flow rates based on runoff frequency. These regional runoff-frequency equations were developed through the multiple-linear regression analyses of the peak flow data of 48 stream gaging stations within Los Angeles County. Runoff data from the 48 gaging stations were first analyzed to obtain peak flows of the selected recurrence intervals at the gage sites. These peak values were then regressed against a number of physical parameters of the drainage basins.

City of Torrance

Flood conveyance channels within the City of Torrance are relatively small, and stormflows either accumulate in numerous small sumps, drain directly into the Pacific Ocean or are tributary to Dominguez Channel. Dominquez Channel is the only gaged watershed in the City of Torrance. However, the gage has an insufficient length of record for frequency analysis purposes. Dominquez Channel was analyzed through a comparison with Compton Creek, a gaged stream in an adjacent watershed outside of the corporate limits with similar hydrologic and hydraulic characteristics. The 1-percent annual chance peak flow for Compton Creek was computed using the log-Pearson Type III frequency analysis method. The ratio of the 1-percent annual chance peak flow for Compton Creek to the peak flow recorded in Compton Creek during the major storm of 1969 was applied to the 1969 peak flow in Dominguez Channel to obtain an approximate 1-percent annual chance peak flow for Dominguez Channel. This peak flow was estimated to be 12,500 cubic feet per second (cfs). Because the available channel capacity is 17,000 cfs, it was concluded that Dominguez Channel has ample capacity to convey the 1-percent annual chance discharge, and no further analysis was necessary.

The remaining watersheds tributaries to the City of Torrance are ungaged. Therefore, regional runoff frequency equations developed by the Los Angeles County Flood Control District were used to calculate flow rates based on runoff frequency. These regional runoff frequency equations were developed through the multiple-linear regression analyses of the peak flow data of 48 stream gaging stations within Los

Angeles County. Runoff data from the 48 gaging stations were first analyzed to obtain peak flows of the selected recurrence intervals at the gage sites. These peak values were then regressed against a number of physical parameters of the drainage basins.

City of West Hollywood

Regional runoff frequency equations developed by the Los Angeles County Flood Control District were used to calculate peak discharges for the City of West Hollywood.

City of Whittier

There are no gaged streams in the watersheds draining the City of Whittier; therefore, Regional Runoff Frequency Equations developed by the Los Angeles County Flood Control District were used to calculate flow rates based on runoff frequency. These Regional Runoff Frequency Equations were developed through the multiple-linear regression analyses of the peak-flow data of 48 gaging stations operated by the Los Angeles County Flood Control District within Los Angeles County. Runoff data from these stations were first analyzed in order to obtain peak flows of the selected recurrence intervals at the gage sites. These peak values were then regressed against a number of physical parameters of the drainage basins.

The flow rates used in this study do not include the substantial amount of mud and debris flows which could be generated from a burned watershed. Therefore, it should be emphasized that the study does not reflect this type of flood hazard in the community.

Peak inflow volumes determined for the ponding areas studied by detailed methods in Torrance are shown in Table 6, "Summary of Inflow Volumes."

Table 6 - SUMMARY OF INFLOW VOLUMES

Flooding Source and Location	Drainage Area (sq. mi.)	Peak Inflows (cfs) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Surface Runoff – Deep Ponding Area					
Southwest of the intersection of Carson Street and Madrona Avenue	0.3	50	110	140	210
At intersection of Doris Way and Reese Road	0.5	160	350	450	700
Surface Runoff – Ponding Area					
At intersection of Anza Avenue and Spencer Street	0.1	10	20	25	40
Northwest of Sepulveda Boulevard and Madrona Avenue	0.3	60	140	180	280

At intersection of California Street and Alaska Avenue	0.7	190	250	270	330
At intersection of Amsler Street and Dormont Avenue	6.2	1,330	2,950	3,760	5,880

A summary of the drainage area-peak discharge relationships for all the streams studied by detailed methods is shown in Table 7, "Summary of Peak Discharges."

Table 7 - SUMMARY OF PEAK DISCHARGES

Flooding Source and Location	Drainage Area (sq. mi.)	Peak Discharges (cfs) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
3,500 feet Northeast of the Intersection of Via Montana and Country Club Drive	0.7	--	--	600	--
At the Intersection of Alameda Avenue and Main Street	1.2	--	--	750	--
At the Intersection of Chestnut and Lake Streets	1.3	--	--	670	--
Amargosa Creek					
At Outlet of Ritter Ranch Detention Pond	23.8	--	--	1,856	--
At Vineyard Ranch	26.5	--	--	2,063	--
At Elizabeth Lake Ford Crossing	28.6	--	--	2,288	--
At 25th Street West Bridge	30.0	--	--	2,341	--
At 10th Street West	32.0	--	--	2,364	--
Amargosa Creek Tributary					
Intersection of Avenue L and 3rd Street East	2.4	150	420	560	1,000
Intersection of Avenue I and Spearman Avenue	7.2	310	900	1,220	2,400

Table 7 - SUMMARY OF PEAK DISCHARGES

Flooding Source and Location	Drainage Area (sq. mi.)	Peak Discharges (cfs)			
		10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Avenue M and Valleyline Drive	1.8	120	340	460	850
Anaverde Creek					
1.85 Miles Downstream of California Aqueduct	15.66	--	--	3,630	--
1.47 Miles Downstream of California Aqueduct	12.79	--	--	3,200	--
Antelope Freeway	16.35	--	--	3,730	--
1.85 miles Downstream of California Aqueduct	15.66	--	--	3,630	--
1.47 miles Downstream of California Aqueduct	12.79	--	--	3,200	--
0.75 miles Downstream of California Aqueduct	11.79	--	--	3,050	--
California Aqueduct	8.25	--	--	2,440	--
Anaverde Creek Tributary					
Division Street between Avenue P and Avenue P-8	1.4	300	1,100	1,600	3,000
Antelope Valley					
Amargosa Creek at 90th Street West	6.9	580	2,000	3,100	4,500

Table 7 - SUMMARY OF PEAK DISCHARGES

Flooding Source and Location	Drainage Area (sq. mi.)	Peak Discharges (cfs)			
		10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Amargosa Creek Approximately Midway between 20th Street West and 10th Street West	32.7	1,800	3,300	5,000	10,100
West of Antelope Valley Freeway North of Avenue H	147	2,000	5,600	8,400	18,000
East of Antelope Valley Freeway North of Avenue H	206	3,000	9,000	13,000	30,000
Avenue F at Sierra Highway	206	3,000	9,000	13,000	30,000
Anaverde Creek East of Antelope Valley Freeway	16	700	2,100	3,000	6,400
West of Sierra Highway at Avenue P-8	19	700	2,100	3,100	6,600
West of 136th Street East at Avenue W-8	2.4	440	1,500	1,900	3,900
165th Street East Approximately 4,000 feet South of Pearblossom Highway	1.0	370	1,300	1,600	3,100
3,000 feet East of 165th Street East and 4,000 feet South of Pearbloosom Highway	7.3	500	1,700	2,300	4,700
Acton Canyon Road, Escondido Canyon Road, and Crown Valley Road	20.3	--	--	3,421	6,052

Table 7 - SUMMARY OF PEAK DISCHARGES

Flooding Source and Location	Drainage Area (sq. mi.)	Peak Discharges (cfs)			
		10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Acton Canyon at Intersection of Crown Valley Road and Acton Avenue	20.3	--	--	3,421	6,052
Agua Dulce Canyon Approximately 5,600 feet Upstream of Darling Road	10.3	--	--	3,509	6,360
Agua Dulce Canyon Approximately 800 feet Upstream of Escondido Canyon Road	14.3	--	--	4,401	7,977
Sand Canyon Approximately 800 feet Upstream of Placerita Canyon Road	6.4	--	--	4,371	5,961
Sand Canyon Approximately 2,900 feet Downstream of Placerita Canyon Road	7.3	--	--	4,908	6,693
Sand Canyon Approximately 250 feet Downstream of Iron Canyon Confluence	10.1	--	--	6,372	8,689
Iron Canyon Approximately 2,000 feet Upstream of Sand Canyon Road	2.8	--	--	2,078	2,833
Oak Springs Canyon Approximately 100 feet Upstream of Union Pacific Railroad (former Southern Pacific Railroad)	5.7	--	--	2,703	4,054
At intersection of Sixth Street and Quincy Avenue	1.0	271	598	763	1,194

Table 7 - SUMMARY OF PEAK DISCHARGES

Flooding Source and Location	Drainage Area (sq. mi.)	Peak Discharges (cfs)			
		10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Avalon Canyon					
At Cross Section A	3.65	859	1,895	2,419	3,785
At Cross Section G	1.83	440	971	1,239	1,938
Ballona Creek Channel					
At intersection of Adams Boulevard and Genesee Avenue	16.7	2,100	4,700	6,000	9,400
Big Rock Wash					
At mouth, Southwest	23.0	--	--	15,000	--
Chatsworth Area					
Vicinity of Santa Susanna Pass Road and Santa Susanna Avenue	1.46	450	990	1,300	2,000
Cheseboro Creek					
1,100 feet Upstream of Driver Avenue	7.6	2,169	4,779	6,088	9,551
Hacienda Creek					

Table 7 - SUMMARY OF PEAK DISCHARGES

Flooding Source and Location	Drainage Area (sq. mi.)	Peak Discharges (cfs)			
		10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Cross Section A	1.46	626	1,381	1,762	2,758
Harbor Area					
North of Carson Street Between Vermont and Berendo Avenues	0.35	74	164	209	327
Hidden Springs Area					
Mill Creek (Cross Section B)	14.8	2,274	5,019	6,405	10,024
Industry Area					
Vicinity of Brea Canyon Road and Lycoming Street	3.85	952	2,102	2,682	4,197
Iron Canyon					
Approximately 2,000 feet Upstream of Sand Canyon Road	2.8	--	--	2,078	2,833
Kagel Canyon Area					
Kagel Canyon Channel (Cross Section A)	2.04	490	1,081	1,380	2,159

Table 7 - SUMMARY OF PEAK DISCHARGES

Flooding Source and Location	Drainage Area (sq. mi.)	Peak Discharges (cfs)			
		10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Little Tujunga Wash Approximately 3,000 feet Upstream of the City of Los Angeles Corporate Limits	17.9	2273	5,019	6,405	10,022
La Mirada Area					
Mystic Street, Vicinity of Parkinson Avenue	0.31	81	179	228	357
La Mirada Creek					
At Ocaso Avenue	4.6	610	1,340	1,700	2,670
Approximately 1100 feet Downstream of La Mirada Boulevard	5.0	610	1,350	1,720	2,690
Ladera Heights Area					
Vicinity of La Cienega Boulevard and Slauson Avenue	0.53	138	305	389	609
Lindero Canyon					
700 feet Downstream of Thousand Oaks Boulevard	4.1	1,369	3,024	3,858	6,037
At Reyes Adobe Road	3.4	1,290	2,847	3,632	5,685

Table 7 - SUMMARY OF PEAK DISCHARGES

Flooding Source and Location	Drainage Area (sq. mi.)	Peak Discharges (cfs)			
		10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Little Rock Wash					
Little Rock Reservoir	48.0	--	--	20,000	--
Lockheed Drain Channel					
Approximately 150 feet Downstream of Hollywood Way	0.90	--	--	965	--
Approximately 300 feet Upstream of Lima Street	1.44	--	--	1,635	--
At Ontario Street	1.82	--	--	2,054	--
Approximately 100 feet Downstream of Naomi Street	1.89	--	--	2,026	--
Approximately 300 feet Downstream of Victory Place	2.48	--	--	2,410	--
Approximately 100 feet Downstream of Burbank Boulevard	3.73	--	--	2,910	--
Lopez Canyon Area					
Lopez Canyon Channel (Cross Section A)	1.78	682	1,506	1,922	3,007
Los Angeles River					

Table 7 - SUMMARY OF PEAK DISCHARGES

Flooding Source and Location	Drainage Area (sq. mi.)	Peak Discharges (cfs)			
		10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
At Compton Creek	808	92,900	133,000	142,000	143,000
At Imperial Highway	752	89,400	126,000	140,000	156,000
Malibu Area					
Trancas Creek Upstream of Pacific Coast Highway (Cross Section A)	8.6	2,499	5,518	7,040	11,106
Zuma Canyon (Cross Section A)	8.9	2,024	4,469	5,705	8,925
Zuma Canyon (Cross Section W)	8.4	2,079	4,590	5,858	9,167
Ramirez Canyon (Cross Section B)	3.3	1,066	2,352	3,000	4,696
Ramirez Canyon (Cross Section I)	2.8	1,150	2,540	3,240	5,070
Escondido Canyon (Cross Section B)	3.2	958	2,116	2,700	4226
Escondido Canyon (Cross Section F)	1.7	986	2176	2778	4,346
Malibu Creek (Cross Section A)	109.6	14183	31,648	40,544	63,934
Malibu Creek (Cross Section B)	109.2	14,183	31,648	40,544	63,934

Table 7 - SUMMARY OF PEAK DISCHARGES

Flooding Source and Location	Drainage Area (sq. mi.)	Peak Discharges (cfs)			
		10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Unnamed Canyon (Serra Retreat Area) (Cross Section C)	0.4	281	619	791	1,237
Las Flores Canyon (Cross Section F)	4.1	1,758	3,882	4,954	7,752
Topanga Canyon (Cross Section H)	19.6	4,095	9,040	11,537	18,054
Topanga Canyon (Cross Section M)	15.0	5,404	11,930	15,223	23,882
Topanga Canyon (Cross Section Q)	14.5	5,208	11,499	14,672	22,960
Topanga Canyon (Cross Section T)	7.3	2,560	5,656	7,215	11,289
Topanga Canyon (Cross Section V)	7.0	2,364	5,222	6,601	10,422
Topanga Canyon (Cross Section X)	5.5	1,862	4,113	5,247	8,210
Topanga Canyon (Cross Section AG)	0.3	259	572	729	1,141
Santa Maria Canyon (Cross Section C)	3.1	1,070	2,333	3,016	4,719
Old Topanga Canyon (Cross Section E)	1.7	567	1,253	1,597	2,499
Old Topanga Canyon (Cross Section H)	0.8	251	554	706	1,104
Garapito Canyon (Cross Section A)	2.9	996	2,171	2,807	4,392

Table 7 - SUMMARY OF PEAK DISCHARGES

Flooding Source and Location	Drainage Area (sq. mi.)	Peak Discharges (cfs)			
		10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Garapito Canyon (Cross Section E)	2.0	675	1,470	1,910	2,974
Cold Creek (Cross Section A)	8.1	2,280	5,019	6,406	10,023
Cold Creek (Cross Section C)	7.8	2,280	5,041	6,432	10,066
Cold Creek (Cross Section G)	5.7	1,734	3,826	4,881	7,640
Dark Canyon (Cross Section A)	1.2	753	1,600	2,118	3,314
Lobo Canyon (Cross Section B)	3.8	1,572	3,473	4,429	6,932
Lobo Canyon (Cross Section C)	2.5	1,625	3,588	4,579	7,166
Stokes Canyon (Cross Section B)	2.9	1,089	2,403	3,067	4,799
Stokes Canyon (Cross Section C)	2.4	934	2,062	2,631	4,117
Dry Canyon (Cross Section C)	1.1	527	1,104	1,484	2,323
Dry Canyon (Cross Section M)	0.8	490	1,083	1,382	2,162
Dry Canyon (Cross Section T)	0.4	242	534	681	1,065
Cheseboro Creek (Cross Section B)	7.6	2,169	4,779	6,088	9,551

Table 7 - SUMMARY OF PEAK DISCHARGES

Flooding Source and Location	Drainage Area (sq. mi.)	Peak Discharges (cfs)			
		10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Palo Comado Creek (Cross Section E)	4.1	1,159	2,562	3,268	5,113
Palo Comado Creek (Cross Section J)	3.5	1,074	2,374	3,028	4,738
Palo Comado Creek (Cross Section K)	3.2	1,032	2,279	2,908	4,551
Las Virgenes Creek (Cross Section D)	14.3	3,591	7,928	10,165	15,832
Las Virgenes Creek (Cross Section H)	12.2	3,542	7,822	9,980	15,619
Liberty Canyon (Cross Section E)	1.4	938	2,072	2,645	4,140
Medea Canyon (Cross Section B)	24.6	5,794	12,788	16,319	25,537
Medea Canyon (Cross Section H)	23.0	6,174	13,628	17,389	25,537
Medea Canyon (Cross Section K)	22.2	6,363	14,074	17,925	28,049
Medea Canyon (Cross Section P)	6.3	2,558	5,647	7,204	11,272
Lindero Canyon (Cross Section C)	6.7	1,725	3,809	4,860	7,604
Lindero Canyon (Cross Section E)	4.1	1,369	3,024	3,858	6,037
Lindero Canyon (Cross Section H)	3.8	1,343	2,965	3,783	5,920

Table 7 - SUMMARY OF PEAK DISCHARGES

Flooding Source and Location	Drainage Area (sq. mi.)	Peak Discharges (cfs)			
		10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Lindero Canyon (Cross Section M)	3.4	1,290	2,847	3,632	5,685
Lindero Canyon (Cross Section N)	3.1	1,258	2,776	3,542	5,545
Triunfo Creek (Cross Section B)	28.7	4,781	11,396	14,898	24,298
Triunfo Creek (Cross Section E)	28.3	4,846	11,544	15,090	24,606
Malibu Lake	64.6	11,859	26,556	34,043	53,712
Medea Creek					
Downstream of Venture Highway	6.3	2,560	2,645	7,200	11,270
Approximately 950 feet Upstream of Canwood Street	--	--	--	6,720	--
Approximately 1,100 feet Upstream of Kanan Road	--	--	--	5,960	--
At Thousand Oaks Boulevard	--	--	--	5,946	--
Approximately 1,700 feet Downstream of Laro Drive	4.1	--	--	5,320	
Approximately 575 feet Downstream of Fountainwood Street	3.9	--	--	5,240	--

Table 7 - SUMMARY OF PEAK DISCHARGES

Flooding Source and Location	Drainage Area (sq. mi.)	Peak Discharges (cfs)			
		10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Just Upstream of Fountainwood Street	3.4	--	--	4,700	--
Mint Canyon					
Downstream of Sierra Highway Crossing	29.3	--	--	8,300	14,581
Downstream of Vasquez Canyon Road	26.8	--	--	7,896	14,179
Approximately 2,600 feet Downstream of Davenport Road	19.9	--	--	6,691	12,604
Newhall Canyon					
Approximately 800 feet Upstream of Railroad Canyon	5.2	--	--	3,224	4,396
Approximately 650 feet Upstream of Railroad Canyon	6.2	--	--	3,390	5,424
Approximately 650 feet Downstream of Railroad Canyon	7.3	--	--	3,892	6,228
Oak Springs Canyon					
Approximately 100 feet Upstream of Union Pacific Railroad (former Southern Pacific Railroad)	5.7	--	--	2,703	4,054

Table 7 - SUMMARY OF PEAK DISCHARGES

Flooding Source and Location	Drainage Area (sq. mi.)	Peak Discharges (cfs)			
		10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Overland Flow					
North of Florence Avenue and East of Pioneer Boulevard	1.34	270	596	760	1,190
North of Lakeland Road, 1000 feet East of Bloomfield Avenue	0.42	68	151	192	301
Marquardt Avenue, 1400 feet North of Rosecrans Avenue	2.09	411	907	1,158	1,812
Palo Comado Creek					
At Fairview Place	3.5	1,074	2,374	3,028	4,738
Placerita Creek					
Approximately 575 feet Downstream of San Fernando Road	9.3	--	--	5,321	7,981
Approximately 2,900 feet Upstream of San Fernando Road	8.6	--	--	4,988	7,482
Approximately 2,000 feet Upstream of Quigley Canyon Road	7.1	--	--	4,085	6,313
Approximately 850 feet Downstream of Antelope Valley Freeway	6.3	--	--	3,546	5,673

Table 7 - SUMMARY OF PEAK DISCHARGES

Flooding Source and Location	Drainage Area (sq. mi.)	Peak Discharges (cfs)			
		10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Ponding					
At Intersection of Mines Avenue and Taylor Avenue	0.5	120	250	330	510
Savage Creek at Intersection of York Avenue and Mar Vista Street	0.9	260	570	730	1,150
Turnbull Canyon at intersection of Painter Avenue and Camilla Street	1.0	250	540	690	1,080
Portal Ridge Wash					
Intersection of Avenue H and Antelope Valley Freeway	147.0	1,600	5,000	7,200	16,000
Rio Honda					
At Stewart and Gray Road	132	35,600	41,000	39,300	40,200
At Beverly Boulevard	113	33,800	37,50	38,000	38,400
At Outflow from Whittier Narrows Dam	110	33,500	36,500	36,500	36,500
San Fernando Valley District					
San Fernando					

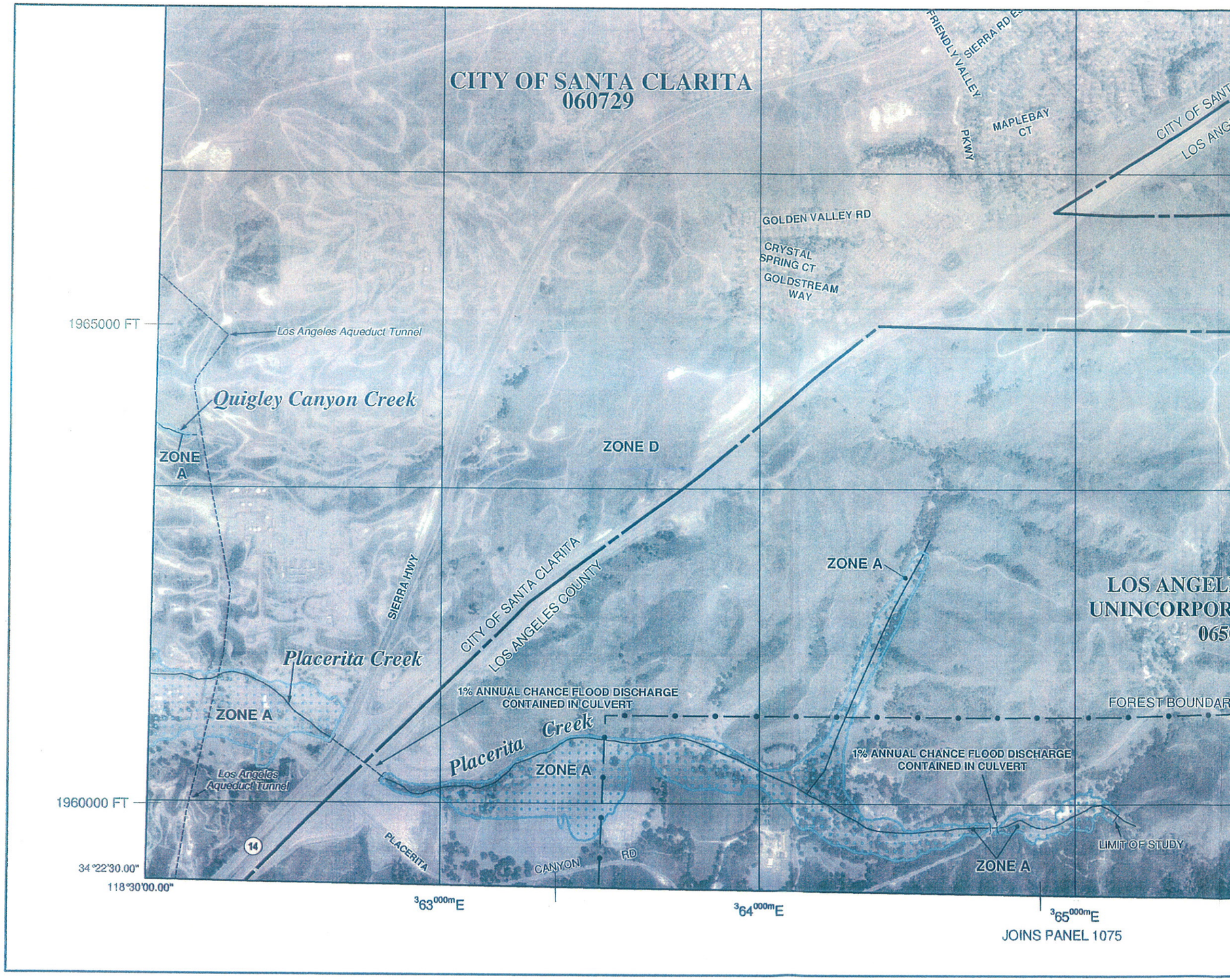
Table 7 - SUMMARY OF PEAK DISCHARGES

Flooding Source and Location	Drainage Area (sq. mi.)	Peak Discharges (cfs)			
		10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Pacoima Wash, Approximately 150 feet Downstream of Shablow Avenue	31.07	1,900	5,600	8,100	12,100
Lockheed Drain Channel, Approximately 450 feet Upstream of Clybourn Avenue	0.42	278	--	448	--
Lakeview Terrace					
Little Tujunga Canyon, Approximately 1,600 feet Upstream of Foothill Boulevard	20.29	2,700	6,000	7,700	12,200
Kagel Canyon, Approximately 650 feet Upstream of Osborne Avenue	2.04	490	1,100	1,400	12,200
Sunland					
Big Tujunga Canyon, Approximately 1,200 feet Upstream of Foothill Boulevard and Tujuna Valley Street	34.57	8,100	24,700	36,500	62,600
Big Tujunga Canyon, Upstream of Wheatland Avenue	43.25	9,300	26,800	38,900	66,000

Table 7 - SUMMARY OF PEAK DISCHARGES

Flooding Source and Location	Drainage Area (sq. mi.)	Peak Discharges (cfs)			
		10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Sylmar					
East Side of Golden State Freeway South of Sierra Highway	0.22	50	120	150	240
Weldon Canyon, Approximately 1,570 feet Downstream of Sierra Highway and San Fernando Road	1.47	410	900	1,150	1,800
Van Nuys					
Victory Boulevard, Vicinity of Hayvenhurst Avenue	0.73	90	200	250	390
Porter Ranch					
Mayerling Street, Northwest of Shoshone Avenue	0.19	40	100	120	190
Vicinity of Sesnon Boulevard	0.10	30	60	70	120
Granada Hills					
Superior Street, West of Paso Robles Avenue	0.53	90	200	260	400
Vicinity of Balboa Boulevard and Citronia Street	0.53	90	200	260	400

ANTELOPE VALLEY FRWY
PONDED WSE = 1421.2'
LIMIT OF STUDY
Q=2000cfs
WIDEN
Q=2150cfs
Q=1700cfs
Q=1750cfs
Q=1500cfs
LEGEND
ADOPTED BY BOARD OF SUPERVISORS
ON OCTOBER 22, 1985
ORDINANCE NO. 85-0169



...o insurance is available in this community, contact your ...ional Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

NFIP

PANEL 0840F

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

LOS ANGELES COUNTY, CALIFORNIA

AND INCORPORATED AREAS

PANEL 840 OF 2350

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LOS ANGELES COUNTY	065043	0840	F
SANTA CLARITA, CITY OF	060729	0840	F

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
06037C0840F

EFFECTIVE DATE
SEPTEMBER 26, 2008

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

SUB-APPENDIX 1-B.

MODIFIED RATIONAL METHOD FOR EXISTING CONDITIONS

EXISTING CONDITIONS

This study addresses hydrology calculations for current runoff from the Proposed Project site. Current runoff is estimated to be 3,232 cfs at the entrance to the culvert under SR-14 based on the County of LA hydrology calculations. Based on information provided by LA County Hydrology section, the $Q50_{burned}$ shown for location 339d from the water resources division hydrology information request summary is shown as 4331 cfs. $Q50_{clear}$ is as shown as 3950 cfs (see LA County hydrology, "Portion – South Fork Santa Clara River" located in sub appendix 1B). This is runoff generated from the entire Placerita Canyon watershed of approximately six square miles. (See the Sub-Basin Watershed Boundary Map).

Burn flows are calculated from information collected from the Santa Clara River Watershed Soil Type shapefile from LACDPW. The soil index number is 200. Burn flows are estimated to be 4,331 cfs at the entrance to the culvert under SR-14 on the western portion of the Proposed Project site based on the County of LA hydrology calculations.

Bulked flows are generated from the burn flows and information collected from the Debris Production Zones shapefile from the County Department of Public Works. Burned and bulked flows are estimated using LACDPW spreadsheets and are shown in sub-appendix 1c to be 6,012 cfs at the entrance to the culvert under SR-14 on the western portion of the Proposed Project site.

Table 1: Placerita Creek Watershed Discharges

Watershed Area	**$Q50_{clear,\ Undeveloped}$**	**$Q50_{burned}$**	**$Q50_{bulk}$**
6 sq. miles	3,950 cfs	4,331 cfs	6,012 cfs

Local Topography and Off-Site Drainage

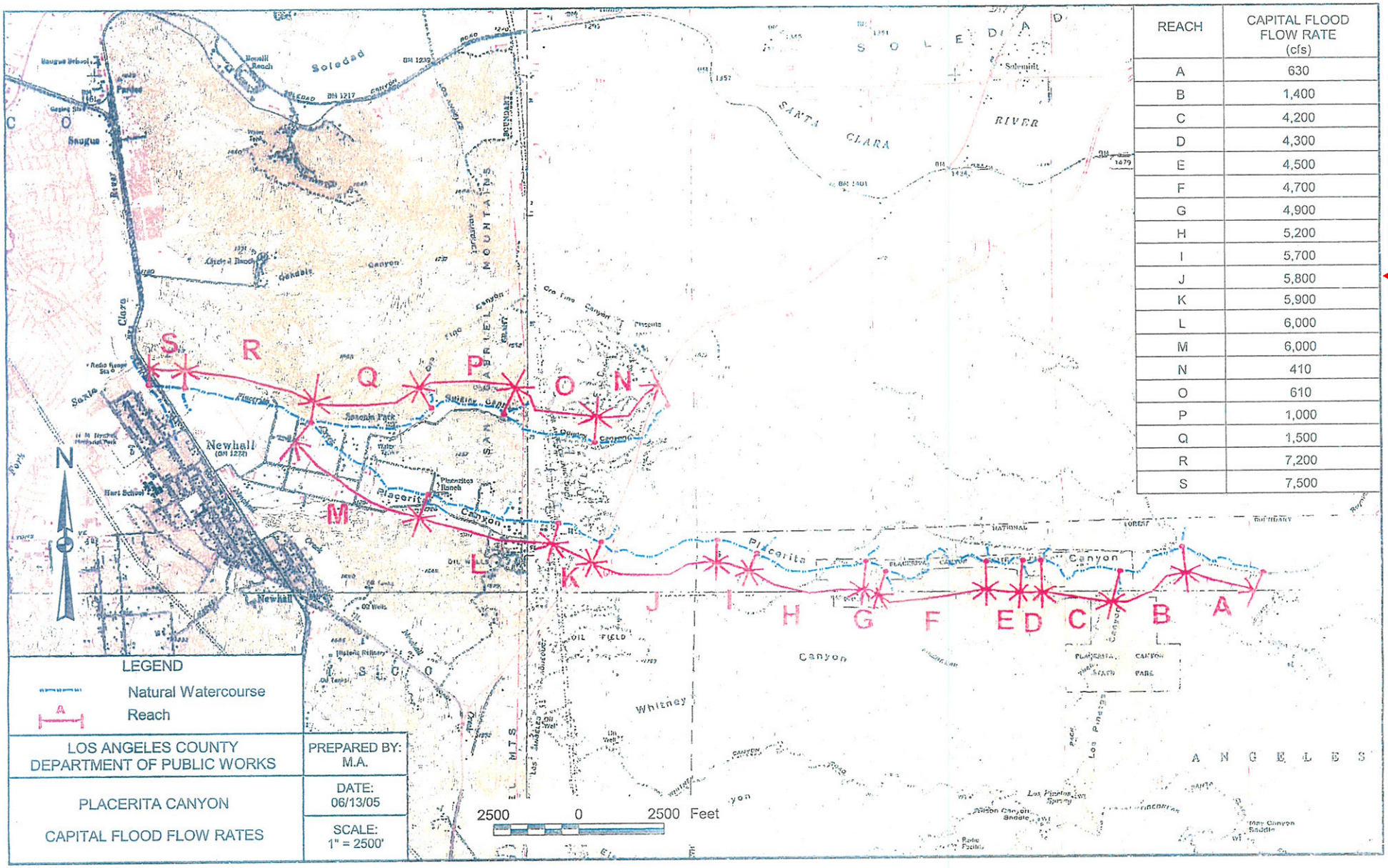
The Proposed Project site is located within the southeastern part of the Upper Santa Clara River Watershed region. The Upper Santa Clara River Watershed consists of the portion of the Santa Clara River Watershed located within Los Angeles County. The major bodies of water in the region include the Santa Clara River and its tributaries. The principal tributaries are Castaic Creek, San Francisquito Creek, Bouquet Creek, and the South Fork of the Santa Clara River.

The Proposed Project site is situated at the bottom of Placerita Canyon with relatively steep hillsides and ridgelines to the north and south measuring approximately 600 feet in height. The bottom of the canyon is relatively flat, with topography descending gently toward the west. Placerita Canyon is an east-west running canyon that includes a seasonal stream, Placerita Creek.

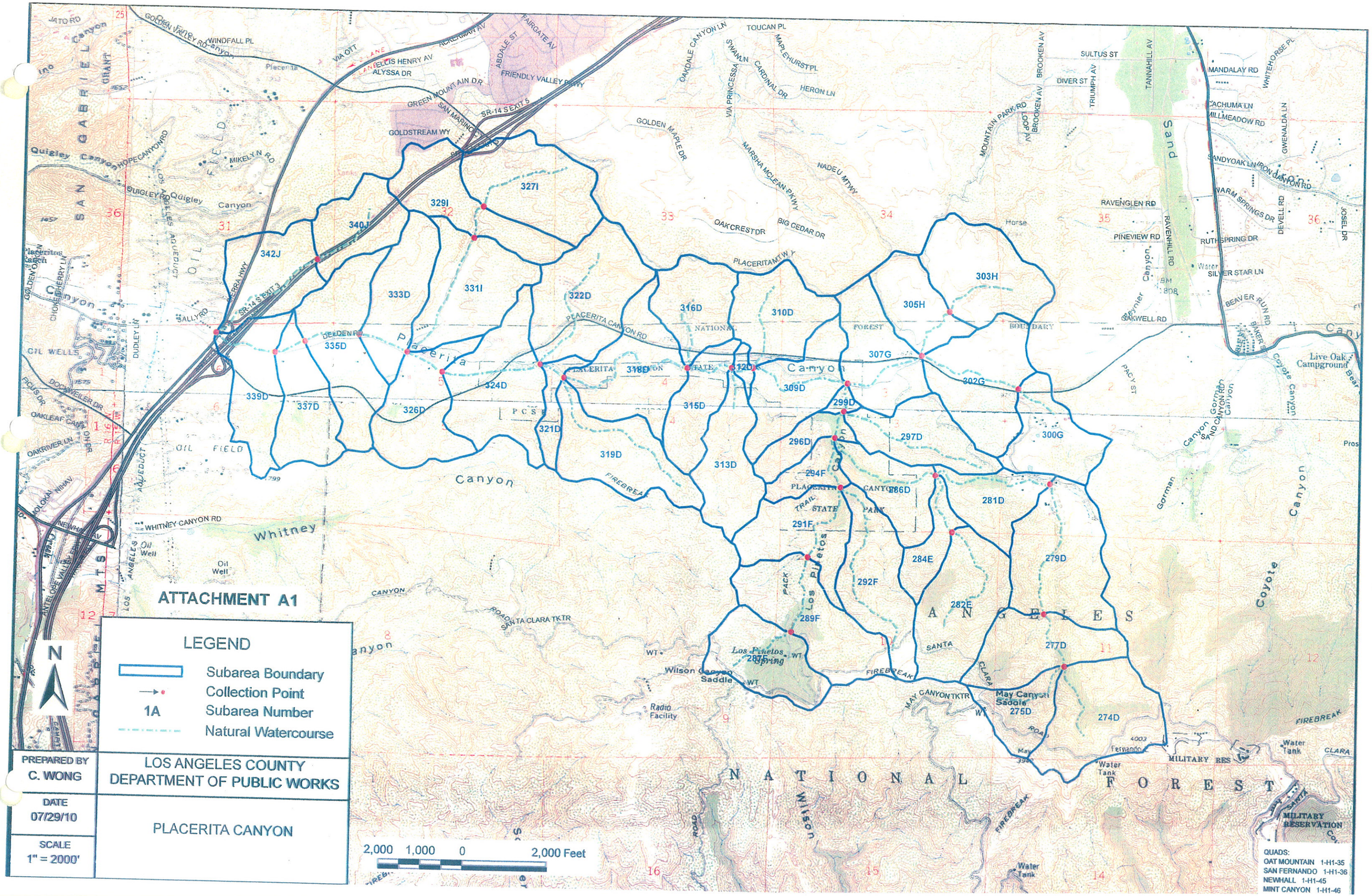
The existing tributary area of Placerita Creek upstream of SR-14 is a watershed of approximately six square miles. See following Hydrology Maps- Attachment A1. Placerita Creek flows east to west into the South Fork of the Santa Clara River. Placerita Creek is an ephemeral creek that receives intermittent surface flows only during, and immediately after, periods of intense precipitation.

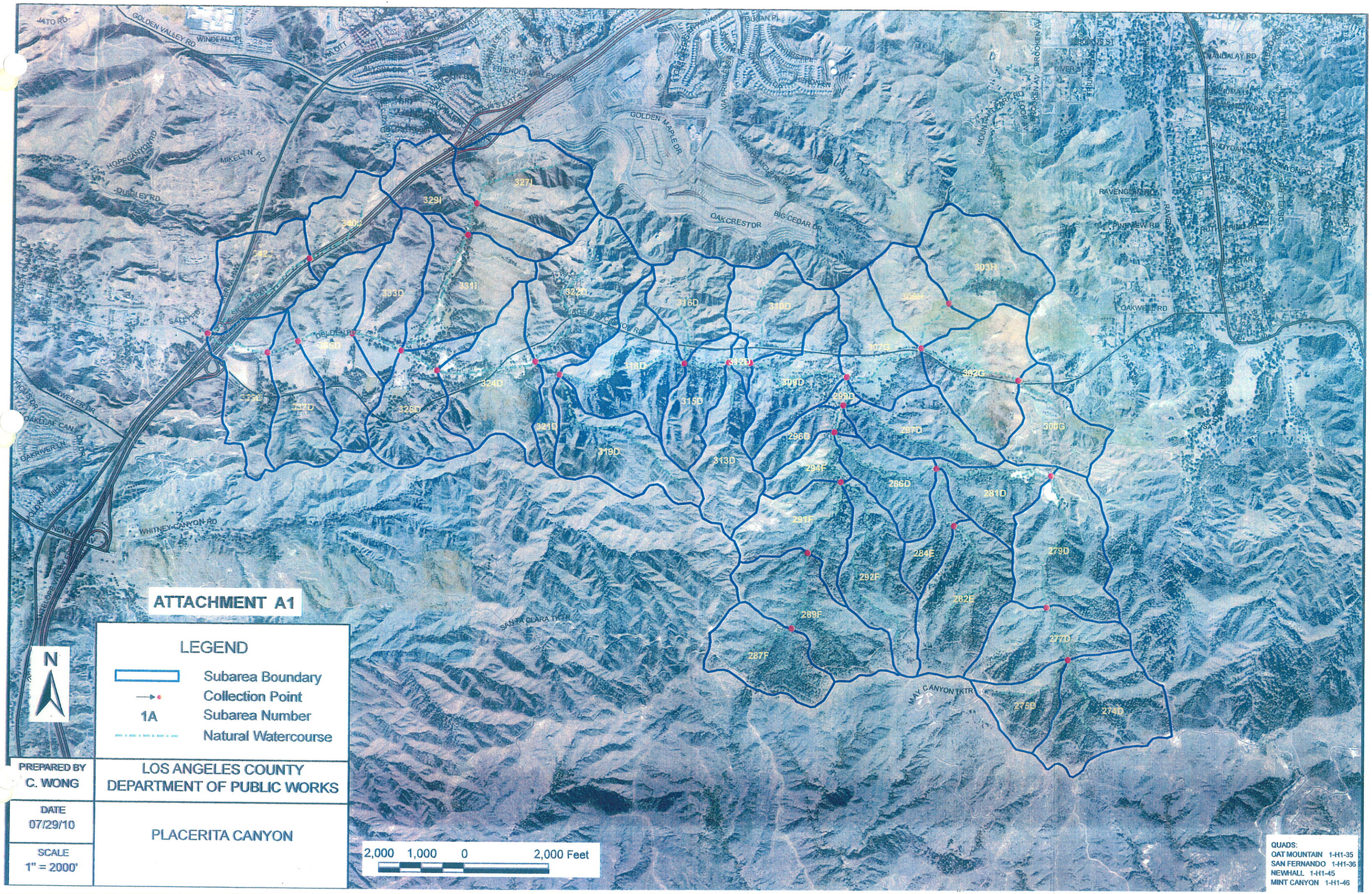
Off-site stormwater runoff flows in a generally south to north direction toward Placerita Creek. There are three major watersheds south of Placerita Canyon Road (Off-1a, Off-2a, and Off-3a), from which runoff flows onto the Development Area through a 24" CMP pipe and two cattle crossing culverts located under Placerita Canyon Road. These cattle crossings are six feet by seven feet arch-type corrugated metal structures that cross under Placerita Canyon Road and these flows are routed to a small ephemeral drainage that traverses the Development Area from south to north.

The Caltrans drainage system at the intersection of SR-14 and Placerita Canyon Road collects runoff from Placerita Canyon Road, SR-14 and the northbound off-ramp, which are located to the southwest and west of the Development Area, and discharges it to Placerita Creek through a 48" corrugated metal pipe that traverses the Development Area. There are five minor watersheds north of the Development Area (Off-4a, Off-5a, Off-6a, Off-11a, and Off-12a), from which runoff flows to the southwest towards Placerita Creek. See Hydrology and Water Quality Study, Figure 2, Off-Site Conditions.



REACH	CAPITAL FLOOD FLOW RATE (cfs)
A	630
B	1,400
C	4,200
D	4,300
E	4,500
F	4,700
G	4,900
H	5,200
I	5,700
J	5,800
K	5,900
L	6,000
M	6,000
N	410
O	610
P	1,000
Q	1,500
R	7,200
S	7,500


ATTACHMENT A1
LEGEND
Subarea Boundary
Collection Point
1A Subarea Number
Natural Watercourse
N
PREPARED BY
C. WONG
LOS ANGELES COUNTY
DEPARTMENT OF PUBLIC WORKS
DATE
07/29/10
PLACERITA CANYON
SCALE
1" = 2000'
2,000 1,000 0 2,000 Feet
QUADS:
OAT MOUNTAIN 1-H1-35
SAN FERNANDO 1-H1-36
NEWHALL 1-H1-45
MINT CANYON 1-H1-46
327I
329I
340J
342J
333D
331I
322D
316D
310D
305H
303H
335D
324D
318D
307G
302G
339D
337D
326D
321D
309D
299D
315D
297D
300G
319D
313D
296D
294F
286D
281D
291F
284E
279D
292F
289F
282E
277D
275D
274D
Placerita Canyon
Whitney Canyon
Los Pinetos Canyon
Wilson Canyon
Sand Canyon
Gorman Canyon
Coyote Canyon
Live Oak Campground
Los Pinetos Spring
Wilson Canyon Saddle
May Canyon Saddle
Radio Facility
Water Tank
MILITARY RES
MILITARY RESERVATION
NATIONAL FOREST
ANGELES
SAN GABRIEL MTS
OIL FIELD
PLACERITA CANYON STATE PARK
PCSP
FIREBREAK
SANTA CLARA TKTR
MAY CANYON TKTR
GOLDEN VALLEY RD
SR-14 S EXIT 3
SR-14 S EXIT 5
SAN MARINO DR
FRIENDLY VALLEY PKWY
GREEN MOUNTAIN DR
GOLDSTREAM WY
PLACERITA CANYON RD
PLACERITA MTN WY
OAKCREST DR
BIG CEDAR DR
MARSHA MCLEAN PKWY
NADEU MTN WY
GOLDEN MAPLE DR
OAKDALE CANYON LN
TOUCAN PL
MAPLEHURST PL
CARDINAL DR
HERON LN
VIA PRINCESSA
SWAMLN
MOUNTAIN PARK RD
BROOKEN AV
SULTUS ST
DIVER ST
TRIUMPH AV
TANNAHILL AV
MANDALAY RD
WHITEHORSE PL
ACHUMA LN
MILLMEADOW RD
GWENALDA LN
SANDYOAK LN
IRON CANYON RD
WARM SPRINGS DR
DEVELL RD
JOSEL DR
RAVENGLEN RD
PINEVIEW RD
RUTH SPRING DR
RAVENHILL RD
SILVER STAR LN
BEAVER RUN RD
OAKWELL RD
PACY ST
WHITNEY CANYON RD
ANTELOPE VALLEY FWY
ALOMA WHAV
NEWHALL AV
OAKRIVER LN
OAKLEAF CAMP
FICUS DR
DOCKWEILER DR
GOLDEN OAK LN
CHOKECHERRY LN
DUDLEY LN
OIL WELLS
SALLY RD
DELDEN RD
QUIGLEY RD
HOPECANYON RD
MIKELYN RD
JATO RD
WINDFALL PL
VIA OTT
ELLIS HENRY AV
ALYSSA DR
ACHENBACH AV
ABDALE ST
FAIRGATE AV
LOS ANGELES AQUEDUCT
Oil Well
Pros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2,000 1,000 0 2,000 Feet
QUADS:
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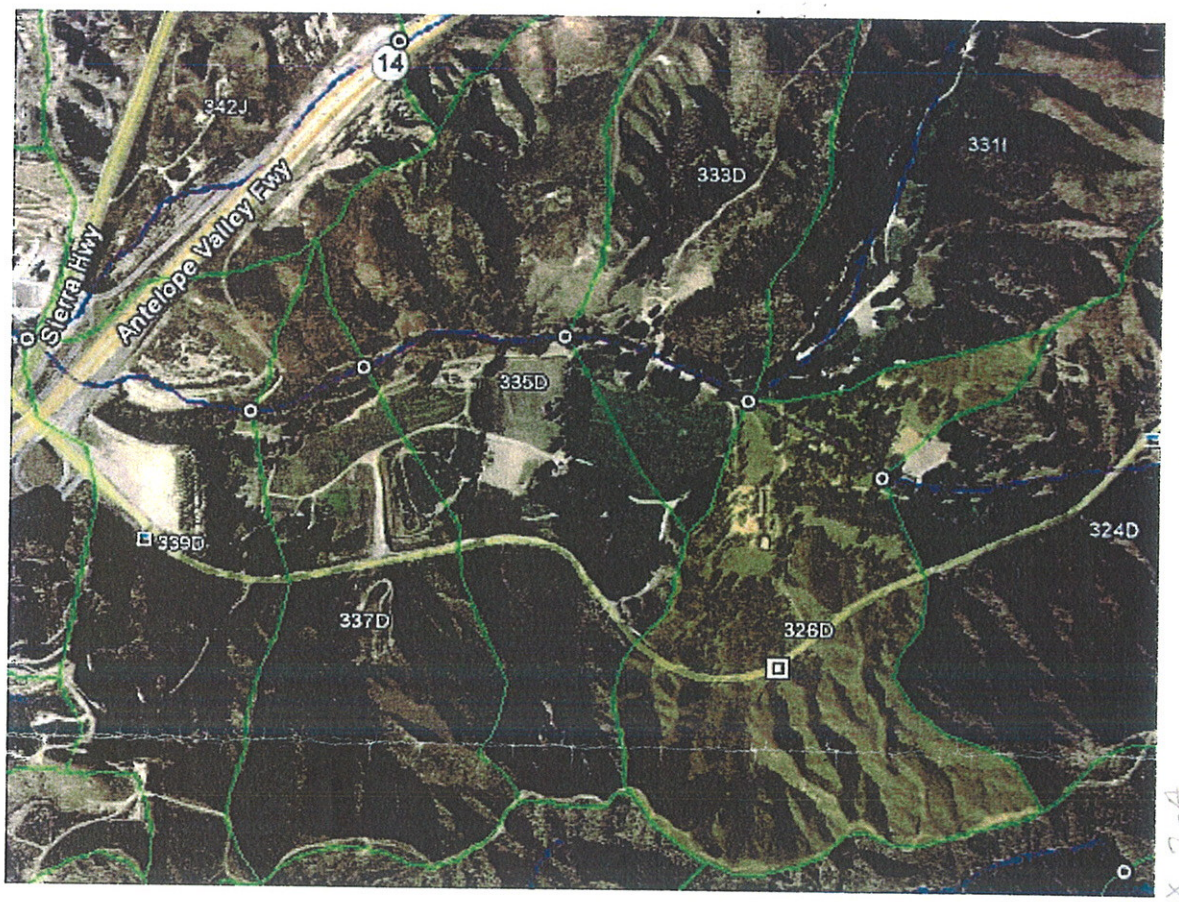
SAN FERNANDO 1-H1-36
NEWHALL 1-H1-45
MINT CANYON 1-H1-46
GOLDEN VALLEY RD
WINDFALL PL
HOPECANYON RD
MIKELYN RD
QUIGLEY RD
SALT RD
OAKCREST DR
BIG CEDAR DR
GOLDEN MAPLE DR
RAVENGLAND RD
PINEVIEW RD
OAKWEIL RD
WHITNEY CANYON RD
SANTA CLARA TKTR
MAY CANYON TKTR
327I
329I
340J
342
331I
333D
322D
316D
310D
303H
305H
307G
302G
309G
299D
300D
318D
312D
315D
324D
326D
325E
337D
321D
319D
313D
296D
297D
294F
286D
281D
291F
284E
279D
292F
282E
289F
277D
287F
275D
274D

Portion – South Fork Santa Clara River



326D

SubArea (ac):	110
TotalArea (ac): 4.8 mi²	3082.8
SubQ50Clear (cfs):	237.1
TotalQ50Clear (cfs):	3369.2
SubQ50Burn (cfs):	237.1
TotalQ50Burn (cfs):	3702.6

Year 2001 Hydrology

BF_5 ~

BF_9 ~

BF_3 ~

331I

SubArea (ac):	128.8
TotalArea (ac): .58 mi²	369
SubQ50Clear (cfs):	220.2
TotalQ50Clear (cfs):	616.7
SubQ50Burn (cfs):	220.2
TotalQ50Burn (cfs):	639.1

Year 2001 Hydrology

BF_5 ~

BF_9 ~

335D

SubArea (ac):	133.7
TotalArea (ac): 5.75 mi²	3682.3
SubQ50Clear (cfs):	253.6
TotalQ50Clear (cfs):	3890.3
SubQ50Burn (cfs):	253.6
TotalQ50Burn (cfs):	4269.2

Year 2001 Hydrology

BF_5 ~

BF_9 ~

BF_3 ~

REFER TO SUB APPENDIX 2-A FOR BEAK BUCKING FACTOR CURVES

N/O CREEK = DPA 5
CREEK = DPA 9
S/O CREEK = DPA 3

PER MAINT CYN QUAD MAP 1-H1.45

Portion – South Fork Santa Clara River

339D

SubArea (ac):	94.1
TotalArea (ac): 6.04 mi²	3867.4
SubQ50Clear (cfs):	180.4
TotalQ50Clear (cfs):	3950.4
SubQ50Burn (cfs):	180.4
TotalQ50Burn (cfs):	4331.2

Year 2001 Hydrology

BF_5 ~

BF_9 ~

BF_3 ~

344D

SubArea (ac):	117.2
TotalArea (ac):	4164.4
SubQ50Clear (cfs):	287.2
TotalQ50Clear (cfs):	4122.1
SubQ50Burn (cfs):	287.2
TotalQ50Burn (cfs):	4512.1

Year 2001 Hydrology

346D

SubArea (ac):	109.4
TotalArea (ac):	4273.8
SubQ50Clear (cfs):	284.3
TotalQ50Clear (cfs):	4167.4
SubQ50Burn (cfs):	284.3
TotalQ50Burn (cfs):	4558.5

Year 2001 Hydrology

N/O CREEK = DPA 5

CREEK = DPA 9

S/O CREEK = DPA 3

WATER RESOURCES DIVISION
Hydrology Section

Q-1914

INFORMATION REQUEST SUMMARY

Date: 03/03/09

Project Name: Santa Clara River South Fork – Placerita Canyon

Project Location: TG 4641, E1

Project Engineer: Victoria Curto

Technical Review by: Peter Imaa PI

Information Requested: 50-year flood Q's (Subarea size, Subarea Q, Total area, and Total Q)

Information Requested By: George Aintablian of Design Division (x7959)

Information To Be Used For: Planning Purposes.

Will Information Be Used In Any Litigation? Yes ☒ No

Information Provided:
Drainage map and the following hydrologic data.

Location	Subarea (acres)	Subarea Q_{50} burned (cfs)	Total Area (acres)	Total Q_{50} burned (cfs)
324D	142	227	2973	3660
326D	110	237	3083	3703
331I	129	220	369	639
333D	97	181	3549	4198
335D	134	254	3682	4269
337D	91	191	3773	4300
339D	94	180	3867	4331

Date Provided: 03/03/2009

References:
Santa Clara River South Fork dated April 2000

Calculations, Comments, Etc...:

Information provided above should be used for planning purposes only. **Total burned Qs provided above must also be bulked to be used for the design of culverts, bridges, etc., and for floodway mapping.**

WATER RESOURCES DIVISION
Hydrology Section

Q-2089

INFORMATION REQUEST SUMMARY

Date: 08/03/10

Project Name: ***SCR South Fork – Placerita Canyon***
Project Location: Placerita Canyon Creek at SR-14 (TG pg. 4641 E1)
Project Engineer: Chi Wong
Technical Review by: Peter Imaa PI
Information Requested: 2, 5, 10, and 25 yr Hydrology Q's from Placerita Canyon Creek at SR-14 (Subarea size, Subarea Q, Total area, and Total Q)
Information Requested By: Wagner Hawthore of David Evans & Associates, email: wxh@dealnc.com, phone: 909-912-7319, fax: 909-481-5757
Information To Be Used For: Sound Stages
Will Information Be Used In Any Litigation? ☐ *Yes* ☒ *No*
Information Provided: One PDF package containing the following for Placerita Canyon Creek at SR-14: • USGS map of watershed (1 page) • Aerial map of watershed (1 page) • 1-Yr Frequency Hydrologic Qs (2 pages) • 2-Yr Frequency Hydrologic Qs (2 pages) • 5-Yr Frequency Hydrologic Qs (2 pages) • 10-Yr Frequency Hydrologic Qs (2 pages) • 25-Yr Frequency Hydrologic Qs (2 pages)
Date Provided: 08/03/10
References: *Year 2000 Santa Clara River Hydrology Study – South Fork* *Year 2010 Placerita Canyon Low Frequency Hydrology Study*
Calculations, Comments, Etc...: Information provided above should be used for planning purpose.

YDROLOGY SUMMARY (2010)
ANTA CLARA RIVER WATERSHED
SCR South Fork - Placerita Canyon: 1-Yr Frequency Depth Method

			CLEAR		34% BURN	
Subarea ID	Subarea Area (ac)	Total Area (ac)	Subarea Q (cfs)	Total Q (cfs)	Subarea Q (cfs)	Total Q (cfs)
274D	141.8	141.8	8.0	8.0	12.4	12.4
275D	60.0	201.8	3.4	11.4	5.3	17.6
276D	0.0	201.8	0.0	11.4	0.0	17.6
277D	106.7	308.5	6.0	16.7	9.3	25.7
278D	0.0	308.5	0.0	16.7	0.0	25.7
279D	158.2	466.7	11.3	25.6	15.8	37.1
280D	0.0	466.7	0.0	25.6	0.0	37.1
281D	73.1	539.8	7.3	30.3	9.2	42.0
282E	136.0	136.0	7.6	7.6	11.9	11.9
283E	0.0	136.0	0.0	7.6	0.0	11.9
284E	43.6	179.6	2.4	9.6	3.7	14.7
285DE	-	719.4	-	39.5	-	55.4
286D	76.1	795.5	4.2	41.4	6.4	57.3
287F	99.0	99.0	5.7	5.7	8.8	8.8
288F	0.0	99.0	0.0	5.7	0.0	8.8
289F	135.7	234.7	7.7	12.3	12.0	18.8
290F	0.0	234.7	0.0	12.3	0.0	18.8
291F	101.0	335.7	5.7	16.8	8.8	25.2
292F	116.6	452.3	6.6	22.7	10.2	34.0
293F	0.0	452.3	0.0	22.7	0.0	34.0
294F	36.9	489.2	2.0	24.2	3.1	36.2
295DF	-	1284.7	-	65.2	-	92.1
296D	40.3	1325.0	2.2	66.6	3.4	94.0
297D	92.6	1417.6	20.4	78.6	22.8	107.3
298D	0.0	1417.6	0.0	78.6	0.0	107.3
299D	8.0	1425.6	1.3	79.3	1.5	108.1
300G	89.9	89.9	21.4	21.4	23.5	23.5
301G	0.0	89.9	0.0	21.4	0.0	23.5
302G	133.3	223.2	27.7	42.3	31.2	48.1
303H	129.0	129.0	24.6	24.6	28.0	28.0
304H	0.0	129.0	0.0	24.6	0.0	28.0
305H	74.6	203.6	14.8	36.6	16.7	42.0
306GH	-	426.8	-	78.8	-	90.1
307G	100.8	527.6	20.9	91.4	23.5	105.7
308DG	-	1953.2	-	170.2	-	211.0
309D	99.9	2053.1	15.9	175.1	19.1	217.8
310D	98.3	2151.4	15.0	183.4	18.1	228.8
311D	0.0	2151.4	0.0	183.4	0.0	228.8
312D	8.8	2160.2	1.9	183.1	2.2	228.5
313D	92.6	2252.8	5.2	187.3	8.1	233.9
314D	0.0	2252.8	0.0	187.3	0.0	233.9

:YDROLOGY SUMMARY (2010)
:ANTA CLARA RIVER WATERSHED
SCR South Fork - Placerita Canyon: 1-Yr Frequency Depth Method

			CLEAR		34% BURN	
Subarea ID	Subarea Area (ac)	Total Area (ac)	Subarea Q (cfs)	Total Q (cfs)	Subarea Q (cfs)	Total Q (cfs)
315D	70.3	2323.1	4.0	189.1	6.1	236.4
316D	84.2	2407.3	13.7	194.3	16.4	243.8
317D	0.0	2407.3	0.0	194.3	0.0	243.8
318D	125.8	2533.1	7.1	187.7	11.0	235.9
319D	119.2	2652.3	6.8	190.0	10.7	238.3
320D	0.0	2652.3	0.0	190.0	0.0	238.3
321D	28.8	2681.1	1.7	190.2	2.6	238.3
322D	150.0	2831.1	28.0	194.2	32.6	242.9
323D	0.0	2831.1	0.0	194.2	0.0	242.9
324D	141.7	2972.8	13.6	195.5	17.9	243.9
325D	0.0	2972.8	0.0	195.5	0.0	243.9
326D	110.0	3082.8	28.4	199.6	28.4	248.2
327I	135.9	135.9	22.8	22.8	27.2	27.2
328I	0.0	135.9	0.0	22.8	0.0	27.2
329I	104.3	240.2	20.7	43.1	23.8	50.5
330I	0.0	240.2	0.0	43.1	0.0	50.5
331I	128.8	369.0	30.0	59.4	30.0	67.3
332DI	-	3451.8	-	222.7	-	277.7
333D	96.8	3548.6	22.3	225.2	22.3	280.2
334D	0.0	3548.6	0.0	225.2	0.0	280.2
335D	133.7	3682.3	31.2	229.4	31.2	284.2
336D	0.0	3682.3	0.0	229.4	0.0	284.2
337D	91.0	3773.3	19.0	235.9	21.9	285.4
338D	0.0	3773.3	0.0	235.9	0.0	285.4
339D	94.1	3867.4	23.6	243.5	23.6	287.7
340J	78.1	78.1	22.8	22.8	22.8	22.8
341J	0.0	78.1	0.0	22.8	0.0	22.8
342J	101.7	179.8	36.8	52.8	36.8	52.8
343DJ	-	4047.2	-	288.5	-	314.1

HYDROLOGY SUMMARY (2010)
SANTA CLARA RIVER WATERSHED
SCR South Fork - Placerita Canyon: 2-Yr Frequency Depth Method

			CLEAR		34% BURN	
Subarea ID	Subarea Area (ac)	Total Area (ac)	Subarea Q (cfs)	Total Q (cfs)	Subarea Q (cfs)	Total Q (cfs)
274D	141.8	141.8	14.0	14.0	22.8	22.8
275D	60.0	201.8	5.9	19.9	9.7	32.4
276D	0.0	201.8	0.0	19.9	0.0	32.4
277D	106.7	308.5	10.5	28.1	17.1	47.2
278D	0.0	308.5	0.0	28.1	0.0	47.2
279D	158.2	466.7	17.9	39.9	27.2	66.9
280D	0.0	466.7	0.0	39.9	0.0	66.9
281D	73.1	539.8	10.8	46.4	14.8	75.6
282E	136.0	136.0	13.4	13.4	21.8	21.8
283E	0.0	136.0	0.0	13.4	0.0	21.8
284E	43.6	179.6	4.1	15.9	6.8	27.0
285DE	-	719.4	-	59.7	-	98.8
286D	76.1	795.5	6.9	63.0	11.5	103.7
287F	99.0	99.0	10.3	10.3	16.5	16.5
288F	0.0	99.0	0.0	10.3	0.0	16.5
289F	135.7	234.7	13.8	20.7	22.2	35.0
290F	0.0	234.7	0.0	20.7	0.0	35.0
291F	101.0	335.7	10.0	26.7	16.3	46.6
292F	116.6	452.3	11.5	36.5	18.7	62.4
293F	0.0	452.3	0.0	36.5	0.0	62.4
294F	36.9	489.2	3.4	38.5	5.7	66.5
295DF	-	1284.7	-	99.7	-	167.2
296D	40.3	1325.0	3.6	101.8	6.0	170.8
297D	92.6	1417.6	34.1	127.8	37.1	198.4
298D	0.0	1417.6	0.0	127.8	0.0	198.4
299D	8.0	1425.6	3.2	128.1	3.6	198.6
300G	89.9	89.9	34.8	34.8	37.4	37.4
301G	0.0	89.9	0.0	34.8	0.0	37.4
302G	133.3	223.2	47.2	75.8	51.5	82.7
303H	129.0	129.0	43.4	43.4	47.4	47.4
304H	0.0	129.0	0.0	43.4	0.0	47.4
305H	74.6	203.6	25.7	66.8	28.0	73.2
306GH	-	426.8	-	142.6	-	155.8
307G	100.8	527.6	35.7	171.0	38.9	187.6
308DG	-	1953.2	-	298.0	-	381.0
309D	99.9	2053.1	28.3	314.9	32.2	400.9
310D	98.3	2151.4	27.0	334.8	30.9	423.2
311D	0.0	2151.4	0.0	334.8	0.0	423.2
312D	8.8	2160.2	4.6	334.7	5.0	423.3
313D	92.6	2252.8	9.3	340.7	15.0	433.2
314D	0.0	2252.8	0.0	340.7	0.0	433.2

YDROLOGY SUMMARY (2010)
ANTA CLARA RIVER WATERSHED
SCR South Fork - Placerita Canyon: 2-Yr Frequency Depth Method

			CLEAR		34% BURN	
Subarea ID	Subarea Area (ac)	Total Area (ac)	Subarea Q (cfs)	Total Q (cfs)	Subarea Q (cfs)	Total Q (cfs)
315D	70.3	2323.1	6.9	344.2	11.3	438.7
316D	84.2	2407.3	24.3	360.4	27.7	457.3
317D	0.0	2407.3	0.0	360.4	0.0	457.3
318D	125.8	2533.1	12.5	353.8	20.3	451.3
319D	119.2	2652.3	12.5	358.6	20.0	457.6
320D	0.0	2652.3	0.0	358.6	0.0	457.6
321D	28.8	2681.1	3.1	358.7	4.9	458.1
322D	150.0	2831.1	48.0	367.5	53.7	472.9
323D	0.0	2831.1	0.0	367.5	0.0	472.9
324D	141.7	2972.8	22.5	370.2	30.6	475.0
325D	0.0	2972.8	0.0	370.2	0.0	475.0
326D	110.0	3082.8	45.1	377.2	45.1	482.6
327I	135.9	135.9	40.3	40.3	45.7	45.7
328I	0.0	135.9	0.0	40.3	0.0	45.7
329I	104.3	240.2	34.8	74.7	38.6	84.0
330I	0.0	240.2	0.0	74.7	0.0	84.0
331I	128.8	369.0	48.5	108.0	48.5	118.1
332DI	-	3451.8	-	435.2 -	-	552.7
333D	96.8	3548.6	36.4	439.8	36.4	557.5
334D	0.0	3548.6	0.0	439.8	0.0	557.5
335D	133.7	3682.3	51.2	446.4	51.2	564.6
336D	0.0	3682.3	0.0	446.4	0.0	564.6
337D	91.0	3773.3	32.6	449.0	36.3	567.8
338D	0.0	3773.3	0.0	449.0	0.0	567.8
339D	94.1	3867.4	38.2	453.4	38.2	572.2
340J	78.1	78.1	40.8	40.8	40.8	40.8
341J	0.0	78.1	0.0	40.8	0.0	40.8
342J	101.7	179.8	55.2	87.7	55.2	87.7
343DJ	-	4047.2	-	510.3	-	600.2

YDROLOGY SUMMARY (2010)
ANTA CLARA RIVER WATERSHED
SCR South Fork - Placerita Canyon: 5-Yr Frequency Depth Method

			CLEAR		34% BURN	
Subarea ID	Subarea Area (ac)	Total Area (ac)	Subarea Q (cfs)	Total Q (cfs)	Subarea Q (cfs)	Total Q (cfs)
274D	141.8	141.8	49.8	49.8	61.2	61.2
275D	60.0	201.8	23.1	72.8	28.1	89.2
276D	0.0	201.8	0.0	72.8	0.0	89.2
277D	106.7	308.5	39.7	109.7	48.4	135.0
278D	0.0	308.5	0.0	109.7	0.0	135.0
279D	158.2	466.7	57.7	156.2	69.7	194.7
280D	0.0	466.7	0.0	156.2	0.0	194.7
281D	73.1	539.8	31.8	174.1	37.1	219.0
282E	136.0	136.0	47.8	47.8	58.7	58.7
283E	0.0	136.0	0.0	47.8	0.0	58.7
284E	43.6	179.6	15.1	60.8	18.5	75.4
285DE	-	719.4	-	229.5	-	289.5
286D	76.1	795.5	25.7	241.7	31.7	308.4
287F	99.0	99.0	39.0	39.0	47.3	47.3
288F	0.0	99.0	0.0	39.0	0.0	47.3
289F	135.7	234.7	48.4	82.5	59.3	102.1
290F	0.0	234.7	0.0	82.5	0.0	102.1
291F	101.0	335.7	35.6	111.7	43.7	139.8
292F	116.6	452.3	40.9	148.4	50.3	186.4
293F	0.0	452.3	0.0	148.4	0.0	186.4
294F	36.9	489.2	14.7	158.9	17.8	200.2
295DF	-	1284.7	-	391.0	-	500.2
296D	40.3	1325.0	13.8	399.3	17.0	512.0
297D	92.6	1417.6	63.7	450.9	67.4	568.0
298D	0.0	1417.6	0.0	450.9	0.0	568.0
299D	8.0	1425.6	7.8	450.6	8.4	567.8
300G	89.9	89.9	74.4	74.4	77.9	77.9
301G	0.0	89.9	0.0	74.4	0.0	77.9
302G	133.3	223.2	90.9	157.4	96.2	166.2
303H	129.0	129.0	97.8	97.8	103.2	103.2
304H	0.0	129.0	0.0	97.8	0.0	103.2
305H	74.6	203.6	61.2	153.6	64.4	162.3
306GH	-	426.8	-	308.9	-	326.3
307G	100.8	527.6	75.2	373.5	79.4	395.2
308DG	527.6	1953.2	373.5	789.5	395.2	932.2
309D	99.9	2053.1	54.6	826.1	59.9	974.0
310D	98.3	2151.4	60.4	863.2	66.0	1016.2
311D	0.0	2151.4	0.0	863.2	0.0	1016.2
312D	8.8	2160.2	9.9	863.1	10.6	1016.4
313D	92.6	2252.8	32.8	887.4	40.3	1047.6
314D	0.0	2252.8	0.0	887.4	0.0	1047.6

HYDROLOGY SUMMARY (2010)
SANTA CLARA RIVER WATERSHED
SCR South Fork - Placerita Canyon: 5-Yr Frequency Depth Method

			CLEAR		34% BURN	
Subarea ID	Subarea Area (ac)	Total Area (ac)	Subarea Q (cfs)	Total Q (cfs)	Subarea Q (cfs)	Total Q (cfs)
315D	70.3	2323.1	26.1	902.3	31.9	1068.1
316D	84.2	2407.3	53.6	932.2	58.5	1102.9
317D	0.0	2407.3	0.0	932.2	0.0	1102.9
318D	125.8	2533.1	44.4	929.9	54.5	1109.7
319D	119.2	2652.3	43.2	949.4	52.9	1139.6
320D	0.0	2652.3	0.0	949.4	0.0	1139.6
321D	28.8	2681.1	10.5	951.6	12.8	1144.3
322D	150.0	2831.1	89.0	1008.7	96.8	1208.9
323D	0.0	2831.1	0.0	1008.7	0.0	1208.9
324D	141.7	2972.8	60.2	1016.3	70.7	1226.3
325D	0.0	2972.8	0.0	1016.3	0.0	1226.3
326D	110.0	3082.8	93.0	1029.1	93.0	1238.4
327I	135.9	135.9	90.7	90.7	98.7	98.7
328I	0.0	135.9	0.0	90.7	0.0	98.7
329I	104.3	240.2	70.9	161.0	76.4	174.4
330I	0.0	240.2	0.0	161.0	0.0	174.4
331I	128.8	369.0	85.3	228.8	85.3	242.7
332DI	-	3451.8	-	1185.0	-	1409.7
333D	96.8	3548.6	66.7	1202.7	66.7	1429.5
334D	0.0	3548.6	0.0	1202.7	0.0	1429.5
335D	133.7	3682.3	95.7	1223.2	95.7	1450.9
336D	0.0	3682.3	0.0	1223.2	0.0	1450.9
337D	91.0	3773.3	64.4	1230.0	69.5	1460.3
338D	0.0	3773.3	0.0	1230.0	0.0	1460.3
339D	94.1	3867.4	66.3	1244.8	66.3	1474.6
340J	78.1	78.1	86.3	86.3	86.3	86.3
341J	0.0	78.1	0.0	86.3	0.0	86.3
342J	101.7	179.8	105.3	174.4	105.3	174.4
343DJ	-	4047.2	-	1290.9	-	1520.3

YDROLOGY SUMMARY (2010)
ANTA CLARA RIVER WATERSHED
SCR South Fork - Placerita Canyon: 10-Yr Frequency Depth Method

			CLEAR		34% BURN	
Subarea ID	Subarea Area (ac)	Total Area (ac)	Subarea Q (cfs)	Total Q (cfs)	Subarea Q (cfs)	Total Q (cfs)
274D	141.8	141.8	91.9	91.9	105.9	105.9
275D	60.0	201.8	45.2	137.1	51.5	157.4
276D	0.0	201.8	0.0	137.1	0.0	157.4
277D	106.7	308.5	77.3	207.9	88.4	239.5
278D	0.0	308.5	0.0	207.9	0.0	239.5
279D	158.2	466.7	82.9	278.4	96.7	324.2
280D	0.0	466.7	0.0	278.4	0.0	324.2
281D	73.1	539.8	56.6	304.4	63.3	359.2
282E	136.0	136.0	69.9	69.9	82.4	82.4
283E	0.0	136.0	0.0	69.9	0.0	82.4
284E	43.6	179.6	28.9	95.1	33.2	112.2
285DE	-	719.4	-	393.7	-	465.7
286D	76.1	795.5	38.6	418.6	45.6	498.3
287F	99.0	99.0	76.1	76.1	86.6	86.6
288F	0.0	99.0	0.0	76.1	0.0	86.6
289F	135.7	234.7	70.8	140.4	83.3	163.7
290F	0.0	234.7	0.0	140.4	0.0	163.7
291F	101.0	335.7	60.9	191.4	70.6	225.1
292F	116.6	452.3	59.9	248.0	70.6	292.2
293F	0.0	452.3	0.0	248.0	0.0	292.2
294F	36.9	489.2	28.1	262.4	32.0	311.6
295DF	-	1284.7	-	669.1	-	798.6
296D	40.3	1325.0	28.0	679.6	32.1	814.2
297D	92.6	1417.6	92.8	755.5	97.1	894.5
298D	0.0	1417.6	0.0	755.5	0.0	894.5
299D	8.0	1425.6	11.4	754.5	12.0	895.1
300G	89.9	89.9	108.3	108.3	112.3	112.3
301G	0.0	89.9	0.0	108.3	0.0	112.3
302G	133.3	223.2	133.2	227.9	139.3	238.2
303H	129.0	129.0	144.5	144.5	150.7	150.7
304H	0.0	129.0	0.0	144.5	0.0	150.7
305H	74.6	203.6	91.0	224.5	94.8	234.3
306GH	-	426.8	-	450.6	-	470.9
307G	100.8	527.6	110.4	541.0	115.2	566.3
308DG	-	1953.2	-	1237.5	-	1410.9
309D	99.9	2053.1	83.4	1293.0	90.0	1474.6
310D	98.3	2151.4	94.0	1343.4	100.8	1531.0
311D	0.0	2151.4	0.0	1343.4	0.0	1531.0
312D	8.8	2160.2	13.0	1342.7	13.8	1531.9
313D	92.6	2252.8	48.0	1384.2	56.5	1581.6
314D	0.0	2252.8	0.0	1384.2	0.0	1581.6

IYDROLOGY SUMMARY (2010)
ANTA CLARA RIVER WATERSHED
SCR South Fork - Placerita Canyon: 10-Yr Frequency Depth Method

			CLEAR		34% BURN	
Subarea ID	Subarea Area (ac)	Total Area (ac)	Subarea Q (cfs)	Total Q (cfs)	Subarea Q (cfs)	Total Q (cfs)
315D	70.3	2323.1	50.9	1401.8	58.2	1605.8
316D	84.2	2407.3	80.8	1444.8	86.7	1655.5
317D	0.0	2407.3	0.0	1444.8	0.0	1655.5
318D	125.8	2533.1	65.0	1463.2	76.6	1685.0
319D	119.2	2652.3	63.2	1508.8	74.3	1742.6
320D	0.0	2652.3	0.0	1508.8	0.0	1742.6
321D	28.8	2681.1	20.7	1508.3	23.6	1744.4
322D	150.0	2831.1	131.3	1580.7	140.6	1828.5
323D	0.0	2831.1	0.0	1580.7	0.0	1828.5
324D	141.7	2972.8	89.6	1612.4	101.9	1874.4
325D	0.0	2972.8	0.0	1612.4	0.0	1874.4
326D	110.0	3082.8	134.7	1630.6	134.7	1895.0
327I	135.9	135.9	136.4	136.4	146.1	146.1
328I	0.0	135.9	0.0	136.4	0.0	146.1
329I	104.3	240.2	107.4	240.8	114.1	257.0
330I	0.0	240.2	0.0	240.8	0.0	257.0
331I	128.8	369.0	117.6	334.0	117.6	350.7
332DI	-	3451.8	-	1852.1	-	2137.3
333D	96.8	3548.6	98.1	1870.9	98.1	2159.0
334D	0.0	3548.6	0.0	1870.9	0.0	2159.0
335D	133.7	3682.3	137.7	1895.7	137.7	2188.6
336D	0.0	3682.3	0.0	1895.7	0.0	2188.6
337D	91.0	3773.3	97.0	1908.0	103.2	2203.3
338D	0.0	3773.3	0.0	1908.0	0.0	2203.3
339D	94.1	3867.4	98.2	1923.3	98.2	2219.1
340J	78.1	78.1	121.1	121.1	121.1	121.1
341J	0.0	78.1	0.0	121.1	0.0	121.1
342J	101.7	179.8	143.1	238.2	143.1	238.2
343DJ	-	4047.2	-	1982.2	-	2280.5

YDROLOGY SUMMARY (2010)
'ANTA CLARA RIVER WATERSHED
SCR South Fork - Placerita Canyon: 25-Yr Frequency Depth Method

			CLEAR		34% BURN	
Subarea ID	Subarea Area (ac)	Total Area (ac)	Subarea Q (cfs)	Total Q (cfs)	Subarea Q (cfs)	Total Q (cfs)
274D	141.8	141.8	153.7	153.7	170.8	170.8
275D	60.0	201.8	74.3	227.9	82.0	252.7
276D	0.0	201.8	0.0	227.9	0.0	252.7
277D	106.7	308.5	131.8	341.4	145.4	379.6
278D	0.0	308.5	0.0	341.4	0.0	379.6
279D	158.2	466.7	131.0	456.6	147.4	512.1
280D	0.0	466.7	0.0	456.6	0.0	512.1
281D	73.1	539.8	89.3	497.7	97.3	561.4
282E	136.0	136.0	118.5	118.5	133.7	133.7
283E	0.0	136.0	0.0	118.5	0.0	133.7
284E	43.6	179.6	48.5	160.6	53.8	181.2
285DE	-	719.4	-	645.1	-	730.6
286D	76.1	795.5	71.1	689.7	79.8	786.4
287F	99.0	99.0	124.9	124.9	137.7	137.7
288F	0.0	99.0	0.0	124.9	0.0	137.7
289F	135.7	234.7	128.0	240.0	143.5	268.5
290F	0.0	234.7	0.0	240.0	0.0	268.5
291F	101.0	335.7	105.7	326.2	117.7	367.1
292F	116.6	452.3	90.7	414.7	103.1	468.2
293F	0.0	452.3	0.0	414.7	0.0	468.2
294F	36.9	489.2	48.4	437.2	53.3	495.5
295DF	-	1284.7	-	1110.1	-	1264.9
296D	40.3	1325.0	47.9	1127.9	52.9	1286.2
297D	92.6	1417.6	134.2	1238.3	139.2	1405.6
298D	0.0	1417.6	0.0	1238.3	0.0	1405.6
299D	8.0	1425.6	14.9	1238.1	15.7	1404.2
300G	89.9	89.9	154.1	154.1	158.7	158.7
301G	0.0	89.9	0.0	154.1	0.0	158.7
302G	133.3	223.2	193.3	324.2	200.5	336.1
303H	129.0	129.0	207.4	207.4	214.6	214.6
304H	0.0	129.0	0.0	207.4	0.0	214.6
305H	74.6	203.6	130.3	318.7	134.7	330.4
306GH	-	426.8	-	636.0	-	659.4
307G	100.8	527.6	161.5	766.5	167.1	795.9
308DG	-	1953.2	-	1935.3	-	2136.4
309D	99.9	2053.1	127.4	2012.4	135.5	2222.8
310D	98.3	2151.4	136.5	2090.0	144.9	2308.6
311D	0.0	2151.4	0.0	2090.0	0.0	2308.6
312D	8.8	2160.2	17.2	2090.8	18.1	2309.7
313D	92.6	2252.8	86.9	2163.4	97.5	2392.2
314D	0.0	2252.8	0.0	2163.4	0.0	2392.2

YDROLOGY SUMMARY (2010)
ANTA CLARA RIVER WATERSHED
SCR South Fork - Placerita Canyon: 25-Yr Frequency Depth Method

			CLEAR		34% BURN	
Subarea ID	Subarea Area (ac)	Total Area (ac)	Subarea Q (cfs)	Total Q (cfs)	Subarea Q (cfs)	Total Q (cfs)
315D	70.3	2323.1	86.7	2187.4	95.7	2423.8
316D	84.2	2407.3	120.7	2251.9	128.0	2498.2
317D	0.0	2407.3	0.0	2251.9	0.0	2498.2
318D	125.8	2533.1	95.9	2291.0	109.2	2551.0
319D	119.2	2652.3	106.7	2368.0	120.1	2640.2
320D	0.0	2652.3	0.0	2368.0	0.0	2640.2
321D	28.8	2681.1	34.8	2365.8	38.5	2642.7
322D	150.0	2831.1	191.2	2477.2	202.5	2767.7
323D	0.0	2831.1	0.0	2477.2	0.0	2767.7
324D	141.7	2972.8	152.3	2513.5	167.4	2820.8
325D	0.0	2972.8	0.0	2513.5	0.0	2820.8
326D	110.0	3082.8	191.6	2543.1	191.6	2852.1
327I	135.9	135.9	205.8	205.8	217.6	217.6
328I	0.0	135.9	0.0	205.8	0.0	217.6
329I	104.3	240.2	152.9	353.3	160.9	373.0
330I	0.0	240.2	0.0	353.3	0.0	373.0
331I	128.8	369.0	167.0	481.4	167.0	501.9
332DI	-	3451.8	-	2869.1	-	3202.7
333D	96.8	3548.6	141.5	2897.9	141.5	3238.3
334D	0.0	3548.6	0.0	2897.9	0.0	3238.3
335D	133.7	3682.3	198.8	2936.7	198.8	3286.8
336D	0.0	3682.3	0.0	2936.7	0.0	3286.8
337D	91.0	3773.3	142.6	2957.1	150.2	3307.8
338D	0.0	3773.3	0.0	2957.1	0.0	3307.8
339D	94.1	3867.4	140.9	2981.8	140.9	3334.1
340J	78.1	78.1	164.2	164.2	164.2	164.2
341J	0.0	78.1	0.0	164.2	0.0	164.2
342J	101.7	179.8	195.9	323.0	195.9	323.0
343DJ	-	4047.2	-	3069.8	-	3427.4

SUB-APPENDIX 1-C.

HEC-RAS HYDRAULICS:

Floodplain & Floodway Models for Existing & Proposed Conditions

REFER TO FULL SIZE (3'X4') HYDRAULICS MAPS 1/2 AND 2/2 FOR CROSS-SECTIONS.

Placerita Creek HEC-RAS Analyses

The Flood Plain models prepared for Vesting Tentative Tract Map 71216 for the Disney | ABC Studios were to provide hydraulic analyses for Placerita Creek. The following narrative has been prepared to provide an overview of the assumptions used as part of the hydraulic modeling.

A total of 5 models were developed for the project and are listed as follows:

1. Flood Plain Modeling for Post Project Conditions using a Manning's "n" value of 0.085 for the sections within the limits of the project improvements. All other sections that are to remain in a natural condition utilized a Manning's "n" value of 0.06. This model was used to provide values for the maximum depth of flow for the water surface elevations.
2. Flood Plain Modeling for Post Project Conditions using a Manning's "n" value of 0.025 for all sections within the limits of the hydraulic model. This model was used to provide values for the maximum velocities to evaluate the potential scour depth.
3. Flood Plain Modeling for Pre Project Conditions using a Manning's "n" value of 0.060 for the sections within the limits of the hydraulic model. This model was used to provide values for the maximum depth of flow for the water surface elevations for the pre-project condition.
4. Floodway Modeling for Post Project Conditions using a Manning's "n" value of 0.085 for the sections within the limits of the project improvements. All other sections that are to remain in a natural condition utilized a Manning's "n" value of 0.06. This model was used to establish the maximum encroachment into the creek using a maximum of 1 foot increase in the water surface elevations or a maximum velocity of 10 ft/s.
5. Floodway Modeling for Pre Project Conditions using a Manning's "n" value of 0.060 for the sections within the limits of the hydraulic model. This model was used to establish the maximum encroachment into the creek using a maximum of 1 foot increase in the water surface elevations or a maximum velocity of 10 ft/s.

The flow rates utilized for the project were based on hydrology results provided by LACPWD and included in Sub-Appendix 1-B. Table A provides the tabulated values used in the HEC-RAS modeling.

The hydraulic models prepared with the USACOE HEC-RAS hydraulic software defined one river system and a total of 4 reaches. The reaches in the model are as follows:

Reach Name	Sections within Reach
Sound Stages	2 to 2524.261
Lower	1000 - 1300
Tributary	10 to 510
Upper	1400 to 1900

The Sound Stages reach extends approximately 3,700 feet downstream of State Route 14 to the west and upstream approximately 1,900 feet to the east of State Route 14. There are a total of 21 sections that were used to evaluate the stream hydraulics. The flow rate used for this reach is the total area tributary to Subarea 339D which has a tributary watershed of 3,867 acres.

The Lower Reach consists of 7 sections and that begin 650 feet upstream of Section 2524.261. The reach is approximately 1,900 feet in length and terminates at the confluence of a secondary stream located north of Placerita Creek. The flow rate used for this reach is the total area tributary to Subarea 335D which has a tributary watershed of 3,682 acres.

The Tributary Reach was performed in order to evaluate the hydraulics at the confluence of the unnamed tributary upstream of the Lower Reach. The model utilizes a total of 6 Sections to define the stream. The flow rate used for this reach is the total area tributary to Subarea 331I which has a tributary watershed of 369 acres.

The Upper Reach was performed in order to evaluate the hydraulics downstream of the Placerita Canyon Road crossing. The Upper Reach utilizes a total of 6 sections to evaluate Placerita Creek. The reach length is approximately 2,100 feet in length. The flow rate used for this reach is the total area tributary to Subarea 326D which has a tributary watershed of 3,083 acres.

It should be noted that the flow rate used for the FEMA 100-Year flow rate was obtained from the FEMA published FIS Study which totals 3,550 ft^3/s at State Route 14. FEMA did not provide detail values along Placerita Creek; as a result, the 3,550 ft^3/s was used for all reaches that area associated with Placerita Creek. Since values were not provided for the unnamed tributary, the LACDPW 50-year maximum flow rate of 860 ft^3/s was used to evaluate the hydraulic model for the Tributary Reach.

Table B was developed to evaluate the available freeboard and scour depth required for the proposed improvements for Placerita Creek. Based on results the channel improvements have a minimum freeboard of 2.8 feet. This meets the 2.5 feet of freeboard for trapezoidal channels as shown in the LACFCD Hydraulic Design Manual. Additionally, the velocities from the hydraulic model using a Mannning's "n" value of 0.025 were used to evaluate scour protection. The required scour ranged from 6 feet to 14 feet. This was compared to the Sediment Transport Study scour analysis. The results shown in the HEC-RAS model indicate that the

sediment transport analysis resulted in values that were lower than the hydraulic model. As a result, the values in Table B will be used to establish the scour protection for the proposed channel improvements.

The appendices included in the study have provided comparison tables between the pre-project and post-project conditions. Additionally, the summary table and cross sections for each storm event have been included for review.

A CD has been included to provide the electronic versions of the HEC-RAS models used for the study.

Table A - HEC-RAS Peak Flow Rates for Placerita Creek

Pre-Project Storm Frequency 50-Year Flow Rate Data									
Node Number	HEC-RAS Section	Profile	Area (acres)	Clearwater Flow Rate (ft^3/s)	Burned Flow Rate (ft^3/s)	Bulked Flow Rate (ft^3/s)	Bulking Factor	Clearwater Flow Rate Yield (ft^3/s)/acre	Burned Flow Rate Yield (ft^3/s)/acre
326	1900	Upper	3082.8	3369.2	3702.6	5214.8	1.41	1.09	1.20
331	510	Tributary	369	616.7	639.1	874.1	1.37	1.67	1.73
335	1300	Lower	3682.3	3890.3	4269.2	5943.5	1.39	1.06	1.16
339	2527.26	Sound Stage	3867.4	3950.4	4331.2	6011.7	1.39	1.02	1.12
344	7	Sound Stage	4164.4	4122.1	4512.1	6229.5	1.38	0.99	1.08
346	3	Sound Stage	4273.8	4167.4	4558.8	6276.6	1.38	0.98	1.07

Post-Project Storm Frequency 50-Year Flow Rate Data									
Node Number	HEC-RAS Section	Profile	Area (acres)	Clearwater Flow Rate (ft^3/s)	Burned Flow Rate (ft^3/s)	Bulked Flow Rate (ft^3/s)	Bulking Factor	Clearwater Flow Rate Yield (ft^3/s)/acre	Burned Flow Rate Yield (ft^3/s)/acre
326	1900	Upper	3082.8	3369.2	3702.6	5214.8	1.41	1.09	1.20
331	510	Tributary	369	616.7	639.1	874.1	1.37	1.67	1.73
335	1300	Lower	3682.3	3890.3	4269.2	5943.5	1.39	1.06	1.16
339	2527.26	Sound Stage	3867.4	3950.4	4331.2	5993.3	1.38	1.02	1.12
344	7	Sound Stage	4164.4	4122.1	4512.1	6211.8	1.38	0.99	1.08
346	3	Sound Stage	4273.8	4167.4	4558.8	6259.1	1.37	0.98	1.07

Storm Frequency 25-Year Flow Rate Data									
Node Number	HEC-RAS Section	Profile	Area (acres)	Clearwater Flow Rate (ft^3/s)	Burned Flow Rate (ft^3/s)	Bulked Flow Rate (ft^3/s)	Bulking Factor	Clearwater Flow Rate Yield (ft^3/s)/acre	Burned Flow Rate Yield (ft^3/s)/acre
326	1900	Upper	3082.8	2543.1	2852.1	5214.8	1.41	0.82	0.93
331	510	Tributary	369	481.4	501.9	874.1	1.37	1.30	1.36
335	1300	Lower	3682.3	2936.7	3286.8	5943.5	1.39	0.80	0.89
339	2527.26	Sound Stage	3867.4	2981.8	3334.1	6011.7	1.39	0.77	0.86
344 [1]	7	Sound Stage	4164.4	3210.8	3590.1	4956.6	1.38	0.77	0.86
346 [1]	3	Sound Stage	4273.8	3295.1	3684.5	5072.8	1.38	0.77	0.86

Storm Frequency 10-Year Flow Rate Data									
Node Number	HEC-RAS Section	Profile	Area (acres)	Clearwater Flow Rate (ft^3/s)	Burned Flow Rate (ft^3/s)	Bulked Flow Rate (ft^3/s)	Bulking Factor	Clearwater Flow Rate Yield (ft^3/s)/acre	Burned Flow Rate Yield (ft^3/s)/acre
326	1900	Upper	3082.8	1630.6	1895	5214.8	1.41	0.53	0.61
331	510	Tributary	369	334	350.7	874.1	1.37	0.91	0.95
335	1300	Lower	3682.3	1895.7	2188.6	5943.5	1.39	0.51	0.59
339	2527.26	Sound Stage	3867.4	1923.3	2219.1	6011.7	1.39	0.50	0.57
344 [1]	7	Sound Stage	4164.4	2071.0	2389.5	3299.0	1.38	0.50	0.57
346 [1]	3	Sound Stage	4273.8	2125.4	2452.3	3376.3	1.38	0.50	0.57

Storm Frequency 5-Year Flow Rate Data									
Node Number	HEC-RAS Section	Profile	Area (acres)	Clearwater Flow Rate (ft^3/s)	Burned Flow Rate (ft^3/s)	Bulked Flow Rate (ft^3/s)	Bulking Factor	Clearwater Flow Rate Yield (ft^3/s)/acre	Burned Flow Rate Yield (ft^3/s)/acre
326	1900	Upper	3082.8	1029.1	1238.4	5214.8	1.41	0.33	0.40
331	510	Tributary	369	228.8	242.7	874.1	1.37	0.62	0.66
335	1300	Lower	3682.3	1223.2	1450.9	5943.5	1.39	0.33	0.39
339	2527.26	Sound Stage	3867.4	1244.8	1474.6	6011.7	1.39	0.32	0.38
344 (1)	7	Sound Stage	4164.4	1340.4	1587.8	2192.2	1.38	0.32	0.38
346 (1)	3	Sound Stage	4273.8	1375.6	1629.6	2243.6	1.38	0.32	0.38

Storm Frequency 2-Year Flow Rate Data									
Node Number	HEC-RAS Section	Profile	Area (acres)	Clearwater Flow Rate (ft^3/s)	Burned Flow Rate (ft^3/s)	Bulked Flow Rate (ft^3/s)	Bulking Factor	Clearwater Flow Rate Yield (ft^3/s)/acre	Burned Flow Rate Yield (ft^3/s)/acre
326	1900	Upper	3082.8	377.2	482.6	5214.8	1.41	0.12	0.16
331	510	Tributary	369	108	118.1	874.1	1.37	0.29	0.32
335	1300	Lower	3682.3	446.4	564.6	5943.5	1.39	0.12	0.15
339	2527.26	Sound Stage	3867.4	453.4	572.2	6011.7	1.39	0.12	0.15
344 (1)	7	Sound Stage	4164.4	488.2	616.1	850.7	1.38	0.12	0.15
346 (1)	3	Sound Stage	4273.8	501.0	632.3	870.6	1.38	0.12	0.15

Note: (1) LACDPW Hydrology Results for the 2-year through the 25-Year flow rate did not include Nodes 344 and 346. As a result, a flow rate yield was computed at Node 339 and use to compute the flow rates for Clearwater, Burned and Bulked Flow Rates.
Based on the 50-Year Storm Frequency the flow rate yield decreases as the watershed progress downstream and the results are conservative.

Storm Frequency ML Flow Rate Data			
HEC-RAS Section	Profile	Area (acres)	Flow Rate (ft^3/s)
1900	Upper	3082.8	7050
510	Tributary	369	540
1300	Lower	3682.3	7770
2527.26	Sound Stage	3867.4	7880
700.65	Sound Stage	3867.4	7880
7	Sound Stage	4164.4	7880
3	Sound Stage	4273.8	7880

Storm Frequency FEMA Flow Rate Data			
HEC-RAS Section	Profile	Area (acres)	Flow Rate (ft^3/s)
1900	Upper	3082.8	3550
510	Tributary	369	860
1300	Lower	3682.3	3550
2527.26	Sound Stage	3867.4	3550
700.65	Sound Stage	3867.4	3550
7	Sound Stage	4164.4	3550
3	Sound Stage	4273.8	3550

Table B
Available Freeboard and Scour Depth Requirements for Placerita Channel Improvements

			Northerly Section of Channel			Southerly Section of Channel				
Section	Minimum Channel Elevation	Mixed Flow Water Surface Elevation	Overbank Station	Elevation of Channel Bank	Freeboard (ft)	Overbank Station	Elevation of Channel Bank	Freeboard (ft)	HEC-RAS Stream Velocity	Required Scour Depth (ft)
700.65	1398	1426.14	64.95	1434.15	8.01	234.9	1432.15	6.01	2.53	6
865.5	1402	1426.14	153.96	1434.15	8.01	1432.15	1432.15	6.01	2.52	6
1052.85	1405.12	1426.11	224.3	1433.15	7.04	391.46	1433.85	7.74	3.22	6
1258.35	1410	1425.99	578.67	1437.15	11.16	730.74	1434.15	8.16	4.99	6
1368.35	1412	1425.95	204.04	1438.15	12.2	350.42	1438.15	12.2	5.65	8
1526.5	1414	1425.39	173.43	1435.15	9.76	294.22	1435.15	9.76	9.73	10
Proposed Clear Span Bridge										
1644.9	1416	1425.33	775.37	1435.36	10.03	891.65	1435.17	9.84	11.21	10
1841.25	1419	1422.52	253.06	1436.15	13.63	435.82	1433.15	10.63	21.32	14

Comparison Tables for Pre-Project and Post-Project Conditions

2-Year Storm Event – Comparison Table

Pre-Project and Post-Project Comparison Table for Placerita Creek (2-Year Storm Event)

				Pre-Project		Post-Project		Change in Hydraulic Parameters	
Reach	River Station	Total Flow Rate (cfs)	Min Channel Elevation (ft)	Water Surface Elevation (ft)	Channnel Velocity (ft/s)	Water Surface Elevation (ft)	Channnel Velocity (ft/s)	Water Surface Elevation (ft)	Channnel Velocity (ft/s)
Upper	1900	377.2	1503	1507.0	4.9	1507.0	4.9	0.0	0.0
Upper	1800	377.2	1497	1500.7	5.6	1500.7	5.6	0.0	0.0
Upper	1700	377.2	1489	1492.1	4.8	1492.1	4.8	0.0	0.0
Upper	1600	377.2	1479	1481.2	6.7	1481.2	6.7	0.0	0.0
Upper	1500	377.2	1474	1478.1	3.7	1478.1	3.7	0.0	0.0
Upper	1400	377.2	1470	1472.7	7.4	1472.7	7.4	0.0	0.0
Tributary	510	108	1545	1546.6	4.8	1546.6	4.8	0.0	0.0
Tributary	410	108	1524	1526.2	5.3	1526.2	5.3	0.0	0.0
Tributary	310	108	1503	1504.8	2.6	1504.8	2.6	0.0	0.0
Tributary	210	108	1486	1487.3	4.6	1487.3	4.6	0.0	0.0
Tributary	110	108	1479	1481.4	3.4	1481.4	3.4	0.0	0.0
Tributary	10	108	1471	1473.1	6.5	1473.1	6.5	0.0	0.0
Sound Stages	2527.261	453.4	1432	1435.4	6.1	1435.0	7.3	-0.3	1.2
Sound Stages	2268.881	453.4	1427	1429.6	5.9	1430.1	4.7	0.5	-1.2
Sound Stages	2007.81	453.4	1422	1425.3	4.4	1424.6	6.6	-0.7	2.2
Sound Stages	1841.25	453.4	1419	1421.8	5.8	1421.4	2.7	-0.4	-3.1
Sound Stages	1644.9	453.4	1416	1419.1	4.1	1418.8	3.5	-0.3	-0.6
Sound Stages	1615	Bridge	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sound Stages	1526.5	453.4	1414	1417.3	5.8	1417.0	5.1	-0.4	-0.7
Sound Stages	1368.35	453.4	1412	1415.2	4.7	1414.7	2.9	-0.5	-1.8
Sound Stages	1258.35	453.4	1410	1412.9	6.2	1412.6	5.0	-0.3	-1.3
Sound Stages	1052.85	453.4	1405.12	1408.2	4.2	1408.9	3.0	0.6	-1.2
Sound Stages	865.5	453.4	1402	1404.7	4.2	1405.8	4.3	1.0	0.1
Sound Stages	700.65	453.4	1398	1403.4	3.9	1403.4	3.3	0.1	-0.6
Sound Stages	700	Culvert	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sound Stages	9.076105	453.4	1390	1395.1	3.9	1395.1	3.9	0.0	0.0
Sound Stages	8	453.4	1390	1394.7	4.2	1394.7	4.2	0.0	0.0
Sound Stages	7	488.2	1388	1389.1	5.3	1389.1	5.3	0.0	0.0
Sound Stages	6	488.2	1378	1383.0	3.2	1383.0	3.2	0.0	0.0
Sound Stages	5	488.2	1376	1377.7	7.0	1377.7	7.0	0.0	0.0
Sound Stages	4	488.2	1362	1366.4	4.8	1366.4	4.8	0.0	0.0
Sound Stages	3	501	1348	1359.5	4.8	1359.5	4.8	0.0	0.0
Sound Stages	2	501	1348	1350.9	3.8	1350.9	3.8	0.0	0.0
Lower	1300	446.4	1468	1470.5	3.8	1470.5	3.8	0.0	0.0
Lower	1250	446.4	1463	1466.1	5.5	1466.1	5.5	0.0	0.0
Lower	1200	446.4	1459	1462.2	4.5	1462.2	4.5	0.0	0.0
Lower	1150	446.4	1453	1456.9	4.7	1456.9	4.7	0.0	0.0
Lower	1100	446.4	1447	1449.8	5.5	1449.8	5.5	0.0	0.0
Lower	1050	446.4	1443	1446.3	4.5	1446.3	4.5	0.0	0.0
Lower	1000	446.4	1439	1443.3	5.1	1443.3	5.1	0	0

5-Year Storm Event – Comparison Table

Pre-Project and Post-Project Comparison Table for Placerita Creek (5-Year Storm Event)

				Pre-Project		Post-Project		Change in Hydraulic Parameters	
Reach	River Station	Total Flow Rate (cfs)	Min Channel Elevation (ft)	Water Surface Elevation (ft)	Channnel Velocity (ft/s)	Water Surface Elevation (ft)	Channnel Velocity (ft/s)	Water Surface Elevation (ft)	Channnel Velocity (ft/s)
Upper	1900	1029.1	1503	1509.3	6.3	1509.3	6.3	0.0	0.0
Upper	1800	1029.1	1497	1502.6	7.7	1502.6	7.7	0.0	0.0
Upper	1700	1029.1	1489	1493.8	5.4	1493.8	5.3	0.0	0.0
Upper	1600	1029.1	1479	1482.7	8.8	1482.7	8.8	0.0	0.0
Upper	1500	1029.1	1474	1479.8	4.8	1479.8	4.8	0.0	0.0
Upper	1400	1029.1	1470	1474.5	6.7	1474.5	6.7	0.0	0.0
Tributary	510	228.8	1545	1547.4	5.8	1547.4	5.8	0.0	0.0
Tributary	410	228.8	1524	1527.1	6.4	1527.1	6.4	0.0	0.0
Tributary	310	228.8	1503	1505.2	3.3	1505.2	3.3	0.0	0.0
Tributary	210	228.8	1486	1488.0	5.5	1488.0	5.5	0.0	0.0
Tributary	110	228.8	1479	1482.3	4.3	1482.3	4.3	0.0	0.0
Tributary	10	228.8	1471	1474.0	7.8	1474.0	7.8	0.0	0.0
Sound Stages	2527.261	1244.8	1432	1437.3	8.1	1436.8	9.3	-0.5	1.2
Sound Stages	2268.881	1244.8	1427	1431.5	7.7	1432.2	6.3	0.7	-1.4
Sound Stages	2007.81	1244.8	1422	1426.8	6.0	1426.0	8.4	-0.8	2.3
Sound Stages	1841.25	1244.8	1419	1423.6	6.9	1423.2	3.4	-0.4	-3.5
Sound Stages	1644.9	1244.8	1416	1421.4	5.4	1420.9	5.0	-0.5	-0.4
Sound Stages	1615	Bridge	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sound Stages	1526.5	1244.8	1414	1419.5	7.9	1418.9	6.6	-0.6	-1.3
Sound Stages	1368.35	1244.8	1412	1416.9	6.7	1416.5	4.5	-0.4	-2.3
Sound Stages	1258.35	1244.8	1410	1415.1	6.4	1414.2	6.4	-0.8	0.0
Sound Stages	1052.85	1244.8	1405.12	1408.9	7.8	1410.6	4.5	1.7	-3.3
Sound Stages	865.5	1244.8	1402	1408.0	3.2	1408.4	4.2	0.3	0.9
Sound Stages	700.65	1244.8	1398	1407.4	3.8	1407.5	3.0	0.1	-0.8
Sound Stages	700	Culvert	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sound Stages	9.076105	1244.8	1390	1396.9	6.3	1396.9	6.3	0.0	0.0
Sound Stages	8	1244.8	1390	1396.6	5.9	1396.6	5.9	0.0	0.0
Sound Stages	7	1340.4	1388	1389.9	6.8	1389.9	6.8	0.0	0.0
Sound Stages	6	1340.4	1378	1384.0	3.0	1384.0	3.0	0.0	0.0
Sound Stages	5	1340.4	1376	1379.2	8.9	1379.2	8.9	0.0	0.0
Sound Stages	4	1340.4	1362	1369.2	6.2	1369.2	6.2	0.0	0.0
Sound Stages	3	1375.6	1348	1361.7	6.9	1361.7	6.9	0.0	0.0
Sound Stages	2	1375.6	1348	1352.5	5.0	1352.5	5.0	0.0	0.0
Lower	1300	1223.2	1468	1472.4	4.9	1472.2	5.2	-0.2	0.4
Lower	1250	1223.2	1463	1467.6	8.1	1467.6	7.2	0.0	-0.9
Lower	1200	1223.2	1459	1464.0	5.5	1464.0	5.5	0.0	0.0
Lower	1150	1223.2	1453	1459.3	6.2	1459.3	6.2	0.0	0.0
Lower	1100	1223.2	1447	1451.5	8.0	1451.5	8.0	0.0	0.0
Lower	1050	1223.2	1443	1448.7	5.6	1448.7	5.6	0.0	0.0
Lower	1000	1223.2	1439	1445.9	6.9	1445.9	6.9	0	0

10-Year Storm Event – Comparison Table

Pre-Project and Post-Project Comparison Table for Placerita Creek (10-Year Storm Event)

				Pre-Project		Post-Project		Change in Hydraulic Parameters	
Reach	River Station	Total Flow Rate (cfs)	Min Channel Elevation (ft)	Water Surface Elevation (ft)	Channnel Velocity (ft/s)	Water Surface Elevation (ft)	Channnel Velocity (ft/s)	Water Surface Elevation (ft)	Channnel Velocity (ft/s)
Upper	1900	1630.6	1503	1510.0	8.2	1510.0	8.2	0.0	0.0
Upper	1800	1630.6	1497	1503.7	7.5	1503.7	7.5	0.0	0.0
Upper	1700	1630.6	1489	1494.2	6.0	1494.2	6.0	0.0	0.0
Upper	1600	1630.6	1479	1483.8	9.3	1483.8	9.3	0.0	0.0
Upper	1500	1630.6	1474	1480.4	5.4	1480.4	5.4	0.0	0.0
Upper	1400	1630.6	1470	1475.1	7.0	1475.1	7.0	0.0	0.0
Tributary	510	334	1545	1547.6	7.5	1547.6	7.5	0.0	0.0
Tributary	410	334	1524	1527.4	5.2	1527.4	5.2	0.0	0.0
Tributary	310	334	1503	1505.4	3.7	1505.4	3.7	0.0	0.0
Tributary	210	334	1486	1488.4	6.3	1488.4	6.3	0.0	0.0
Tributary	110	334	1479	1482.7	4.7	1482.7	4.6	0.0	0.0
Tributary	10	334	1471	1474.6	8.5	1474.6	8.6	0.0	0.0
Sound Stages	2527.261	1923.3	1432	1438.4	9.4	1437.9	10.5	-0.4	1.1
Sound Stages	2268.881	1923.3	1427	1432.6	8.8	1433.2	7.6	0.6	-1.2
Sound Stages	2007.81	1923.3	1422	1427.6	7.0	1426.8	9.4	-0.9	2.4
Sound Stages	1841.25	1923.3	1419	1424.8	7.2	1424.4	3.7	-0.4	-3.5
Sound Stages	1644.9	1923.3	1416	1422.8	6.2	1422.2	5.8	-0.6	-0.4
Sound Stages	1615	Bridge	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sound Stages	1526.5	1923.3	1414	1421.4	6.2	1420.1	7.4	-1.3	1.2
Sound Stages	1368.35	1923.3	1412	1418.2	7.5	1417.7	5.3	-0.5	-2.2
Sound Stages	1258.35	1923.3	1410	1415.3	9.2	1415.2	7.4	-0.1	-1.8
Sound Stages	1052.85	1923.3	1405.12	1410.8	5.7	1411.9	5.1	1.1	-0.6
Sound Stages	865.5	1923.3	1402	1410.5	3.0	1410.7	3.7	0.2	0.7
Sound Stages	700.65	1923.3	1398	1410.2	3.4	1410.3	3.1	0.0	-0.4
Sound Stages	700	Culvert	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sound Stages	9.076105	1923.3	1390	1397.3	8.7	1397.3	8.7	0.0	0.0
Sound Stages	8	1923.3	1390	1397.0	7.4	1397.0	7.4	0.0	0.0
Sound Stages	7	2071	1388	1390.5	6.5	1390.5	6.5	0.0	0.0
Sound Stages	6	2071	1378	1384.2	3.7	1384.2	3.7	0.0	0.0
Sound Stages	5	2071	1376	1380.6	6.4	1380.6	6.4	0.0	0.0
Sound Stages	4	2071	1362	1371.0	6.7	1371.0	6.7	0.0	0.0
Sound Stages	3	2125.4	1348	1363.0	7.8	1363.0	7.8	0.0	0.0
Sound Stages	2	2125.4	1348	1353.1	5.6	1353.1	5.6	0.0	0.0
Lower	1300	1895.7	1468	1472.9	6.2	1472.9	6.2	0.0	-0.1
Lower	1250	1895.7	1463	1468.3	7.7	1468.3	7.8	0.0	0.1
Lower	1200	1895.7	1459	1464.8	5.0	1464.8	5.0	0.0	0.0
Lower	1150	1895.7	1453	1460.6	7.1	1460.6	7.1	0.0	0.0
Lower	1100	1895.7	1447	1452.7	9.0	1452.7	9.0	0.0	0.0
Lower	1050	1895.7	1443	1450.3	5.9	1450.3	5.9	0.0	0.0
Lower	1000	1895.7	1439	1447.5	7.7	1447.5	7.7	0	0

25-Year Storm Event – Comparison Table

Pre-Project and Post-Project Comparison Table for Placerita Creek (25-Year Storm Event)

				Pre-Project		Post-Project		Change in Hydraulic Parameters	
Reach	River Station	Total Flow Rate (cfs)	Min Channel Elevation (ft)	Water Surface Elevation (ft)	Channnel Velocity (ft/s)	Water Surface Elevation (ft)	Channnel Velocity (ft/s)	Water Surface Elevation (ft)	Channnel Velocity (ft/s)
Upper	1900	2543.1	1503	1511.1	10.2	1511.1	10.2	0.0	0.0
Upper	1800	2543.1	1497	1504.4	8.1	1504.4	8.1	0.0	0.0
Upper	1700	2543.1	1489	1494.5	7.9	1494.5	7.9	0.0	0.0
Upper	1600	2543.1	1479	1484.8	8.6	1484.8	8.6	0.0	0.0
Upper	1500	2543.1	1474	1481.0	6.1	1481.0	6.1	0.0	0.0
Upper	1400	2543.1	1470	1475.7	7.8	1475.7	7.9	0.0	0.1
Tributary	510	481.4	1545	1548.2	7.4	1548.2	7.4	0.0	0.0
Tributary	410	481.4	1524	1527.6	6.0	1527.6	6.0	0.0	0.0
Tributary	310	481.4	1503	1505.7	4.0	1505.7	4.0	0.0	0.0
Tributary	210	481.4	1486	1488.7	7.5	1488.7	7.5	0.0	0.0
Tributary	110	481.4	1479	1483.1	4.8	1483.1	4.8	0.0	0.0
Tributary	10	481.4	1471	1475.3	9.3	1475.3	9.3	0.0	0.0
Sound Stages	2527.261	2981.8	1432	1439.8	10.7	1439.3	11.8	-0.5	1.0
Sound Stages	2268.881	2981.8	1427	1433.6	10.6	1434.4	9.2	0.7	-1.4
Sound Stages	2007.81	2981.8	1422	1428.8	7.7	1427.8	10.3	-1.0	2.6
Sound Stages	1841.25	2981.8	1419	1426.2	7.9	1426.0	4.1	-0.1	-3.8
Sound Stages	1644.9	2981.8	1416	1423.4	8.4	1423.9	6.7	0.5	-1.7
Sound Stages	1615	Bridge	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sound Stages	1526.5	2981.8	1414	1422.5	4.9	1421.6	8.4	-1.0	3.5
Sound Stages	1368.35	2981.8	1412	1420.1	6.4	1419.1	6.3	-1.0	-0.1
Sound Stages	1258.35	2981.8	1410	1416.3	10.2	1416.6	8.2	0.4	-2.0
Sound Stages	1052.85	2981.8	1405.12	1414.3	4.2	1414.9	4.7	0.5	0.5
Sound Stages	865.5	2981.8	1402	1414.2	2.7	1414.3	3.3	0.1	0.6
Sound Stages	700.65	2981.8	1398	1414.0	3.1	1414.0	3.0	0.0	-0.1
Sound Stages	700	Culvert	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sound Stages	9.076105	2981.8	1390	1398.0	11.4	1398.0	11.4	0.0	0.0
Sound Stages	8	2981.8	1390	1397.0	11.1	1397.0	11.0	0.0	-0.1
Sound Stages	7	3210.8	1388	1391.0	7.3	1391.0	7.3	0.0	0.0
Sound Stages	6	3210.8	1378	1384.7	3.7	1384.7	3.7	0.0	0.0
Sound Stages	5	3210.8	1376	1381.0	7.5	1381.0	7.5	0.0	0.0
Sound Stages	4	3210.8	1362	1372.9	7.5	1372.9	7.5	0.0	0.0
Sound Stages	3	3295.1	1348	1364.2	8.9	1364.2	8.9	0.0	0.0
Sound Stages	2	3295.1	1348	1353.7	6.3	1353.7	6.3	0.0	0.0
Lower	1300	2936.7	1468	1473.7	7.2	1473.7	7.1	0.0	-0.1
Lower	1250	2936.7	1463	1468.9	8.9	1468.8	9.1	0.0	0.2
Lower	1200	2936.7	1459	1465.6	4.7	1465.7	4.4	0.1	-0.3
Lower	1150	2936.7	1453	1461.4	8.7	1461.5	9.2	0.1	0.5
Lower	1100	2936.7	1447	1454.3	8.7	1454.3	8.7	0.0	0.0
Lower	1050	2936.7	1443	1452.0	4.5	1452.0	4.5	0.0	0.0
Lower	1000	2936.7	1439	1449.6	8.6	1449.6	8.6	0	0

50-Year Storm Event – Comparison Table

Pre-Project and Post-Project Comparison Table for Placerita Creek (50-Year Storm Event)

				Pre-Project		Post-Project		Change in Hydraulic Parameters	
Reach	River Station	Total Flow Rate (cfs)	Min Channel Elevation (ft)	Water Surface Elevation (ft)	Channnel Velocity (ft/s)	Water Surface Elevation (ft)	Channnel Velocity (ft/s)	Water Surface Elevation (ft)	Channnel Velocity (ft/s)
Upper	1900	3369.2	1503	1512.0	11.1	1512.0	11.1	0.0	0.0
Upper	1800	3369.2	1497	1504.9	8.5	1504.9	8.5	0.0	0.0
Upper	1700	3369.2	1489	1494.8	8.7	1494.8	8.7	0.0	0.0
Upper	1600	3369.2	1479	1485.3	8.8	1485.3	8.8	0.0	0.0
Upper	1500	3369.2	1474	1481.5	6.4	1481.4	6.7	-0.1	0.3
Upper	1400	3369.2	1470	1476.1	8.7	1476.3	8.1	0.2	-0.7
Tributary	510	616.7	1545	1548.4	7.9	1548.4	7.9	0.0	0.0
Tributary	410	616.7	1524	1527.7	6.0	1527.7	6.0	0.0	0.0
Tributary	310	616.7	1503	1505.9	4.3	1505.9	4.3	0.0	0.0
Tributary	210	616.7	1486	1489.1	7.8	1489.1	7.8	0.0	0.0
Tributary	110	616.7	1479	1483.3	4.8	1483.3	4.8	0.0	0.0
Tributary	10	616.7	1471	1475.8	9.9	1475.8	9.9	0.0	0.0
Sound Stages	2527.261	3950.4	1432	1441.1	11.2	1440.5	12.5	-0.6	1.3
Sound Stages	2268.881	3950.4	1427	1434.3	12.3	1435.2	10.4	0.9	-1.9
Sound Stages	2007.81	3950.4	1422	1429.8	8.0	1428.6	10.8	-1.2	2.8
Sound Stages	1841.25	3950.4	1419	1427.1	8.4	1427.3	4.4	0.2	-4.1
Sound Stages	1644.9	3950.4	1416	1423.8	9.7	1425.2	7.3	1.3	-2.4
Sound Stages	1615	Bridge	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sound Stages	1526.5	3950.4	1414	1423.1	5.1	1422.8	9.1	-0.3	4.0
Sound Stages	1368.35	3950.4	1412	1420.7	6.7	1420.5	6.8	-0.3	0.1
Sound Stages	1258.35	3950.4	1410	1417.2	10.3	1418.8	7.4	1.5	-2.9
Sound Stages	1052.85	3950.4	1405.12	1417.5	3.5	1417.8	4.3	0.3	0.7
Sound Stages	865.5	3950.4	1402	1417.4	2.6	1417.5	3.1	0.1	0.5
Sound Stages	700.65	3950.4	1398	1417.3	3.0	1417.3	3.0	0.0	0.0
Sound Stages	700	Culvert	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sound Stages	9.076105	3950.4	1390	1399.2	11.1	1399.2	11.1	0.0	0.0
Sound Stages	8	3950.4	1390	1397.1	14.0	1397.1	14.0	0.0	0.0
Sound Stages	7	4122.1	1388	1391.3	7.7	1391.3	7.7	0.0	0.0
Sound Stages	6	4122.1	1378	1384.9	4.2	1384.9	4.2	0.0	0.0
Sound Stages	5	4122.1	1376	1381.5	6.7	1381.5	6.7	0.0	0.0
Sound Stages	4	4122.1	1362	1372.8	9.6	1372.8	9.7	0.0	0.0
Sound Stages	3	4167.4	1348	1364.9	7.6	1364.9	7.6	0.0	0.0
Sound Stages	2	4167.4	1348	1354.0	6.6	1354.0	6.6	0.0	0.0
Lower	1300	3890.3	1468	1474.5	7.2	1474.1	8.3	-0.4	1.0
Lower	1250	3890.3	1463	1469.0	11.1	1469.5	8.9	0.5	-2.2
Lower	1200	3890.3	1459	1465.9	5.5	1466.5	4.1	0.6	-1.4
Lower	1150	3890.3	1453	1462.1	7.9	1462.1	10.9	0.1	3.0
Lower	1100	3890.3	1447	1454.6	10.2	1455.0	8.9	0.3	-1.2
Lower	1050	3890.3	1443	1452.9	4.0	1452.9	4.0	0.0	0.0
Lower	1000	3890.3	1439	1448.3	14.0	1448.3	14.0	0	0

50 YEAR STORM EVENT BURNED AND BULK – COMPARISON TABLES

Pre-Project and Post-Project Comparison Table for Placerita Creek (Bulked 50-Year Storm Event)

				Pre-Project		Post-Project		Change in Hydraulic Parameters	
Reach	River Station	Total Flow Rate (cfs)	Min Channel Elevation (ft)	Water Surface Elevation (ft)	Channnel Velocity (ft/s)	Water Surface Elevation (ft)	Channnel Velocity (ft/s)	Water Surface Elevation (ft)	Channnel Velocity (ft/s)
Upper	1900	5214.8	1503	1513.8	11.6	1513.8	11.6	0.0	0.0
Upper	1800	5214.8	1497	1505.7	9.9	1505.7	9.9	0.0	0.0
Upper	1700	5214.8	1489	1495.4	9.2	1495.4	9.2	0.0	0.0
Upper	1600	5214.8	1479	1485.9	10.0	1485.9	10.0	0.0	0.0
Upper	1500	5214.8	1474	1482.3	7.3	1482.3	7.3	0.0	0.0
Upper	1400	5214.8	1470	1477.2	9.2	1477.2	9.2	0.0	0.0
Tributary	510	874.1	1545	1548.7	8.5	1548.7	8.5	0.0	0.0
Tributary	410	874.1	1524	1527.9	6.5	1527.9	6.5	0.0	0.0
Tributary	310	874.1	1503	1506.2	4.9	1506.2	4.9	0.0	0.0
Tributary	210	874.1	1486	1489.7	8.0	1489.7	8.0	0.0	0.0
Tributary	110	874.1	1479	1483.7	4.7	1483.7	4.8	0.0	0.0
Tributary	10	874.1	1471	1476.7	10.7	1476.7	10.7	0.0	0.0
Sound Stages	2527.261	6011.7	1432	1442.2	14.4	1442.7	13.3	0.5	-1.1
Sound Stages	2268.881	6011.7	1427	1436.9	14.2	1436.2	13.5	-0.7	-0.7
Sound Stages	2007.81	6011.7	1422	1431.7	8.3	1430.4	10.5	-1.3	2.3
Sound Stages	1841.25	6011.7	1419	1427.4	12.2	1430.0	4.6	2.7	-7.6
Sound Stages	1644.9	6011.7	1416	1426.0	6.6	1428.2	7.6	2.1	1.0
Sound Stages	1615	Bridge	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sound Stages	1526.5	6011.7	1414	1425.8	3.5	1426.7	8.0	0.9	4.6
Sound Stages	1368.35	6011.7	1412	1425.6	3.4	1425.9	5.5	0.4	2.1
Sound Stages	1258.35	6011.7	1410	1425.3	4.4	1425.5	5.0	0.3	0.6
Sound Stages	1052.85	6011.7	1405.12	1425.3	2.6	1425.3	3.3	0.0	0.7
Sound Stages	865.5	6011.7	1402	1425.2	2.2	1425.2	2.6	0.0	0.4
Sound Stages	700.65	6011.7	1398	1425.2	2.6	1425.1	2.6	-0.1	0.1
Sound Stages	700	Culvert	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sound Stages	9.076105	6011.7	1390	1400.8	10.9	1400.8	10.9	0.0	0.0
Sound Stages	8	6011.7	1390	1397.6	16.9	1397.6	16.9	0.0	0.0
Sound Stages	7	6229.5	1388	1391.8	8.8	1391.8	8.8	0.0	0.0
Sound Stages	6	6229.5	1378	1385.4	4.7	1385.4	4.7	0.0	0.0
Sound Stages	5	6229.5	1376	1382.4	6.3	1382.4	6.3	0.0	0.0
Sound Stages	4	6229.5	1362	1374.3	11.3	1374.3	11.3	0.0	0.0
Sound Stages	3	6276.6	1348	1365.5	8.5	1365.5	8.5	0.0	0.0
Sound Stages	2	6276.6	1348	1354.6	7.2	1354.6	7.2	0.0	0.0
Lower	1300	5943.5	1468	1475.0	9.7	1475.0	9.7	0.0	0.0
Lower	1250	5943.5	1463	1470.2	10.0	1470.2	10.0	0.0	0.0
Lower	1200	5943.5	1459	1466.7	5.8	1466.4	6.4	-0.2	0.6
Lower	1150	5943.5	1453	1462.6	9.3	1463.0	7.7	0.4	-1.6
Lower	1100	5943.5	1447	1455.7	10.1	1455.1	12.7	-0.5	2.6
Lower	1050	5943.5	1443	1455.0	2.8	1455.0	2.8	0.0	0.0
Lower	1000	5943.5	1439	1450.6	15.0	1450.6	15.0	0	0

100 YEAR STORM EVENT FEMA – COMPARISON TABLES

Pre-Project and Post-Project Comparison Table for Placerita Creek (100-Year Storm Event)

				Pre-Project		Post-Project		Change in Hydraulic Parameters	
Reach	River Station	Total Flow Rate (cfs)	Min Channel Elevation (ft)	Water Surface Elevation (ft)	Channnel Velocity (ft/s)	Water Surface Elevation (ft)	Channnel Velocity (ft/s)	Water Surface Elevation (ft)	Channnel Velocity (ft/s)
Upper	1900	3550	1503	1512.2	11.3	1512.2	11.3	0.0	0.0
Upper	1800	3550	1497	1505.0	8.7	1505.0	8.7	0.0	0.0
Upper	1700	3550	1489	1494.8	8.7	1494.8	8.7	0.0	0.0
Upper	1600	3550	1479	1485.3	9.0	1485.3	9.0	0.0	0.0
Upper	1500	3550	1474	1481.6	6.4	1481.6	6.4	0.0	0.0
Upper	1400	3550	1470	1476.2	9.0	1476.2	9.0	0.0	0.0
Tributary	510	860	1545	1548.7	8.5	1548.7	8.5	0.0	0.0
Tributary	410	860	1524	1527.9	6.5	1527.9	6.5	0.0	0.0
Tributary	310	860	1503	1506.2	4.8	1506.2	4.8	0.0	0.0
Tributary	210	860	1486	1489.7	7.9	1489.7	7.9	0.0	0.0
Tributary	110	860	1479	1483.7	4.7	1483.7	4.8	0.0	0.0
Tributary	10	860	1471	1476.6	10.6	1476.6	10.6	0.0	0.0
Sound Stages	2527.261	3550	1432	1441.4	9.7	1440.0	12.3	-1.4	2.6
Sound Stages	2268.881	3550	1427	1434.7	12.4	1434.9	9.9	0.1	-2.5
Sound Stages	2007.81	3550	1422	1429.4	7.9	1428.3	10.6	-1.1	2.7
Sound Stages	1841.25	3550	1419	1426.8	8.2	1426.8	4.3	0.1	-4.0
Sound Stages	1644.9	3550	1416	1423.6	9.2	1424.7	7.1	1.0	-2.1
Sound Stages	1615	Bridge	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sound Stages	1526.5	3550	1414	1422.9	5.0	1422.3	8.8	-0.6	3.8
Sound Stages	1368.35	3550	1412	1420.6	6.4	1419.9	6.7	-0.7	0.3
Sound Stages	1258.35	3550	1410	1416.7	10.7	1417.8	7.8	1.1	-2.8
Sound Stages	1052.85	3550	1405.12	1416.2	3.8	1416.6	4.4	0.4	0.7
Sound Stages	865.5	3550	1402	1416.1	2.7	1416.2	3.2	0.1	0.5
Sound Stages	700.65	3550	1398	1416.0	3.0	1416.0	3.0	0.0	0.0
Sound Stages	700	Culvert	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sound Stages	9.076105	3550	1390	1398.8	11.1	1398.8	11.1	0.0	0.0
Sound Stages	8	3550	1390	1397.0	13.2	1397.0	13.2	0.0	0.0
Sound Stages	7	3550	1388	1391.1	7.5	1391.1	7.5	0.0	0.0
Sound Stages	6	3550	1378	1384.9	3.8	1384.9	3.8	0.0	0.0
Sound Stages	5	3550	1376	1381.0	7.7	1381.0	7.7	0.0	0.0
Sound Stages	4	3550	1362	1373.2	7.9	1373.2	7.9	0.0	0.0
Sound Stages	3	3550	1348	1364.3	9.1	1364.3	9.1	0.0	0.0
Sound Stages	2	3550	1348	1353.8	6.4	1353.8	6.4	0.0	0.0
Lower	1300	3550	1468	1474.2	7.3	1474.2	7.3	0.0	0.0
Lower	1250	3550	1463	1469.0	10.1	1469.0	10.1	0.0	0.0
Lower	1200	3550	1459	1465.7	5.3	1466.2	4.2	0.5	-1.1
Lower	1150	3550	1453	1461.9	7.8	1462.0	10.3	0.0	2.4
Lower	1100	3550	1447	1454.4	10.2	1454.8	8.9	0.3	-1.3
Lower	1050	3550	1443	1452.8	3.7	1452.8	3.7	0.0	0.0
Lower	1000	3550	1439	1450.7	8.9	1450.7	8.9	0	0

Pre-Project Floodway Comparison

PRE-PROJECT FLOODWAY ANALYSIS COMPARISON TABLE
FOR PLACERITA CREEK

Reach	River Sta	Q Total	Flood Plain		Floodway		Δ	Left Encroachment	Right Encroachment
			W.S. Elev	Vel Chnl	W.S. Elev	Vel Chnl			
		(cfs)	(ft)	(ft/s)	(ft)	(ft/s)	W.S. Elev	Station	Station
Upper	1900	5214.8	1513.8	11.6	1513.7	11.7	0.0	1158.9	1294.4
Upper	1800	5214.8	1505.7	9.9	1506.0	10.0	0.3	1180.6	1381.1
Upper	1700	5214.8	1495.4	9.2	1495.7	10.0	0.3	1142.7	1424.1
Upper	1600	5214.8	1485.9	10.0	1485.9	10.1	0.0	1044.5	1360.2
Upper	1500	5214.8	1482.3	7.3	1482.8	8.0	0.5	1274.9	1486.7
Upper	1400	5214.8	1477.2	9.2	1477.3	9.7	0.1	1614.6	1755.0
Lower	1300	5943.5	1475.0	9.7	1475.1	9.8	0.1	1578.4	1744.2
Lower	1250	5943.5	1470.2	10.0	1470.1	10.1	-0.1	1310.2	1654.0
Lower	1200	5943.5	1466.7	5.8	1467.6	7.2	0.9	1819.8	2026.2
Lower	1150	5943.5	1462.6	9.3	1462.9	10.0	0.3	1354.7	1715.6
Lower	1100	5943.5	1455.7	10.1	1456.7	7.7	1.0	1747.9	2007.5
Lower	1050	5943.5	1455.0	2.8	1454.1	9.1	-0.8	1744.5	1876.0
Lower	1000	5943.5	1450.6	15.0	1451.6	9.5	1.0	1958.4	2112.6
Sound Stages	2527.261	6011.7	1442.2	14.4	1443.1	12.5	0.9	2186.7	2251.8
Sound Stages	2268.881	6011.7	1435.8	14.2	1435.8	14.4	0.0	2130.3	2194.9
Sound Stages	2007.81	6011.7	0.0	8.3	1431.5	9.3	1431.5	1496.2	1596.6
Sound Stages	1841.25	6011.7	1427.3	12.2	1427.6	11.6	0.2	1918.0	2029.8
Sound Stages	1644.9	6011.7	1426.0	6.6	1426.6	7.2	0.7	1662.6	1883.5
Sound Stages	1526.5	6011.7	1425.8	3.5	1426.7	2.9	0.9	1616.1	2089.6
Sound Stages	1368.35	6011.7	1425.5	3.4	1426.5	3.0	1.0	1345.4	1654.8
Sound Stages	1258.35	6011.7	1425.2	4.4	1426.2	4.6	1.0	1603.1	1706.9
Sound Stages	1052.85	6011.7	1425.2	2.6	1425.4	6.6	0.2	1296.0	1345.0
Sound Stages	865.5	6011.7	1425.1	2.2	1425.3	4.4	0.2	1222.3	1284.8
Sound Stages	700.65	6011.7	1425.1	2.6	1423.9	9.2	-1.2	1140.5	1166.7
Sound Stages	700								
Sound Stages	9.076105	6011.7	1400.8	10.9	1400.4	12.4	-0.5	1208.3	1366.3
Sound Stages	8	6011.7	1397.6	16.9	1397.6	16.6	0.0	1329.9	1581.5
Sound Stages	7	6229.5	1391.8	8.8	1392.0	9.9	0.2	1231.2	1477.9
Sound Stages	6	6229.5	1385.3	4.7	1386.4	4.3	1.0	1401.9	1975.4
Sound Stages	5	6229.5	1382.7	6.3	1383.7	7.1	1.0	1645.5	1884.7
Sound Stages	4	6229.5	1374.3	11.3	1374.6	10.1	0.3	1297.7	1949.8
Sound Stages	3	6276.6	1365.5	8.5	1365.9	9.5	0.4	1741.6	2128.5
Sound Stages	2	6276.6	1354.6	7.2	1355.6	8.2	1.0	1604.7	1782.8

Post-Project Floodway Comparison

POST-PROJECT FLOODWAY ANALYSIS COMPARISON TABLE
FOR PLACERITA CREEK

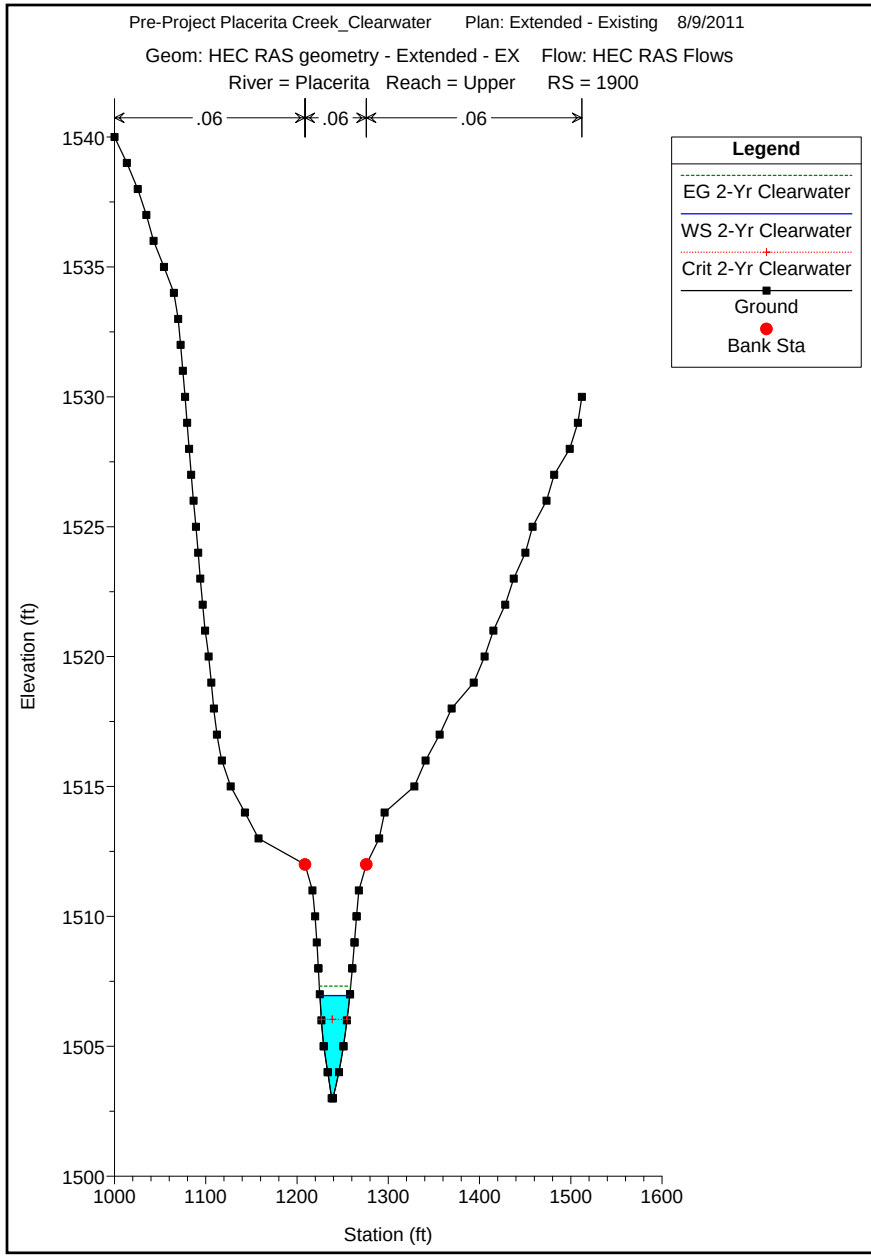
Reach	River Sta	Q Total	Flood Plain		Floodway		Δ	Left Encroachment	Right Encroachment
			W.S. Elev	Vel Chnl	W.S. Elev	Vel Chnl			
		(cfs)	(ft)	(ft/s)	(ft)	(ft/s)	W.S. Elev	Station	Station
Upper	1900	5214.8	1513.8	11.6	1513.8	11.6	0.0	1158.9	1294.4
Upper	1800	5214.8	1505.7	9.9	1506.0	10.0	0.3	1180.6	1381.1
Upper	1700	5214.8	1495.4	9.2	1495.7	10.0	0.3	1142.7	1424.1
Upper	1600	5214.8	1485.9	10.0	1485.9	10.1	0.0	1044.5	1360.2
Upper	1500	5214.8	1482.3	7.3	1482.8	8.0	0.5	1274.9	1486.7
Upper	1400	5214.8	1477.2	9.2	1477.3	9.7	0.1	1614.6	1755.0
Lower	1300	5943.5	1475.0	9.6	1475.1	9.8	0.0	1578.4	1744.2
Lower	1250	5943.5	1470.1	10.2	1470.1	10.2	-0.1	1310.2	1653.9
Lower	1200	5943.5	1466.4	6.4	1467.5	7.3	1.0	1819.8	2026.2
Lower	1150	5943.5	1463.0	7.7	1463.0	9.5	0.0	1354.7	1715.6
Lower	1100	5943.5	1455.1	12.7	1456.7	7.7	1.5	1717.9	2007.3
Lower	1050	5943.5	1455.0	2.8	1454.1	9.1	-0.8	1734.5	1886.0
Lower	1000	5943.5	1450.6	15.0	1451.6	9.5	1.0	1958.4	2112.6
Sound Stages	2527.261	6011.7	1442.7	13.3	1443.1	12.7	0.3	2186.7	2251.8
Sound Stages	2268.881	6011.7	1436.2	13.5	1435.8	14.4	-0.4	2130.4	2194.9
Sound Stages	2007.81	6011.7	1430.4	10.5	1431.4	8.7	1.0	1476.2	1596.5
Sound Stages	1841.25	6011.7	1430.0	4.6	1430.6	5.6	0.5	1923.0	2024.8
Sound Stages	1644.9	6011.7	1428.2	7.6	1428.9	7.0	0.8	1788.3	1878.5
Sound Stages	1526.5	6011.7	1426.7	8.0	1427.5	8.5	0.7	2000.7	2061.5
Sound Stages	1368.35	6011.7	1425.9	5.5	1426.8	5.7	0.9	1560.5	1636.9
Sound Stages	1258.35	6011.7	1425.5	5.0	1426.5	4.9	1.0	1608.7	1700.7
Sound Stages	1052.85	6011.7	1425.3	3.3	1426.1	4.1	0.9	1269.3	1346.5
Sound Stages	865.5	6011.7	1425.2	2.6	1425.7	4.8	0.5	1214.0	1271.8
Sound Stages	700.65	6011.7	1425.1	2.6	1424.2	8.2	-0.9	1135.0	1164.9
Sound Stages	700								
Sound Stages	9.076105	6011.7	1400.8	10.9	1400.5	12.1	-0.4	1208.3	1366.3
Sound Stages	8	6011.7	1397.6	16.9	1397.6	16.7	0.0	1330.0	1580.9
Sound Stages	7	6229.5	1391.8	8.8	1392.0	9.8	0.2	1231.2	1477.9
Sound Stages	6	6229.5	1385.4	4.7	1386.4	4.3	1.0	1401.9	1975.4
Sound Stages	5	6229.5	1382.4	6.3	1383.2	8.1	0.8	1645.5	1885.0
Sound Stages	4	6229.5	1374.3	11.3	1374.8	11.0	0.5	1841.8	1912.2
Sound Stages	3	6276.6	1365.5	8.5	1365.9	9.5	0.4	1741.6	2128.5
Sound Stages	2	6276.6	1354.6	7.2	1355.6	8.2	1.0	1604.7	1782.8

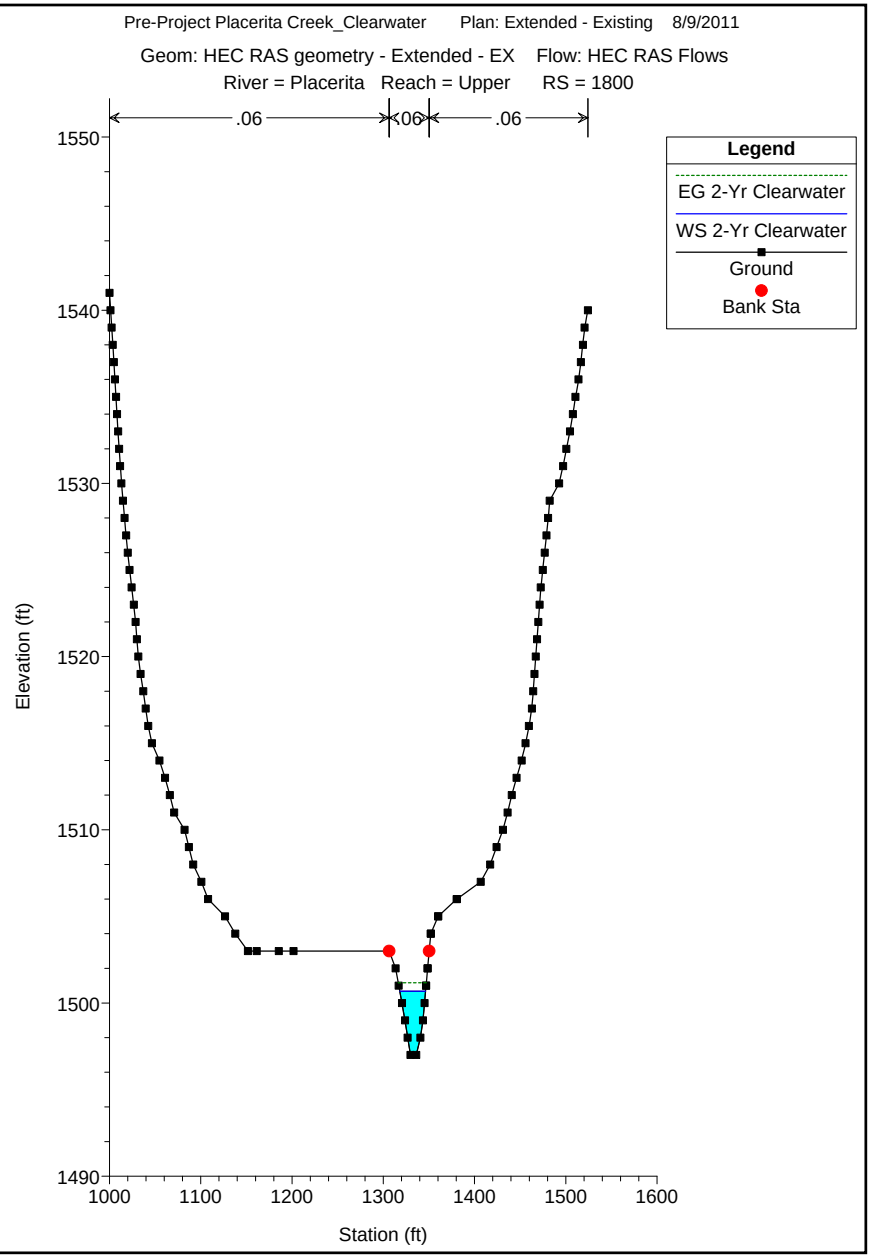
Pre Project Condition HEC-RAS Output

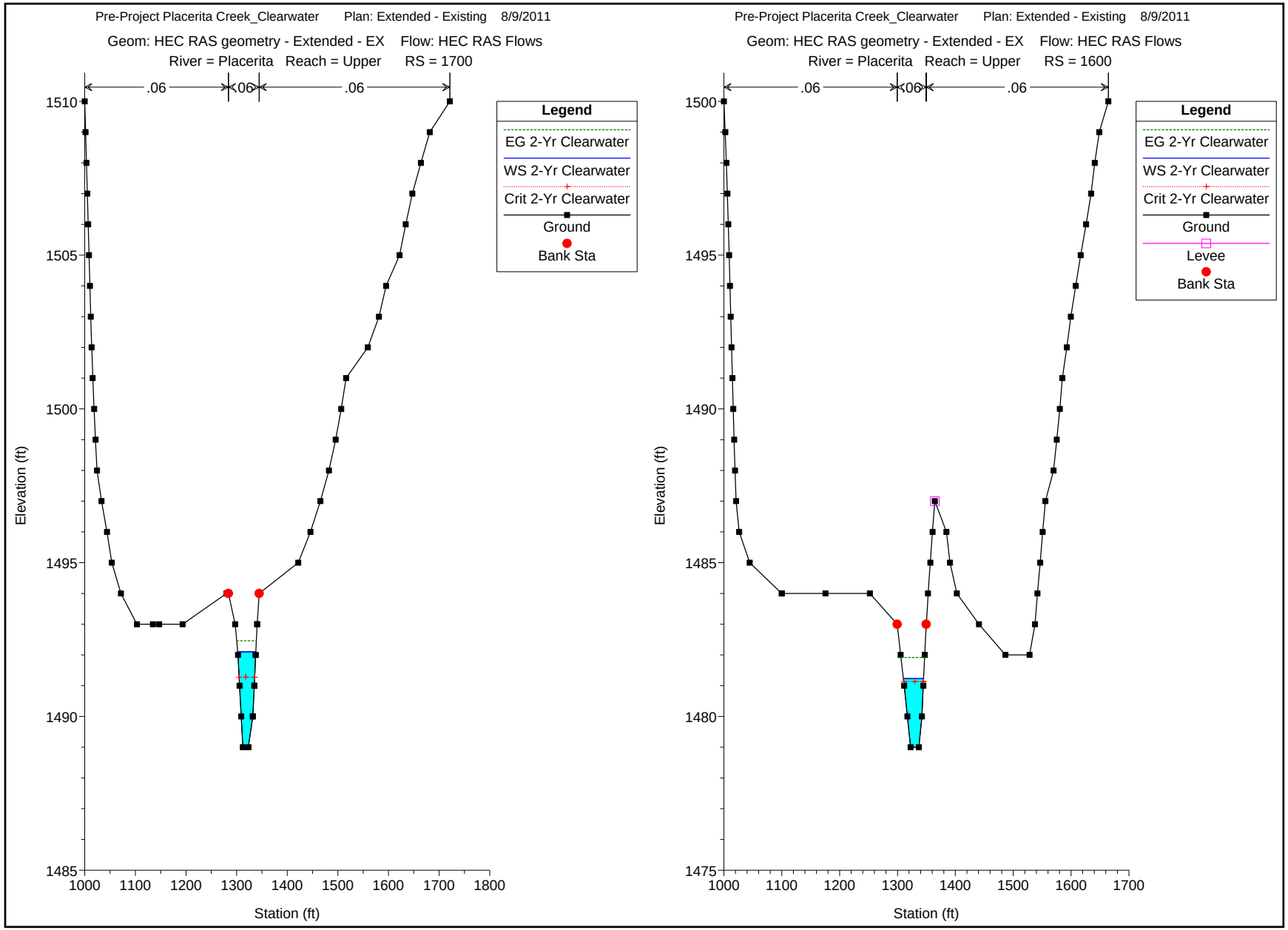
2-Year Storm Event – Pre Project Condition HEC-RAS Output

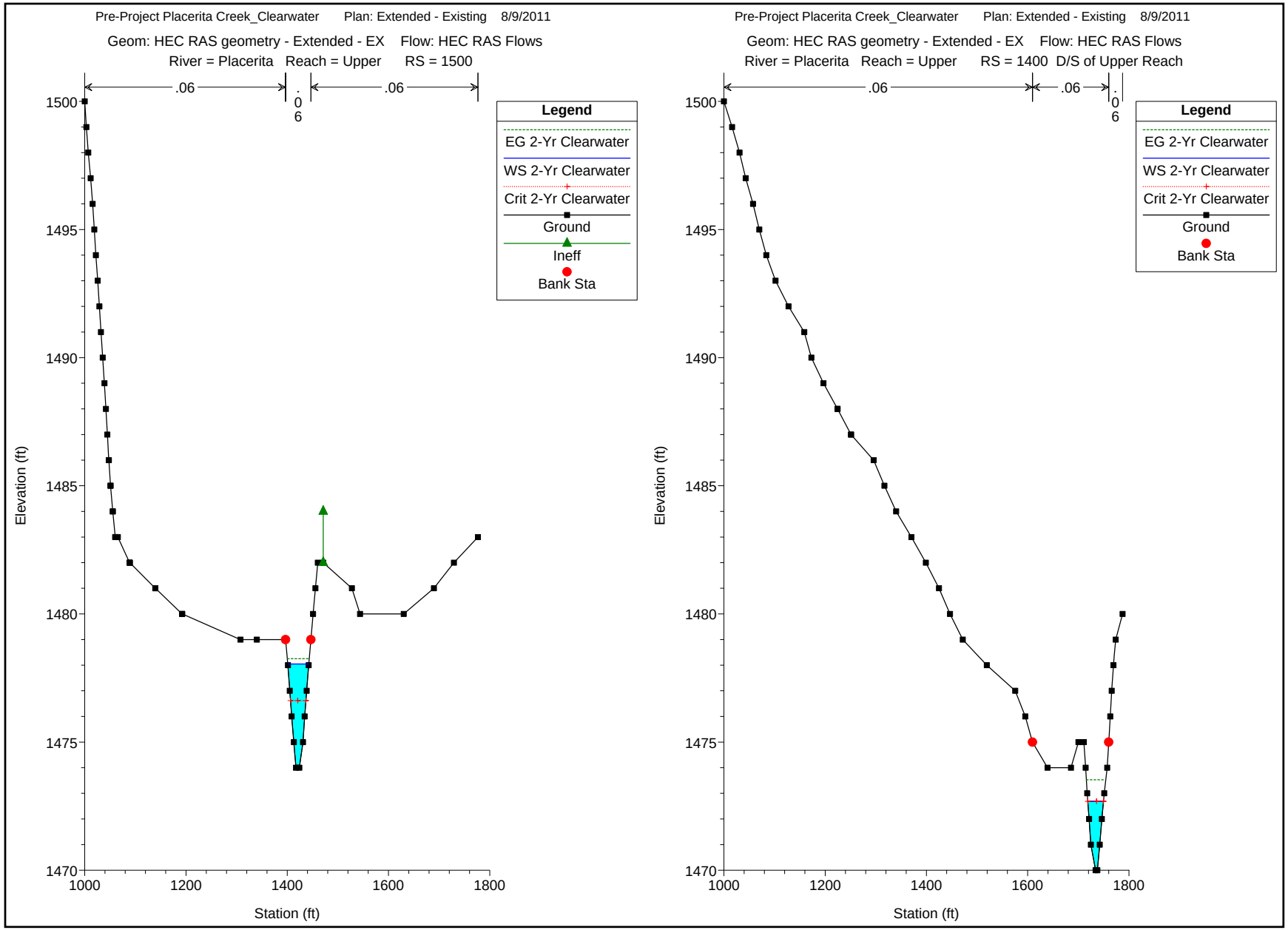
HEC-RAS Plan: EX_Extended Profile: 2-Yr Clearwater

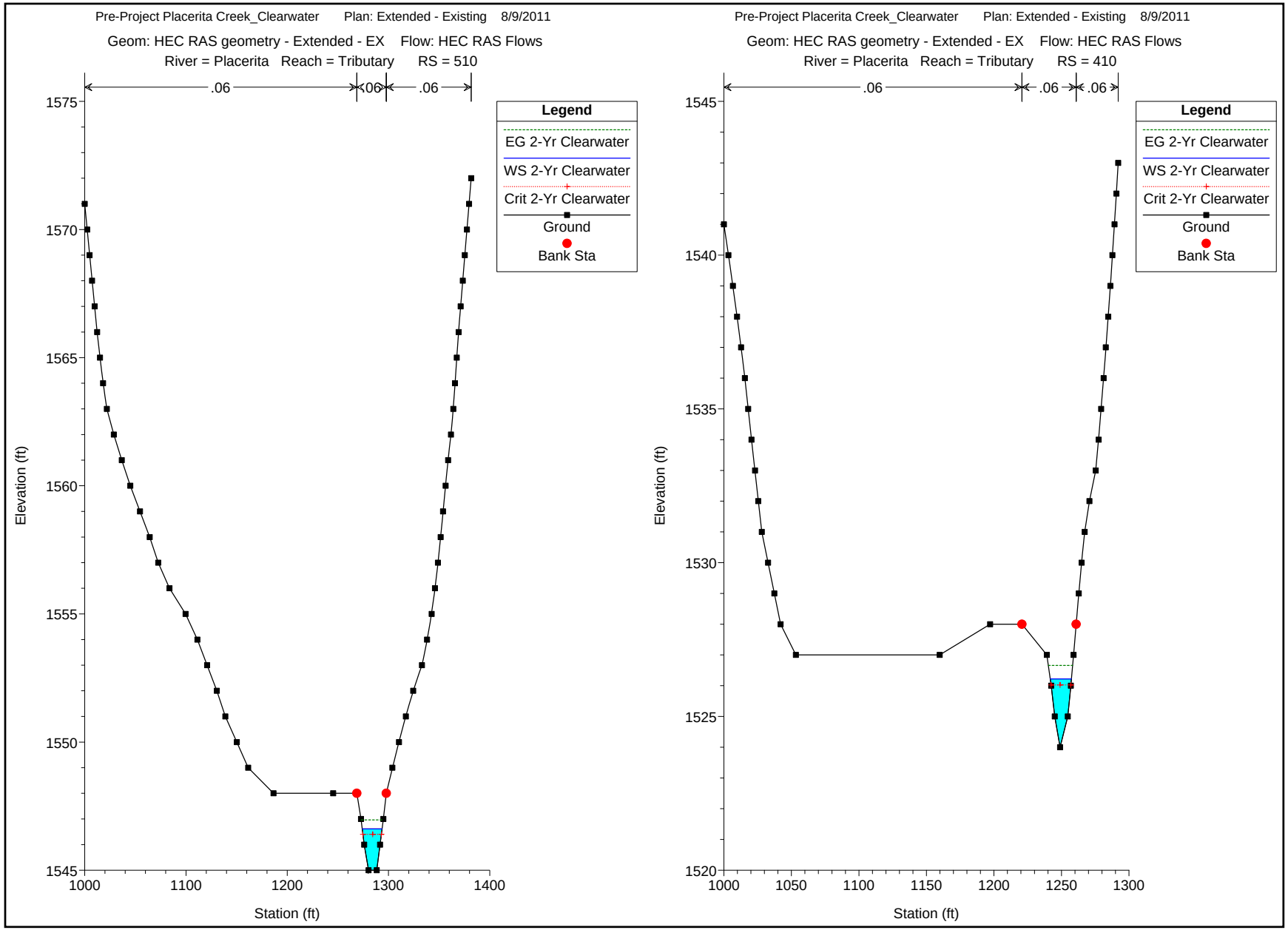
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Upper	1900	2-Yr Clearwater	377.20	1503.00	1506.95	1506.04	1507.32	0.012828	4.87	77.48	32.75	0.56
Upper	1800	2-Yr Clearwater	377.20	1497.00	1500.68		1501.17	0.017407	5.63	66.97	28.29	0.65
Upper	1700	2-Yr Clearwater	377.20	1489.00	1492.10	1491.27	1492.46	0.013497	4.79	78.76	35.79	0.57
Upper	1600	2-Yr Clearwater	377.20	1479.00	1481.23	1481.13	1481.92	0.039000	6.65	56.74	35.28	0.92
Upper	1500	2-Yr Clearwater	377.20	1474.00	1478.05	1476.62	1478.26	0.006776	3.67	102.71	41.51	0.41
Upper	1400	2-Yr Clearwater	377.20	1470.00	1472.69	1472.69	1473.53	0.046527	7.36	51.22	31.06	1.01
Tributary	510	2-Yr Clearwater	108.00	1545.00	1546.61	1546.40	1546.96	0.031381	4.76	22.67	19.59	0.78
Tributary	410	2-Yr Clearwater	108.00	1524.00	1526.22	1526.03	1526.66	0.034634	5.32	20.32	15.71	0.82
Tributary	310	2-Yr Clearwater	108.00	1503.00	1504.79	1504.54	1504.90	0.022310	2.64	40.85	67.39	0.60
Tributary	210	2-Yr Clearwater	108.00	1486.00	1487.33	1487.16	1487.66	0.034233	4.63	23.35	22.68	0.80
Tributary	110	2-Yr Clearwater	108.00	1479.00	1481.39		1481.56	0.010880	3.37	32.03	20.64	0.48
Tributary	10	2-Yr Clearwater	108.00	1471.00	1473.11	1473.11	1473.75	0.054876	6.45	16.75	13.29	1.01
Sound Stages	2527.261	2-Yr Clearwater	453.40	1432.00	1435.35	1434.96	1435.93	0.024904	6.11	74.22	36.75	0.76
Sound Stages	2268.881	2-Yr Clearwater	453.40	1425.00	1429.56	1428.75	1430.10	0.020492	5.89	76.98	33.67	0.69
Sound Stages	2007.81	2-Yr Clearwater	453.40	1422.00	1425.25	1424.44	1425.55	0.014571	4.44	102.05	55.32	0.58
Sound Stages	1841.249	2-Yr Clearwater	453.40	1419.00	1421.76		1422.28	0.027381	5.81	78.02	45.71	0.78
Sound Stages	1644.9	2-Yr Clearwater	453.40	1416.00	1419.08		1419.34	0.009090	4.10	110.68	46.61	0.47
Sound Stages	1526.451	2-Yr Clearwater	453.40	1414.00	1417.34		1417.86	0.017526	5.80	78.22	31.93	0.65
Sound Stages	1368.322	2-Yr Clearwater	453.40	1412.00	1415.15		1415.49	0.012424	4.65	97.41	43.77	0.55
Sound Stages	1258.328	2-Yr Clearwater	453.40	1410.00	1412.90	1412.57	1413.50	0.027889	6.23	72.75	38.67	0.80
Sound Stages	1052.822	2-Yr Clearwater	453.40	1405.12	1408.23		1408.51	0.020648	4.24	107.02	81.61	0.65
Sound Stages	865.4710	2-Yr Clearwater	453.40	1402.00	1404.73		1405.00	0.016941	4.22	107.35	70.88	0.60
Sound Stages	700.6461	2-Yr Clearwater	453.40	1398.00	1403.36	1401.07	1403.59	0.005091	3.90	116.29	32.68	0.36
Sound Stages	700		Culvert									
Sound Stages	9.076105	2-Yr Clearwater	453.40	1390.00	1395.07		1395.31	0.006187	3.91	116.01	39.06	0.40
Sound Stages	8	2-Yr Clearwater	453.40	1390.00	1394.74	1393.15	1395.01	0.007518	4.16	108.99	38.79	0.44
Sound Stages	7	2-Yr Clearwater	488.20	1388.00	1389.07	1389.07	1389.50	0.056090	5.28	92.46	108.19	1.01
Sound Stages	6	2-Yr Clearwater	488.20	1378.00	1383.04	1382.58	1383.13	0.004683	3.16	272.52	363.40	0.34
Sound Stages	5	2-Yr Clearwater	488.20	1376.00	1377.71	1377.71	1378.47	0.046313	6.99	70.49	47.53	1.00
Sound Stages	4	2-Yr Clearwater	488.20	1362.00	1366.39	1365.03	1366.75	0.009698	4.84	100.87	34.28	0.50
Sound Stages	3	2-Yr Clearwater	501.00	1356.00	1359.48		1359.84	0.010466	4.83	103.67	37.88	0.51
Sound Stages	2	2-Yr Clearwater	501.00	1348.00	1350.90	1349.88	1351.12	0.010203	3.77	132.95	71.37	0.49
Lower	1300	2-Yr Clearwater	446.40	1468.00	1470.54	1469.82	1470.76	0.010725	3.76	118.73	65.83	0.49
Lower	1250	2-Yr Clearwater	446.40	1463.00	1466.13	1465.52	1466.59	0.018860	5.46	81.76	39.41	0.67
Lower	1200	2-Yr Clearwater	446.40	1459.00	1462.24		1462.54	0.011536	4.46	100.19	45.52	0.53
Lower	1150	2-Yr Clearwater	446.40	1453.00	1456.87		1457.22	0.010943	4.73	94.37	37.16	0.52
Lower	1100	2-Yr Clearwater	446.40	1447.00	1449.77		1450.23	0.017933	5.48	81.46	37.44	0.65
Lower	1050	2-Yr Clearwater	446.40	1443.00	1446.34		1446.66	0.012116	4.54	98.39	45.09	0.54
Lower	1000	2-Yr Clearwater	446.40	1439.00	1443.25	1442.09	1443.66	0.011104	5.10	87.61	30.27	0.53

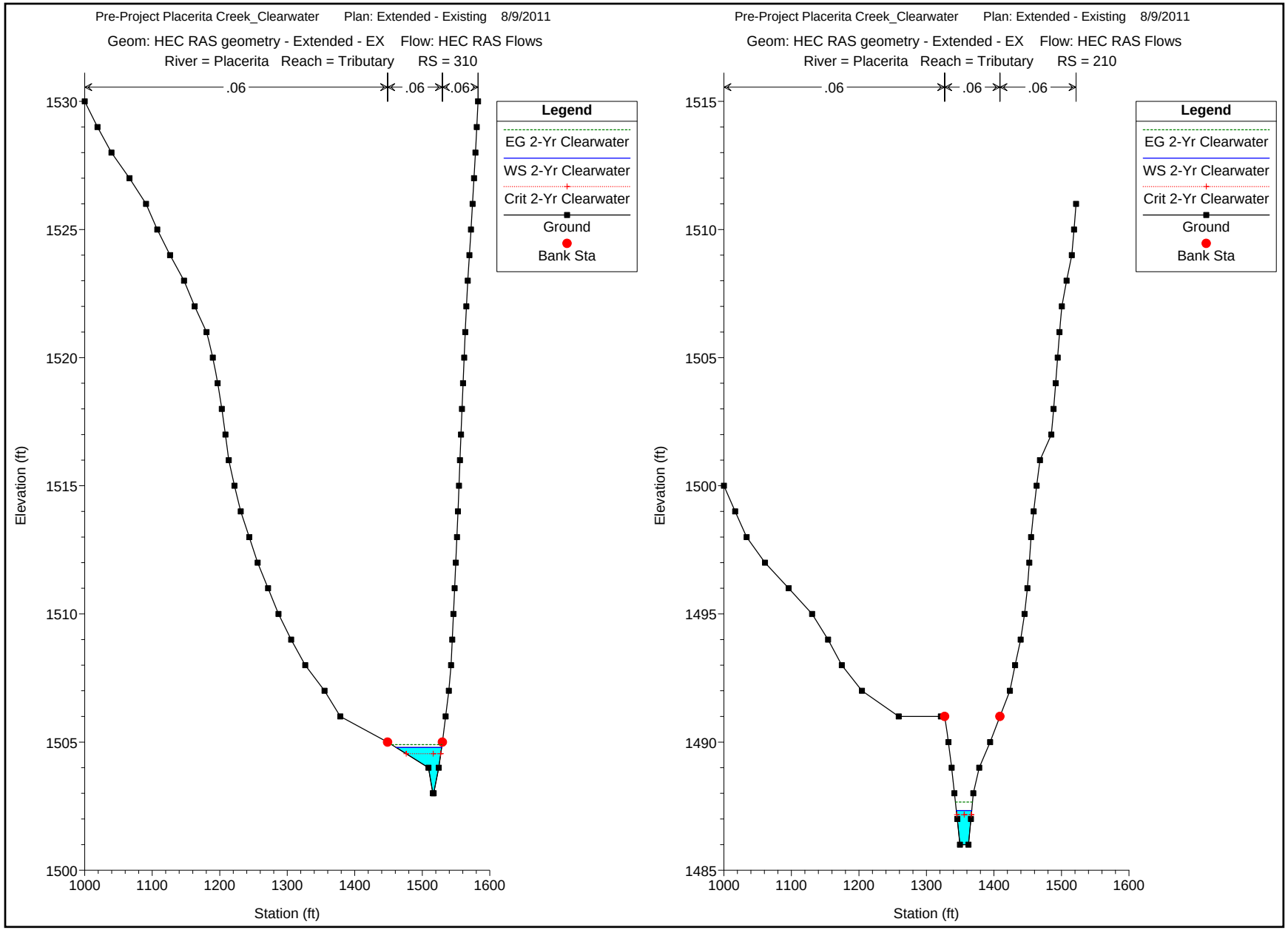

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1900
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1540
1535
1530
1525
1520
1515
1510
1505
1500
1000
1100
1200
1300
1400
1500
1600
Station (ft)

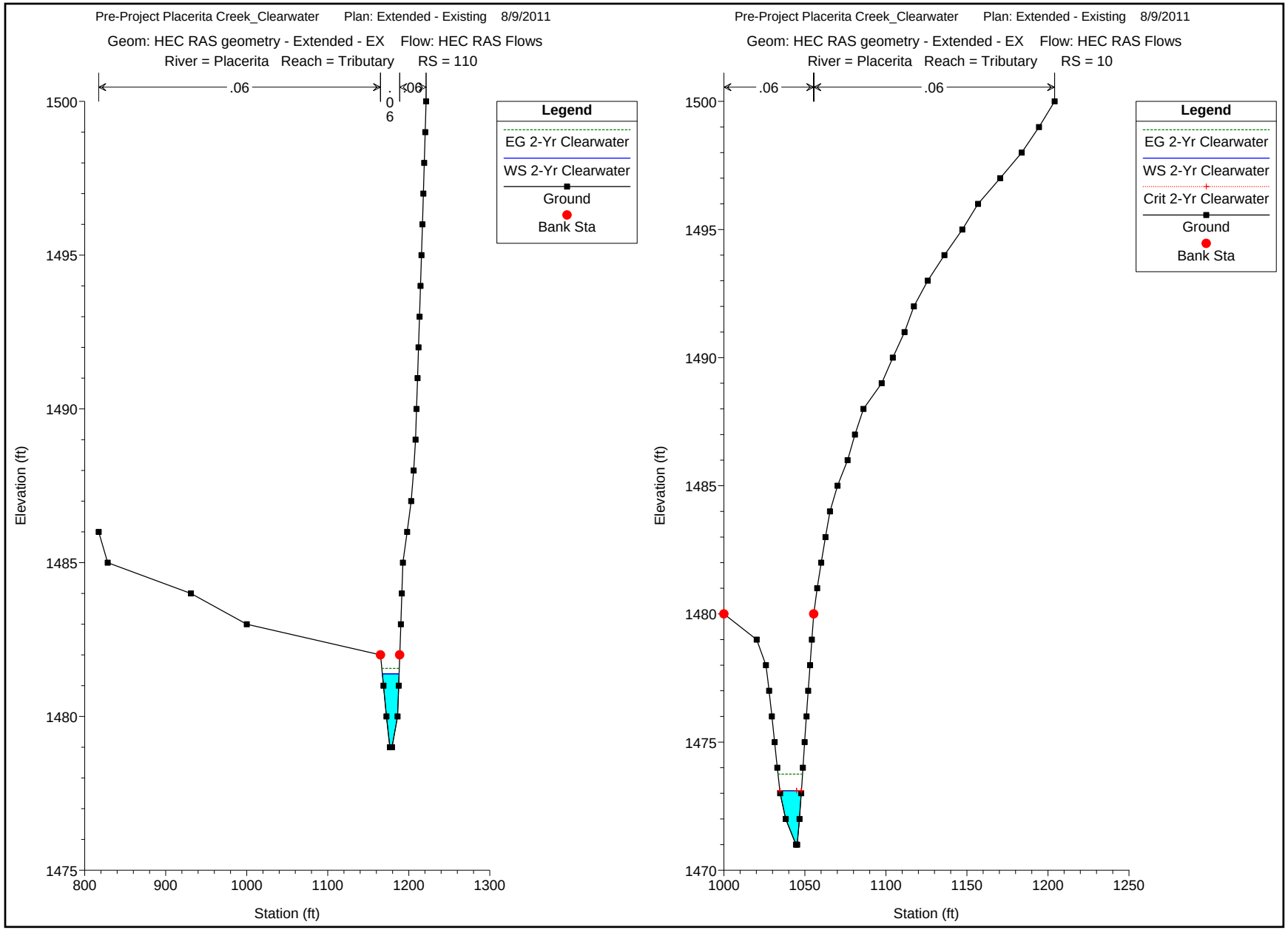

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1800
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1550
1540
1530
1520
1510
1500
1490
1000
1100
1200
1300
1400
1500
1600
Station (ft)

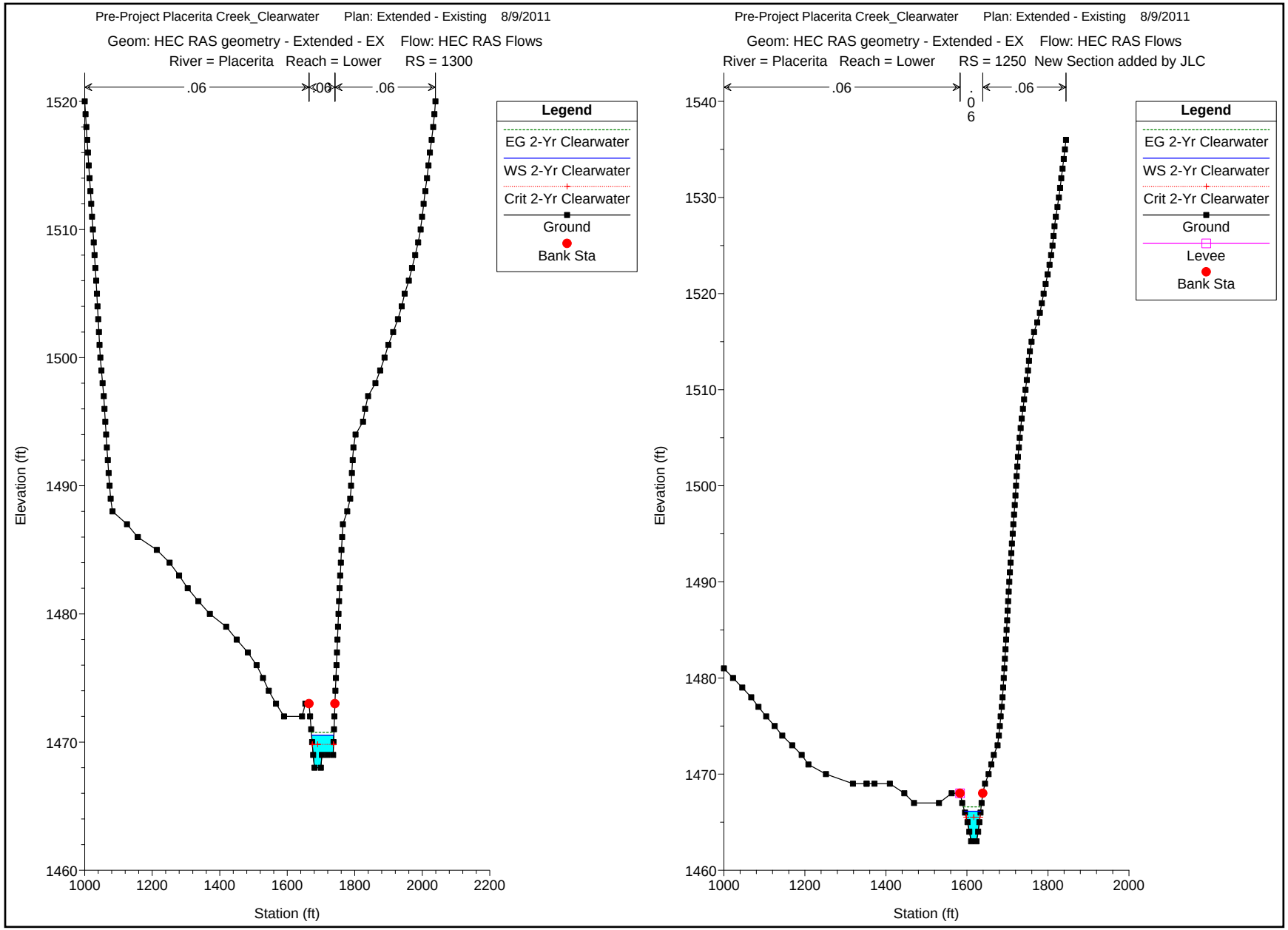

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1700
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1600
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

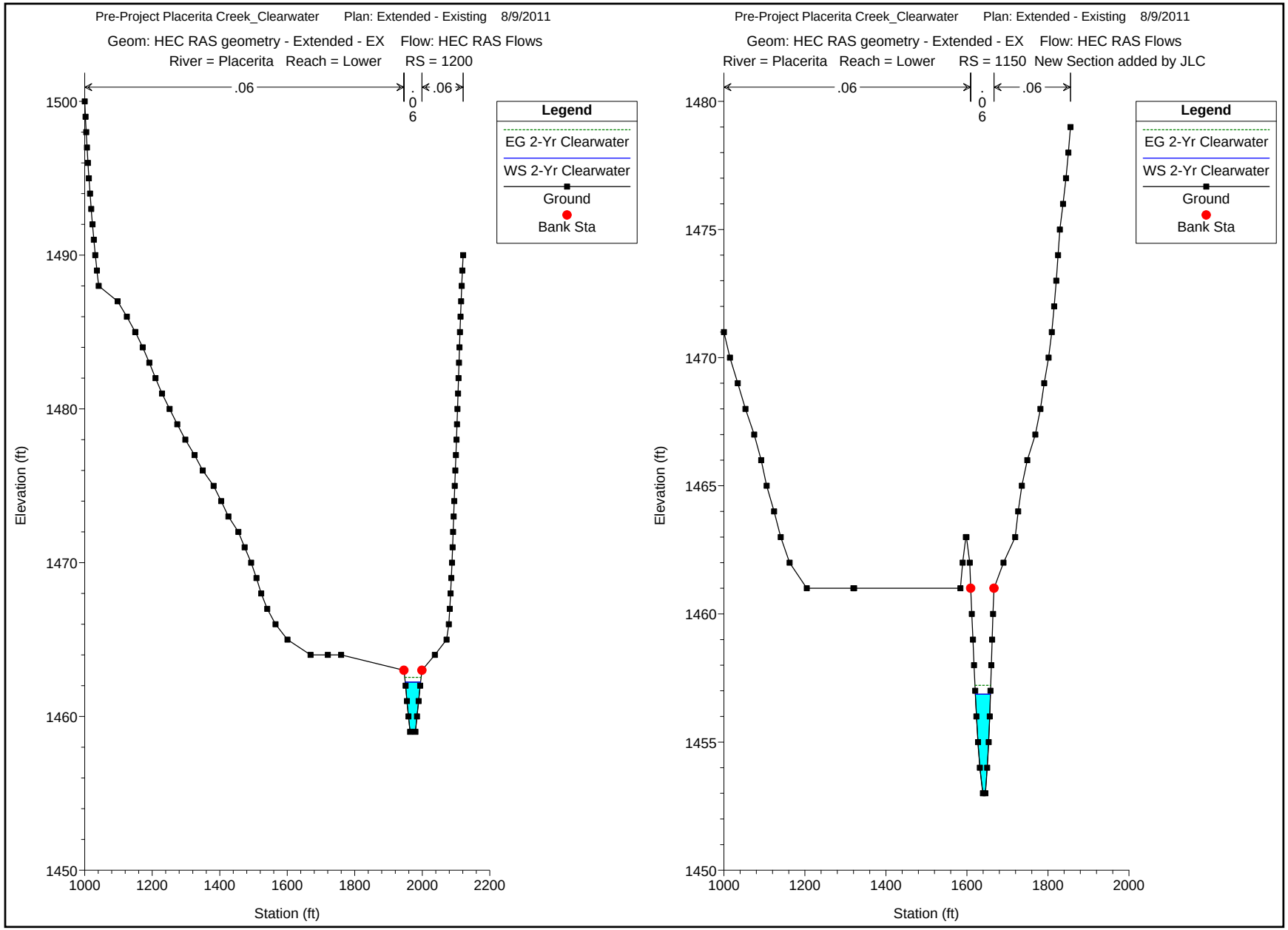

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1500
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1200
1400
1600
1800
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1400 D/S of Upper Reach
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1200
1400
1600
1800

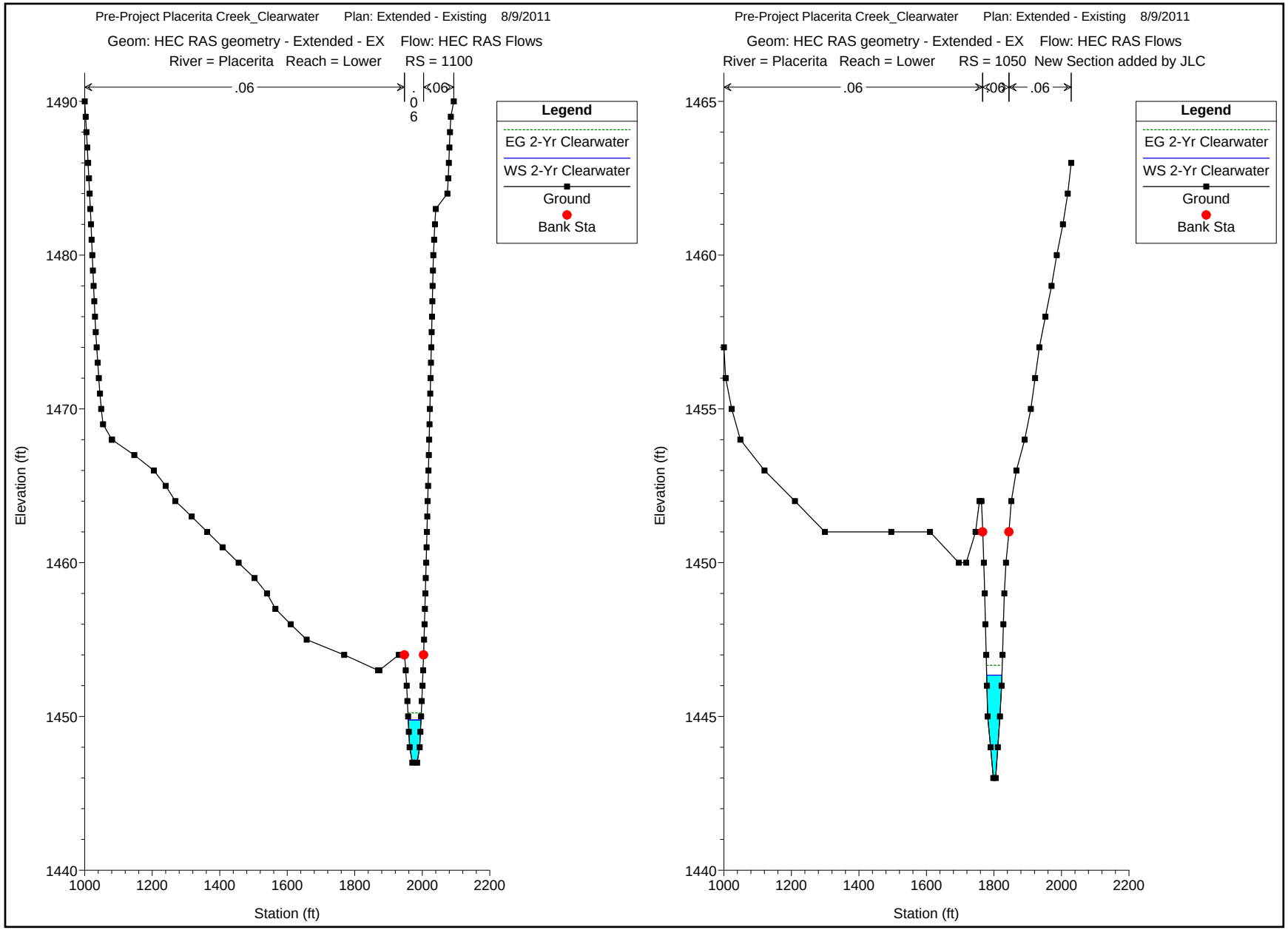

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 510
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1575
1570
1565
1560
1555
1550
1545
1000
1100
1200
1300
1400
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 410
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1545
1540
1535
1530
1525
1520
1000
1050
1100
1150
1200
1250
1300

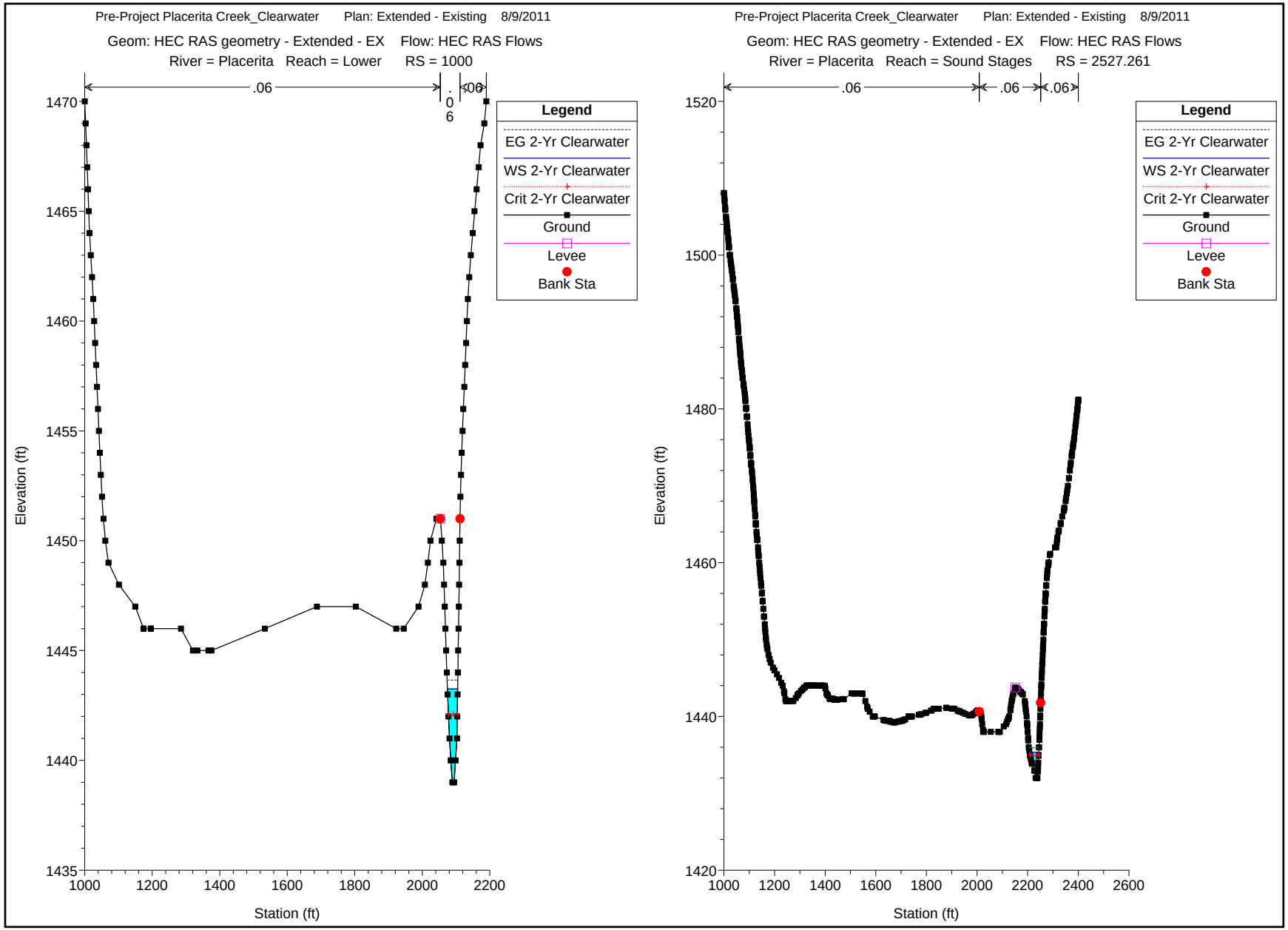

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 310
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1530
1525
1520
1515
1510
1505
1500
1000
1100
1200
1300
1400
1500
1600
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 210
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1515
1510
1505
1500
1495
1490
1485
1000
1100
1200
1300
1400
1500
1600
Station (ft)

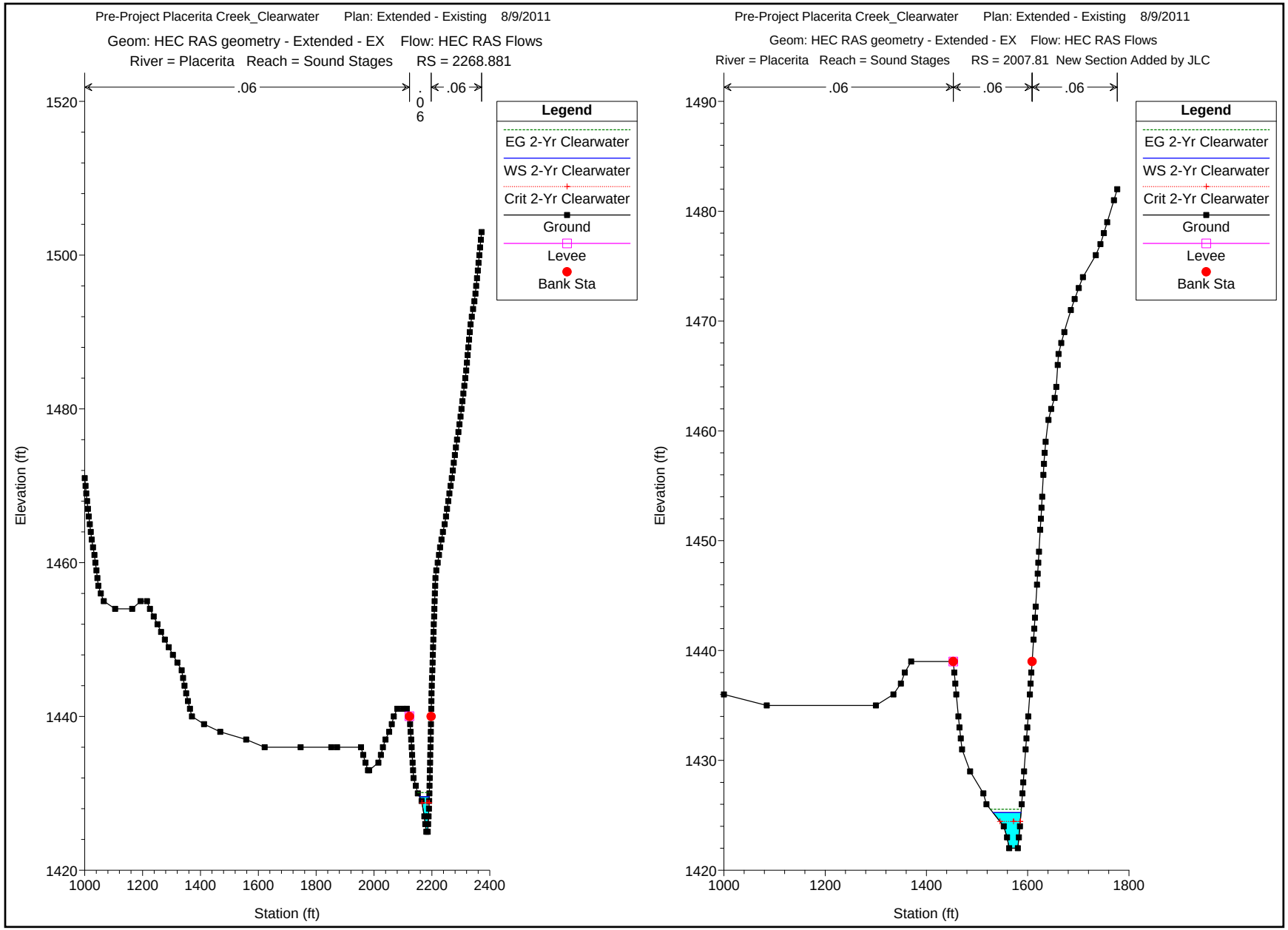

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 110
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
800
900
1000
1100
1200
1300
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 10
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1050
1100
1150
1200
1250

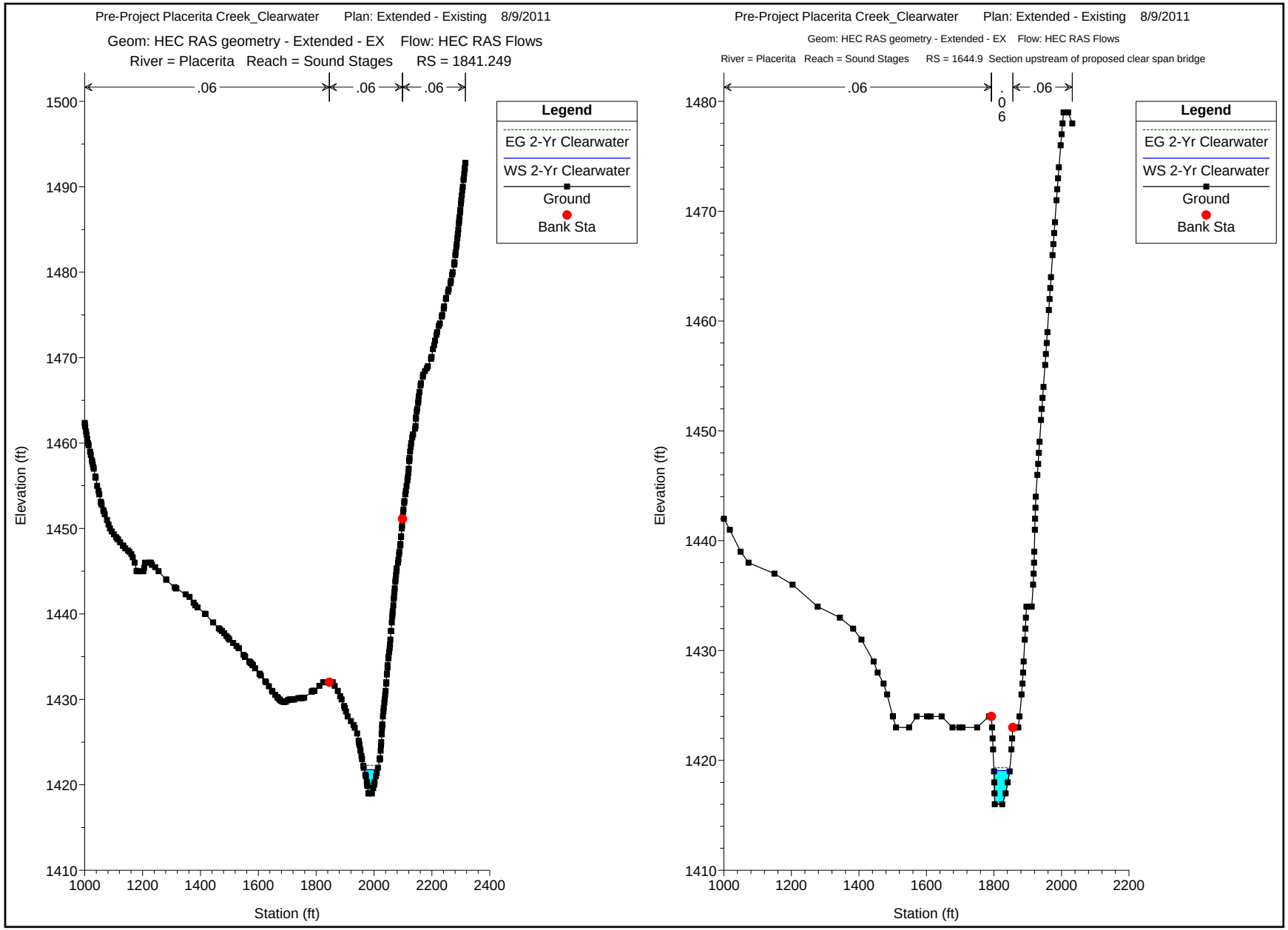

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1300
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1250 New Section added by JLC
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

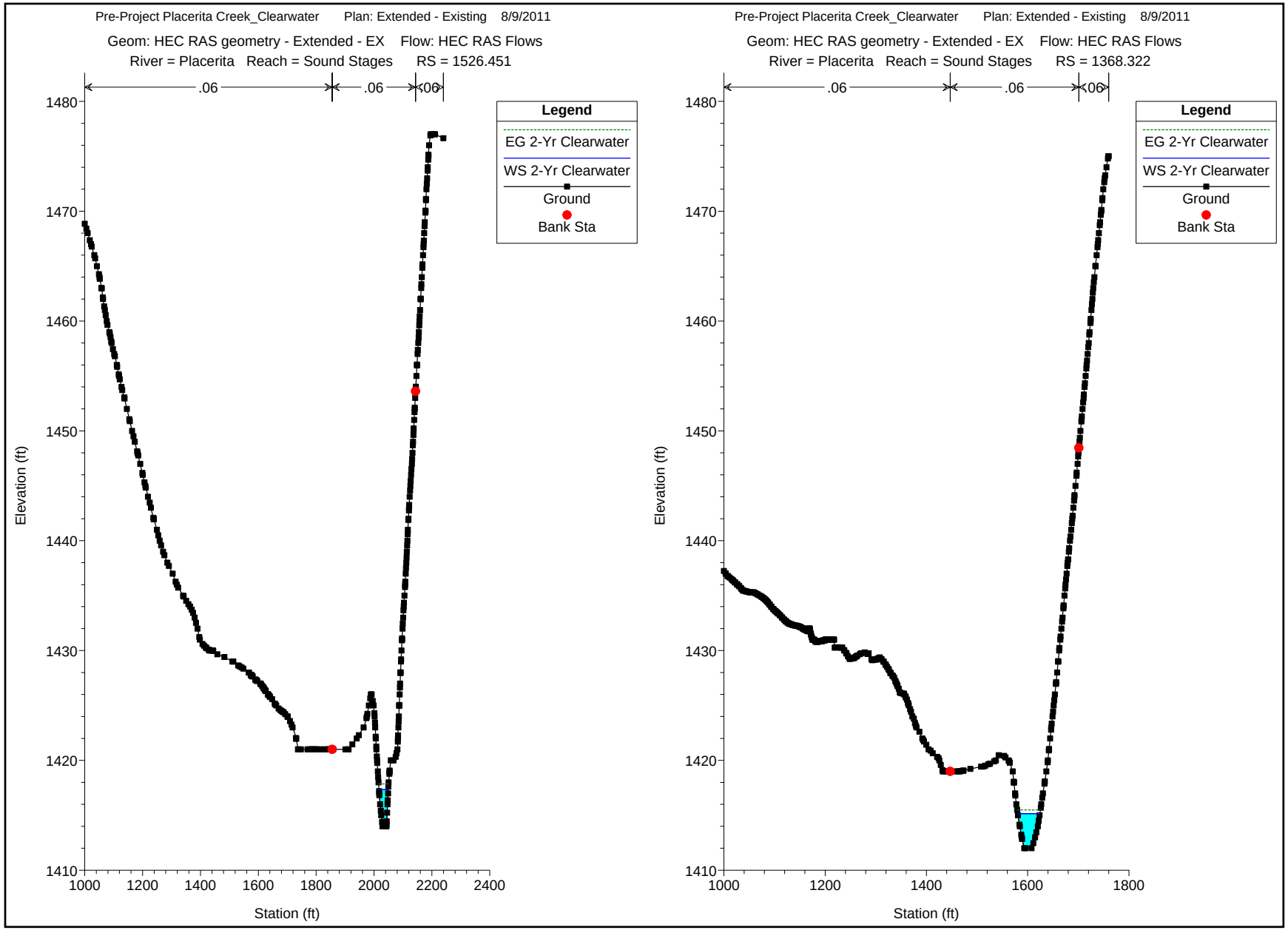

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1200
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1150 New Section added by JLC
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

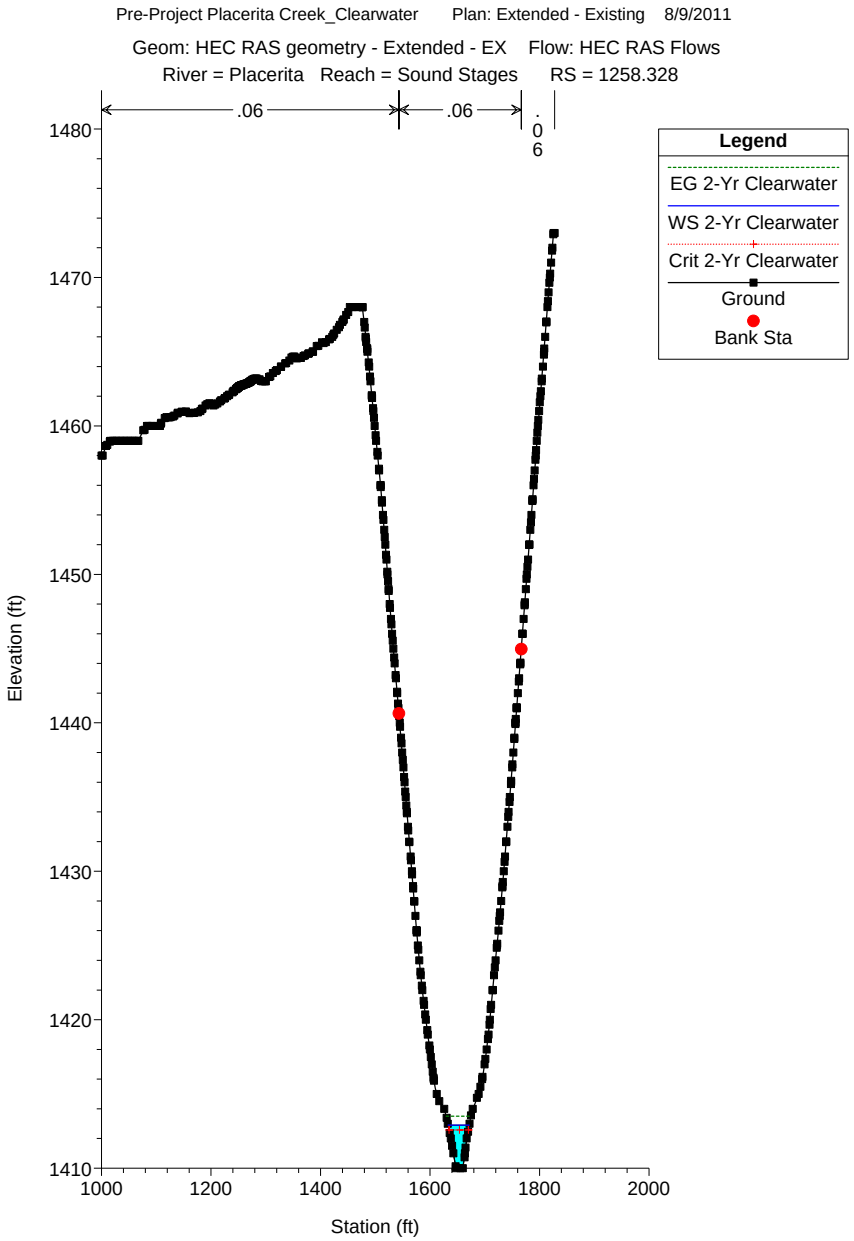

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1100
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1490
1480
1470
1460
1450
1440
1000
1200
1400
1600
1800
2000
2200
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1050 New Section added by JLC
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1465
1460
1455
1450
1445
1440
1000
1200
1400
1600
1800
2000
2200

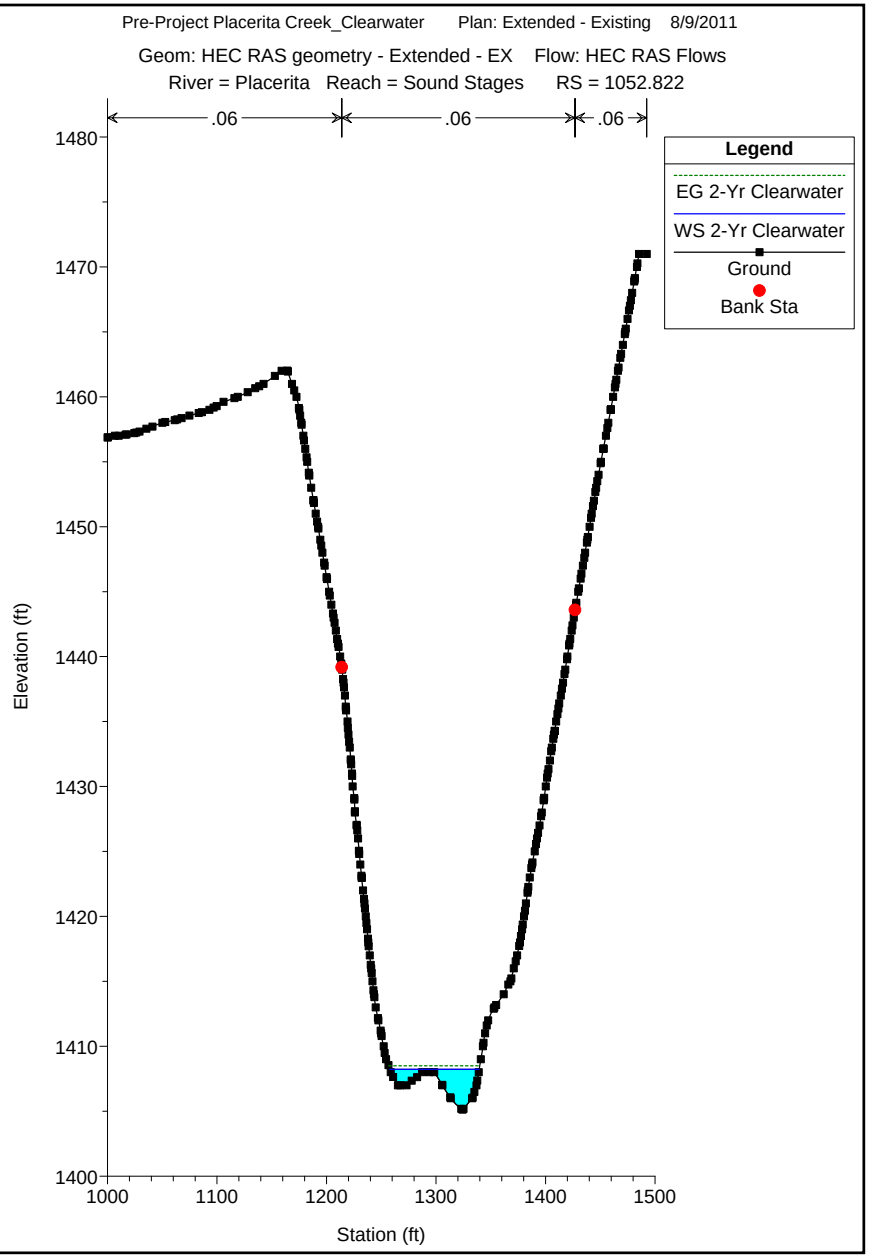

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1000
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2527.261
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

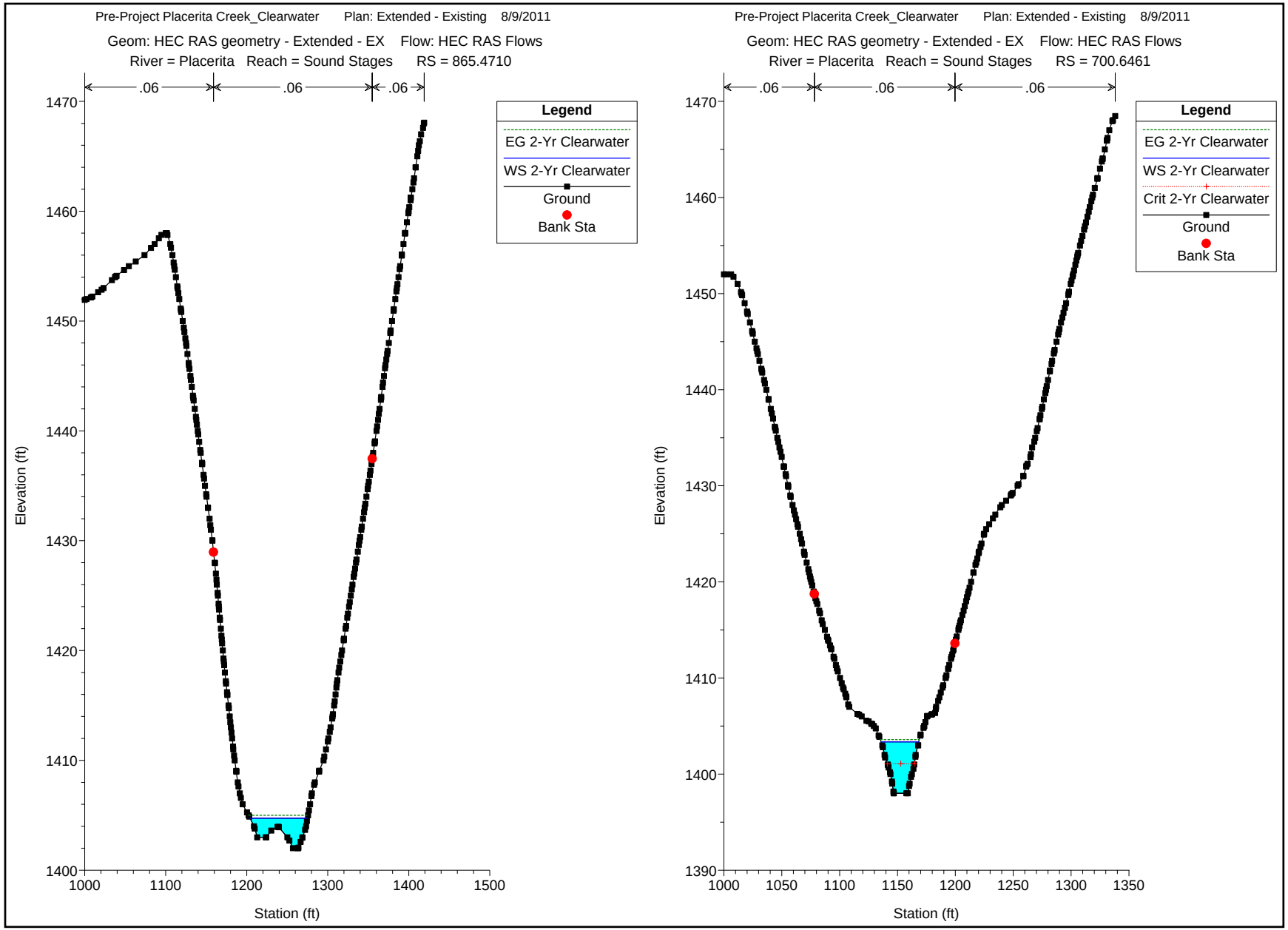

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2268.881
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2007.81 New Section Added by JLC
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

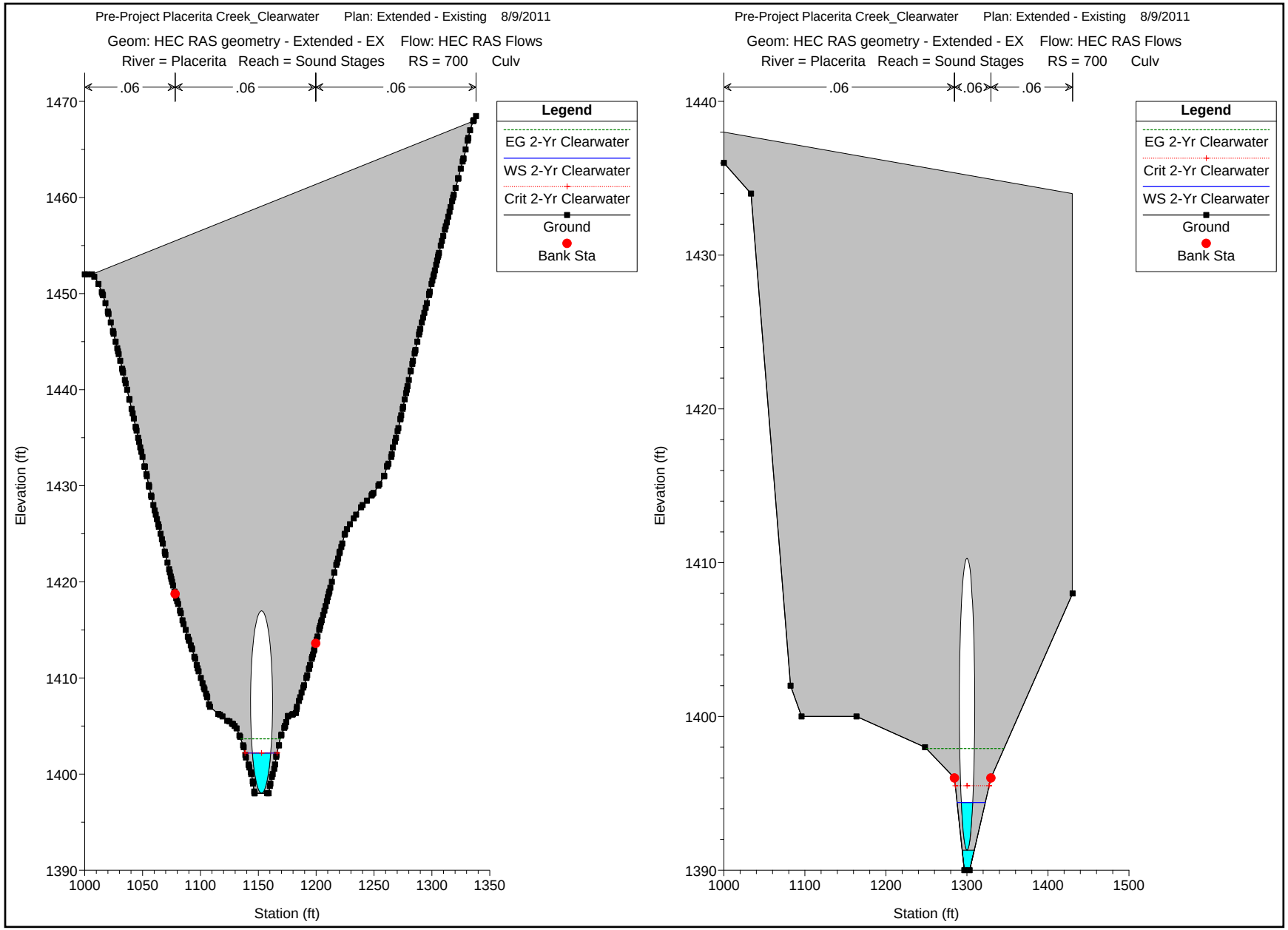

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1841.249
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1644.9 Section upstream of proposed clear span bridge
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)


Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1526.451
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1368.322
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)


Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1258.328
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1480
1470
1460
1450
1440
1430
1420
1410
1000
1200
1400
1600
1800
2000


Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1052.822
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1480
1470
1460
1450
1440
1430
1420
1410
1400
1000
1100
1200
1300
1400
1500


Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 865.4710
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700.6461
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)


Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700 Culv
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1470
1460
1450
1440
1430
1420
1410
1400
1390
1000
1050
1100
1150
1200
1250
1300
1350
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700 Culv
.06
.06
.06
Legend
EG 2-Yr Clearwater
Crit 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1440
1430
1420
1410
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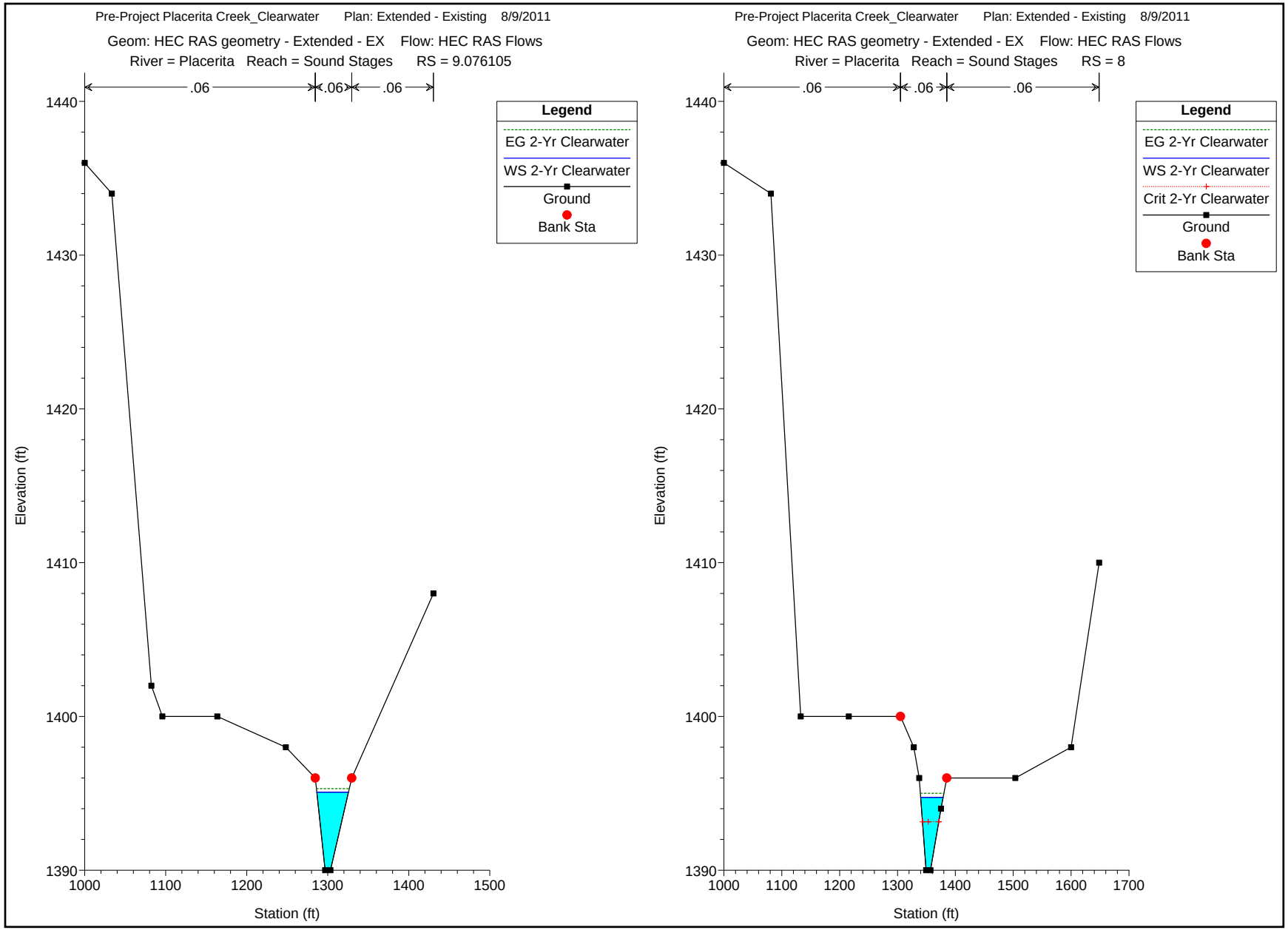
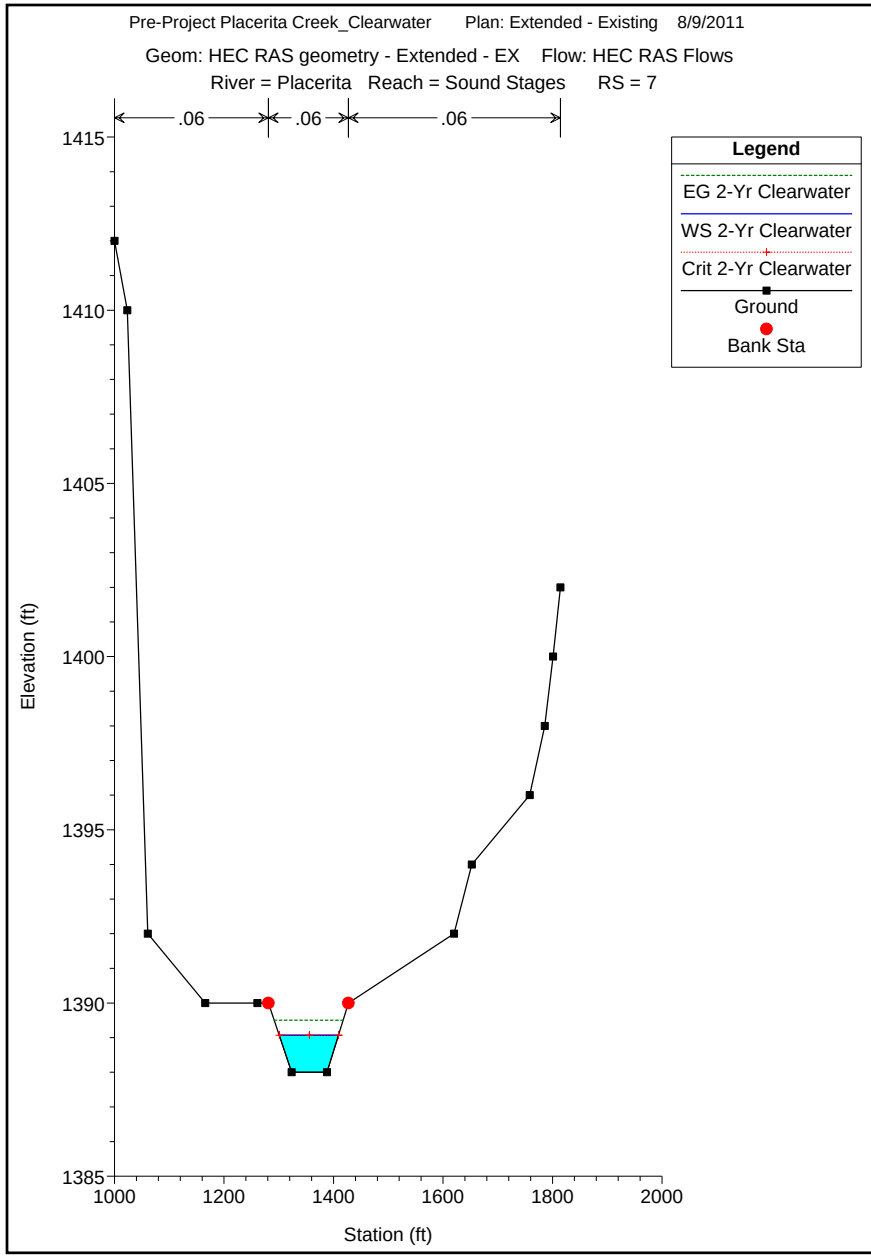
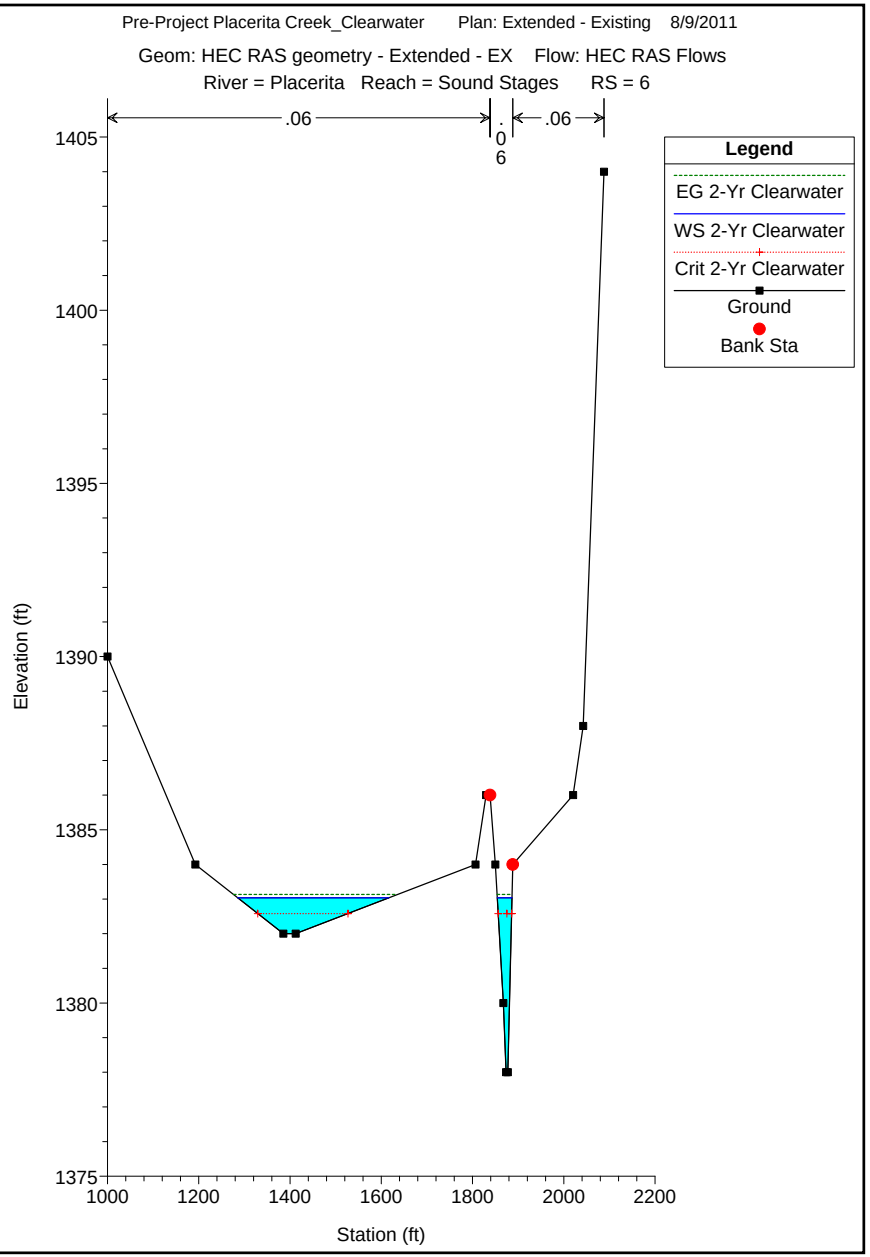
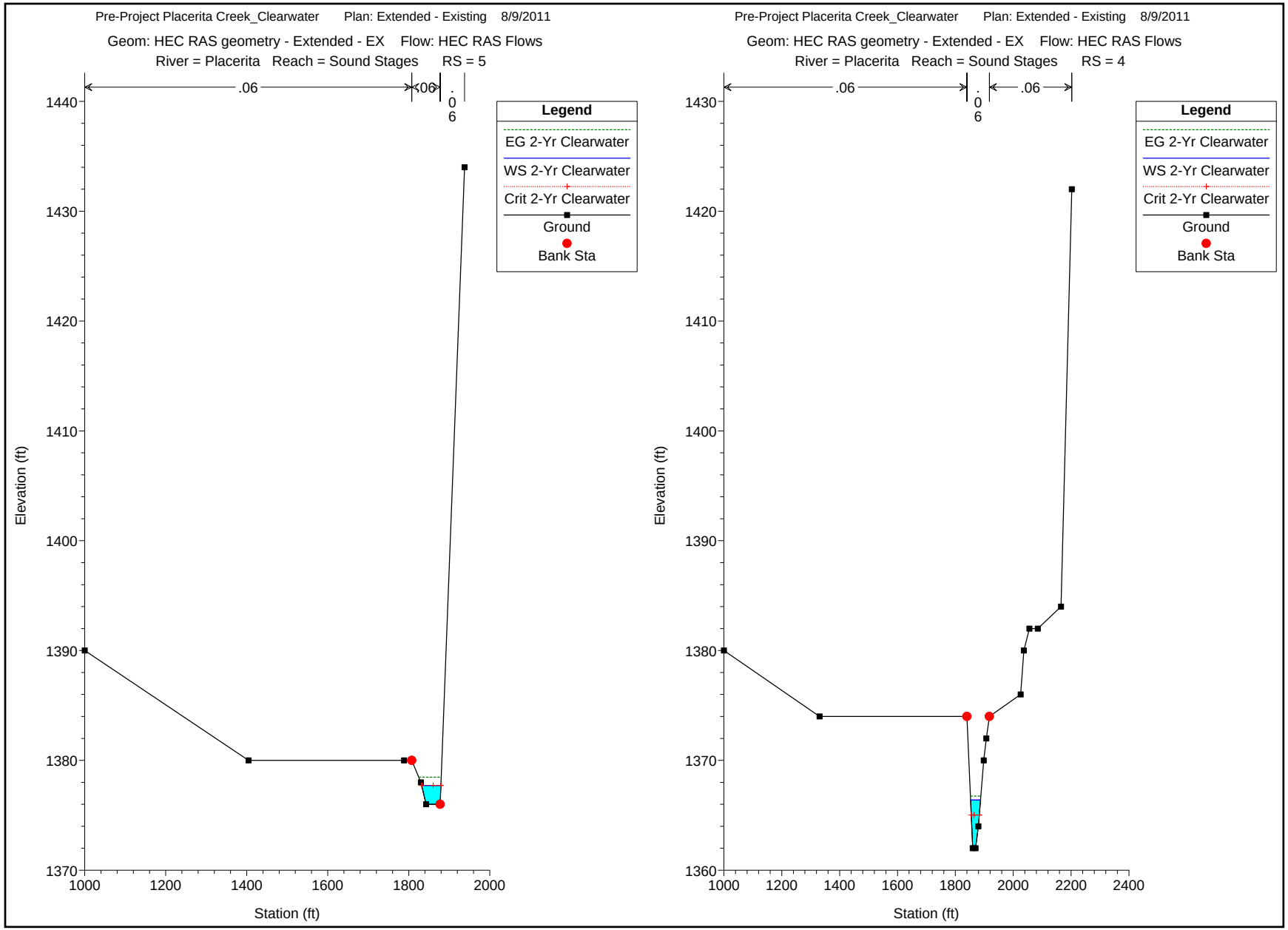
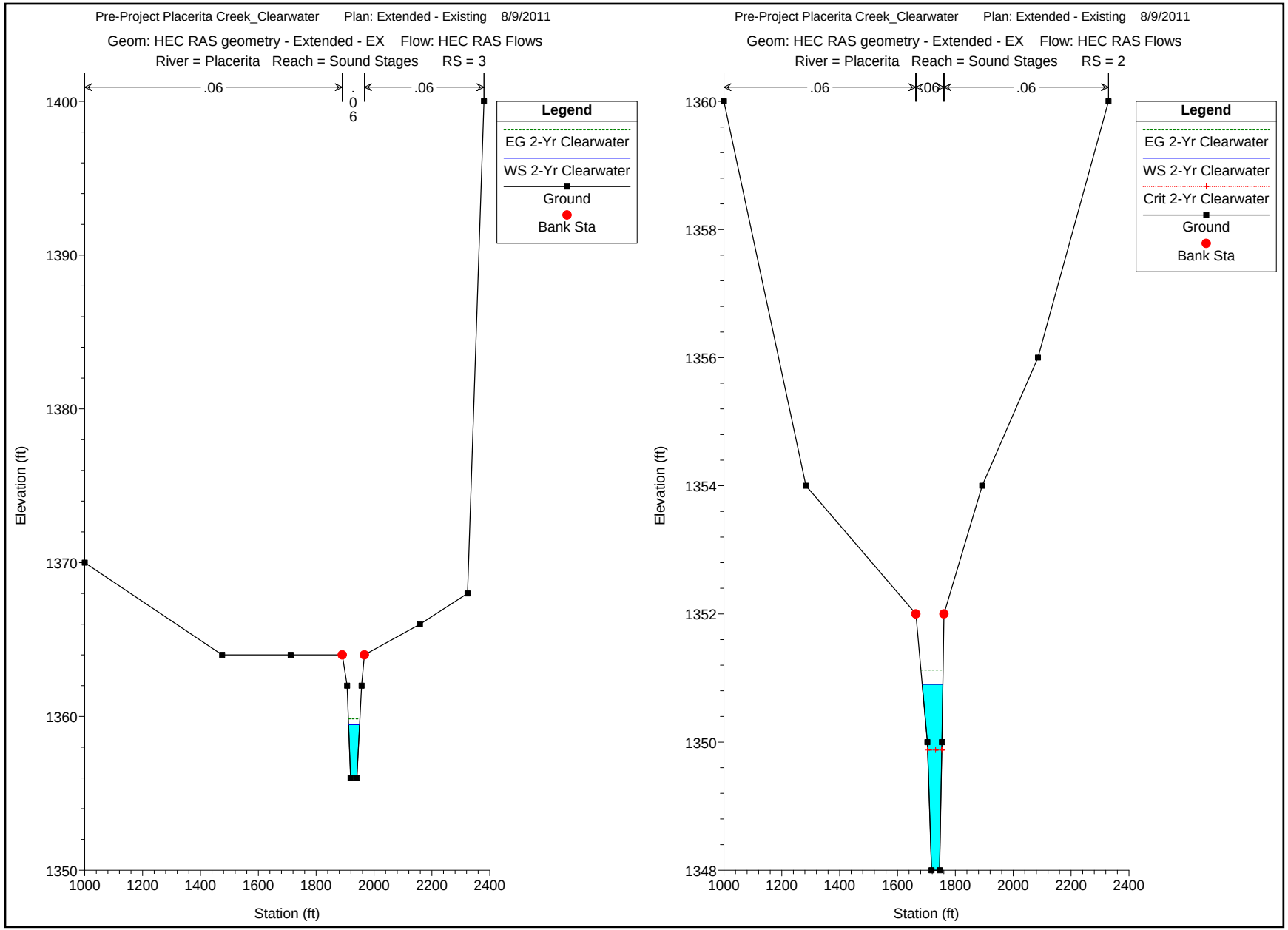
1000
1100
1200
1300
1400
1500


Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 9.076105
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 8
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500
1600
1700
Station (ft)


Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 7
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1415
1410
1405
1400
1395
1390
1385
1000
1200
1400
1600
1800
2000
Station (ft)


Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 6
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1405
1400
1395
1390
1385
1380
1375
1000
1200
1400
1600
1800
2000
2200
Station (ft)

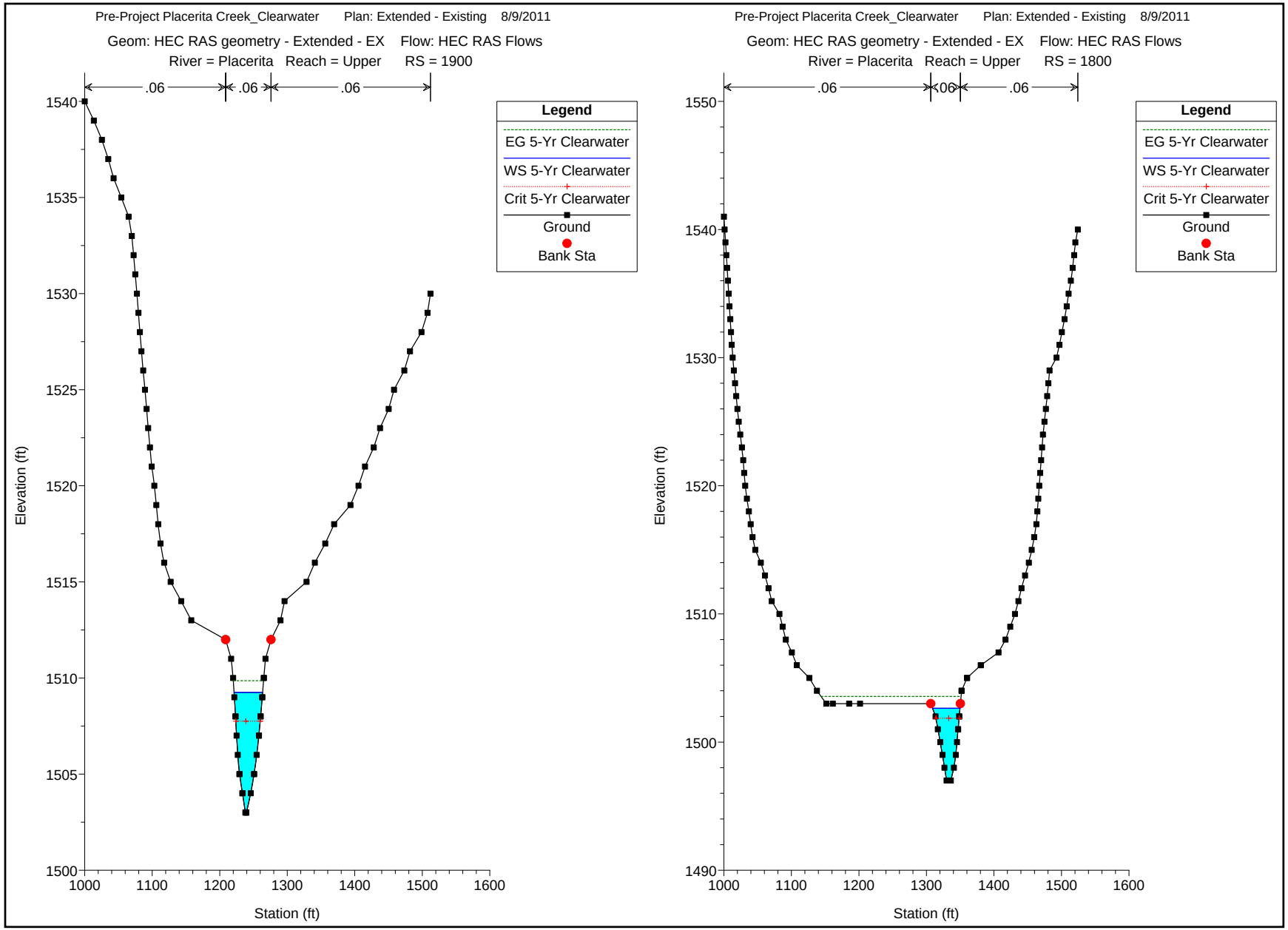

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 5
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 4
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

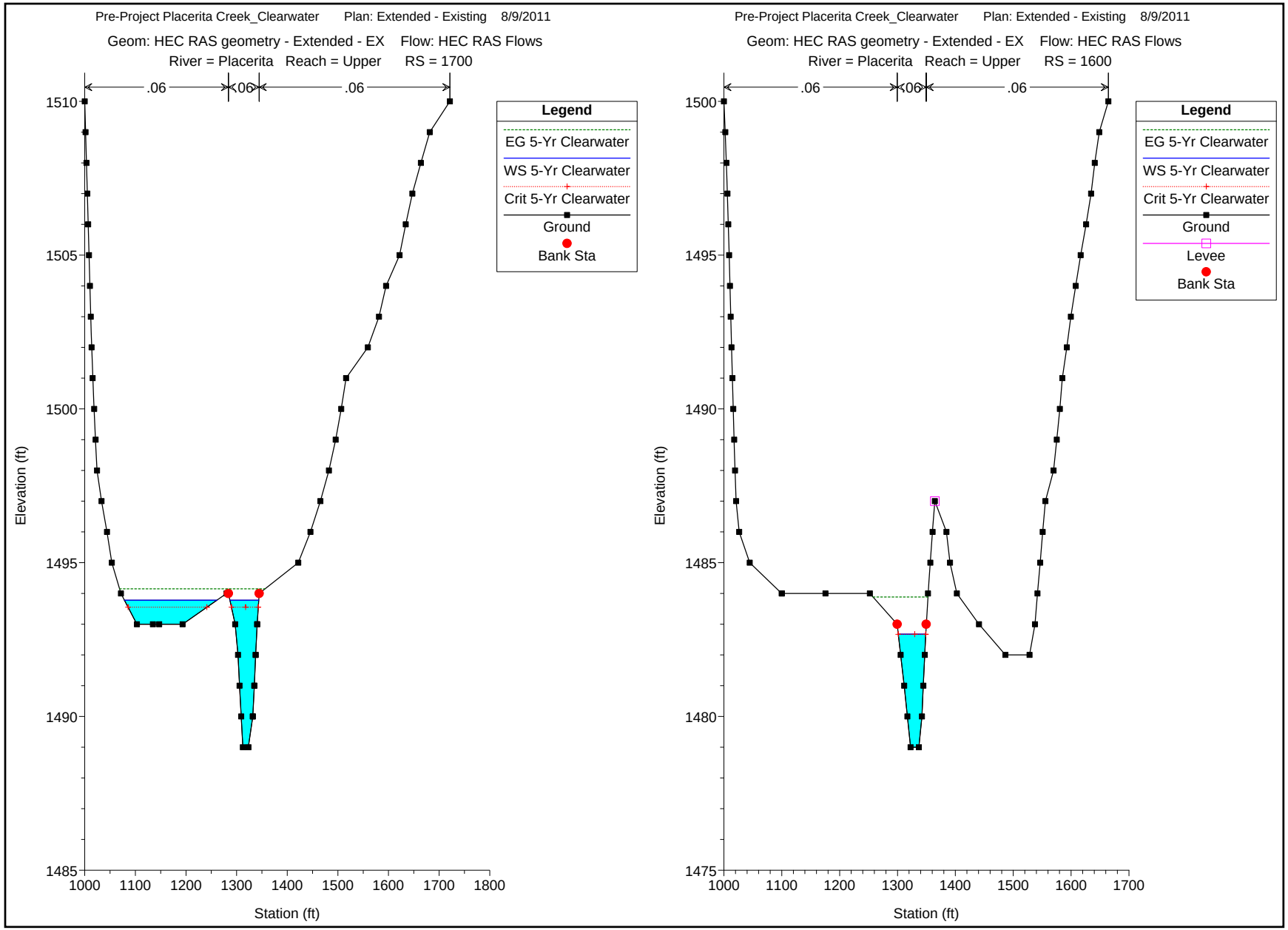

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 3
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

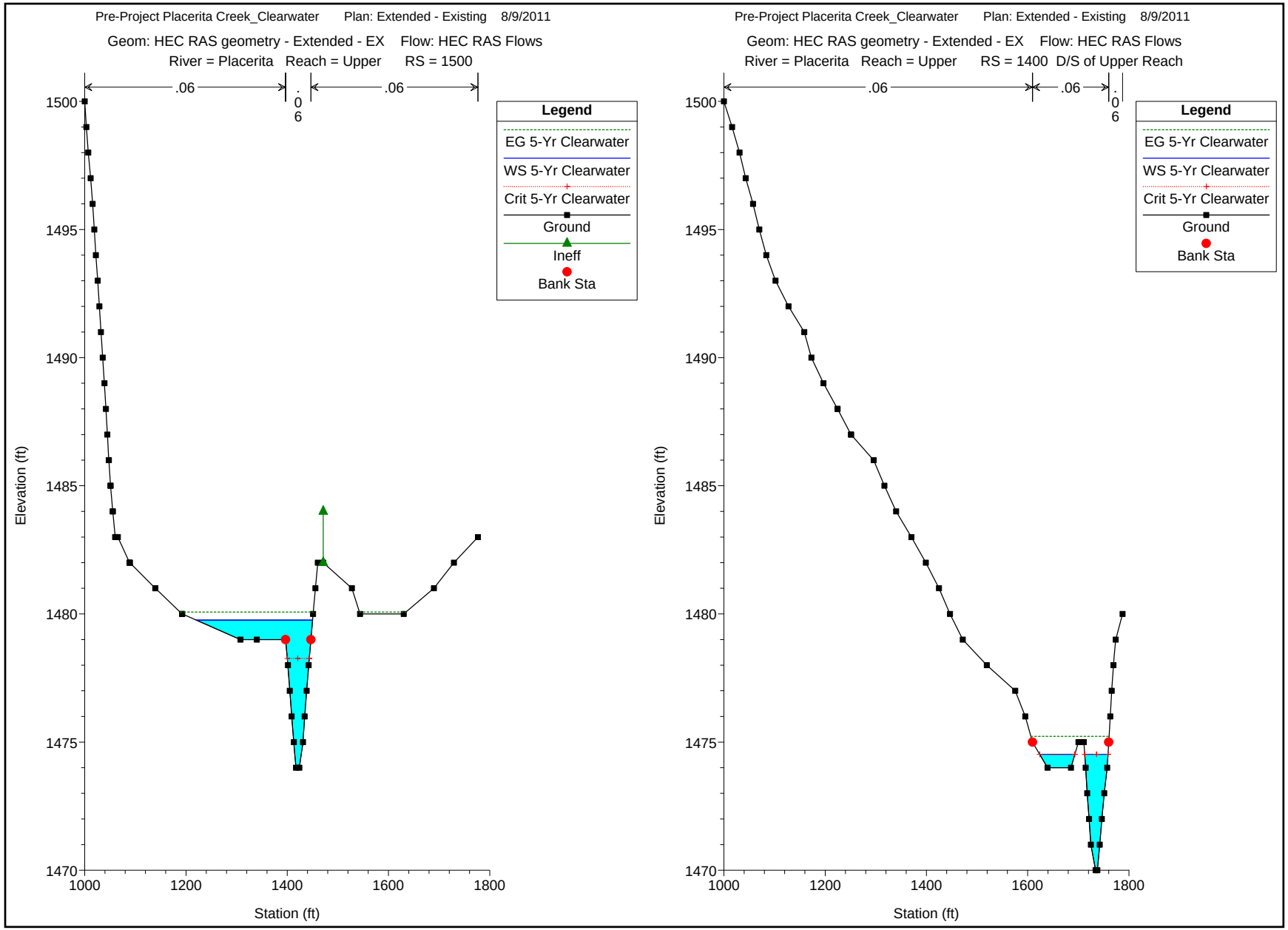
5-Year Storm Event – Pre Project Condition HEC-RAS Output

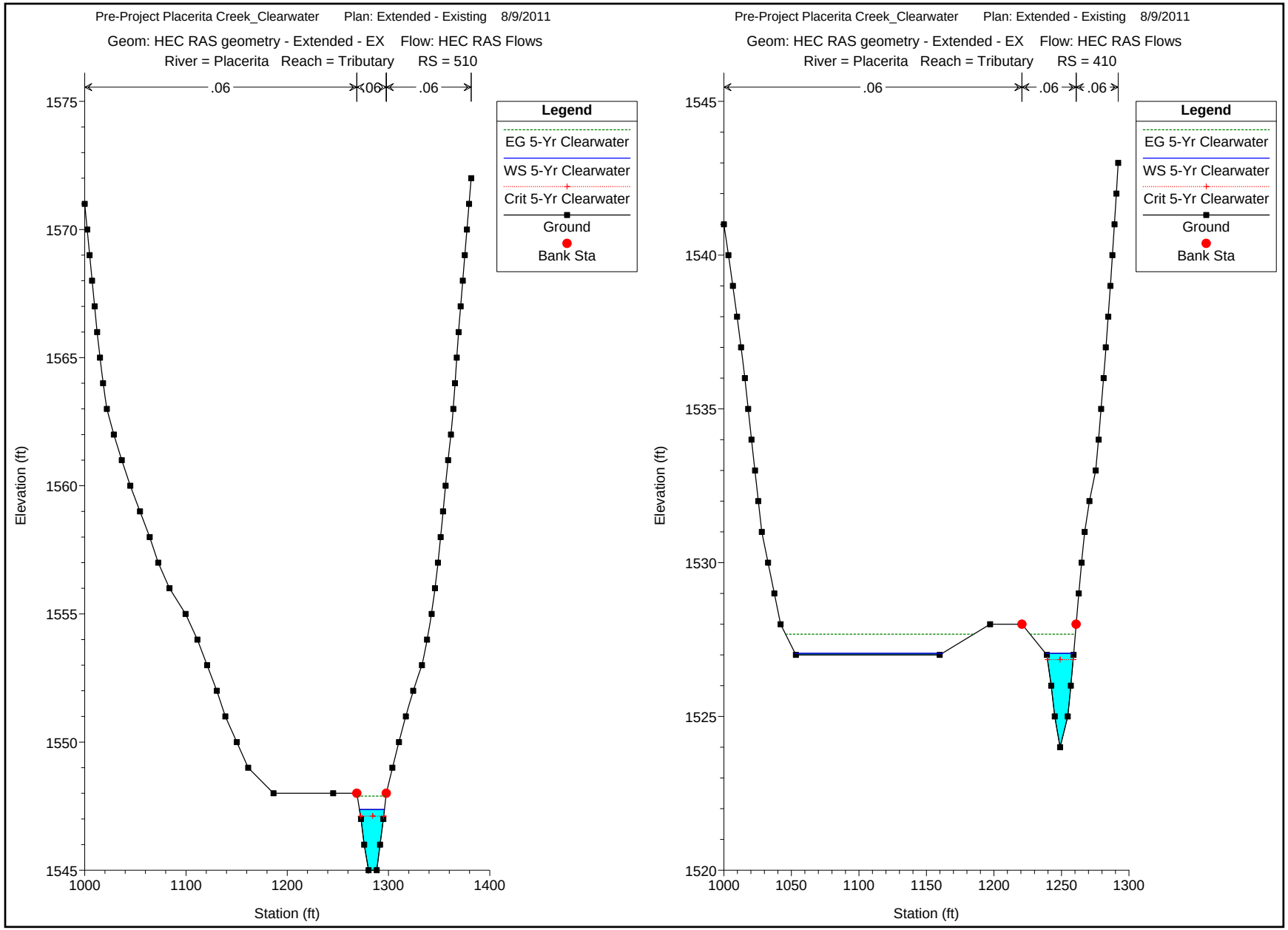
HEC-RAS Plan: EX_Extended Profile: 5-Yr Clearwater

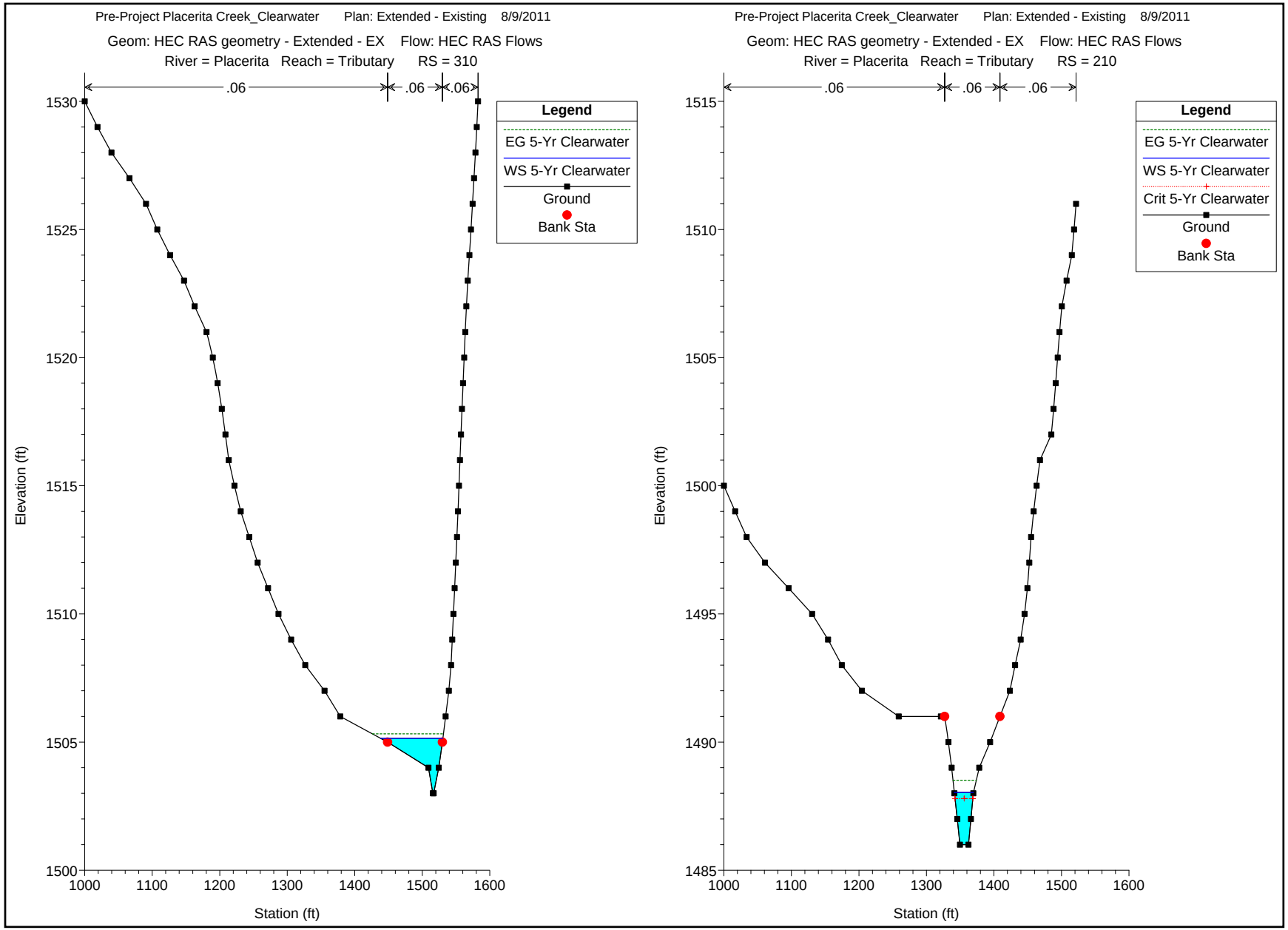
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Upper	1900	5-Yr Clearwater	1029.10	1503.00	1509.25	1507.76	1509.86	0.011310	6.27	164.05	42.40	0.56
Upper	1800	5-Yr Clearwater	1029.10	1497.00	1502.64	1501.86	1503.56	0.021400	7.73	133.21	40.71	0.75
Upper	1700	5-Yr Clearwater	1029.10	1489.00	1493.78	1493.55	1494.15	0.012764	5.35	260.15	239.63	0.57
Upper	1600	5-Yr Clearwater	1029.10	1479.00	1482.68	1482.67	1483.89	0.039361	8.83	116.58	47.49	0.99
Upper	1500	5-Yr Clearwater	1029.10	1474.00	1479.76	1478.26	1480.07	0.006827	4.81	285.99	229.58	0.44
Upper	1400	5-Yr Clearwater	1029.10	1470.00	1474.52	1474.52	1475.23	0.051184	6.72	153.18	115.57	1.03
Tributary	510	5-Yr Clearwater	228.80	1545.00	1547.37	1547.11	1547.89	0.030597	5.81	39.36	24.65	0.81
Tributary	410	5-Yr Clearwater	228.80	1524.00	1527.05	1526.85	1527.68	0.035255	6.38	40.97	130.07	0.87
Tributary	310	5-Yr Clearwater	228.80	1503.00	1505.15		1505.32	0.023039	3.34	69.08	92.18	0.64
Tributary	210	5-Yr Clearwater	228.80	1486.00	1488.03	1487.80	1488.51	0.031143	5.54	41.32	28.46	0.81
Tributary	110	5-Yr Clearwater	228.80	1479.00	1482.28		1482.56	0.011019	4.28	59.08	70.95	0.51
Tributary	10	5-Yr Clearwater	228.80	1471.00	1473.97	1473.97	1474.92	0.049266	7.82	29.27	15.67	1.01
Sound Stages	2527.261	5-Yr Clearwater	1244.80	1432.00	1437.26	1436.68	1438.29	0.022206	8.12	153.35	44.74	0.77
Sound Stages	2268.881	5-Yr Clearwater	1244.80	1425.00	1431.51	1430.87	1432.43	0.022922	7.69	161.96	51.76	0.77
Sound Stages	2007.81	5-Yr Clearwater	1244.80	1422.00	1426.78	1425.99	1427.35	0.016068	6.04	205.98	75.59	0.65
Sound Stages	1841.249	5-Yr Clearwater	1244.80	1419.00	1423.55		1424.29	0.020883	6.92	179.78	65.97	0.74
Sound Stages	1644.9	5-Yr Clearwater	1244.80	1416.00	1421.41		1421.87	0.007728	5.41	230.20	55.79	0.47
Sound Stages	1526.451	5-Yr Clearwater	1244.80	1414.00	1419.45		1420.42	0.019892	7.93	156.90	43.72	0.74
Sound Stages	1368.322	5-Yr Clearwater	1244.80	1412.00	1416.93		1417.64	0.014888	6.73	185.07	54.43	0.64
Sound Stages	1258.328	5-Yr Clearwater	1244.80	1410.00	1415.09	1414.39	1415.73	0.020051	6.40	194.35	77.79	0.71
Sound Stages	1052.822	5-Yr Clearwater	1244.80	1405.12	1408.85	1408.85	1409.80	0.044534	7.84	158.80	85.44	1.01
Sound Stages	865.4710	5-Yr Clearwater	1244.80	1402.00	1408.02	1405.37	1408.18	0.002700	3.23	385.34	95.18	0.28
Sound Stages	700.6461	5-Yr Clearwater	1244.80	1398.00	1407.44	1403.34	1407.66	0.003628	3.78	329.42	77.70	0.32
Sound Stages	700		Culvert									
Sound Stages	9.076105	5-Yr Clearwater	1244.80	1390.00	1396.92		1397.52	0.009523	6.26	207.43	69.31	0.53
Sound Stages	8	5-Yr Clearwater	1244.80	1390.00	1396.57	1395.17	1397.06	0.010070	5.89	265.83	196.06	0.53
Sound Stages	7	5-Yr Clearwater	1340.40	1388.00	1389.92	1389.92	1390.62	0.048025	6.76	198.33	142.63	1.01
Sound Stages	6	5-Yr Clearwater	1340.40	1378.00	1384.00	1383.24	1384.07	0.003504	3.04	764.19	652.52	0.30
Sound Stages	5	5-Yr Clearwater	1340.40	1376.00	1379.21	1379.21	1380.41	0.039593	8.86	153.36	64.52	1.00
Sound Stages	4	5-Yr Clearwater	1340.40	1362.00	1369.18	1367.15	1369.78	0.009179	6.23	215.27	47.62	0.52
Sound Stages	3	5-Yr Clearwater	1375.60	1356.00	1361.70		1362.44	0.012537	6.91	199.06	48.19	0.60
Sound Stages	2	5-Yr Clearwater	1375.60	1348.00	1352.48	1351.37	1352.85	0.010220	4.95	301.76	220.35	0.52
Lower	1300	5-Yr Clearwater	1223.20	1468.00	1472.36	1470.95	1472.73	0.008105	4.89	267.04	139.10	0.47
Lower	1250	5-Yr Clearwater	1223.20	1463.00	1467.63	1467.25	1468.64	0.027104	8.08	151.38	53.09	0.84
Lower	1200	5-Yr Clearwater	1223.20	1459.00	1464.04	1462.92	1464.45	0.009017	5.49	319.22	372.67	0.51
Lower	1150	5-Yr Clearwater	1223.20	1453.00	1459.25		1459.85	0.010415	6.24	196.15	48.54	0.55
Lower	1100	5-Yr Clearwater	1223.20	1447.00	1451.50		1452.50	0.021427	8.01	152.70	44.80	0.76
Lower	1050	5-Yr Clearwater	1223.20	1443.00	1448.70		1449.19	0.008786	5.61	218.03	56.34	0.50
Lower	1000	5-Yr Clearwater	1223.20	1439.00	1445.89	1444.14	1446.62	0.011116	6.85	178.66	38.51	0.56

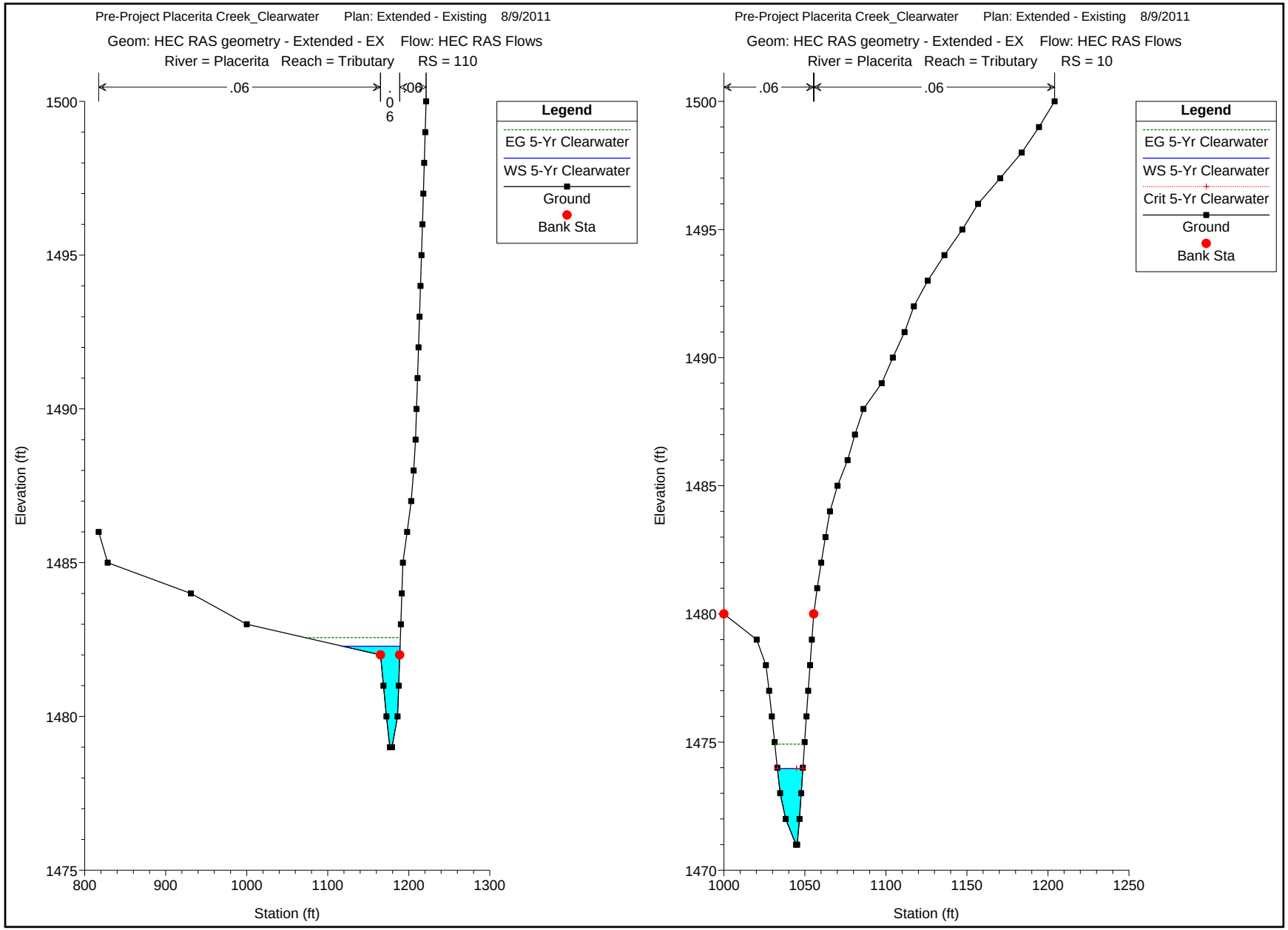

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1900
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1800
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

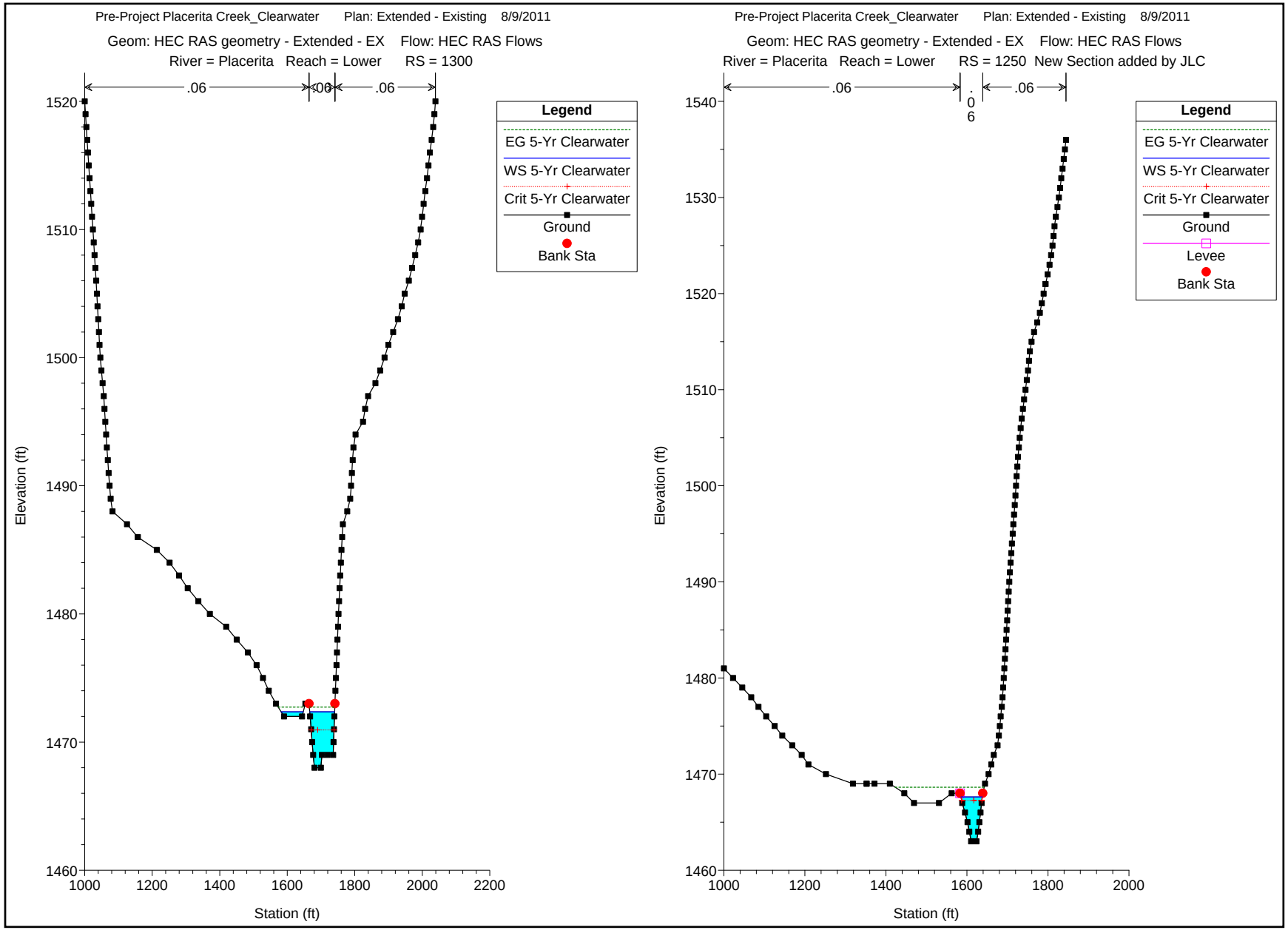

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1700
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1600
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

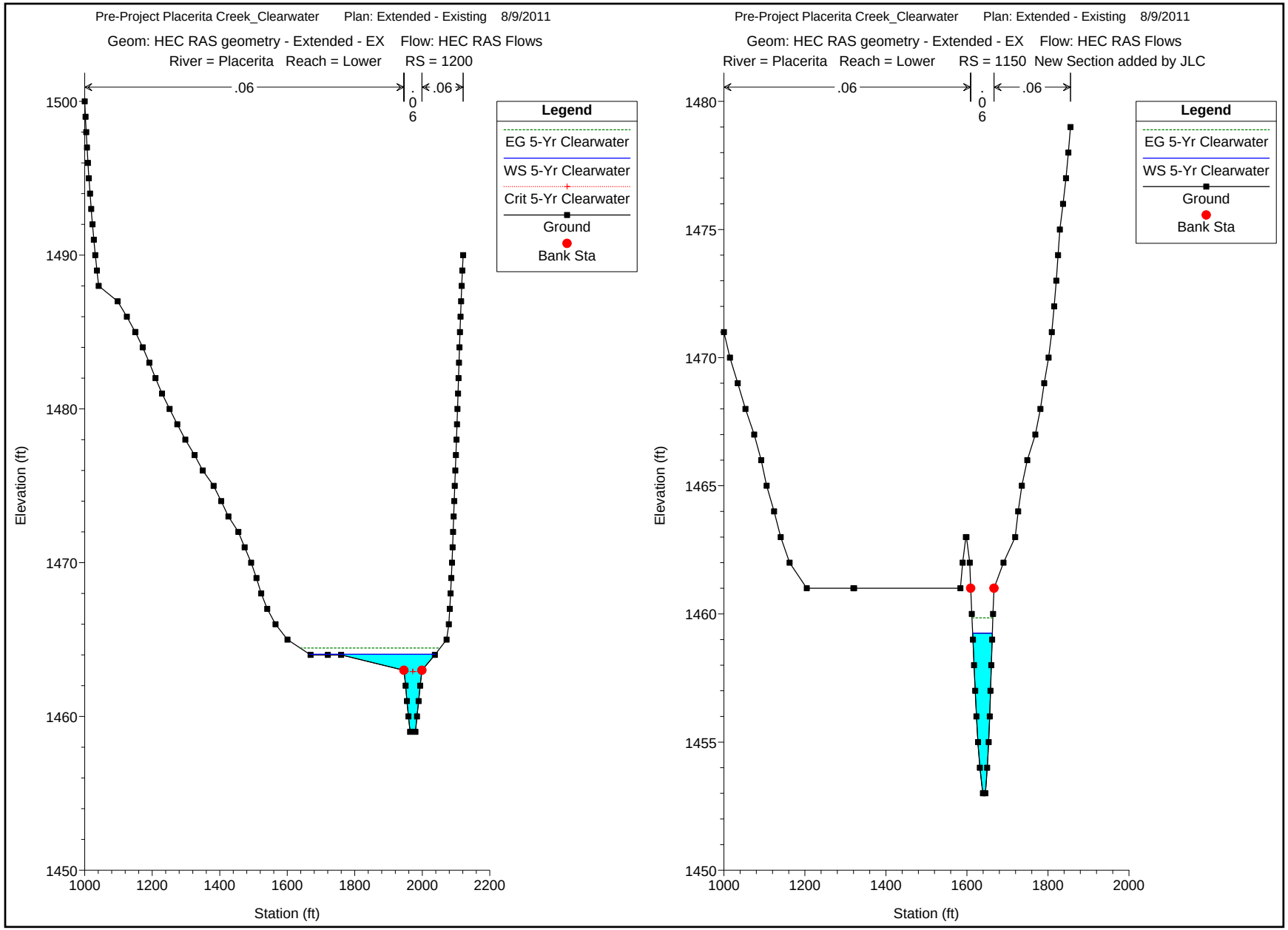

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1500
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1200
1400
1600
1800
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1400 D/S of Upper Reach
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1200
1400
1600
1800

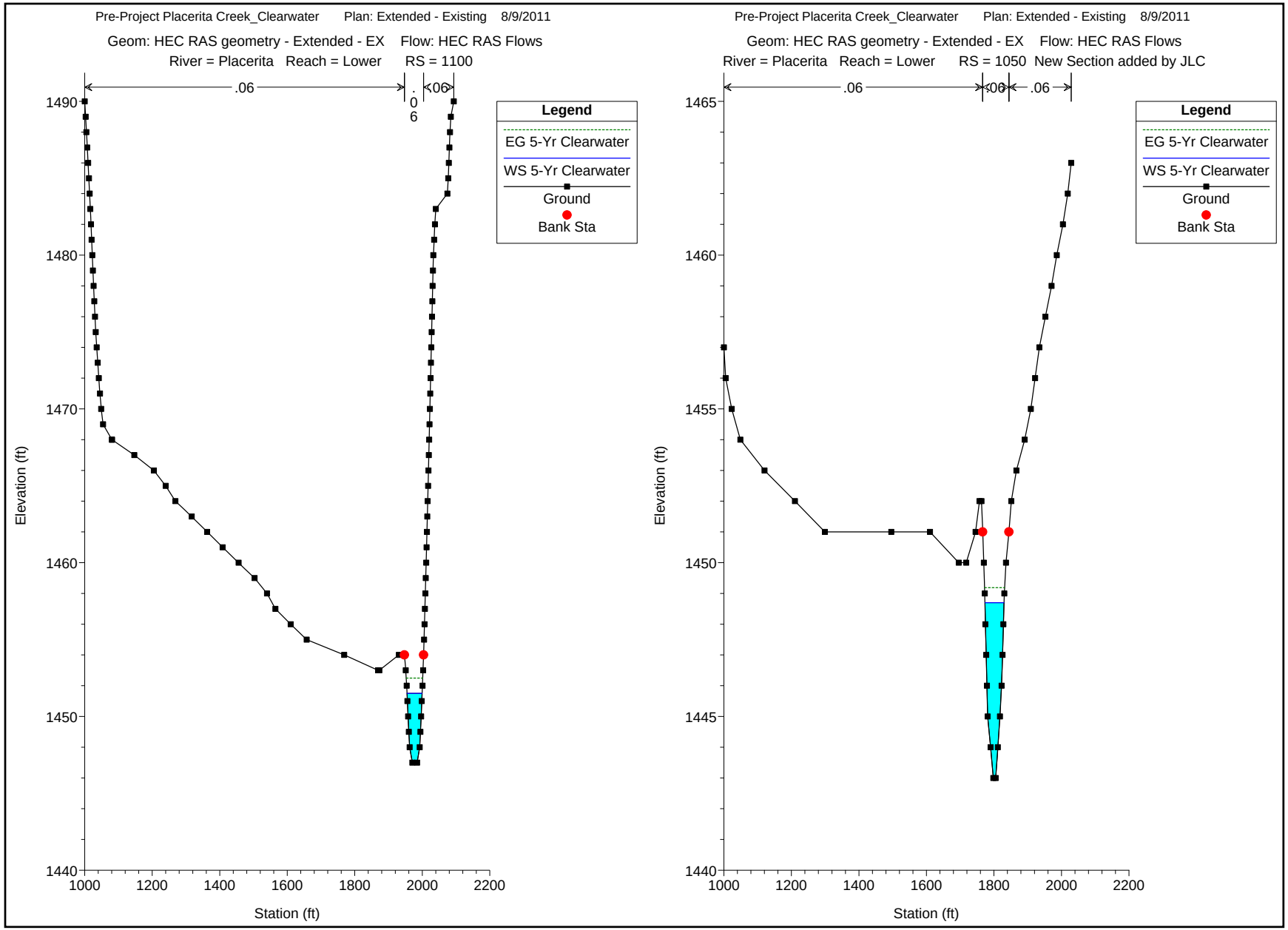

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 510
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1575
1570
1565
1560
1555
1550
1545
1000
1100
1200
1300
1400
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 410
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1545
1540
1535
1530
1525
1520
1000
1050
1100
1150
1200
1250
1300

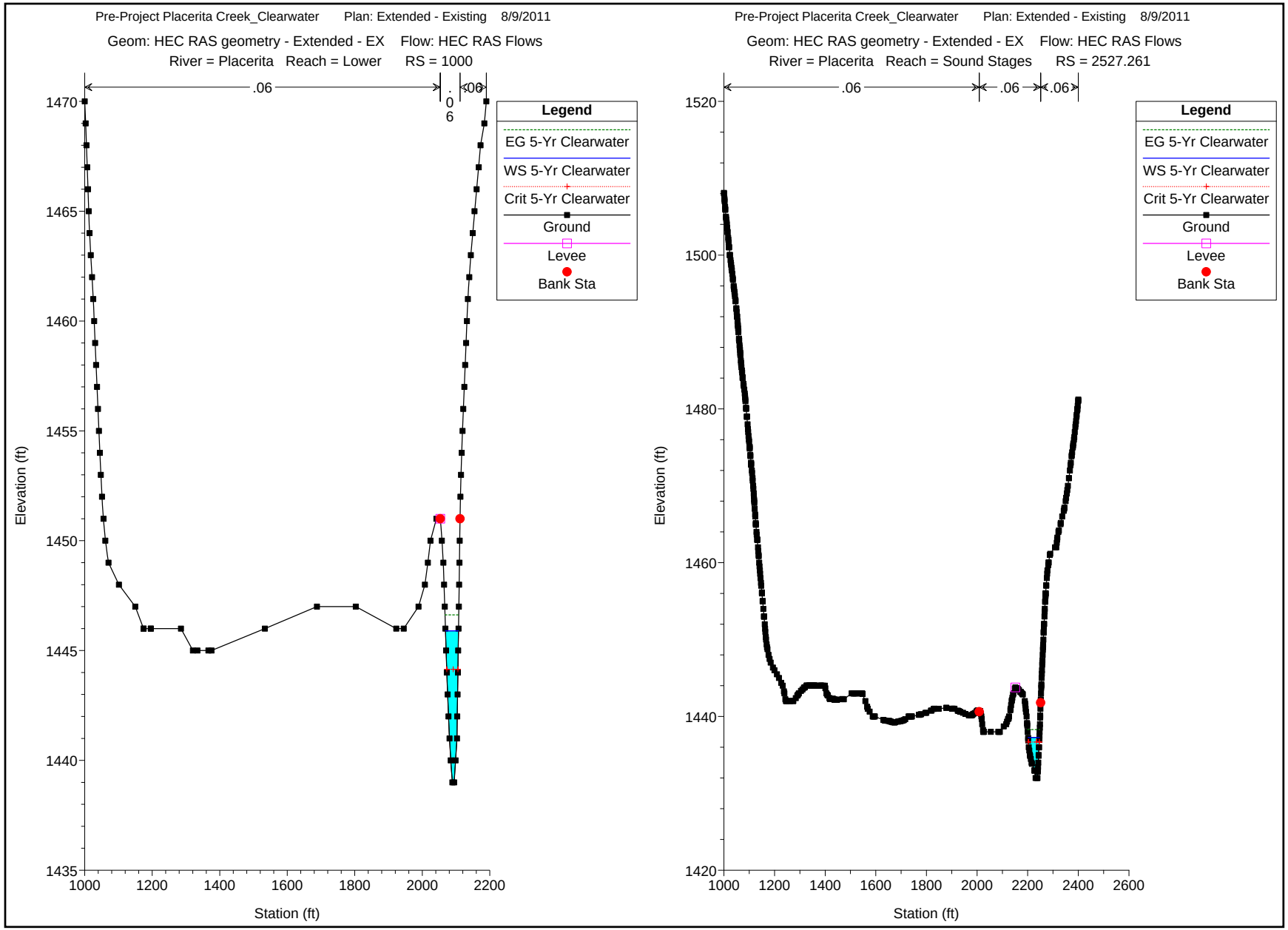

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 310
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1530
1525
1520
1515
1510
1505
1500
1000
1100
1200
1300
1400
1500
1600
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 210
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1515
1510
1505
1500
1495
1490
1485
1000
1100
1200
1300
1400
1500
1600

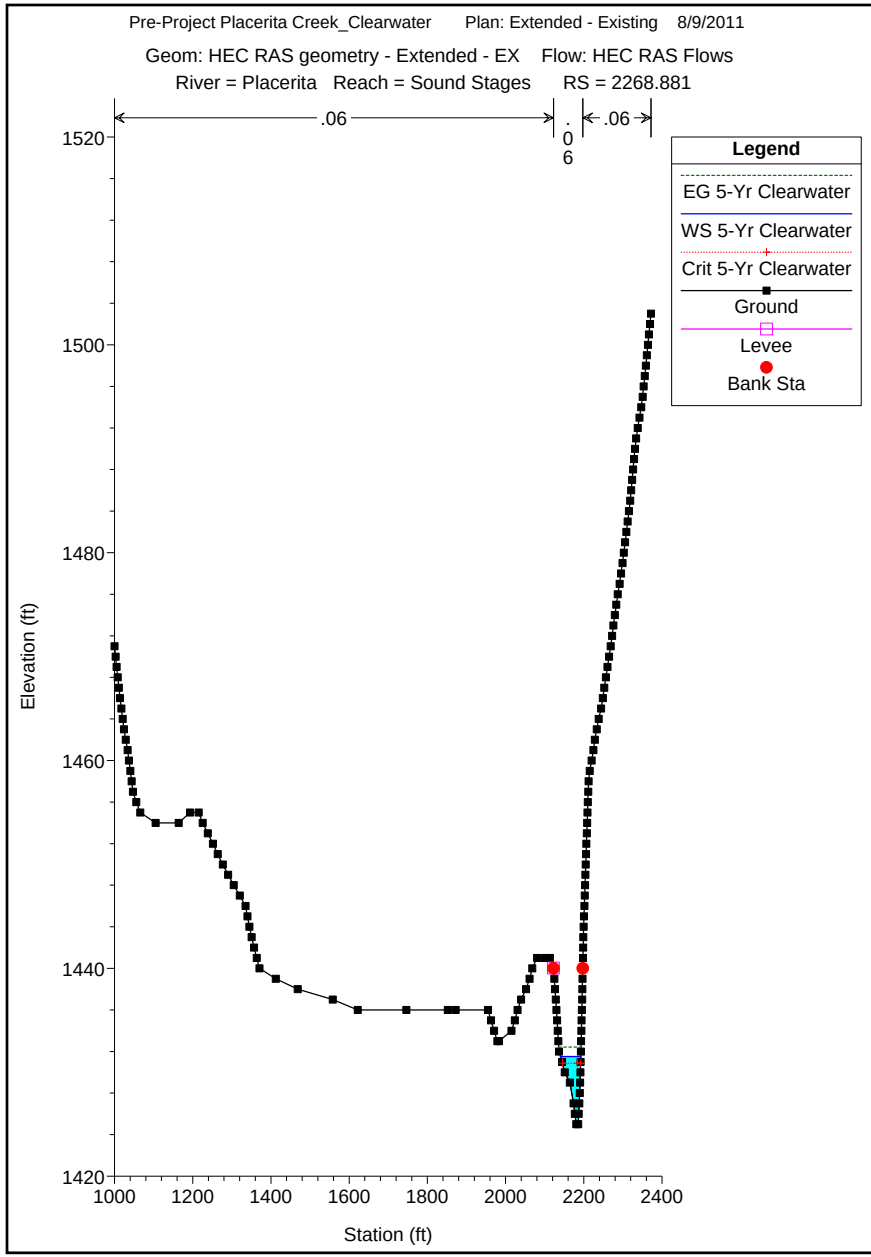

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 110
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
800
900
1000
1100
1200
1300
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 10
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1050
1100
1150
1200
1250

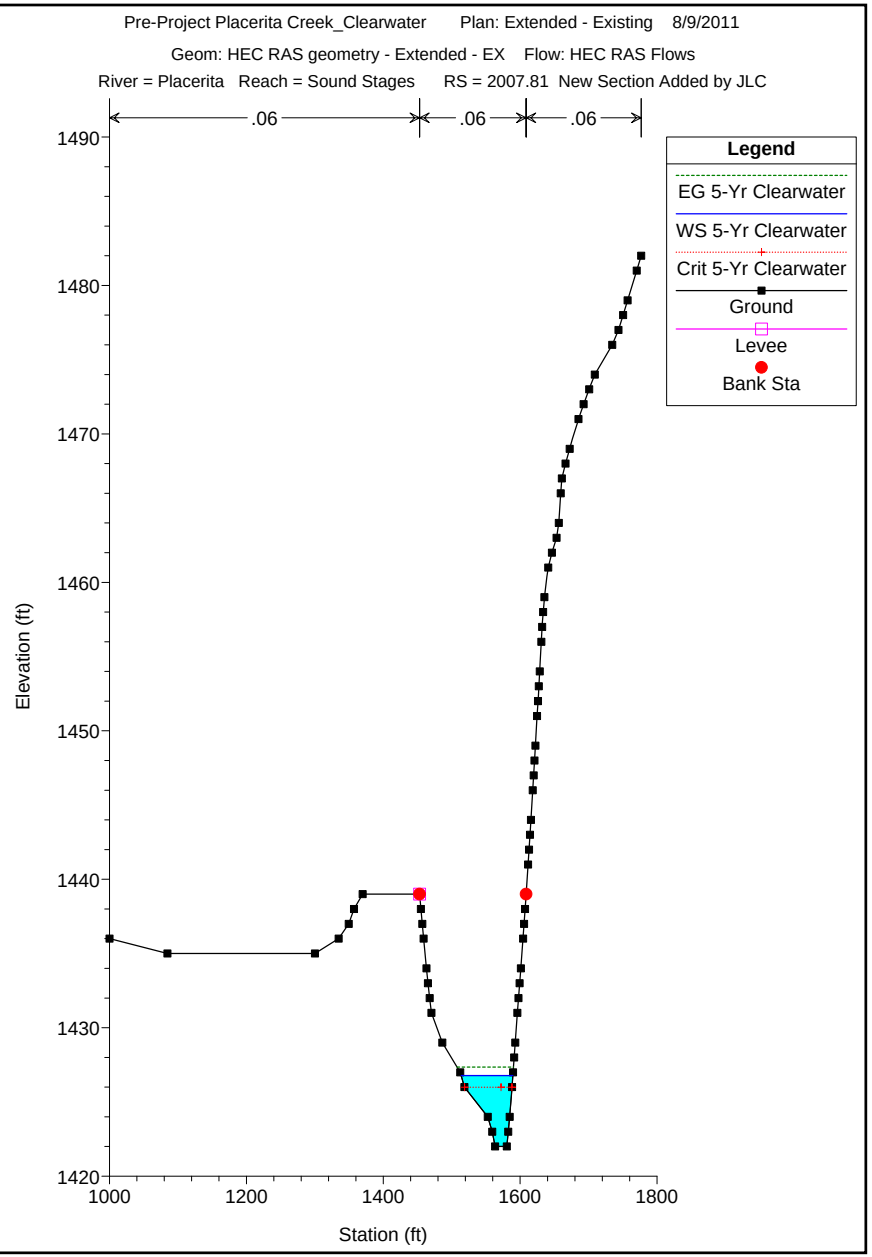

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1300
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1250 New Section added by JLC
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

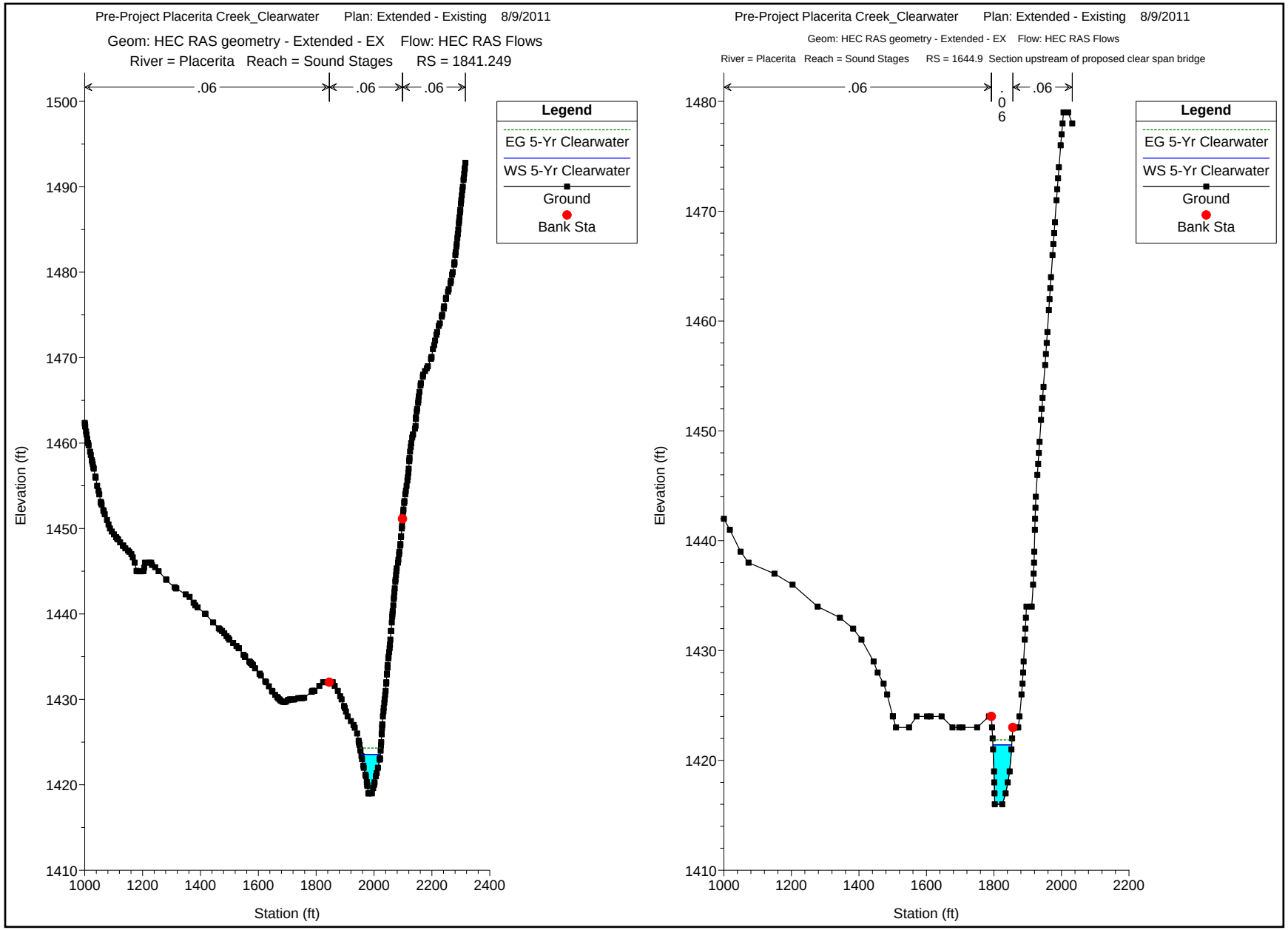

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1200
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1150 New Section added by JLC
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

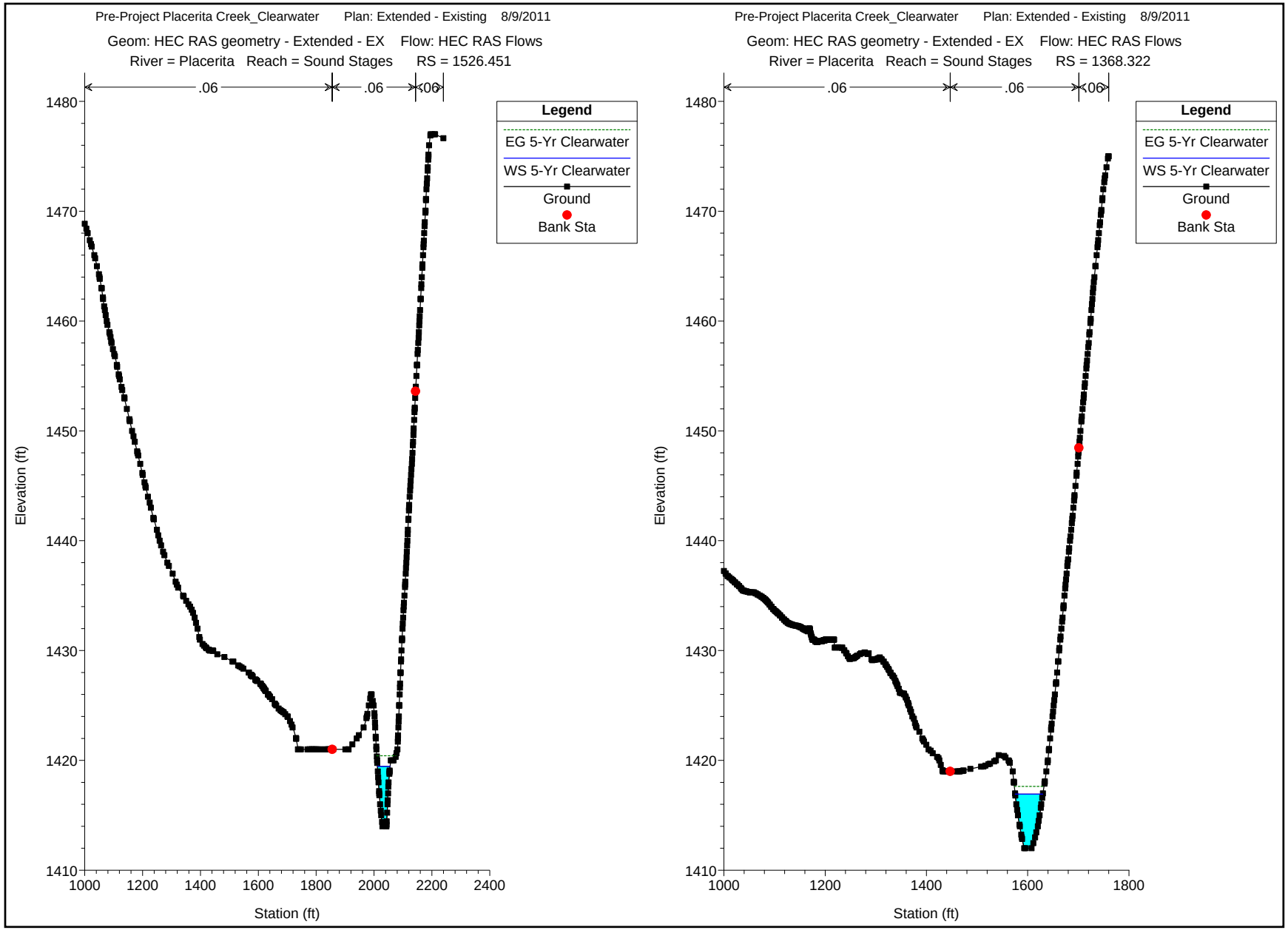

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1100
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1490
1480
1470
1460
1450
1440
1000
1200
1400
1600
1800
2000
2200
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1050 New Section added by JLC
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1465
1460
1455
1450
1445
1440
1000
1200
1400
1600
1800
2000
2200

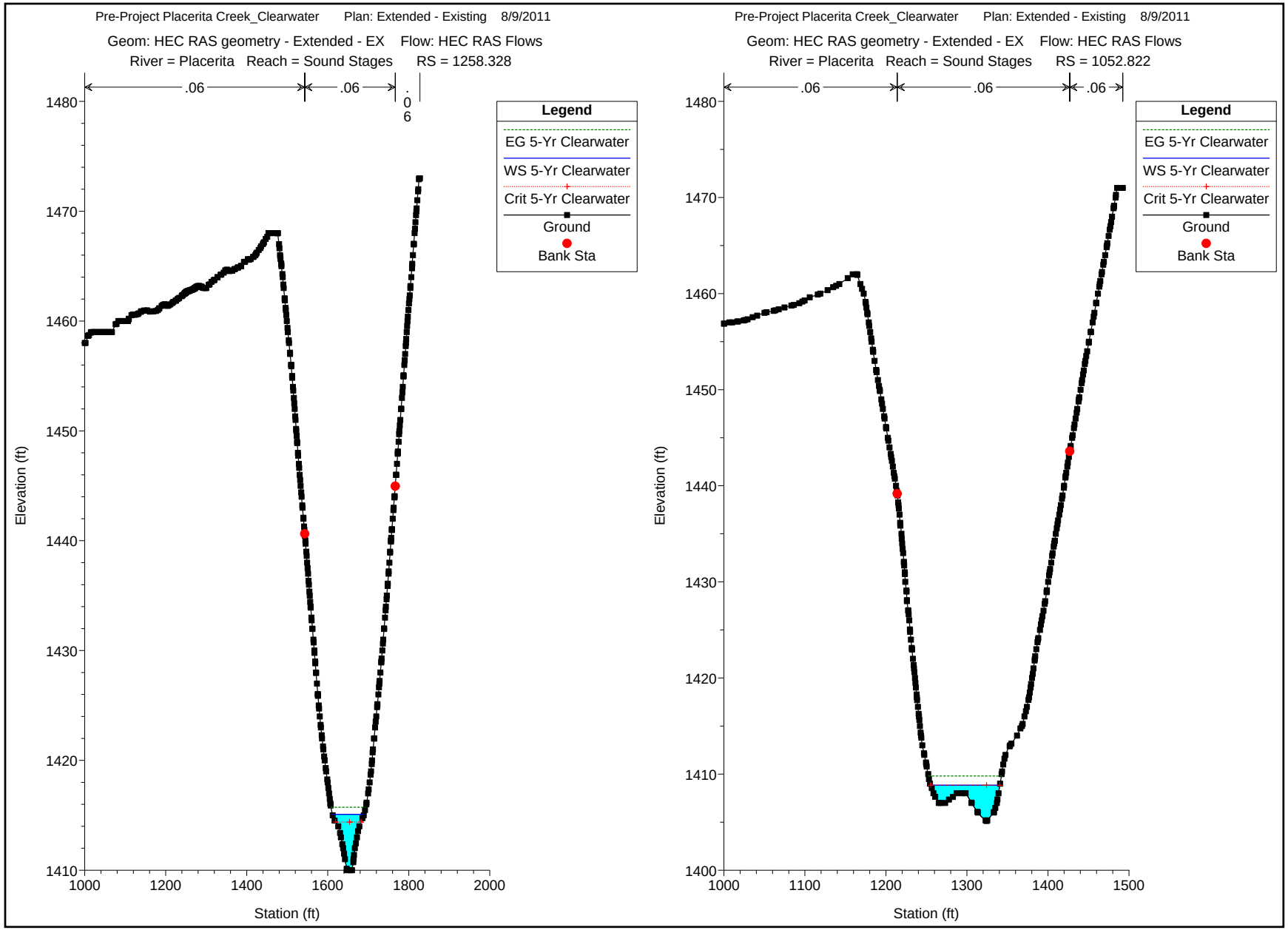

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1000
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2527.261
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

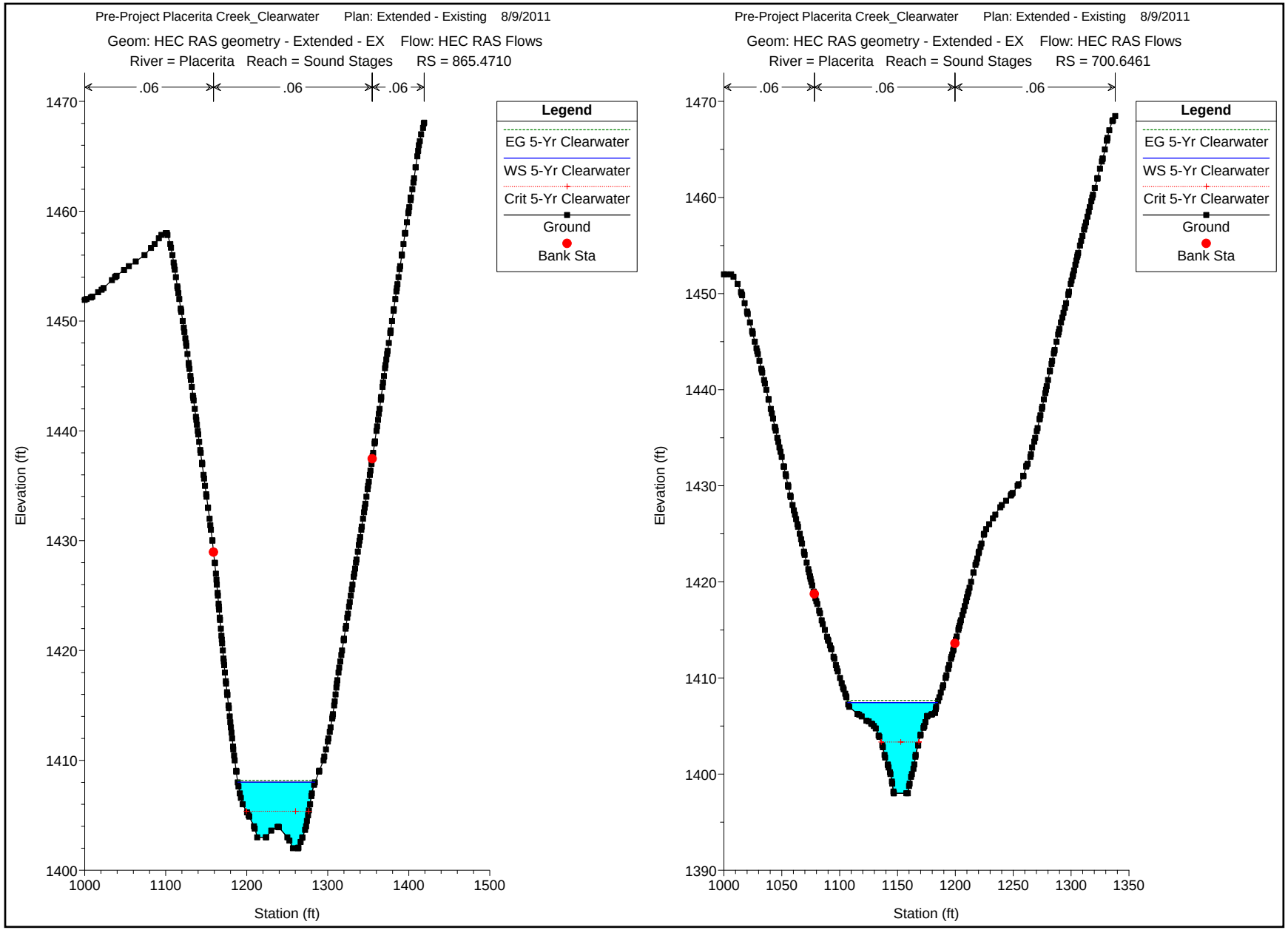

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2268.881
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
1520
1500
1480
1460
1440
1420
1000
1200
1400
1600
1800
2000
2200
2400

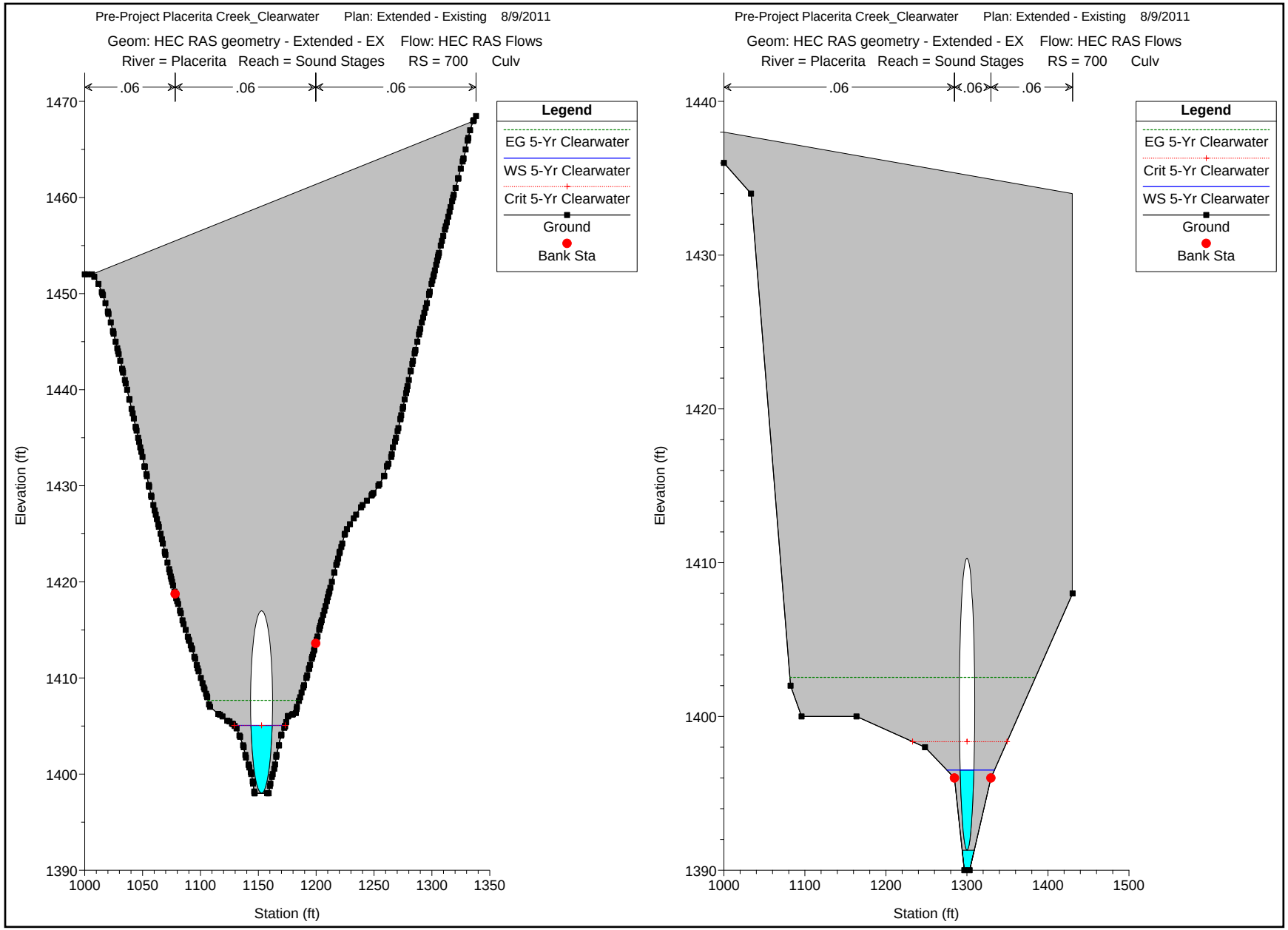

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2007.81 New Section Added by JLC
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
1490
1480
1470
1460
1450
1440
1430
1420
1000
1200
1400
1600
1800

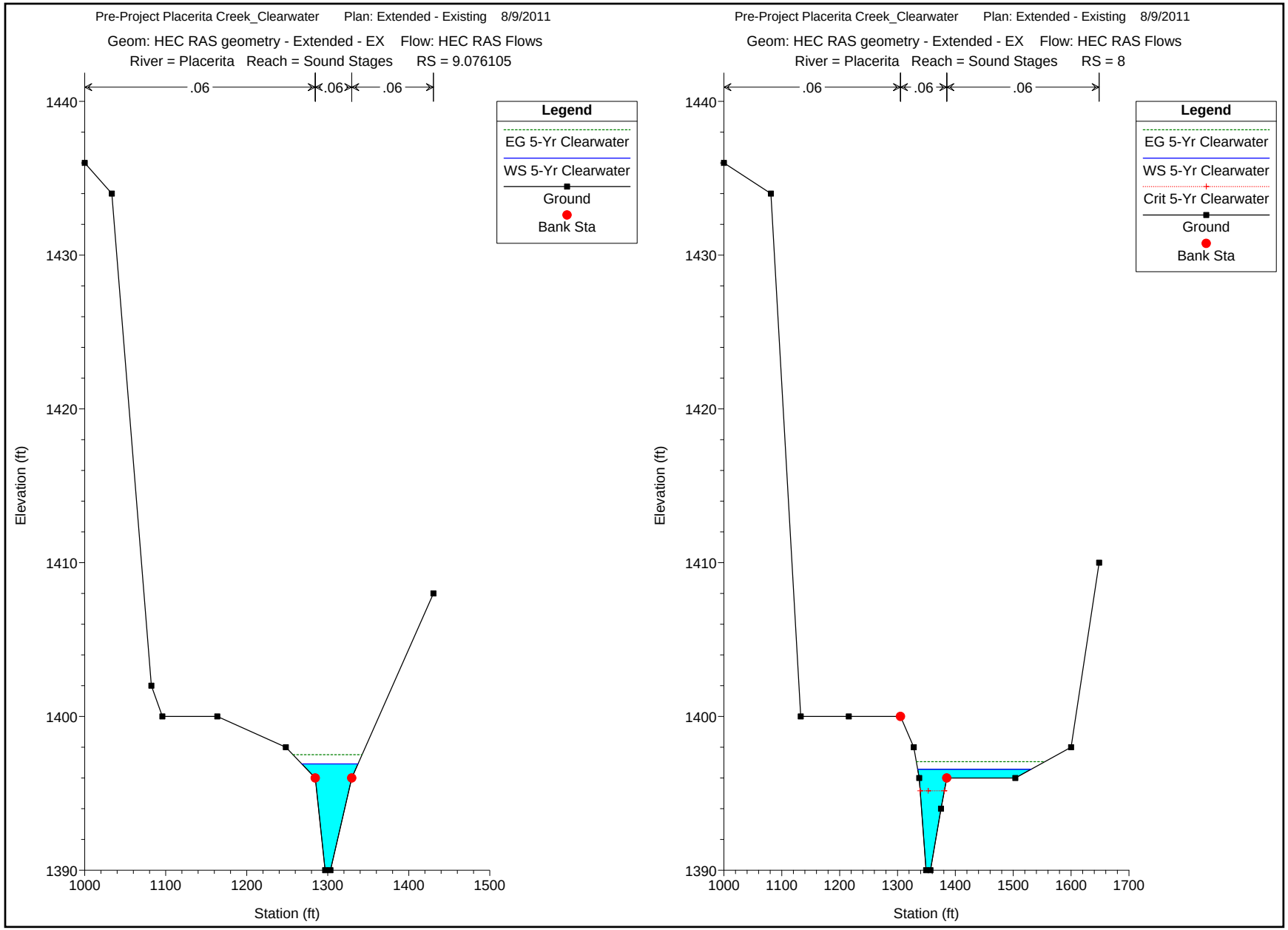

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1841.249
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1644.9 Section upstream of proposed clear span bridge
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

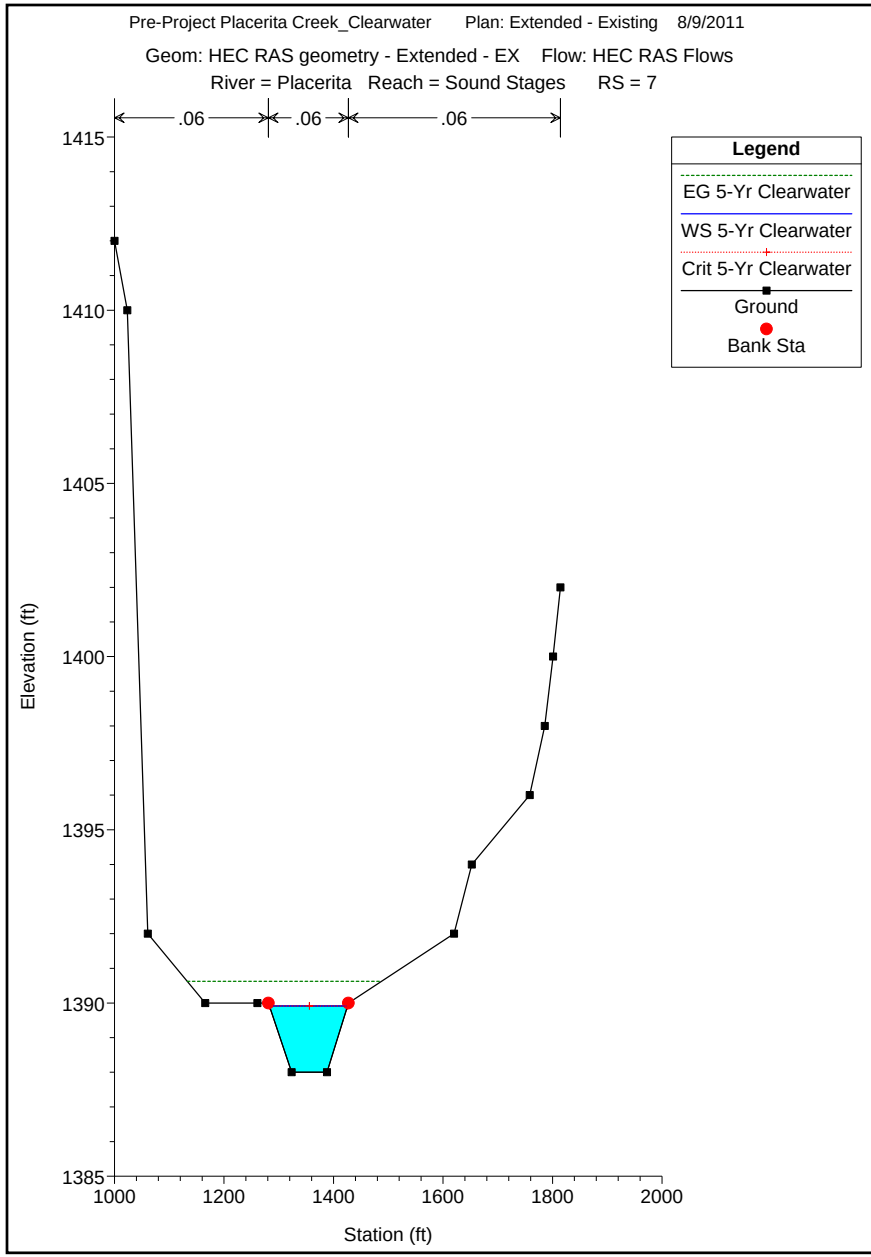

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1526.451
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1368.322
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

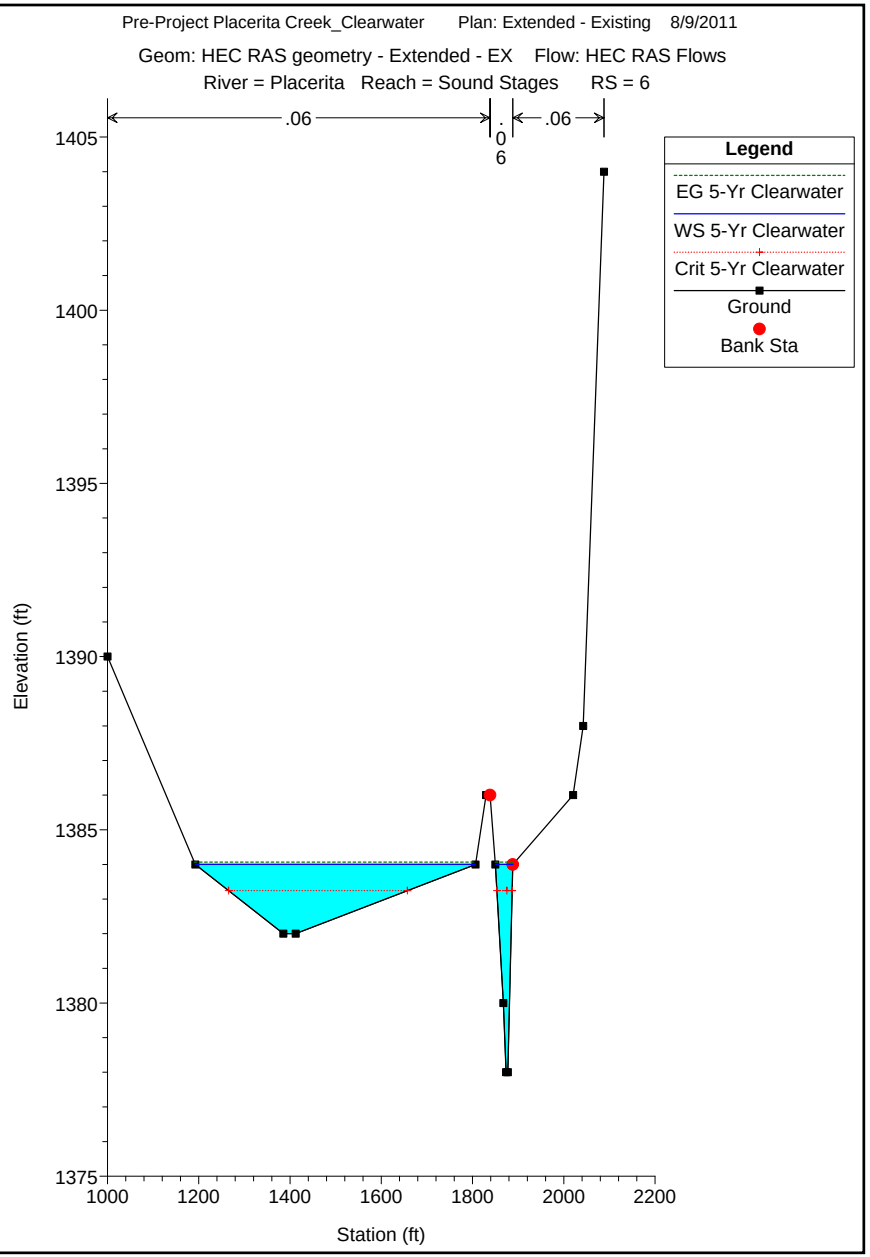

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1258.328
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1052.822
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

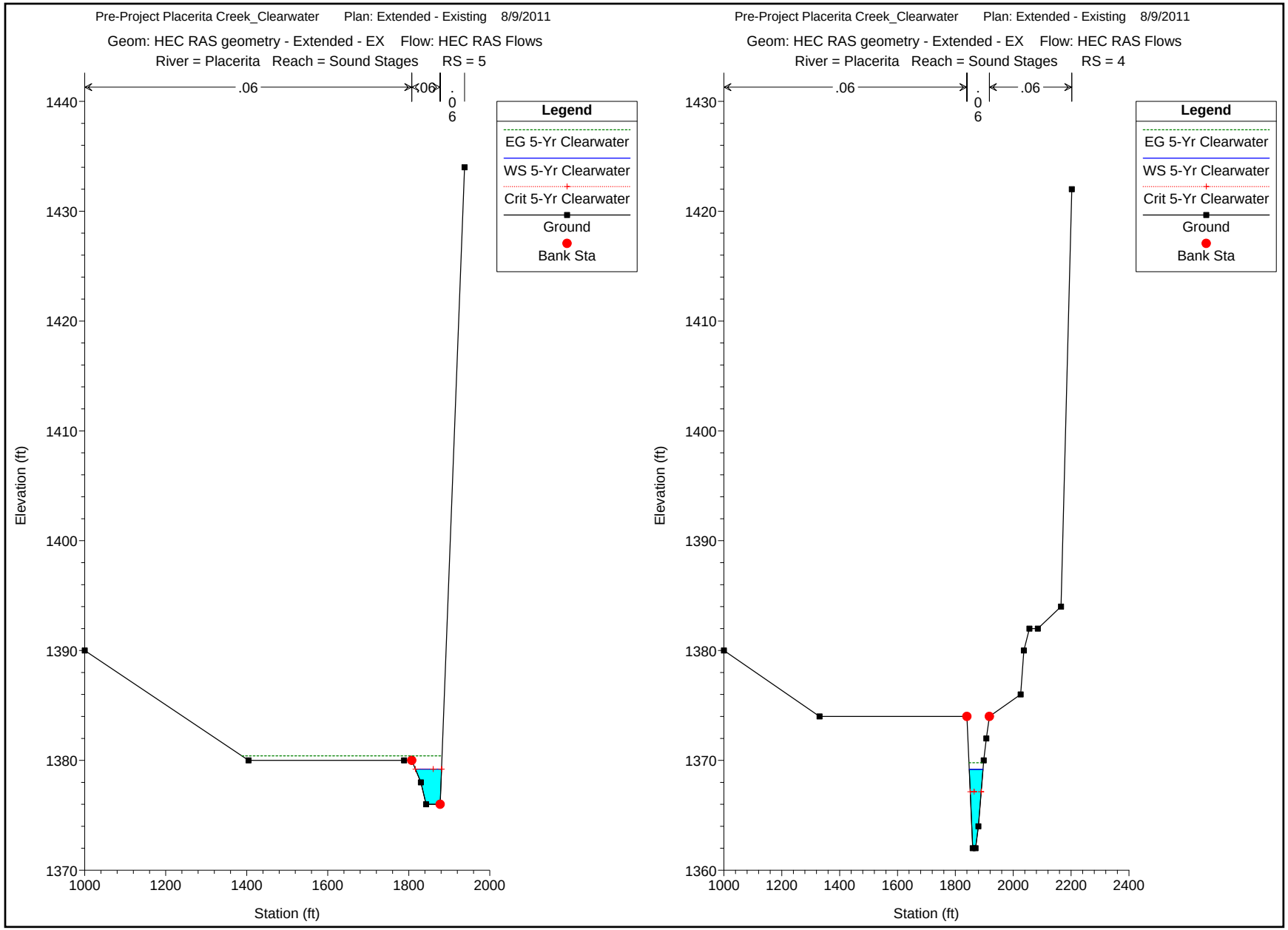

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 865.4710
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700.6461
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

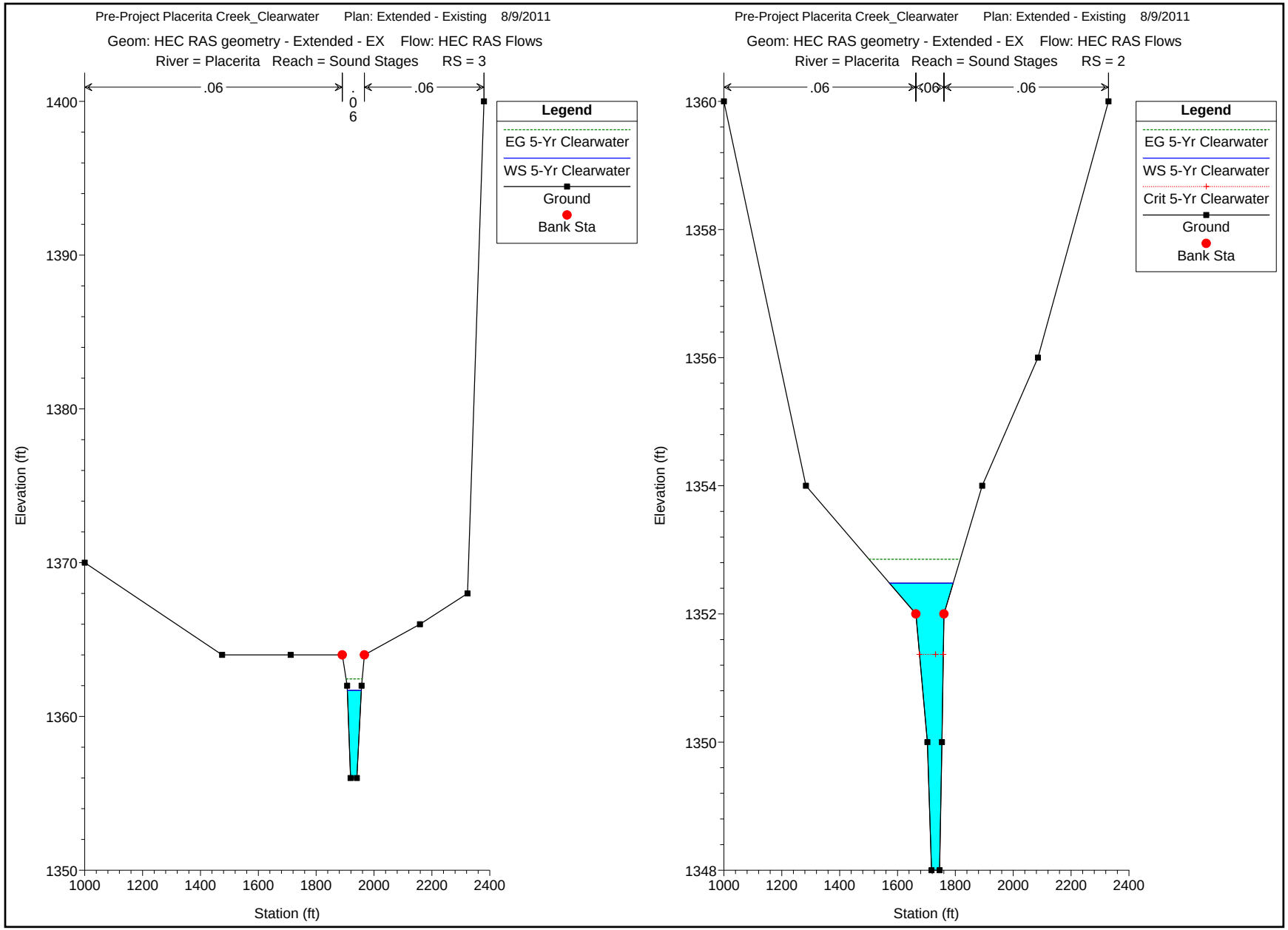

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700 Culv
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1470
1460
1450
1440
1430
1420
1410
1400
1390
1000
1050
1100
1150
1200
1250
1300
1350
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700 Culv
.06
.06
.06
Legend
EG 5-Yr Clearwater
Crit 5-Yr Clearwater
WS 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500
Station (ft)


Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 9.076105
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 8
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500
1600
1700
Station (ft)


Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 7
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1415
1410
1405
1400
1395
1390
1385
1000
1200
1400
1600
1800
2000
Station (ft)


Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 6
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1405
1400
1395
1390
1385
1380
1375
1000
1200
1400
1600
1800
2000
2200
Station (ft)

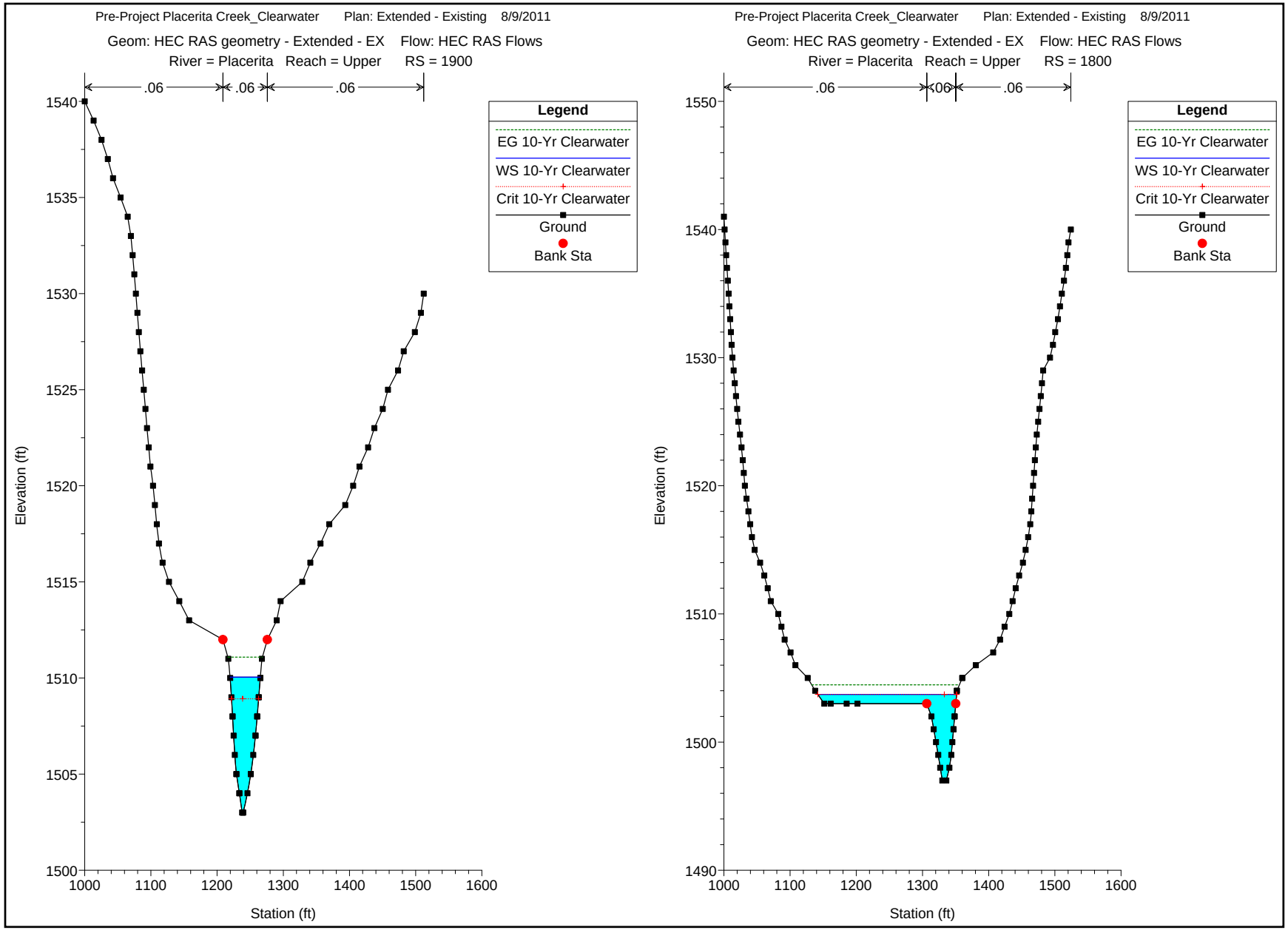

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 5
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 4
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

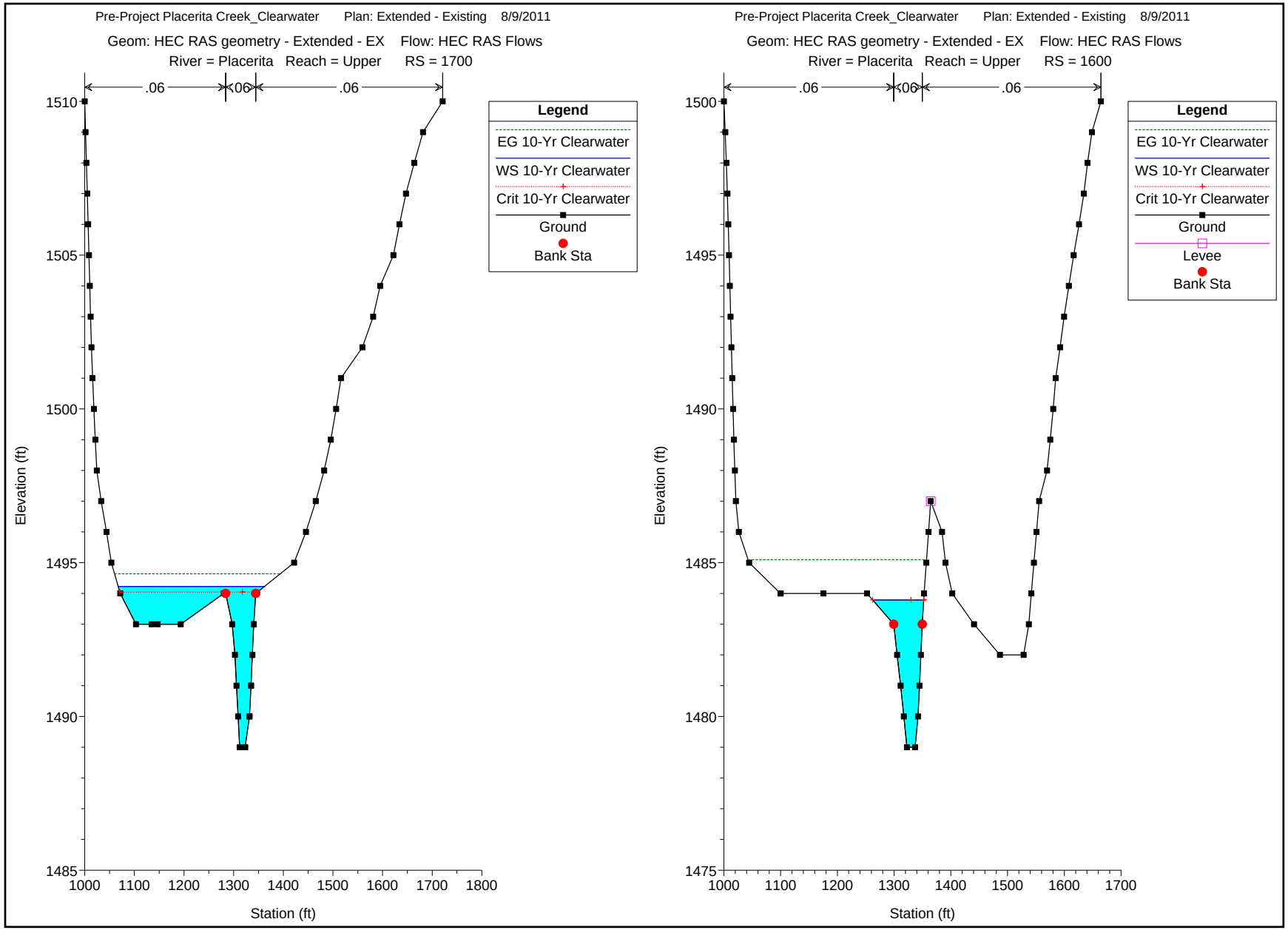

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 3
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

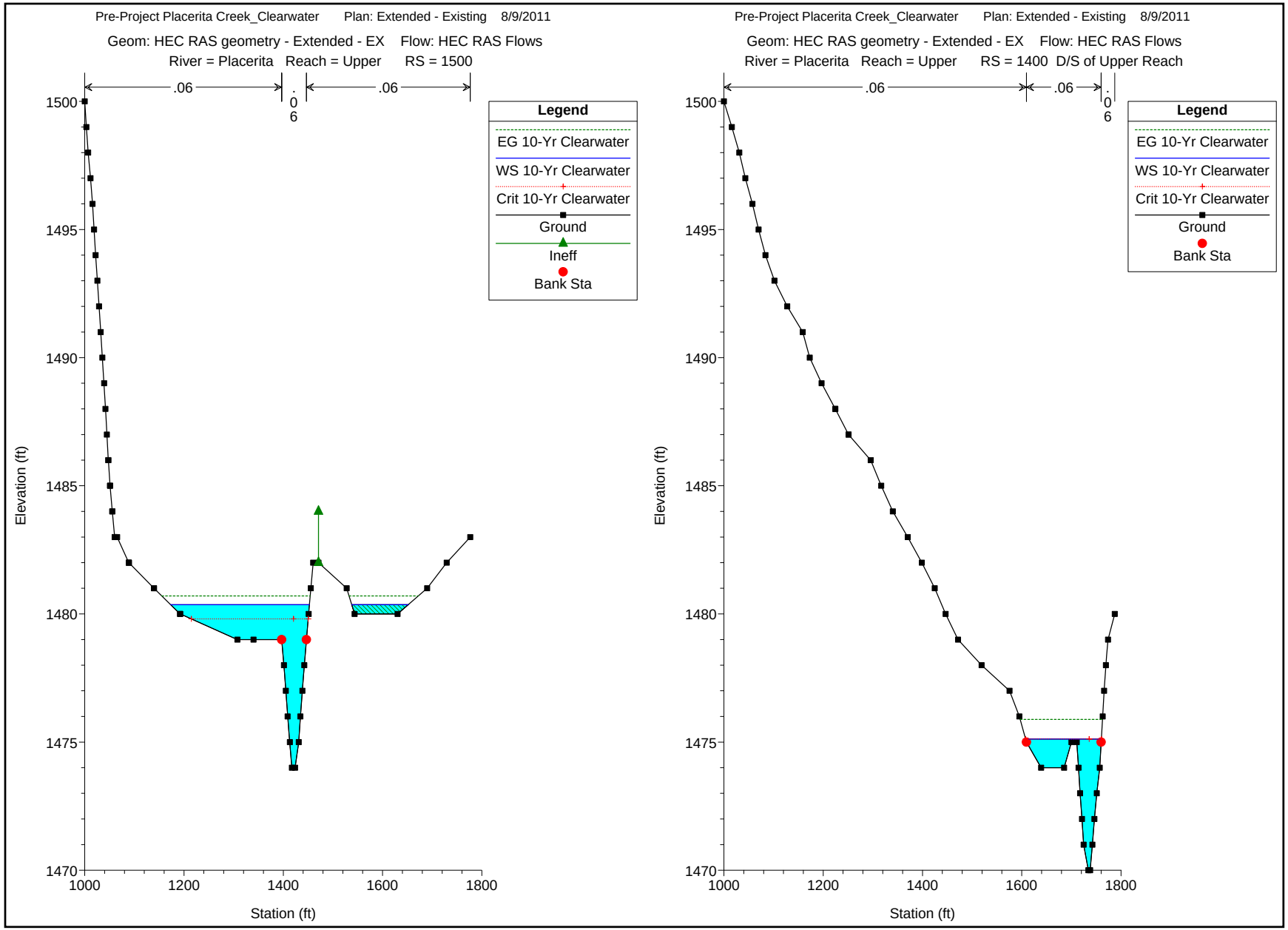
10-Year Storm Event – Pre Project Condition HEC-RAS Output

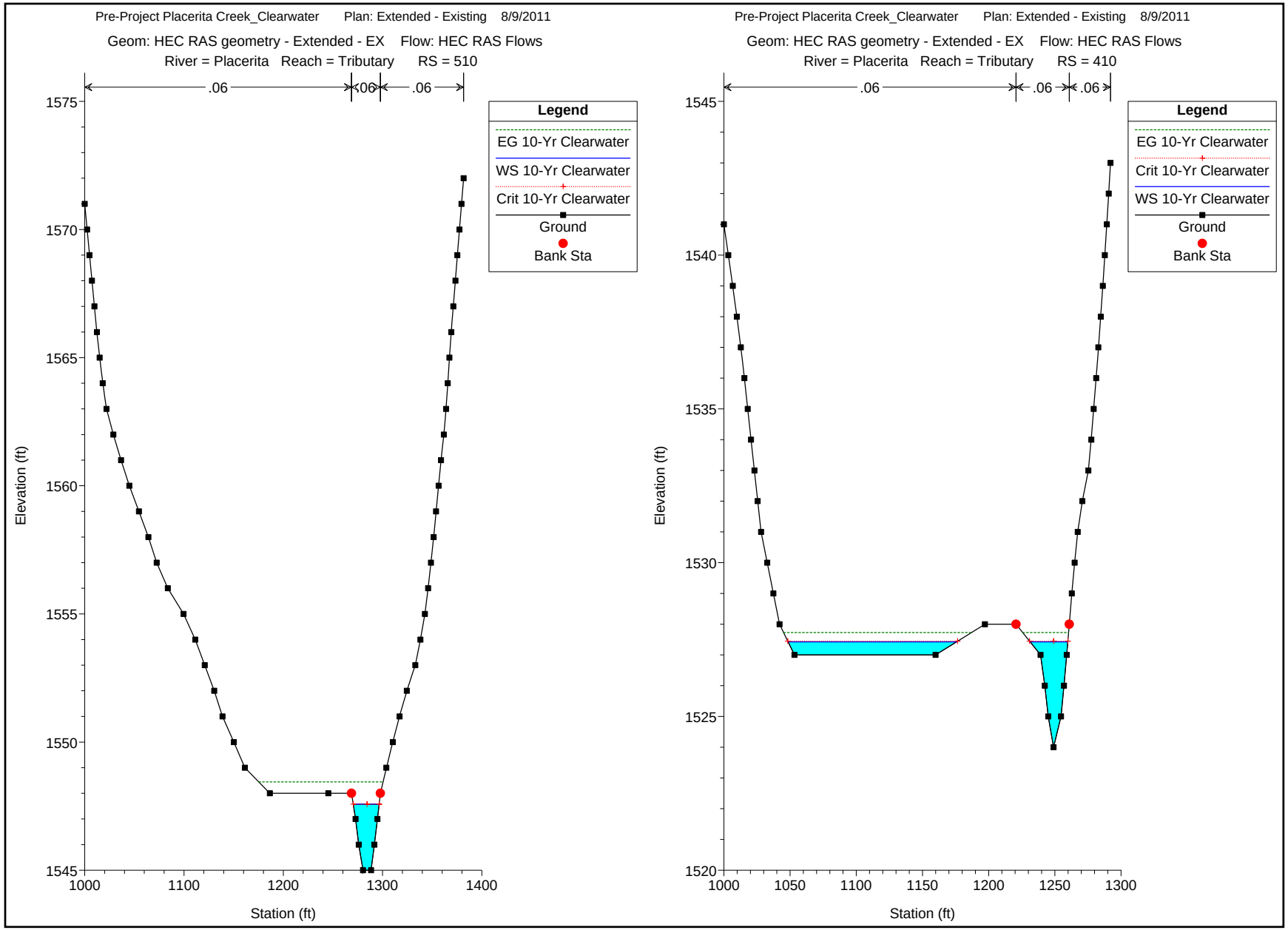
HEC-RAS Plan: EX_Extended Profile: 10-Yr Clearwater

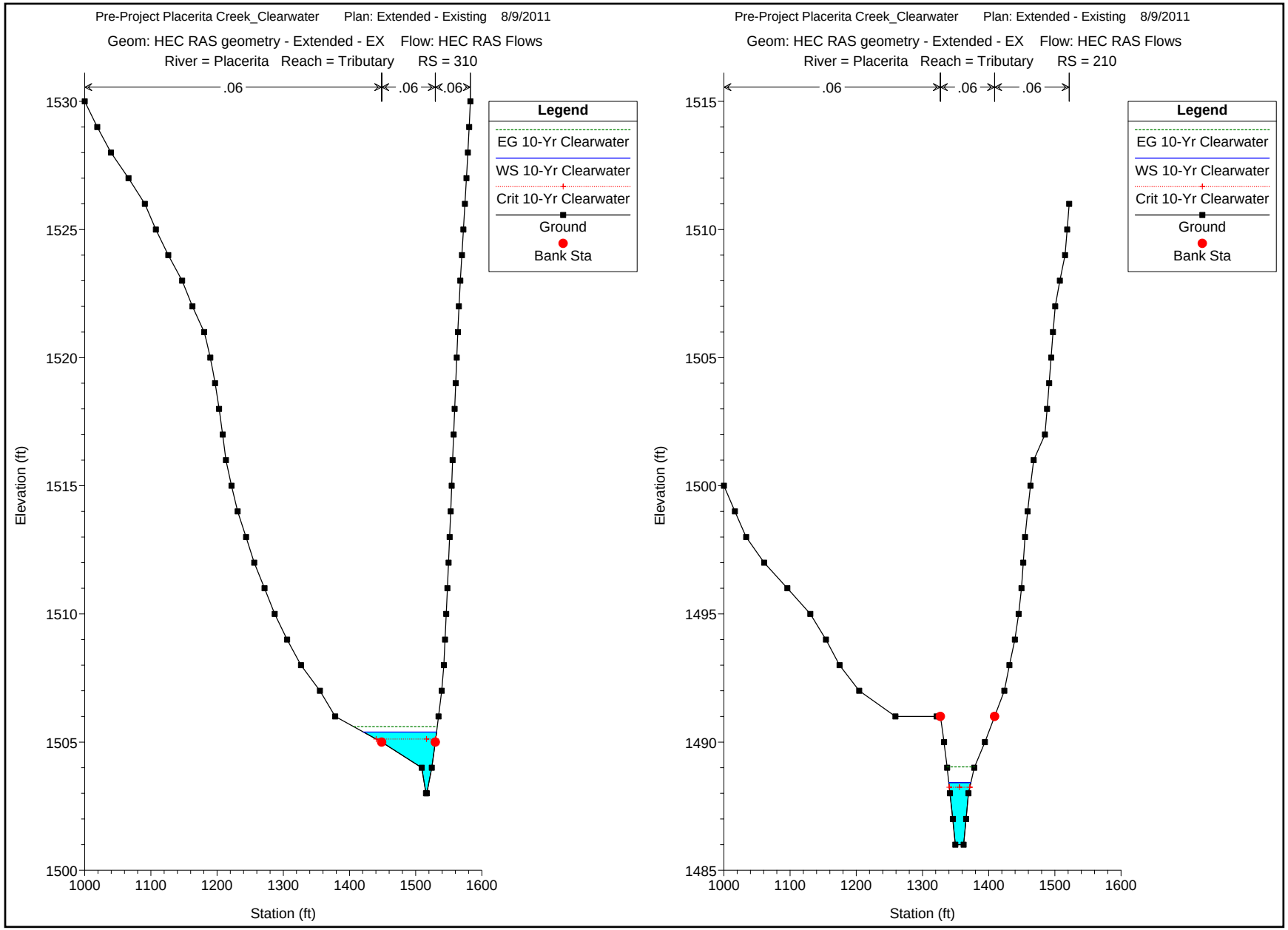
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Upper	1900	10-Yr Clearwater	1630.60	1503.00	1510.04	1508.92	1511.09	0.016605	8.20	198.91	45.72	0.69
Upper	1800	10-Yr Clearwater	1630.60	1497.00	1503.72	1503.72	1504.47	0.015057	7.54	294.95	209.76	0.66
Upper	1700	10-Yr Clearwater	1630.60	1489.00	1494.23	1494.05	1494.64	0.014084	5.99	380.49	294.76	0.61
Upper	1600	10-Yr Clearwater	1630.60	1479.00	1483.79	1483.79	1485.10	0.027855	9.27	187.73	89.86	0.88
Upper	1500	10-Yr Clearwater	1630.60	1474.00	1480.36	1479.81	1480.70	0.007051	5.41	442.06	393.17	0.46
Upper	1400	10-Yr Clearwater	1630.60	1470.00	1475.12	1475.12	1475.89	0.045901	7.04	231.84	152.52	1.00
Tributary	510	10-Yr Clearwater	334.00	1545.00	1547.58	1547.58	1548.45	0.046318	7.48	44.64	26.11	1.01
Tributary	410	10-Yr Clearwater	334.00	1524.00	1527.43	1527.45	1527.73	0.025137	5.15	94.38	155.82	0.73
Tributary	310	10-Yr Clearwater	334.00	1503.00	1505.39	1505.12	1505.60	0.020198	3.71	93.91	110.55	0.63
Tributary	210	10-Yr Clearwater	334.00	1486.00	1488.42	1488.24	1489.03	0.035416	6.28	53.17	33.39	0.88
Tributary	110	10-Yr Clearwater	334.00	1479.00	1482.68	1481.89	1482.97	0.010459	4.65	99.98	136.60	0.51
Tributary	10	10-Yr Clearwater	334.00	1471.00	1474.57	1474.57	1475.70	0.046303	8.53	39.14	17.33	1.00
Sound Stages	2527.261	10-Yr Clearwater	1923.30	1432.00	1438.35	1437.73	1439.73	0.023043	9.44	203.82	48.34	0.81
Sound Stages	2268.881	10-Yr Clearwater	1923.30	1425.00	1432.55	1431.96	1433.74	0.022885	8.77	219.40	57.11	0.79
Sound Stages	2007.81	10-Yr Clearwater	1923.30	1422.00	1427.64	1426.78	1428.40	0.017548	6.99	275.21	86.70	0.69
Sound Stages	1841.249	10-Yr Clearwater	1923.30	1419.00	1424.76		1425.58	0.016323	7.24	265.59	75.50	0.68
Sound Stages	1644.9	10-Yr Clearwater	1923.30	1416.00	1422.82		1423.41	0.007575	6.15	312.57	61.07	0.48
Sound Stages	1526.451	10-Yr Clearwater	1923.30	1414.00	1421.35	1419.87	1421.93	0.024160	6.24	337.24	261.29	0.76
Sound Stages	1368.322	10-Yr Clearwater	1923.30	1412.00	1418.19		1419.05	0.013999	7.45	258.00	61.85	0.64
Sound Stages	1258.328	10-Yr Clearwater	1923.30	1410.00	1415.27	1415.27	1416.59	0.039119	9.21	208.75	79.93	1.00
Sound Stages	1052.822	10-Yr Clearwater	1923.30	1405.12	1410.83	1409.49	1411.34	0.009906	5.70	337.62	94.20	0.53
Sound Stages	865.4710	10-Yr Clearwater	1923.30	1402.00	1410.52		1410.66	0.001442	2.98	646.10	112.10	0.22
Sound Stages	700.6461	10-Yr Clearwater	1923.30	1398.00	1410.21	1404.77	1410.39	0.001816	3.41	564.61	92.33	0.24
Sound Stages	700		Culvert									
Sound Stages	9.076105	10-Yr Clearwater	1923.30	1390.00	1397.34	1396.49	1398.47	0.016166	8.67	238.91	80.48	0.70
Sound Stages	8	10-Yr Clearwater	1923.30	1390.00	1396.96	1396.86	1397.67	0.014582	7.40	347.53	216.97	0.65
Sound Stages	7	10-Yr Clearwater	2071.00	1388.00	1390.54	1390.54	1391.13	0.027581	6.48	372.19	341.30	0.81
Sound Stages	6	10-Yr Clearwater	2071.00	1378.00	1384.23	1383.56	1384.33	0.004922	3.70	916.98	679.05	0.36
Sound Stages	5	10-Yr Clearwater	2071.00	1376.00	1380.60	1380.60	1381.09	0.012877	6.40	499.51	502.01	0.61
Sound Stages	4	10-Yr Clearwater	2071.00	1362.00	1370.95	1368.39	1371.66	0.008548	6.73	307.78	57.33	0.51
Sound Stages	3	10-Yr Clearwater	2125.40	1356.00	1363.04		1363.98	0.015017	7.79	272.85	63.65	0.66
Sound Stages	2	10-Yr Clearwater	2125.40	1348.00	1353.09	1352.28	1353.53	0.010202	5.64	484.27	376.85	0.54
Lower	1300	10-Yr Clearwater	1895.70	1468.00	1472.88	1471.70	1473.44	0.011361	6.23	343.38	158.99	0.57
Lower	1250	10-Yr Clearwater	1895.70	1463.00	1468.32	1468.32	1469.06	0.019626	7.69	324.55	206.77	0.74
Lower	1200	10-Yr Clearwater	1895.70	1459.00	1464.80	1464.34	1465.05	0.005695	4.95	629.39	450.28	0.42
Lower	1150	10-Yr Clearwater	1895.70	1453.00	1460.60	1458.74	1461.39	0.010777	7.11	266.76	55.46	0.57
Lower	1100	10-Yr Clearwater	1895.70	1447.00	1452.72	1451.95	1453.98	0.020737	9.00	210.67	50.34	0.78
Lower	1050	10-Yr Clearwater	1895.70	1443.00	1450.33		1450.87	0.007799	5.91	332.28	128.75	0.49
Lower	1000	10-Yr Clearwater	1895.70	1439.00	1447.51	1445.42	1448.44	0.011102	7.74	244.89	43.26	0.57

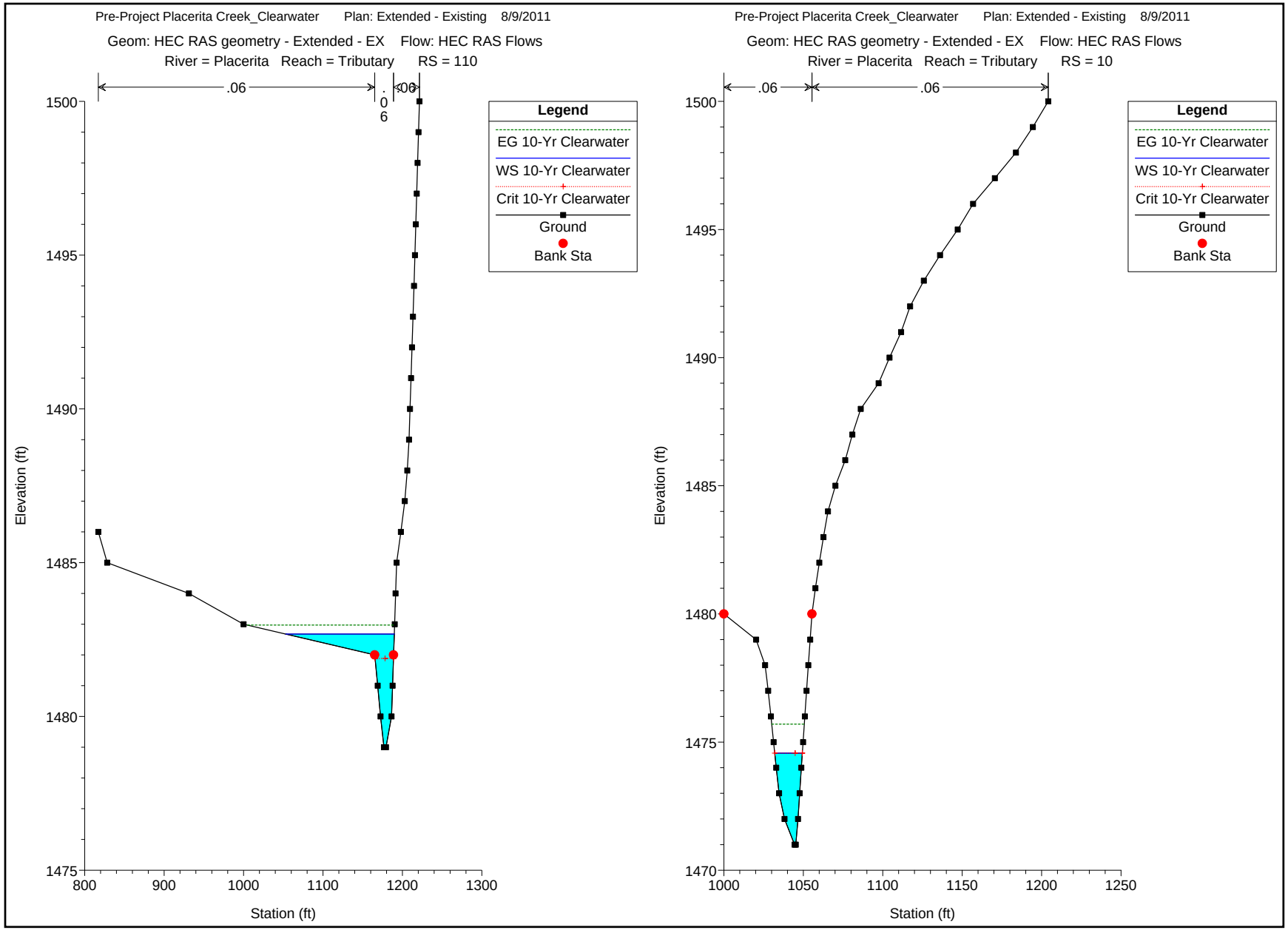

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1900
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1800
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

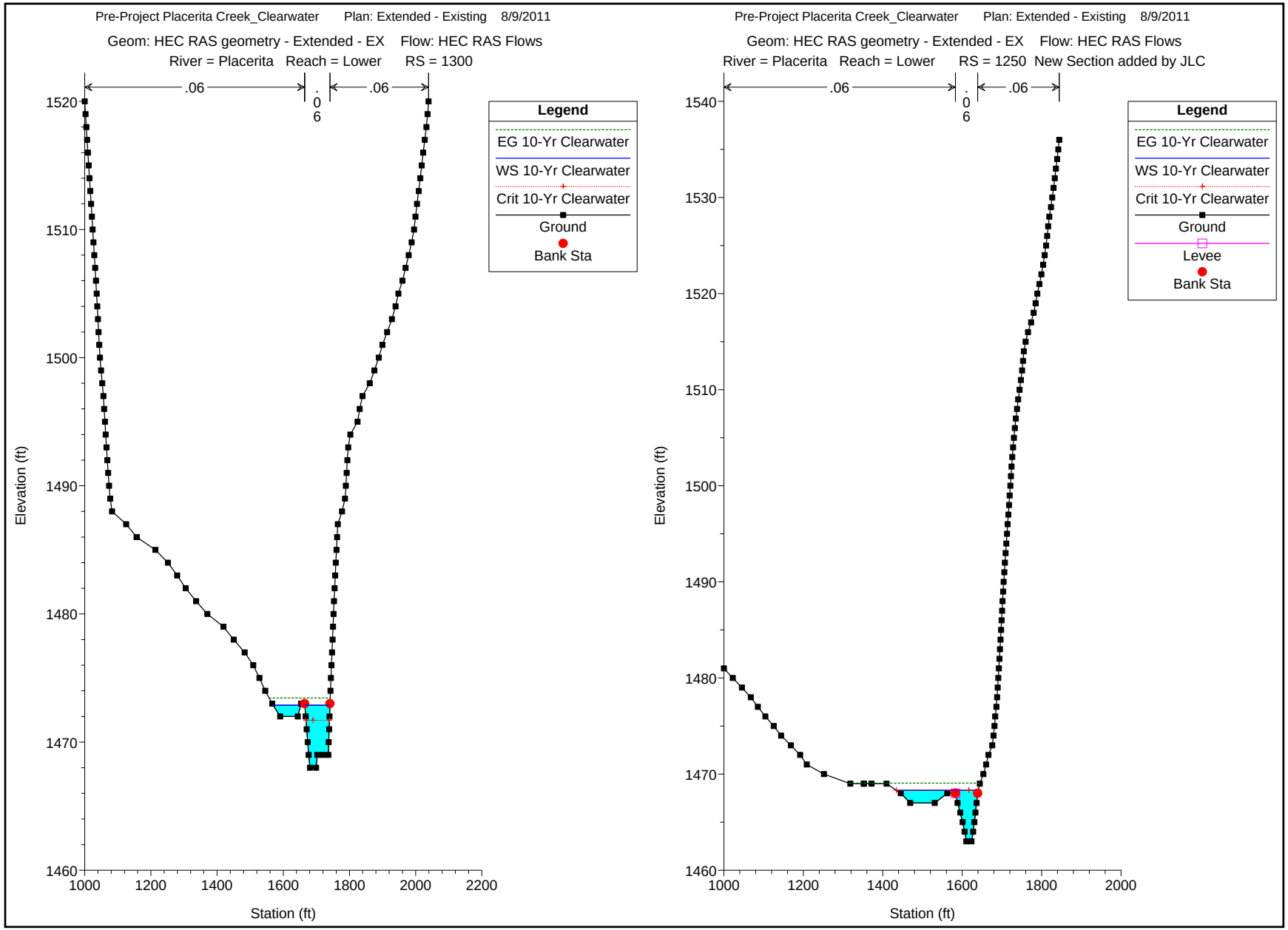

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1700
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1600
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

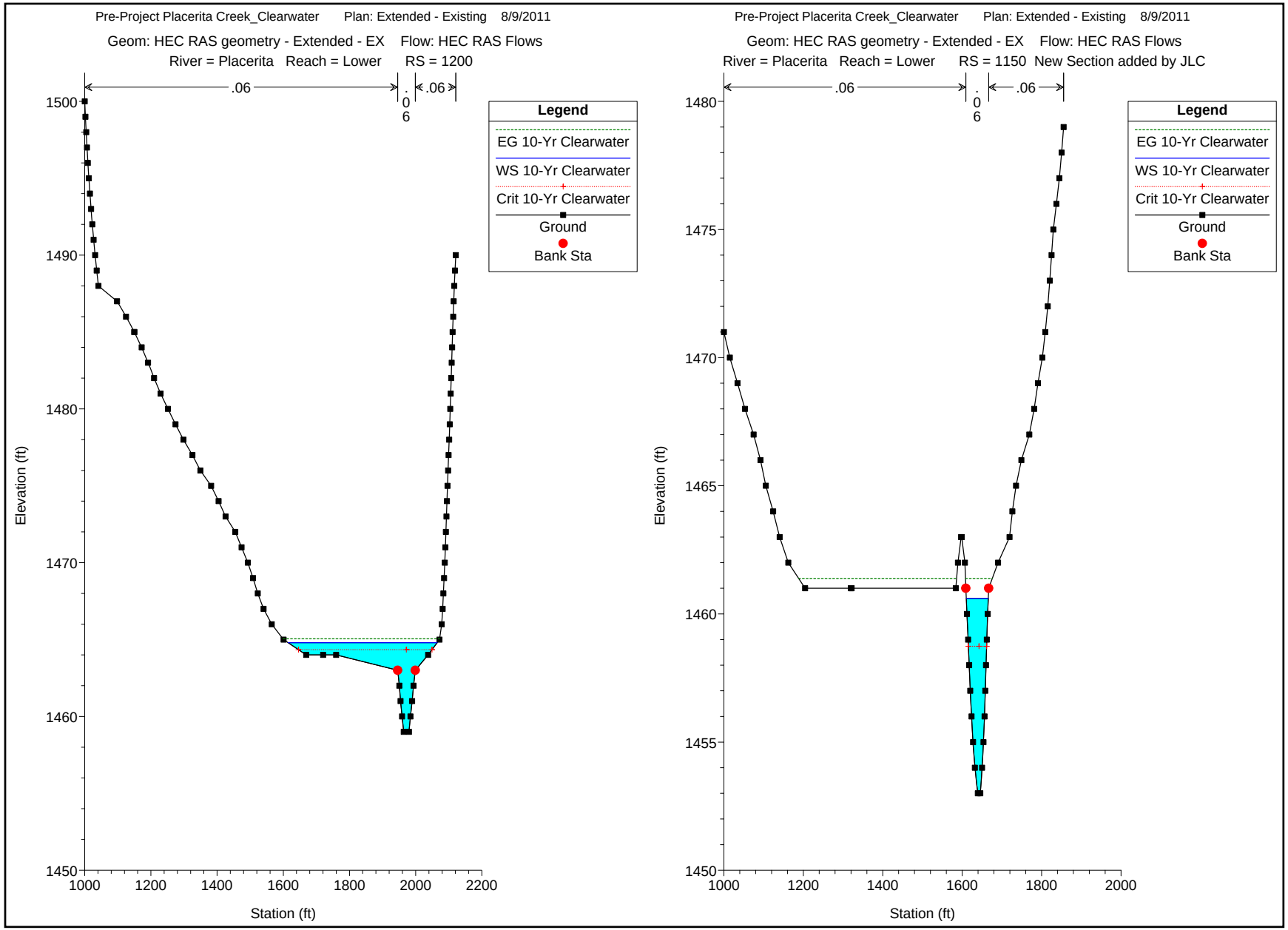

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1500
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1400 D/S of Upper Reach
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

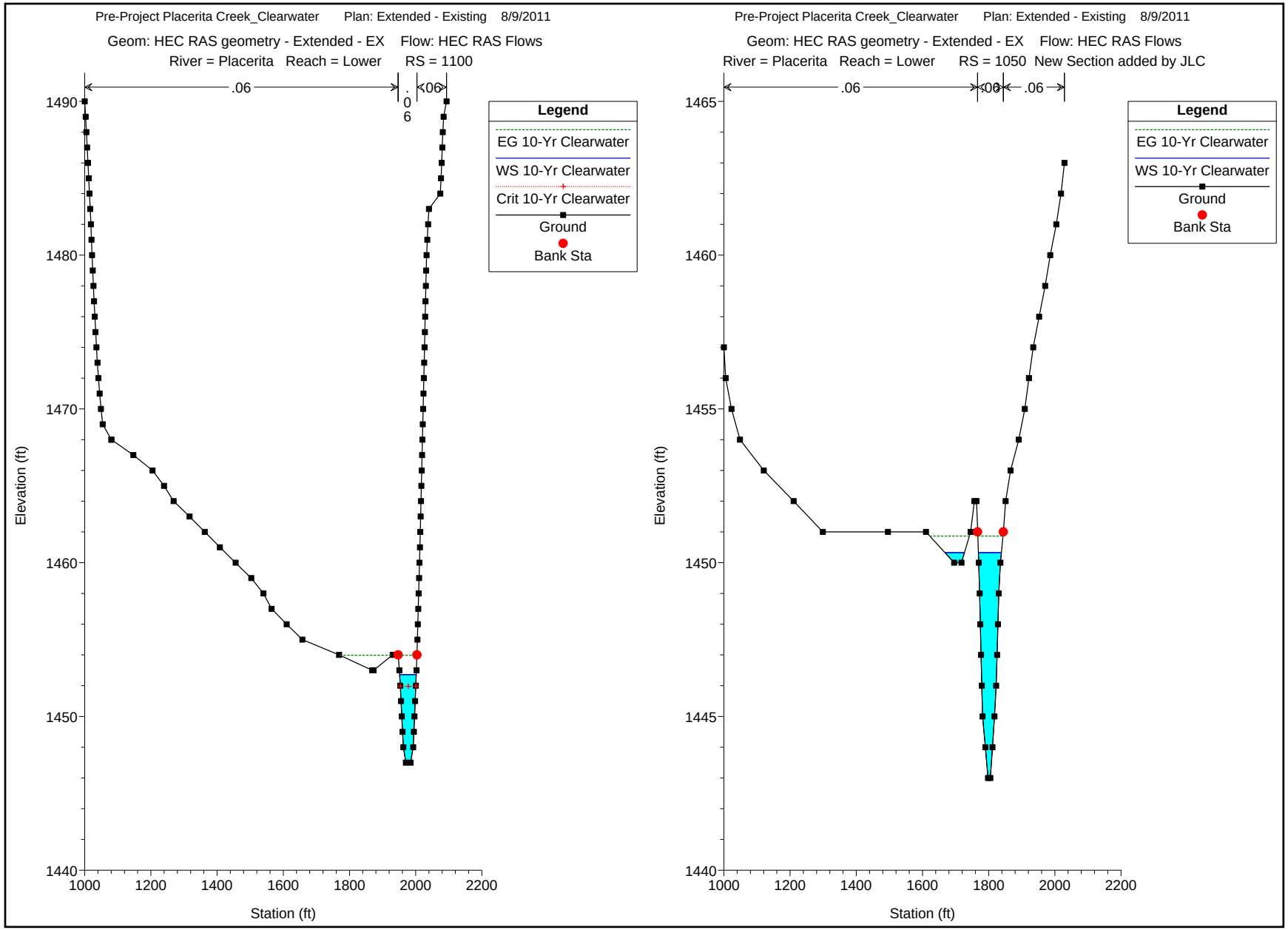

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 510
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1575
1570
1565
1560
1555
1550
1545
1000
1100
1200
1300
1400
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 410
.06
.06
.06
Legend
EG 10-Yr Clearwater
Crit 10-Yr Clearwater
WS 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1545
1540
1535
1530
1525
1520
1000
1050
1100
1150
1200
1250
1300

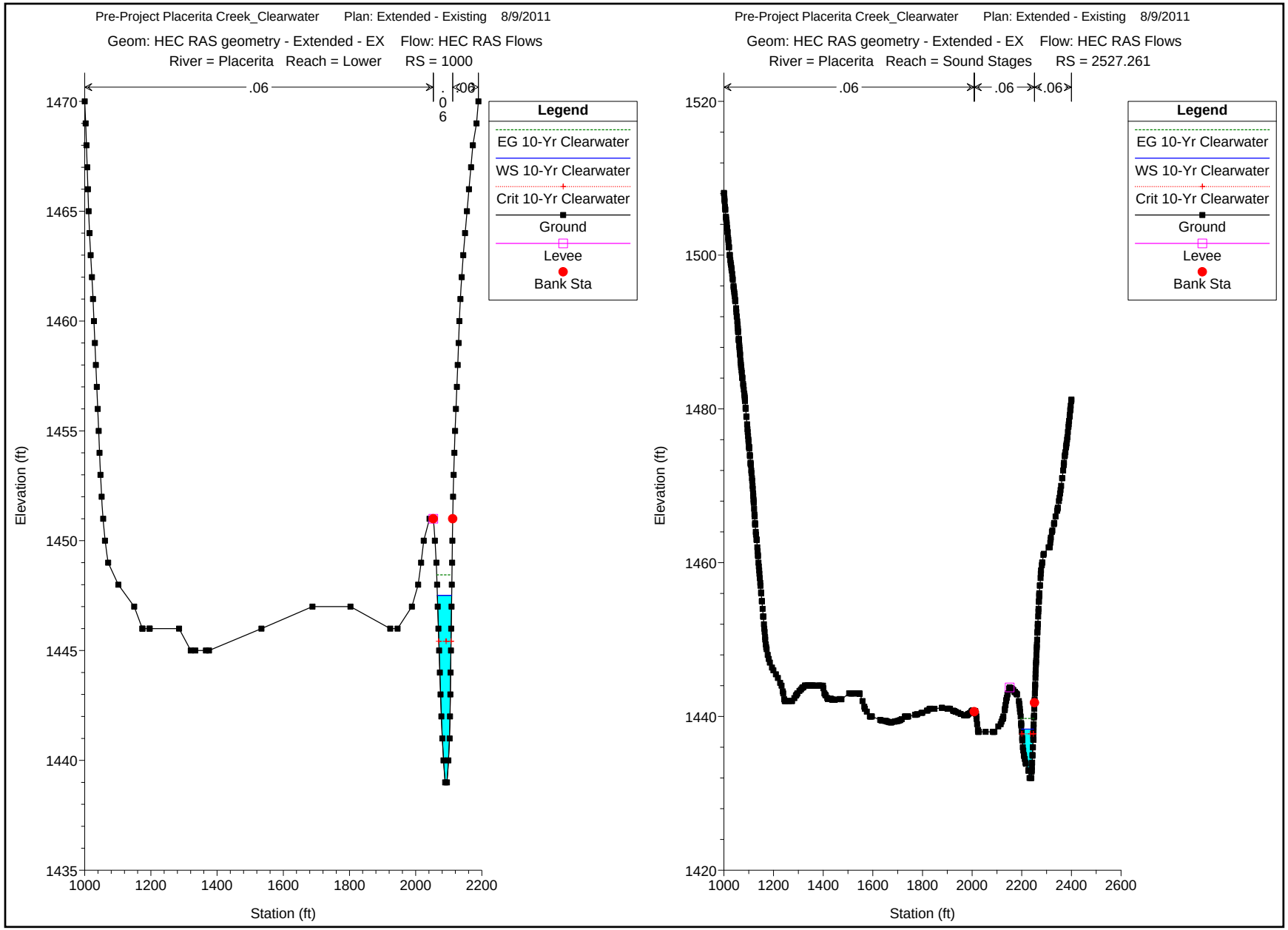

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 310
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1530
1525
1520
1515
1510
1505
1500
1000
1100
1200
1300
1400
1500
1600
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 210
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1515
1510
1505
1500
1495
1490
1485
1000
1100
1200
1300
1400
1500
1600

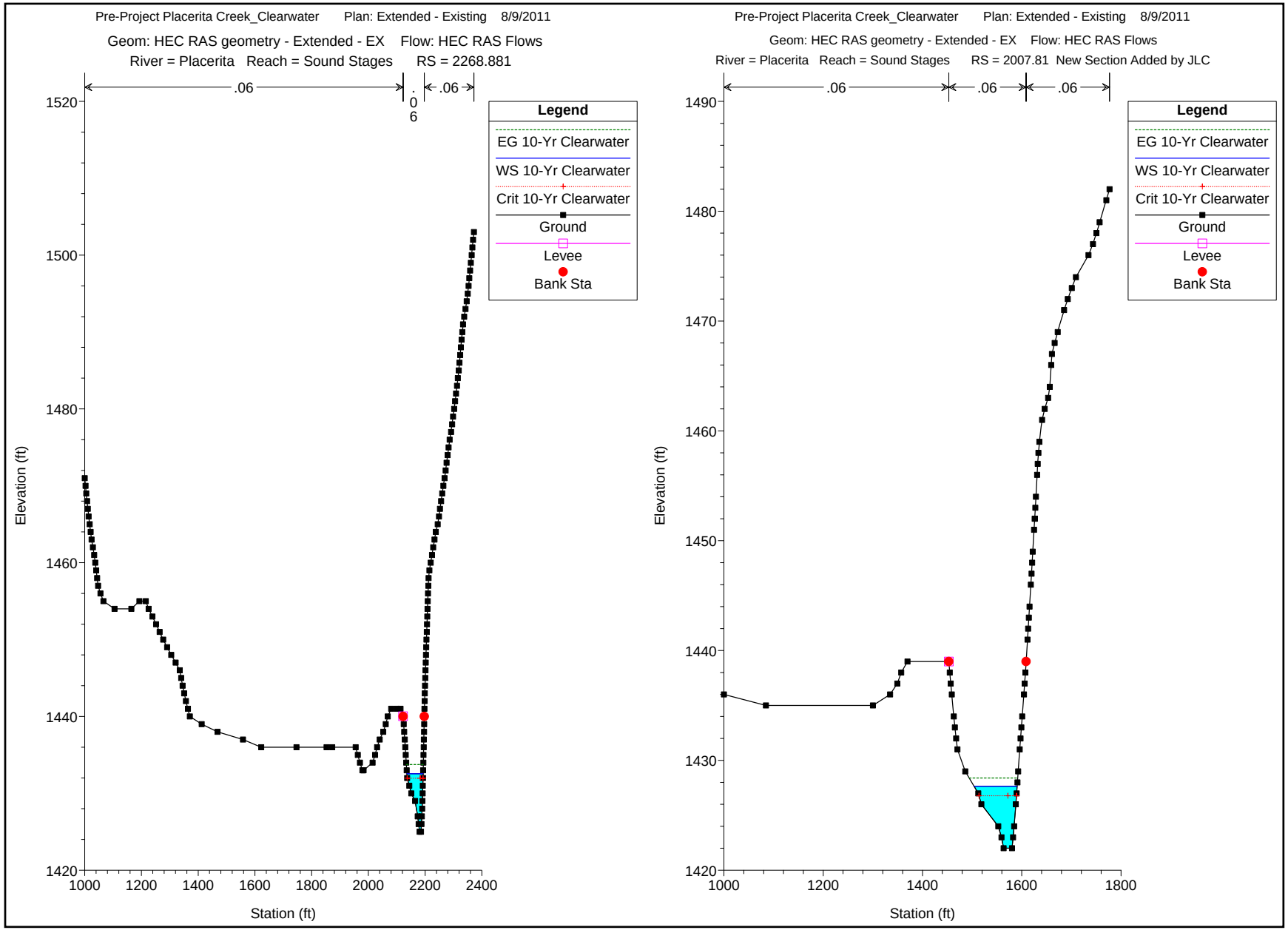

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 110
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
800
900
1000
1100
1200
1300
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 10
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1050
1100
1150
1200
1250

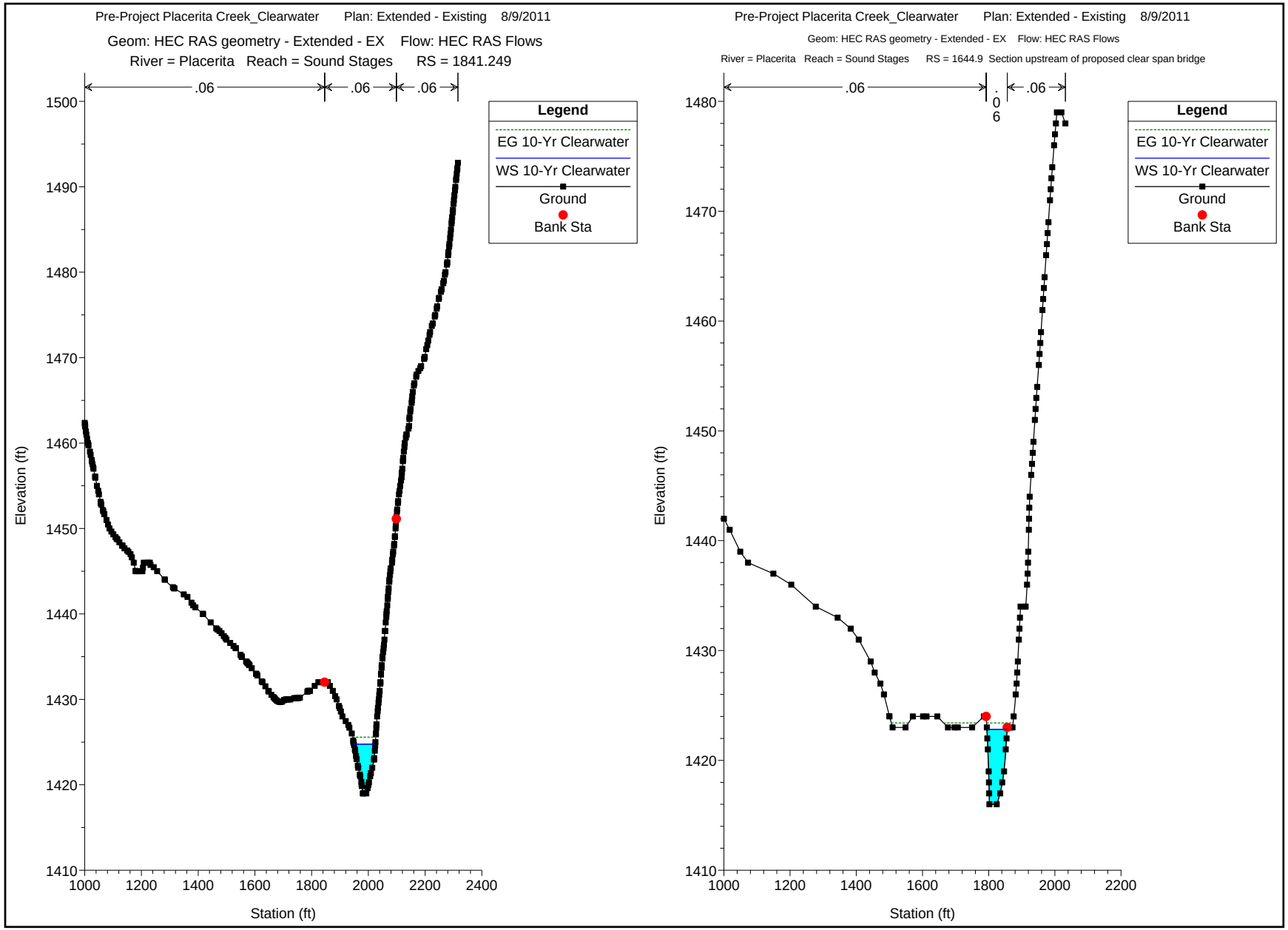

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1300
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1250 New Section added by JLC
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

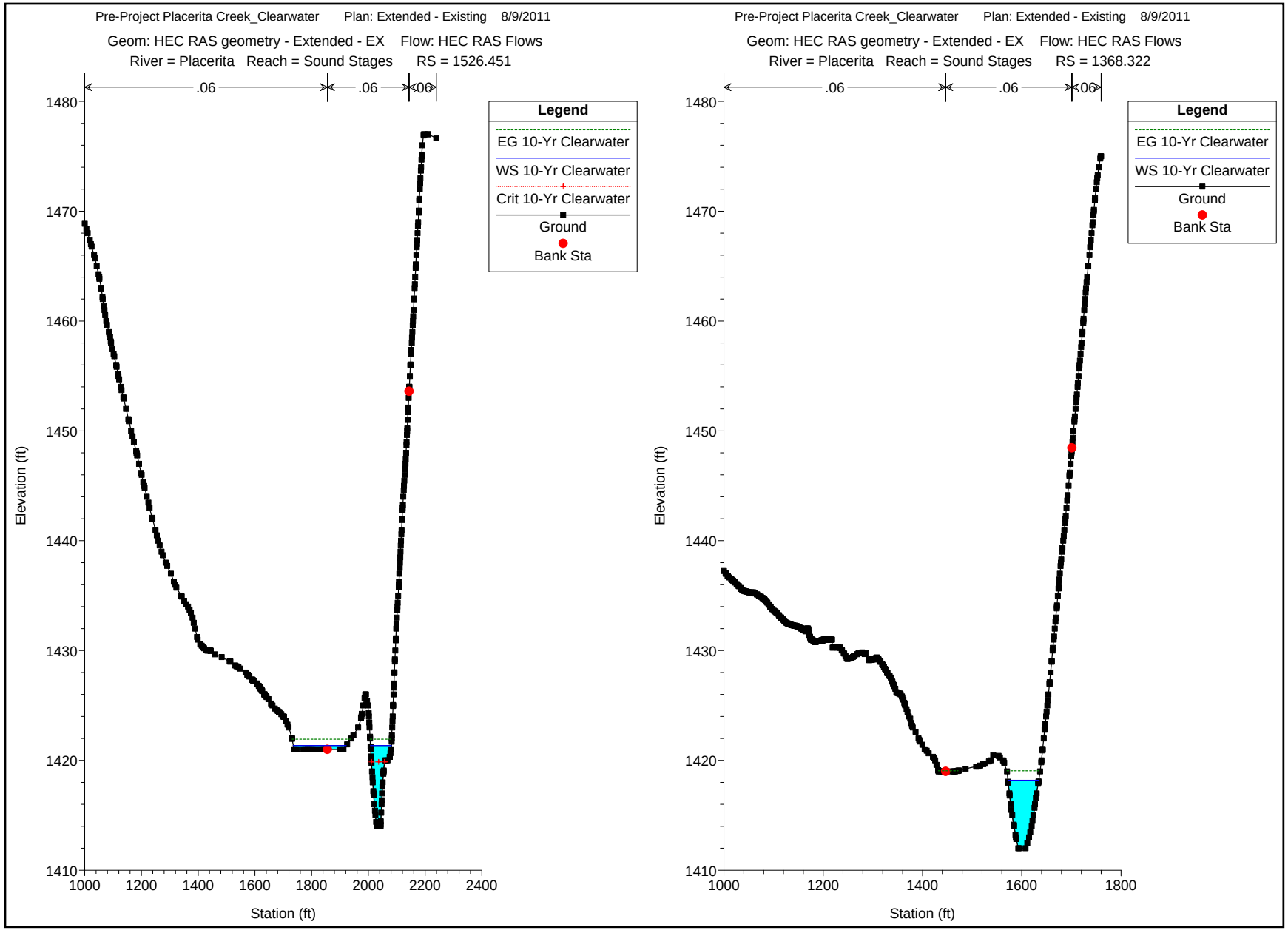

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1200
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1150 New Section added by JLC
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

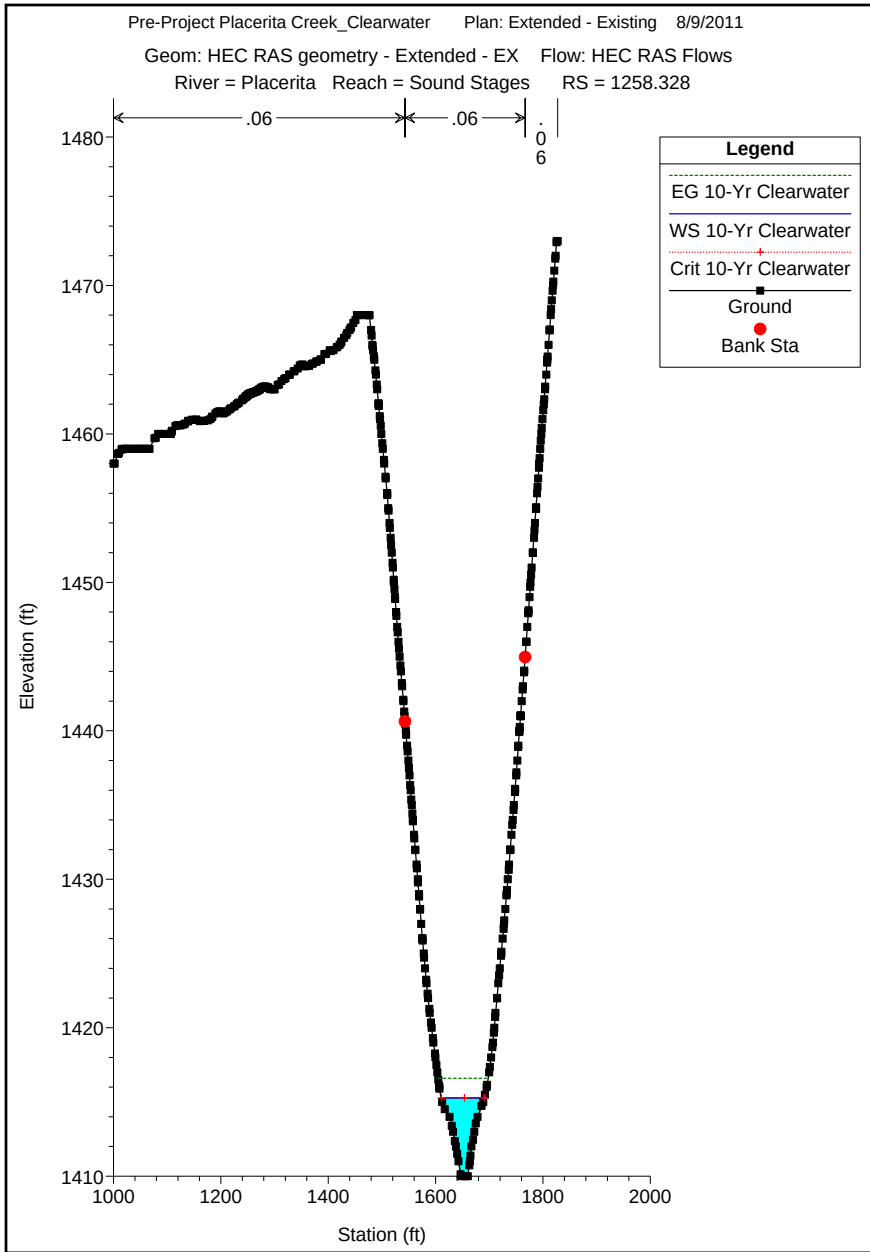

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1100
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1050 New Section added by JLC
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

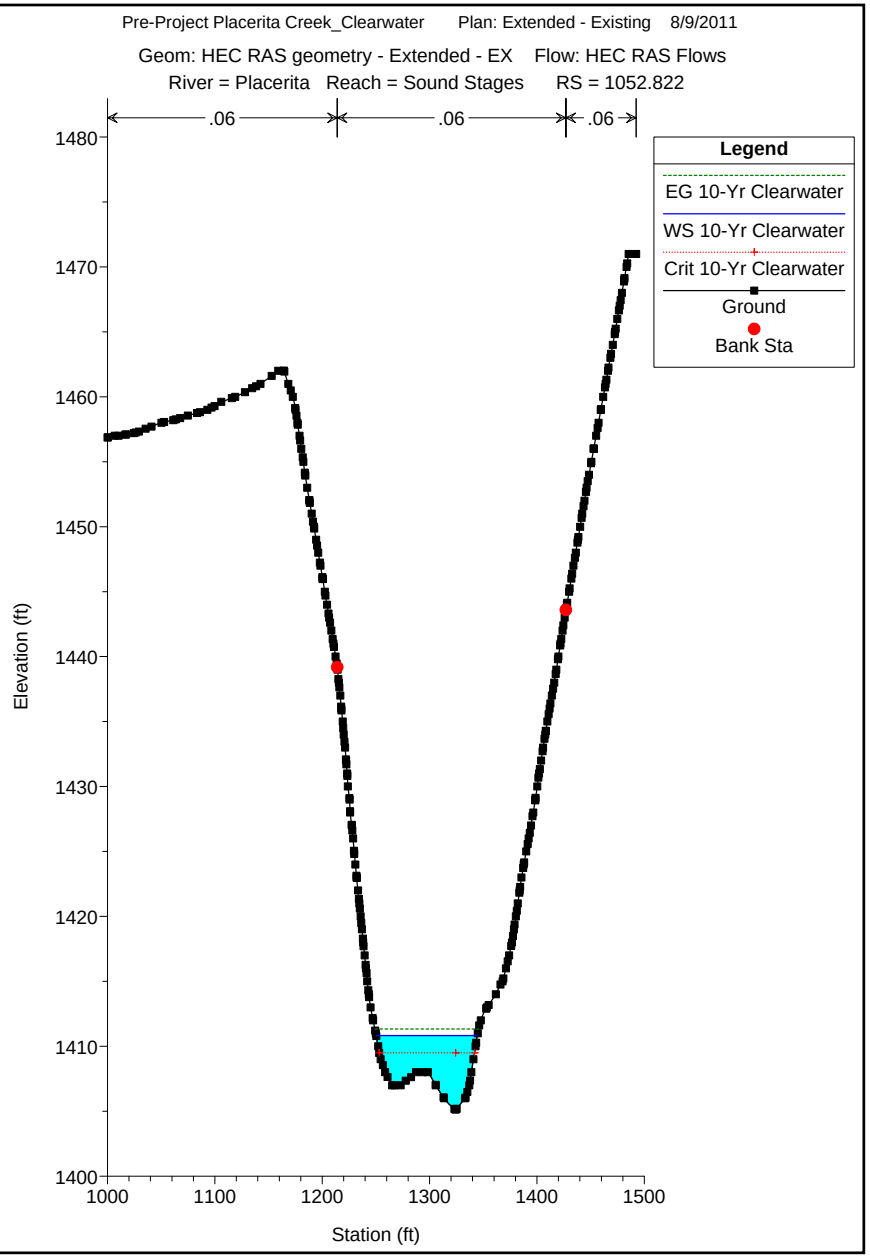

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1000
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2527.261
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

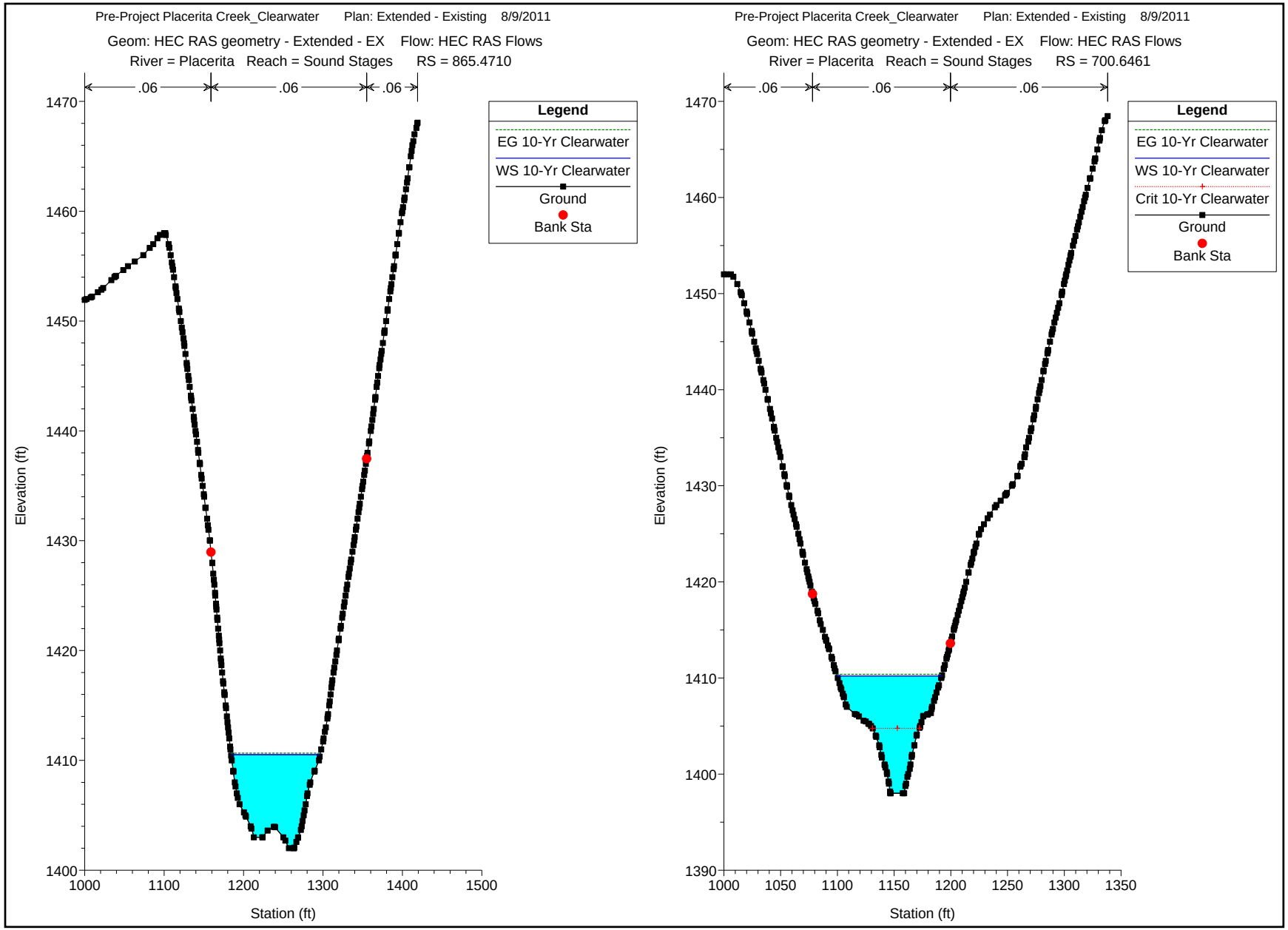

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2268.881
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2007.81 New Section Added by JLC
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)


Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1841.249
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1644.9 Section upstream of proposed clear span bridge
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)


Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1526.451
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1368.322
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)


Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1258.328
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1480
1470
1460
1450
1440
1430
1420
1410
1000
1200
1400
1600
1800
2000


Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1052.822
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1480
1470
1460
1450
1440
1430
1420
1410
1400
1000
1100
1200
1300
1400
1500


Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 865.4710
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1400
1410
1420
1430
1440
1450
1460
1470
1000
1100
1200
1300
1400
1500
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700.6461
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1390
1400
1410
1420
1430
1440
1450
1460
1470
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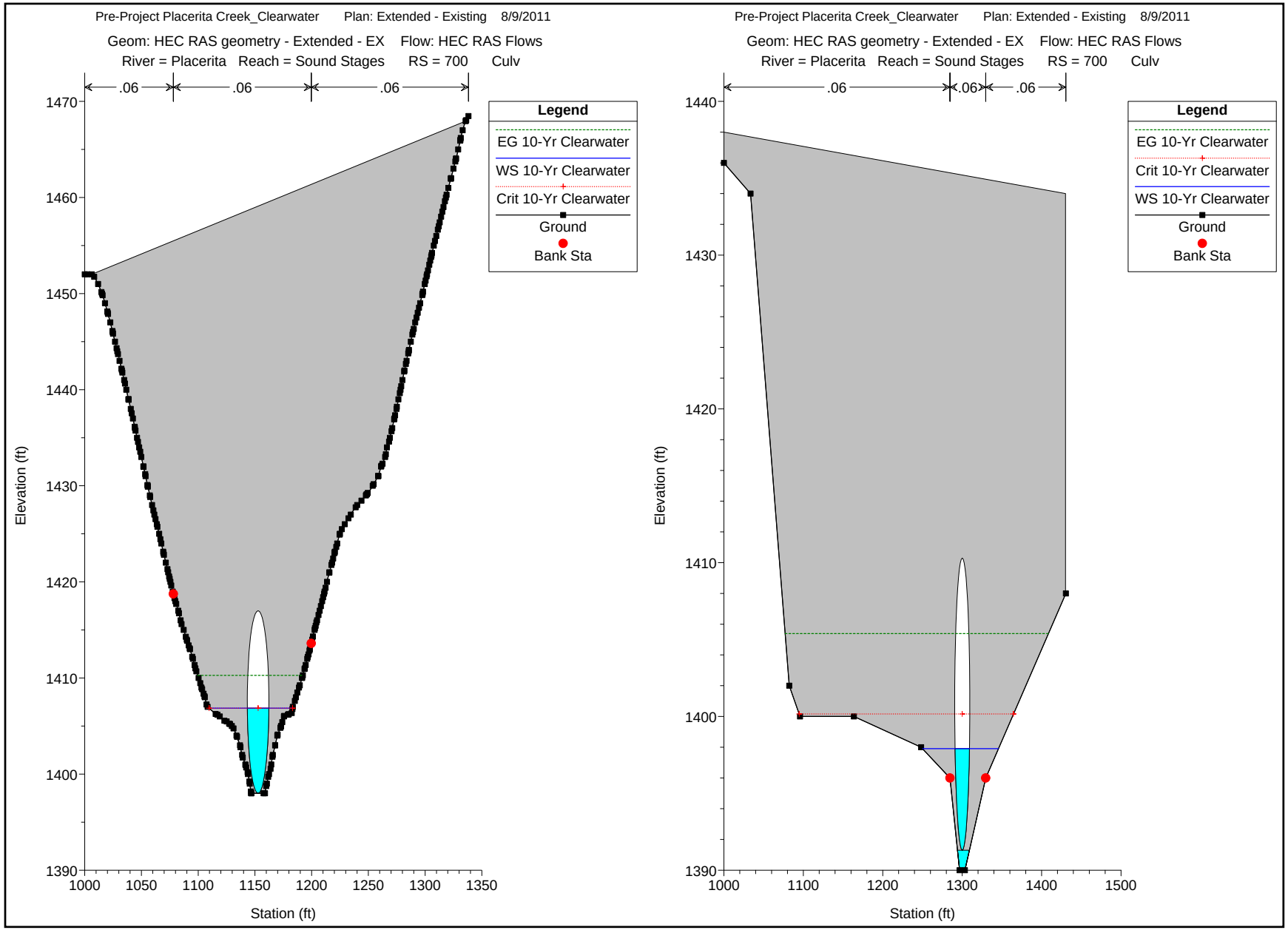
1150
1200
1250
1300
1350


Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700 Culv
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1470
1460
1450
1440
1430
1420
1410
1400
1390
1000
1050
1100
1150
1200
1250
1300
1350
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700 Culv
.06
.06
.06
Legend
EG 10-Yr Clearwater
Crit 10-Yr Clearwater
WS 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1440
1430
1420
1410
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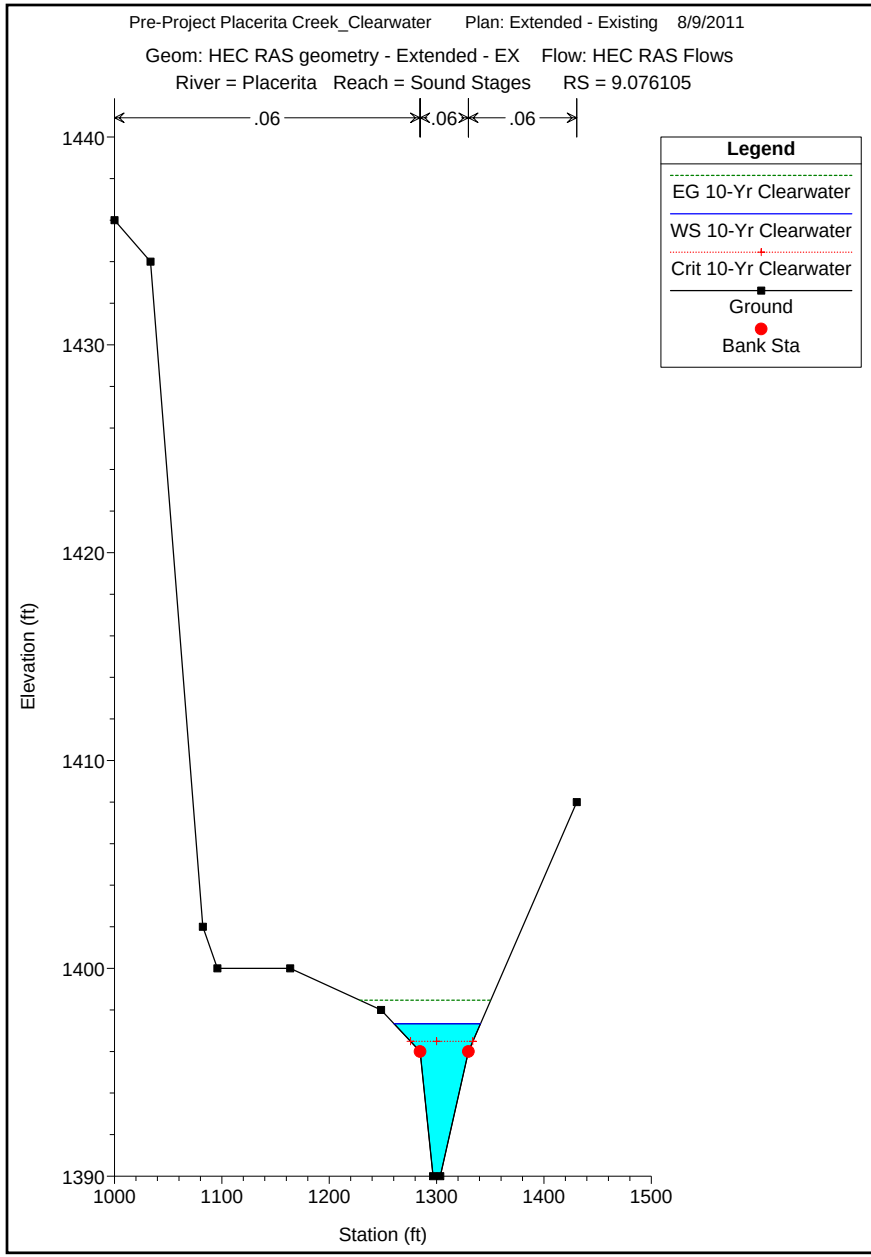
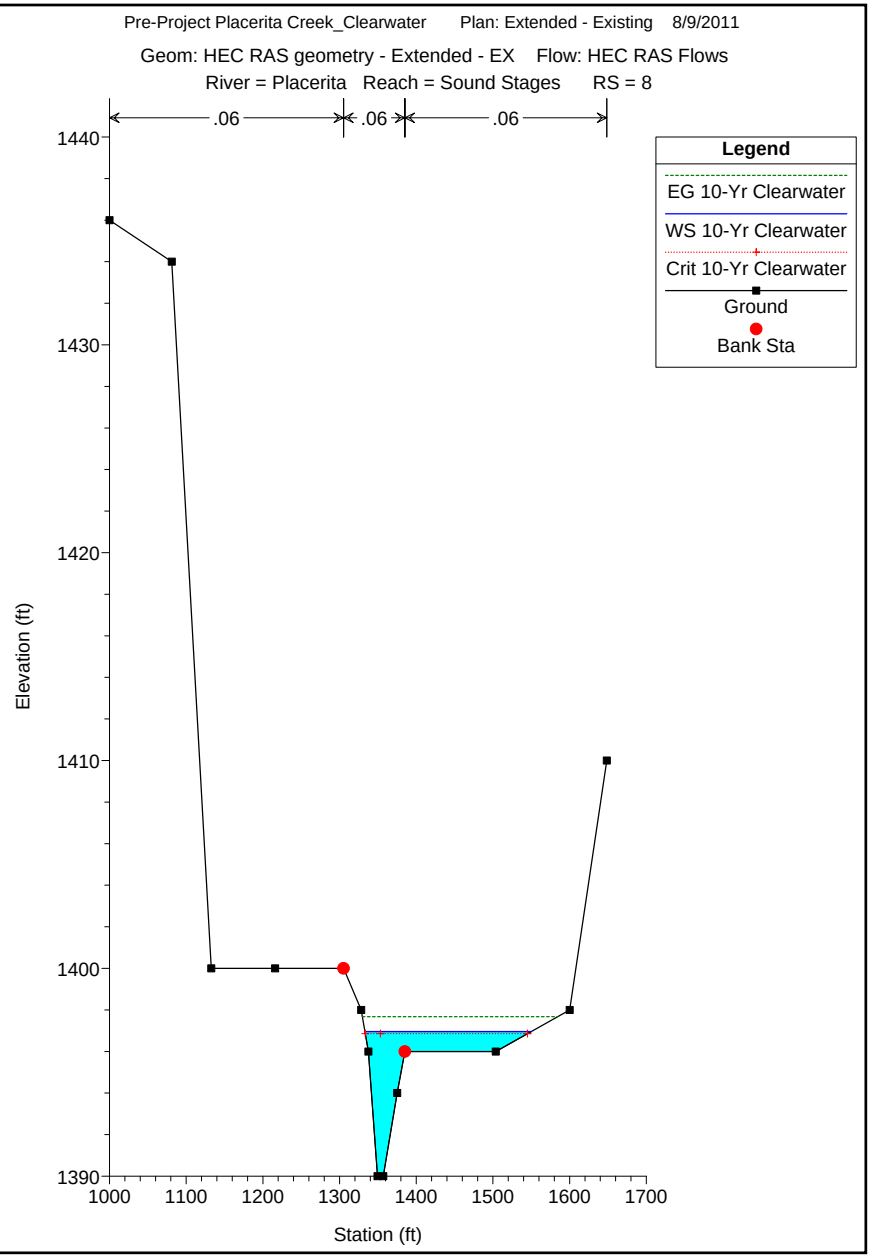
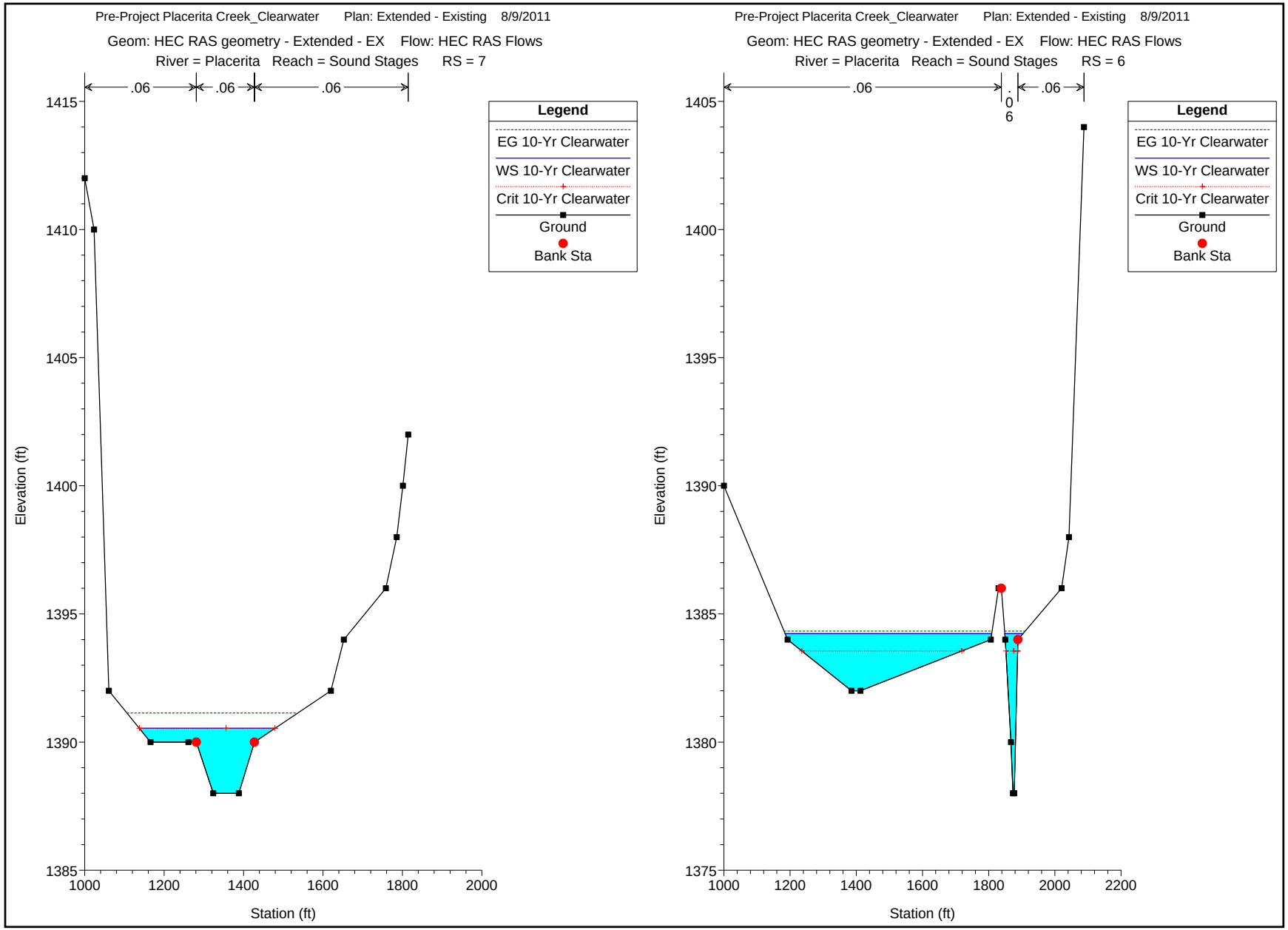
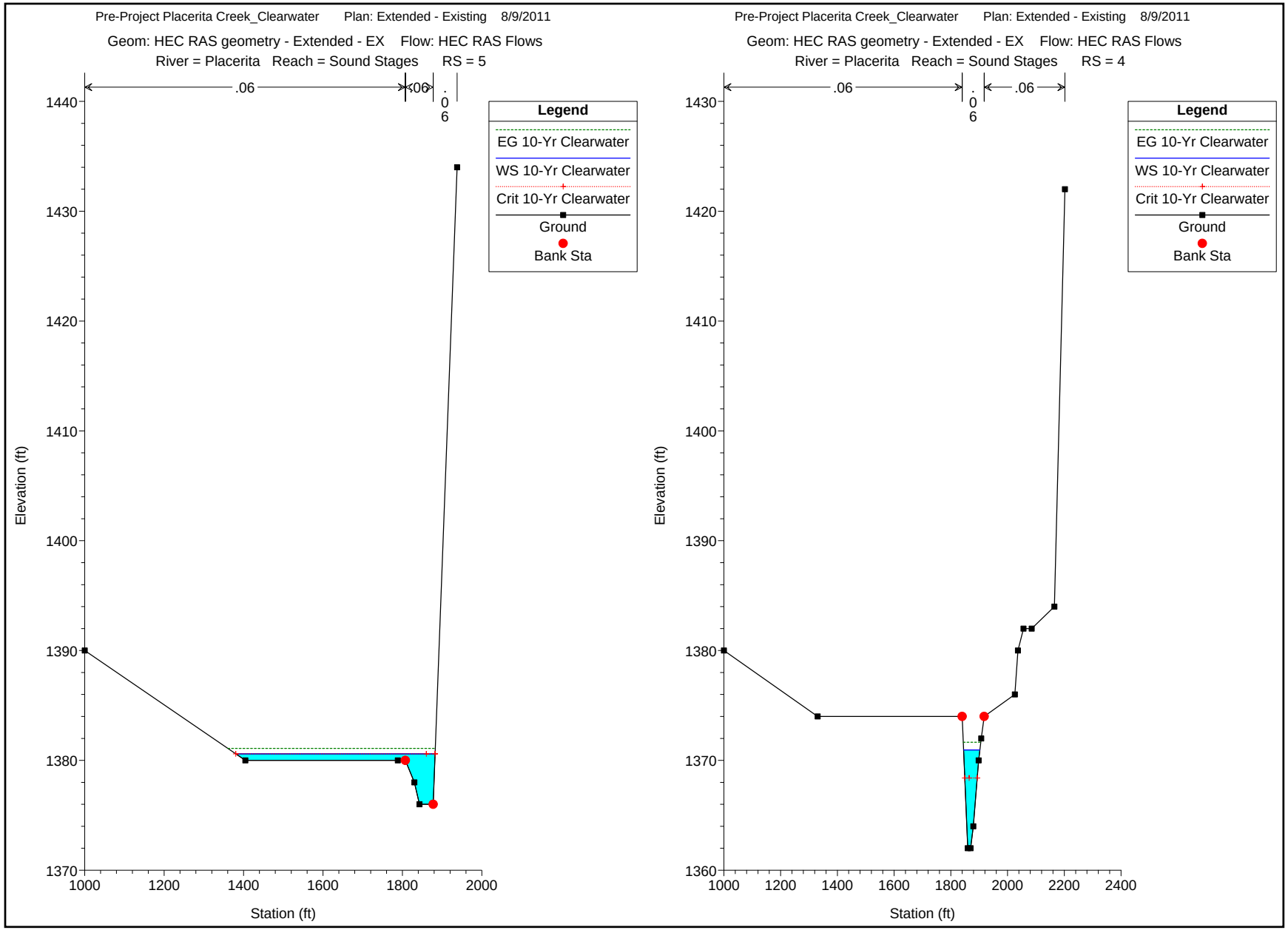
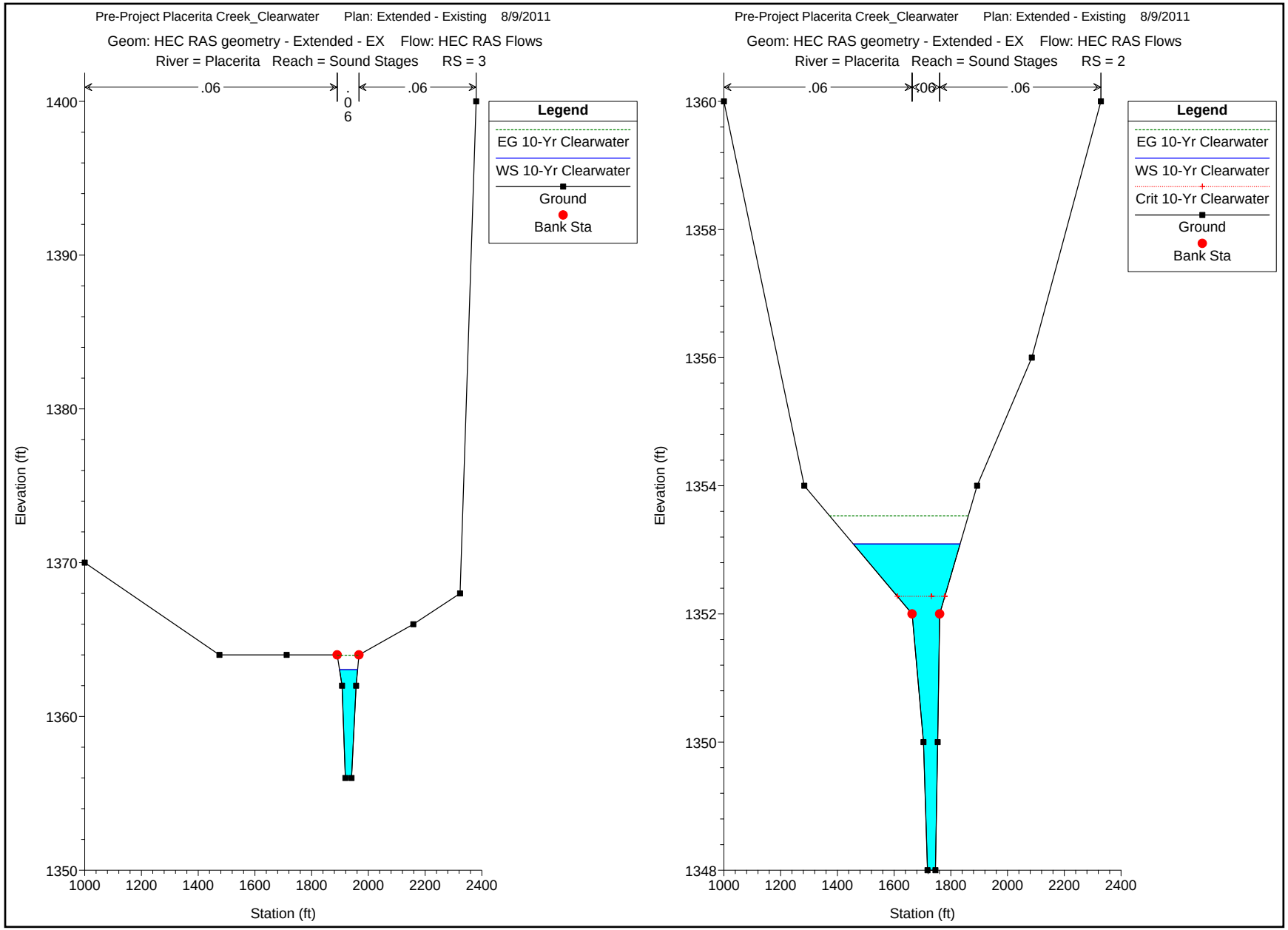
1390
1000
1100
1200
1300
1400
1500


Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 9.076105
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500
Station (ft)


Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 8
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500
1600
1700
Station (ft)


Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 7
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 6
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

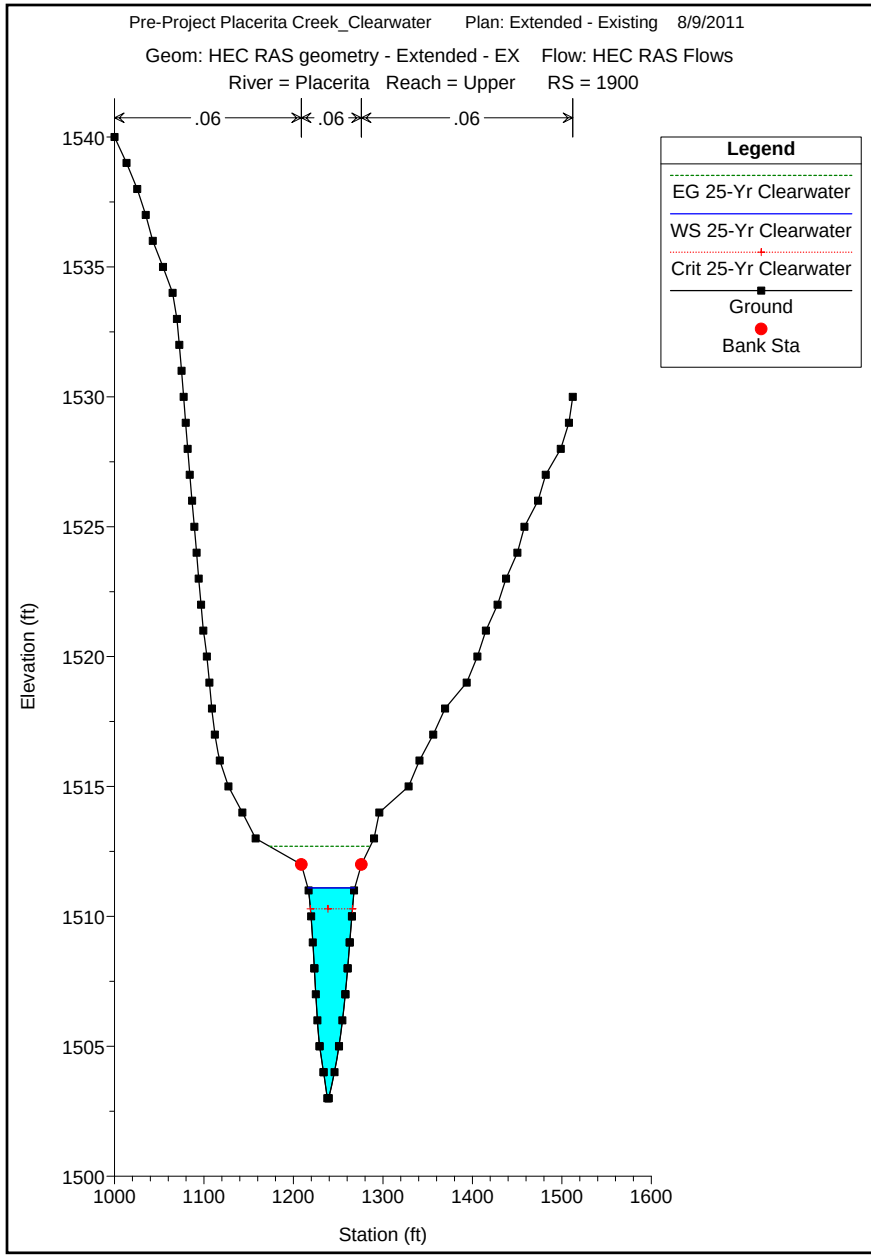

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 5
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 4
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

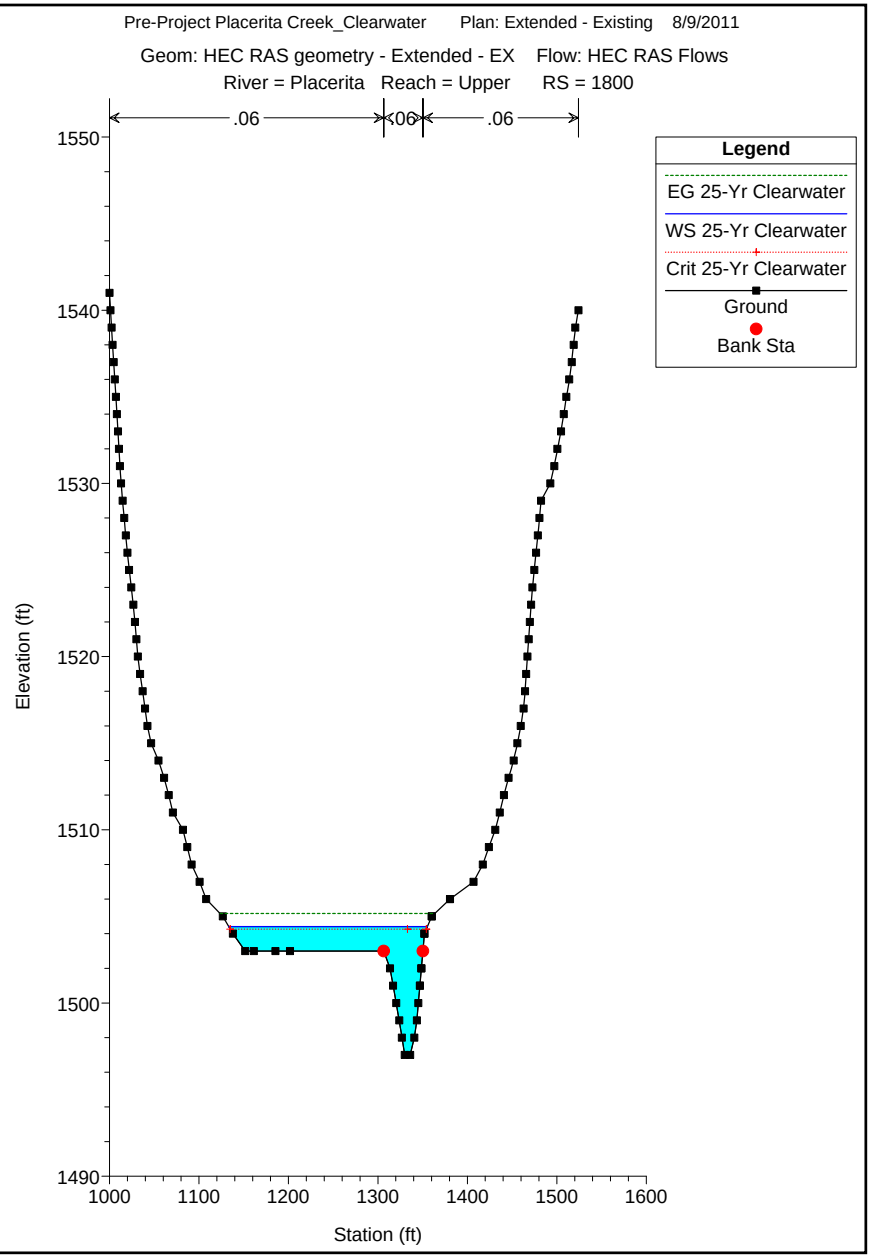

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 3
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

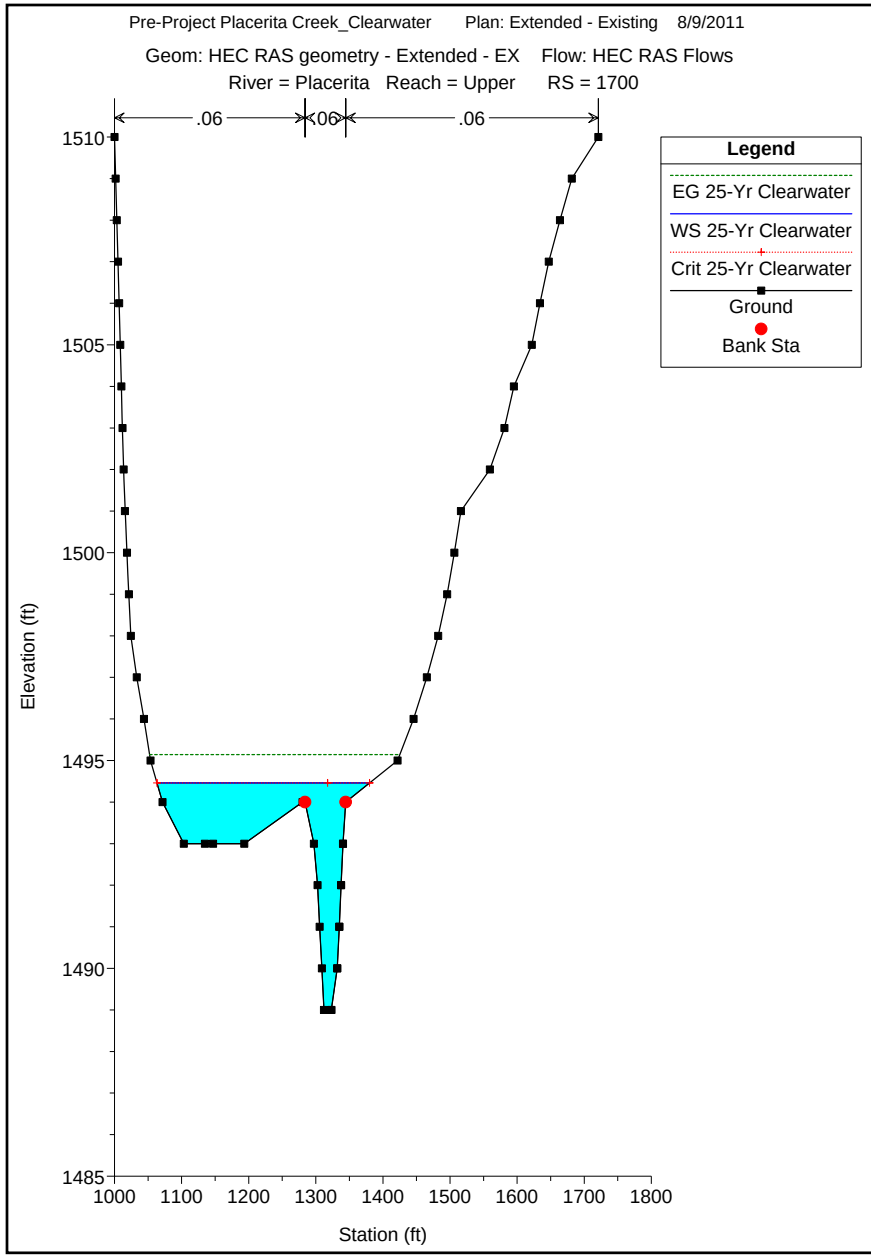
25-Year Storm Event – Pre Project Condition HEC-RAS Output

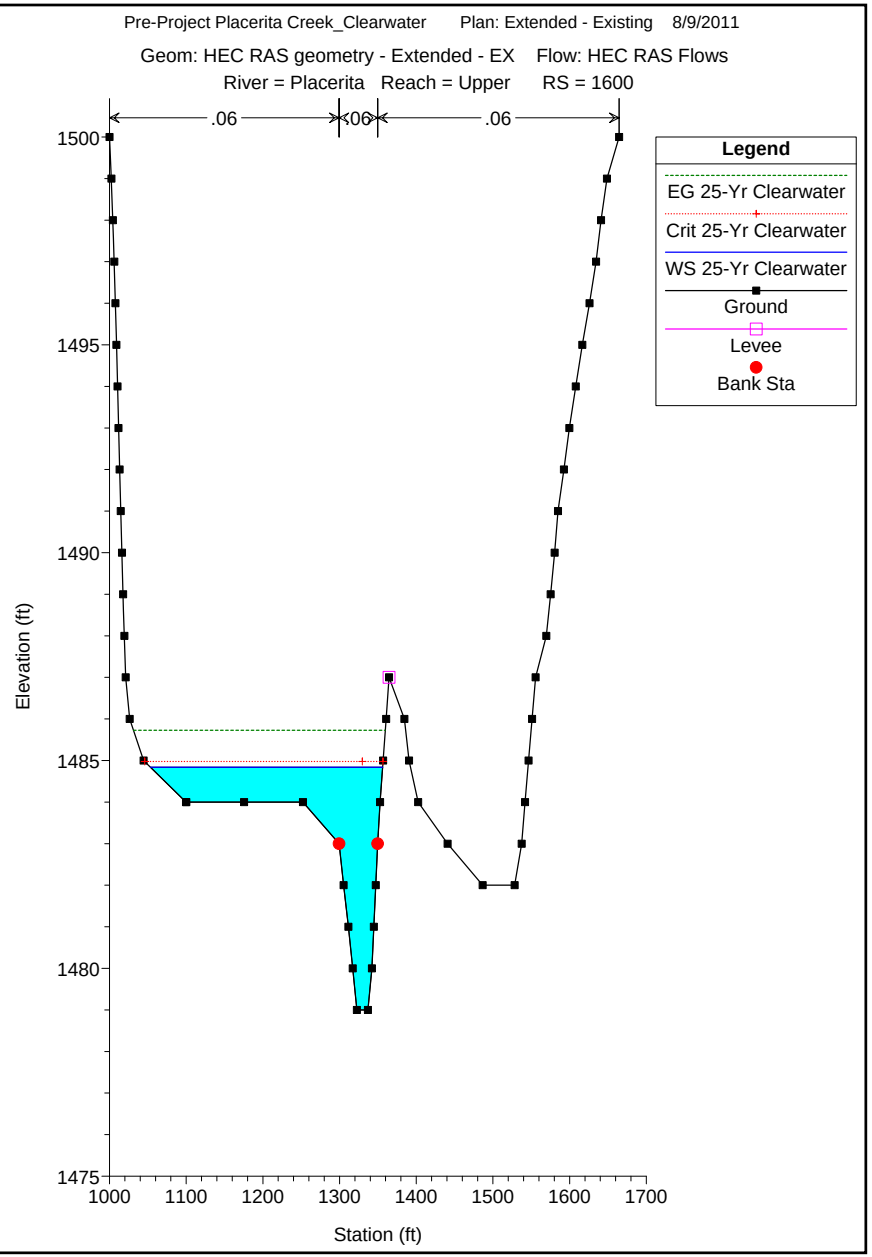
HEC-RAS Plan: EX_Extended Profile: 25-Yr Clearwater

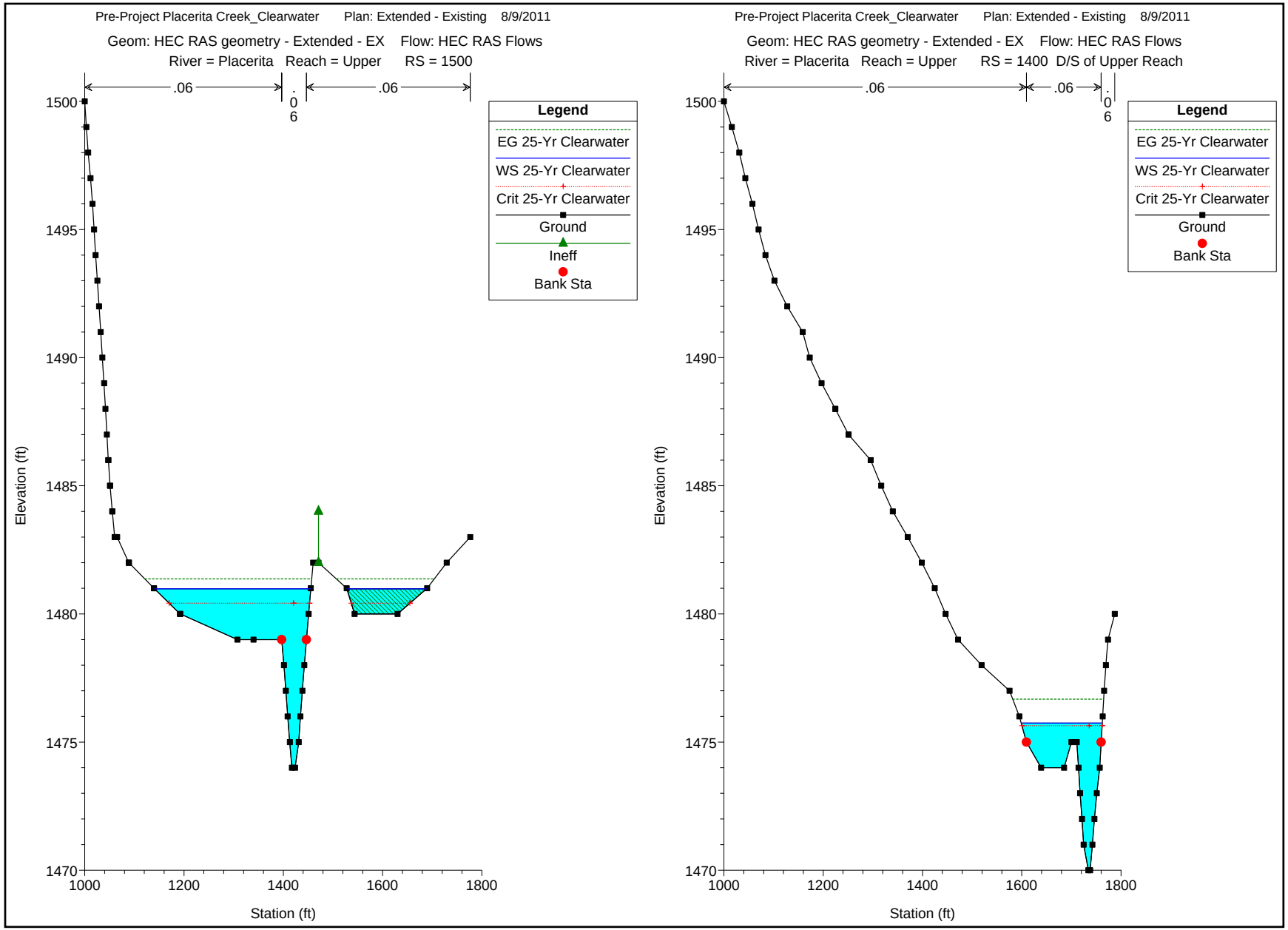
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Upper	1900	25-Yr Clearwater	2543.10	1503.00	1511.10	1510.29	1512.70	0.022576	10.17	249.96	52.33	0.82
Upper	1800	25-Yr Clearwater	2543.10	1497.00	1504.41	1504.27	1505.16	0.014131	8.11	445.22	222.16	0.65
Upper	1700	25-Yr Clearwater	2543.10	1489.00	1494.46	1494.46	1495.14	0.022215	7.91	451.26	316.78	0.78
Upper	1600	25-Yr Clearwater	2543.10	1479.00	1484.84	1484.98	1485.73	0.016603	8.55	440.71	302.65	0.71
Upper	1500	25-Yr Clearwater	2543.10	1474.00	1480.98	1480.42	1481.37	0.007550	6.12	625.32	475.02	0.49
Upper	1400	25-Yr Clearwater	2543.10	1470.00	1475.74	1475.64	1476.68	0.035762	7.79	329.94	163.32	0.93
Tributary	510	25-Yr Clearwater	481.40	1545.00	1548.19	1548.44	1549.00	0.033855	7.39	78.12	117.30	0.89
Tributary	410	25-Yr Clearwater	481.40	1524.00	1527.56	1527.61	1527.94	0.034047	5.98	115.14	164.74	0.85
Tributary	310	25-Yr Clearwater	481.40	1503.00	1505.70	1505.35	1505.94	0.016605	3.98	132.05	133.95	0.59
Tributary	210	25-Yr Clearwater	481.40	1486.00	1488.73	1488.73	1489.60	0.045555	7.49	64.24	37.41	1.01
Tributary	110	25-Yr Clearwater	481.40	1479.00	1483.05	1482.79	1483.31	0.009330	4.80	161.49	193.48	0.49
Tributary	10	25-Yr Clearwater	481.40	1471.00	1475.26	1475.26	1476.60	0.044445	9.31	51.68	19.25	1.00
Sound Stages	2527.261	25-Yr Clearwater	2981.80	1432.00	1439.80	1439.11	1441.59	0.022787	10.74	277.59	53.21	0.83
Sound Stages	2268.881	25-Yr Clearwater	2981.80	1425.00	1433.63	1433.12	1435.36	0.025444	10.56	282.36	59.51	0.85
Sound Stages	2007.81	25-Yr Clearwater	2981.80	1422.00	1428.84	1427.83	1429.75	0.016935	7.65	389.59	104.24	0.70
Sound Stages	1841.249	25-Yr Clearwater	2981.80	1419.00	1426.15		1427.12	0.014738	7.88	378.24	87.43	0.67
Sound Stages	1644.9	25-Yr Clearwater	2981.80	1416.00	1423.37	1421.77	1424.44	0.012656	8.39	401.34	228.49	0.63
Sound Stages	1526.451	25-Yr Clearwater	2981.80	1414.00	1422.53		1422.86	0.010392	4.90	673.84	307.16	0.52
Sound Stages	1368.322	25-Yr Clearwater	2981.80	1412.00	1420.09	1418.16	1420.71	0.018140	6.38	477.75	192.95	0.69
Sound Stages	1258.328	25-Yr Clearwater	2981.80	1410.00	1416.25	1416.25	1417.87	0.036191	10.21	292.07	90.40	1.00
Sound Stages	1052.822	25-Yr Clearwater	2981.80	1405.12	1414.33	1410.36	1414.60	0.002833	4.21	707.65	120.72	0.31
Sound Stages	865.4710	25-Yr Clearwater	2981.80	1402.00	1414.20		1414.31	0.000736	2.74	1087.64	127.63	0.17
Sound Stages	700.6461	25-Yr Clearwater	2981.80	1398.00	1414.02	1406.65	1414.17	0.000973	3.14	951.07	110.65	0.19
Sound Stages	700		Culvert									
Sound Stages	9.076105	25-Yr Clearwater	2981.80	1390.00	1397.98	1397.98	1399.88	0.023591	11.40	296.46	97.64	0.86
Sound Stages	8	25-Yr Clearwater	2981.80	1390.00	1397.02	1397.49	1398.61	0.032380	11.11	361.41	220.32	0.97
Sound Stages	7	25-Yr Clearwater	3210.80	1388.00	1390.99	1390.99	1391.69	0.026383	7.28	543.72	409.33	0.82
Sound Stages	6	25-Yr Clearwater	3210.80	1378.00	1384.73	1383.87	1384.85	0.004548	3.74	1271.49	736.93	0.35
Sound Stages	5	25-Yr Clearwater	3210.80	1376.00	1380.96	1380.96	1381.54	0.015316	7.46	682.92	516.94	0.67
Sound Stages	4	25-Yr Clearwater	3210.80	1362.00	1372.87	1369.97	1373.74	0.008794	7.48	429.20	69.75	0.53
Sound Stages	3	25-Yr Clearwater	3295.10	1356.00	1364.22	1363.14	1365.41	0.017455	8.91	453.53	530.81	0.73
Sound Stages	2	25-Yr Clearwater	3295.10	1348.00	1353.70	1353.33	1354.18	0.010219	6.30	761.52	532.91	0.55
Lower	1300	25-Yr Clearwater	2936.70	1468.00	1473.70	1473.09	1474.40	0.011542	7.15	492.14	190.50	0.59
Lower	1250	25-Yr Clearwater	2936.70	1463.00	1468.87	1468.87	1469.79	0.021517	8.91	444.49	229.41	0.79
Lower	1200	25-Yr Clearwater	2936.70	1459.00	1465.60	1464.76	1465.79	0.004106	4.70	1012.00	496.50	0.36
Lower	1150	25-Yr Clearwater	2936.70	1453.00	1461.39	1460.13	1462.47	0.013697	8.67	465.45	465.53	0.66
Lower	1100	25-Yr Clearwater	2936.70	1447.00	1454.34	1454.34	1455.38	0.014309	8.67	448.54	273.50	0.67
Lower	1050	25-Yr Clearwater	2936.70	1443.00	1452.03	1449.28	1452.27	0.003376	4.54	1048.90	644.41	0.33
Lower	1000	25-Yr Clearwater	2936.70	1439.00	1449.57	1447.03	1450.73	0.011102	8.63	340.40	50.62	0.59

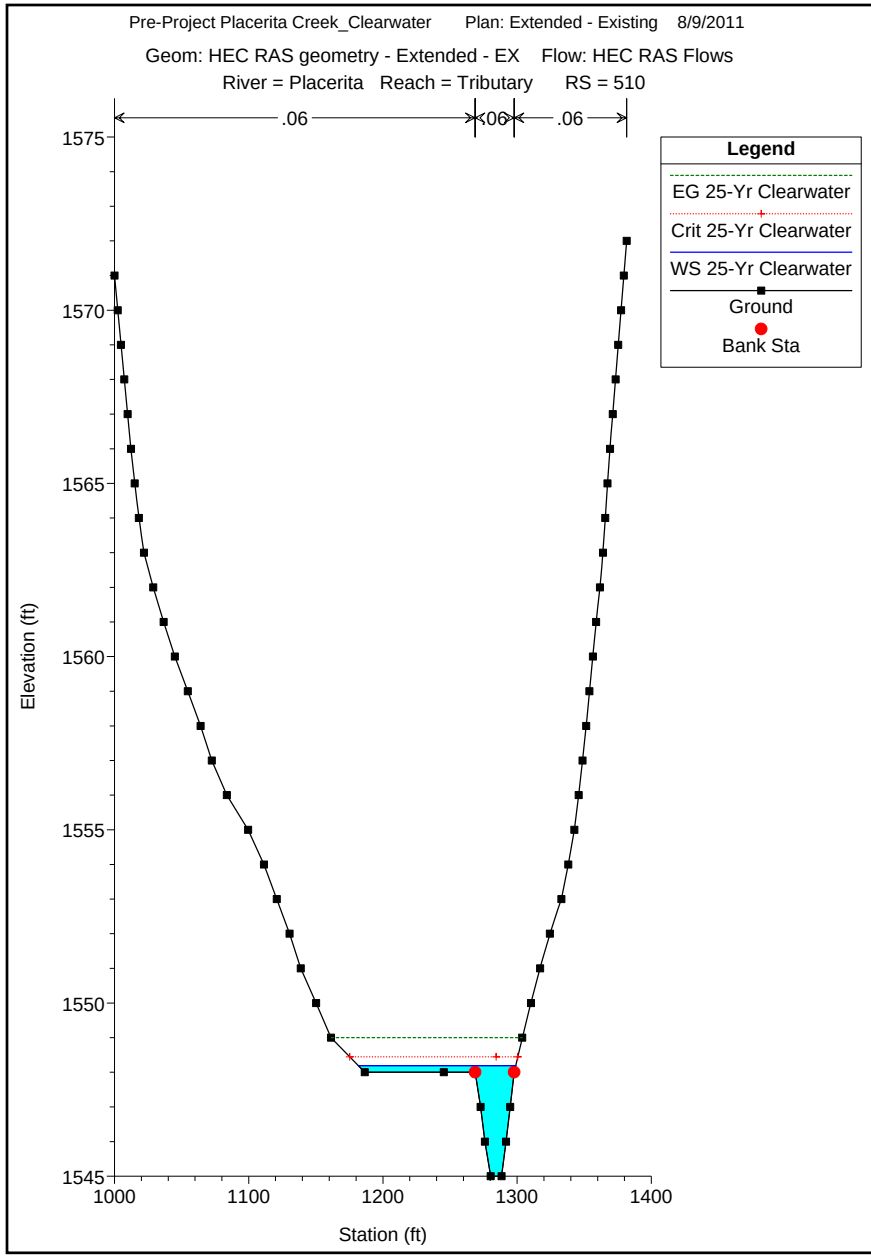

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1900
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1540
1535
1530
1525
1520
1515
1510
1505
1500
1000
1100
1200
1300
1400
1500
1600

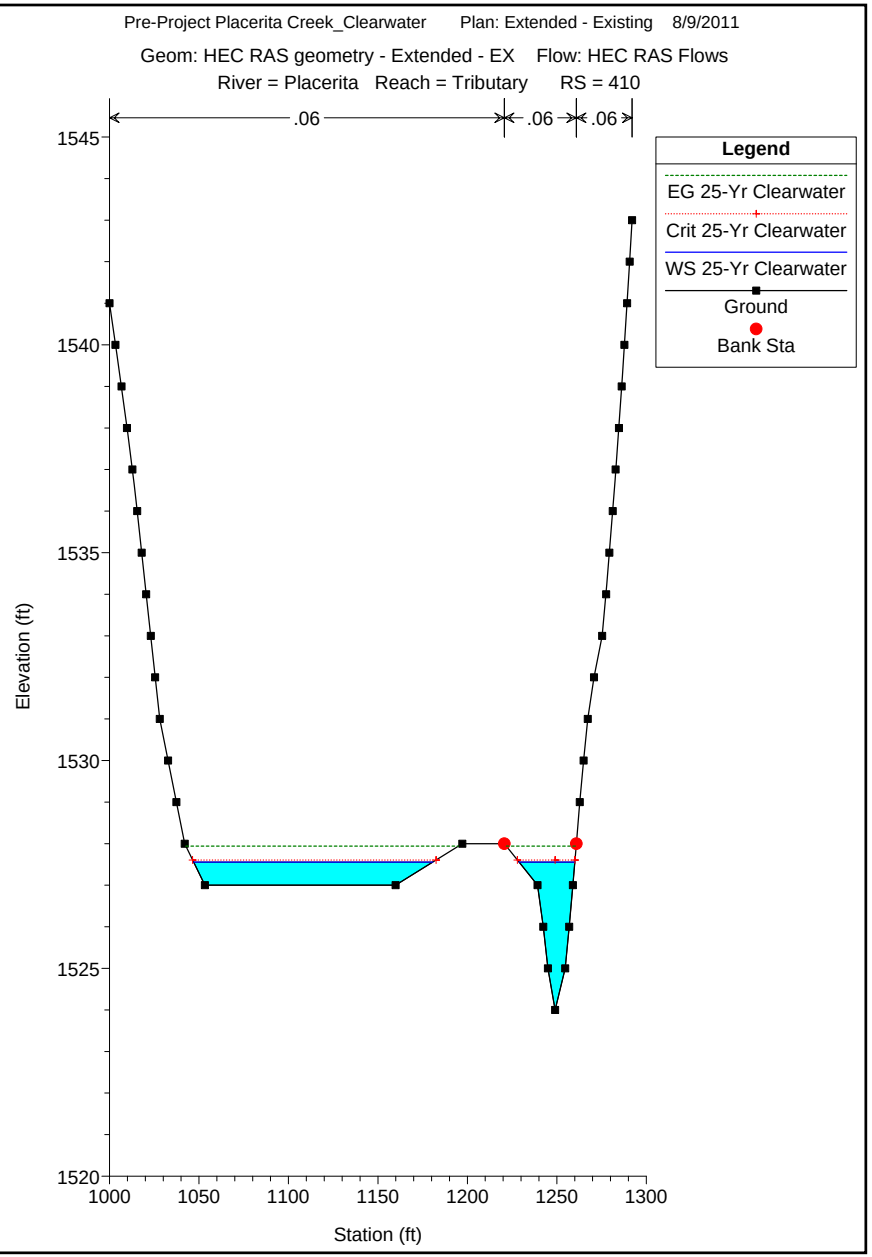

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1800
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1550
1540
1530
1520
1510
1500
1490
1000
1100
1200
1300
1400
1500
1600

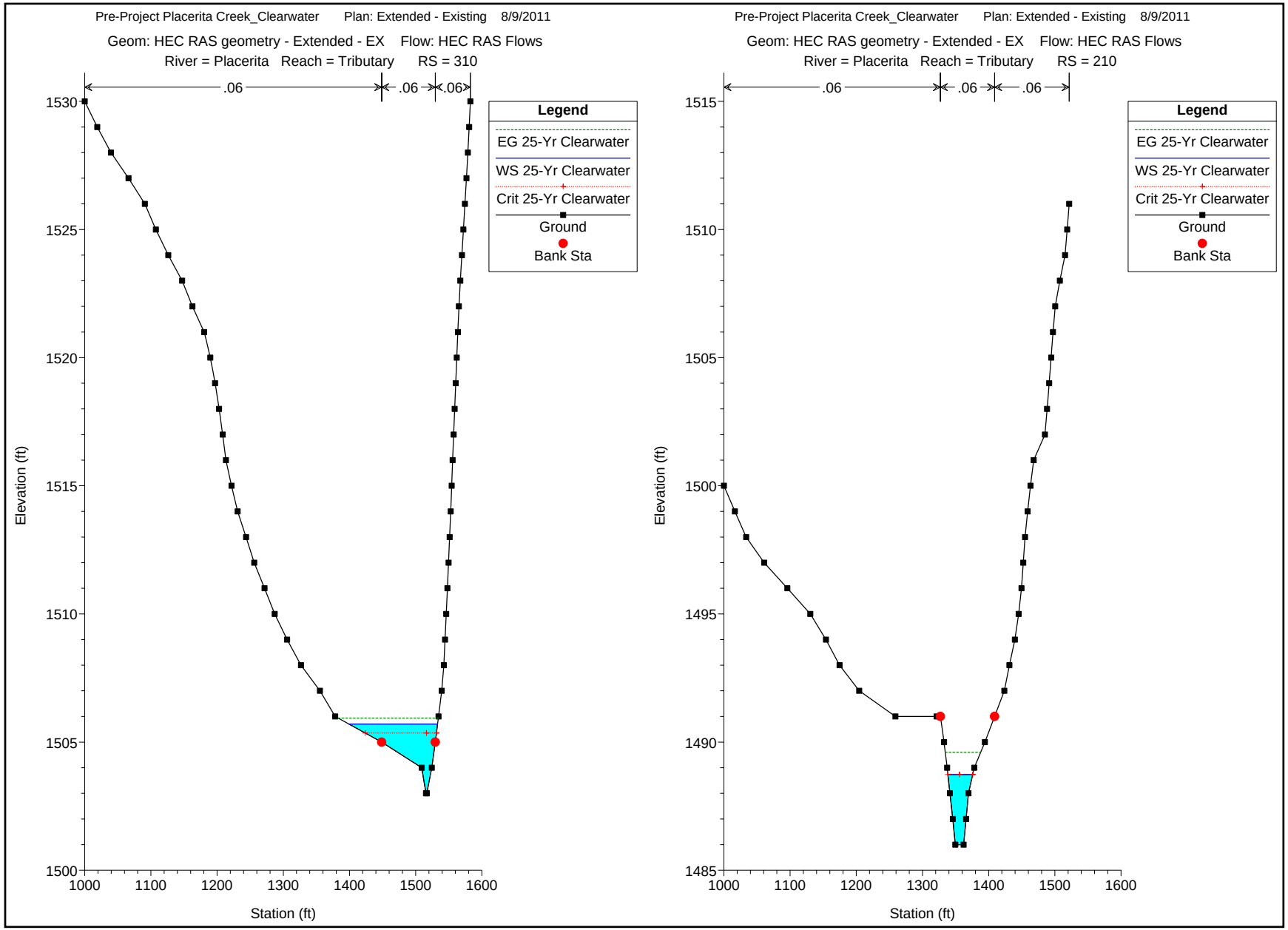

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1700
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1510
1505
1500
1495
1490
1485
1000
1100
1200
1300
1400
1500
1600
1700
1800
Station (ft)

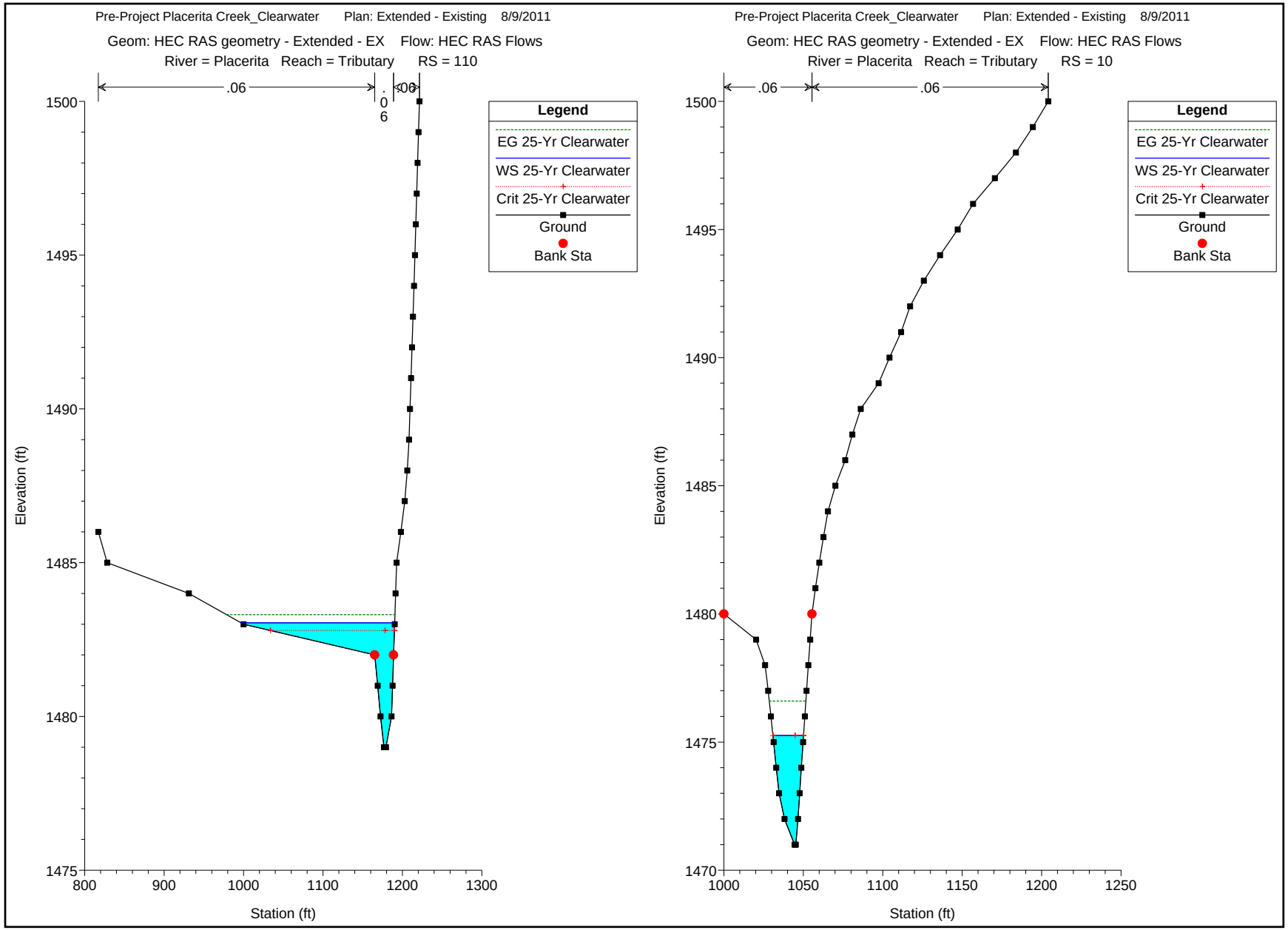

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1600
.06
.06
.06
Legend
EG 25-Yr Clearwater
Crit 25-Yr Clearwater
WS 25-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
1500
1495
1490
1485
1480
1475
1000
1100
1200
1300
1400
1500
1600
1700
Station (ft)

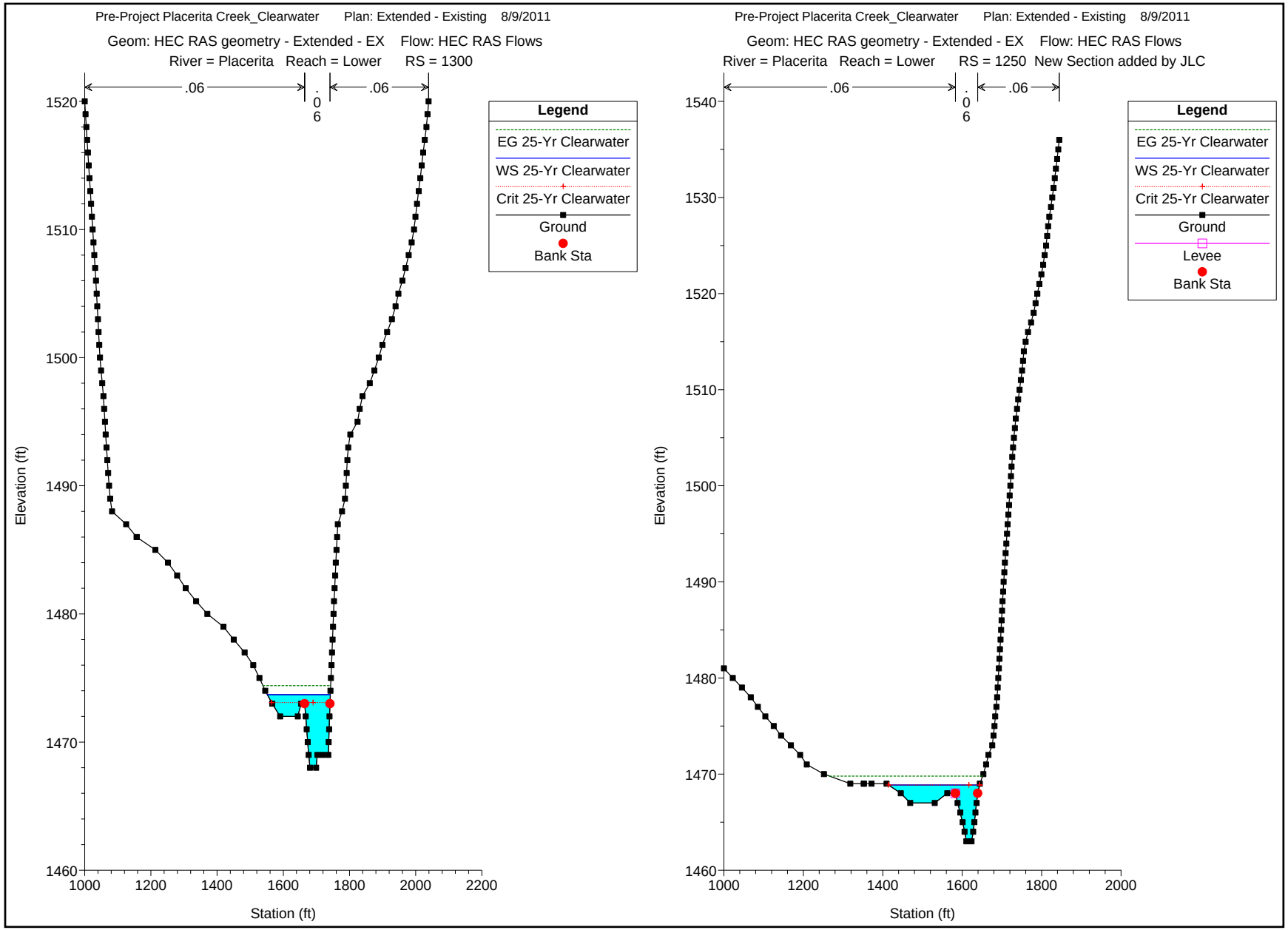

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1500
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1200
1400
1600
1800
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1400 D/S of Upper Reach
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1200
1400
1600
1800

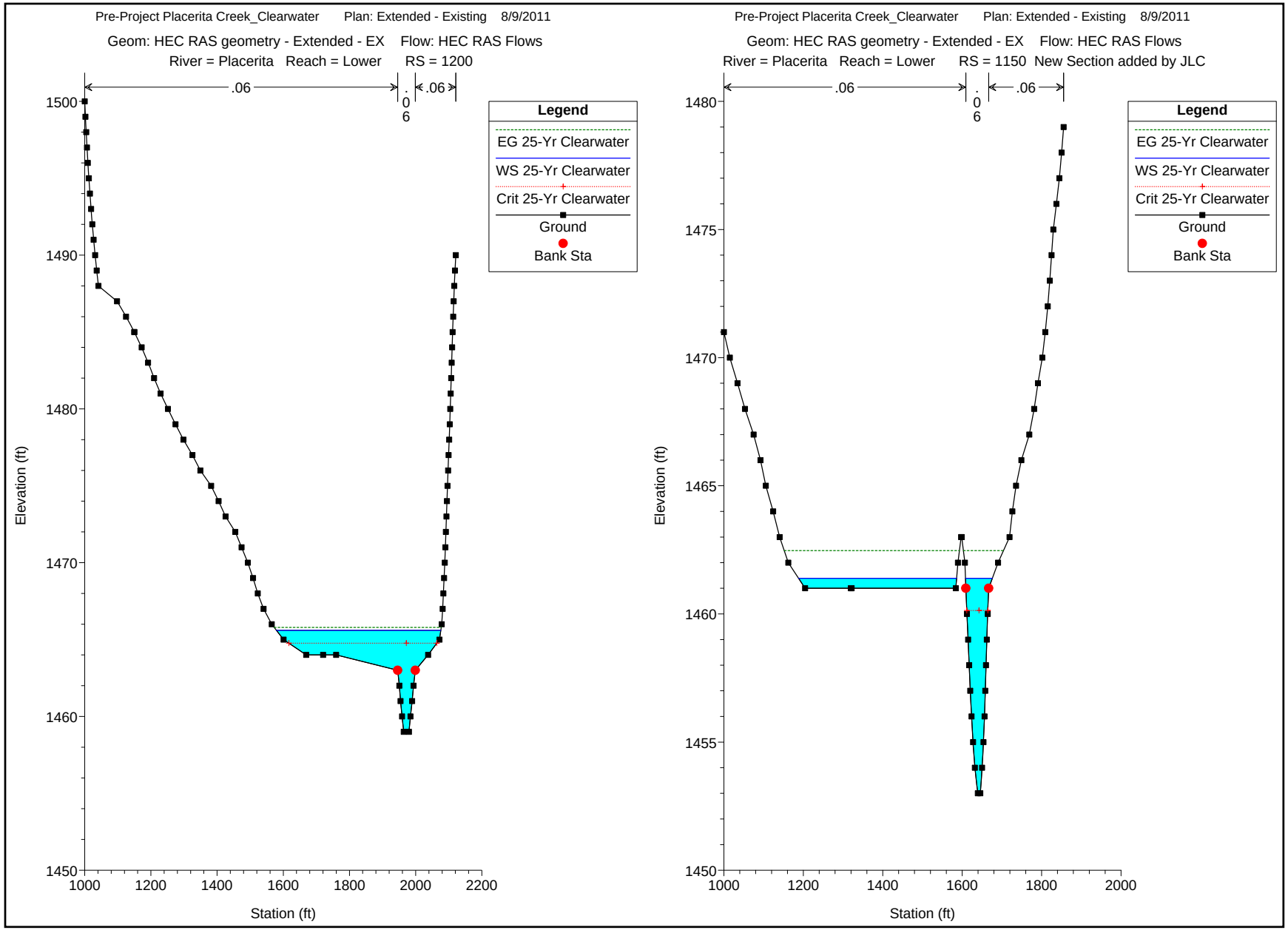

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 510
.06
.06
.06
Legend
EG 25-Yr Clearwater
Crit 25-Yr Clearwater
WS 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1575
1570
1565
1560
1555
1550
1545
1000
1100
1200
1300
1400
Station (ft)

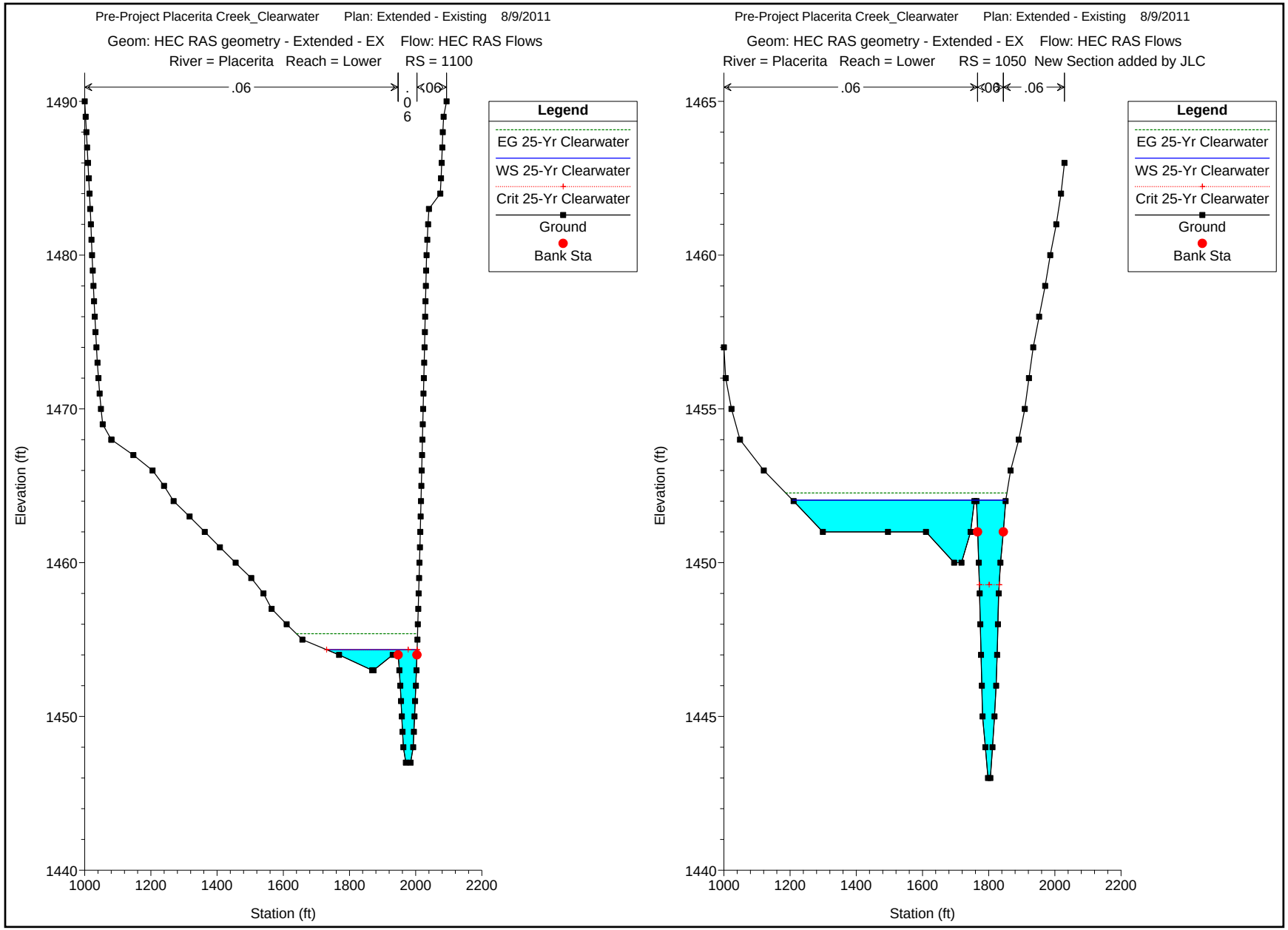

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 410
.06
.06
.06
Legend
EG 25-Yr Clearwater
Crit 25-Yr Clearwater
WS 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1545
1540
1535
1530
1525
1520
1000
1050
1100
1150
1200
1250
1300
Station (ft)

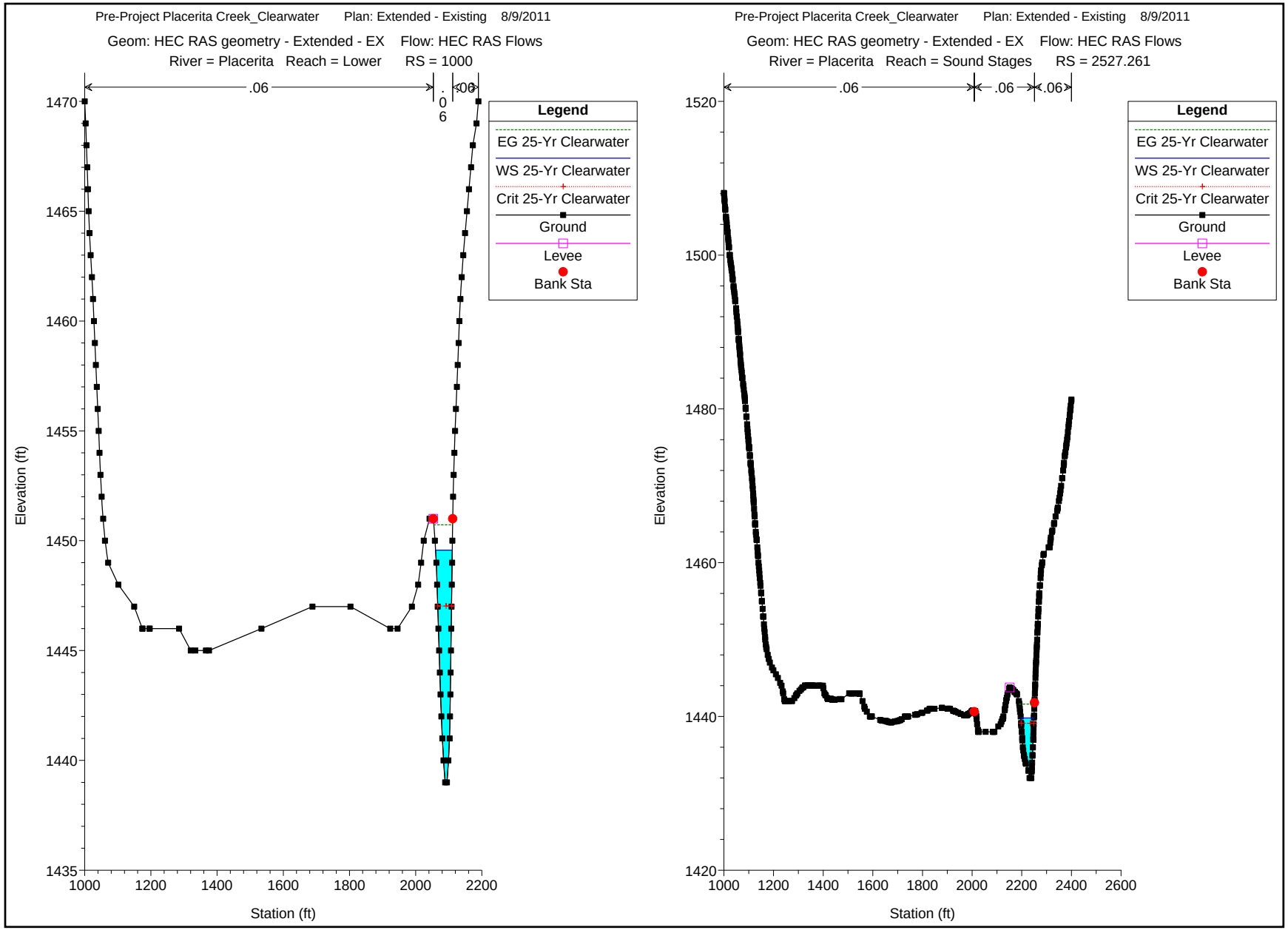

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 310
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 210
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

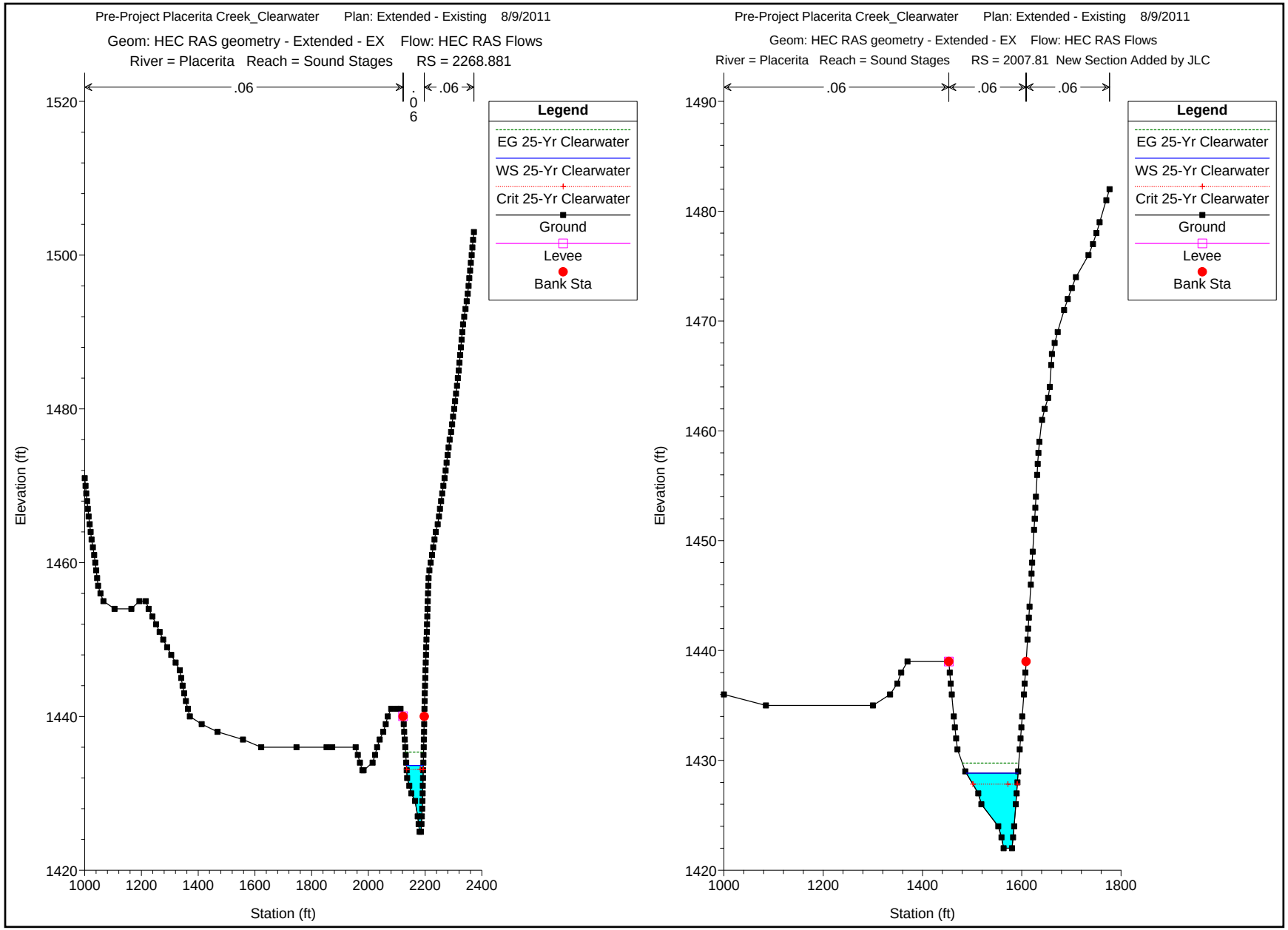

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 110
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
800
900
1000
1100
1200
1300
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 10
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1050
1100
1150
1200
1250

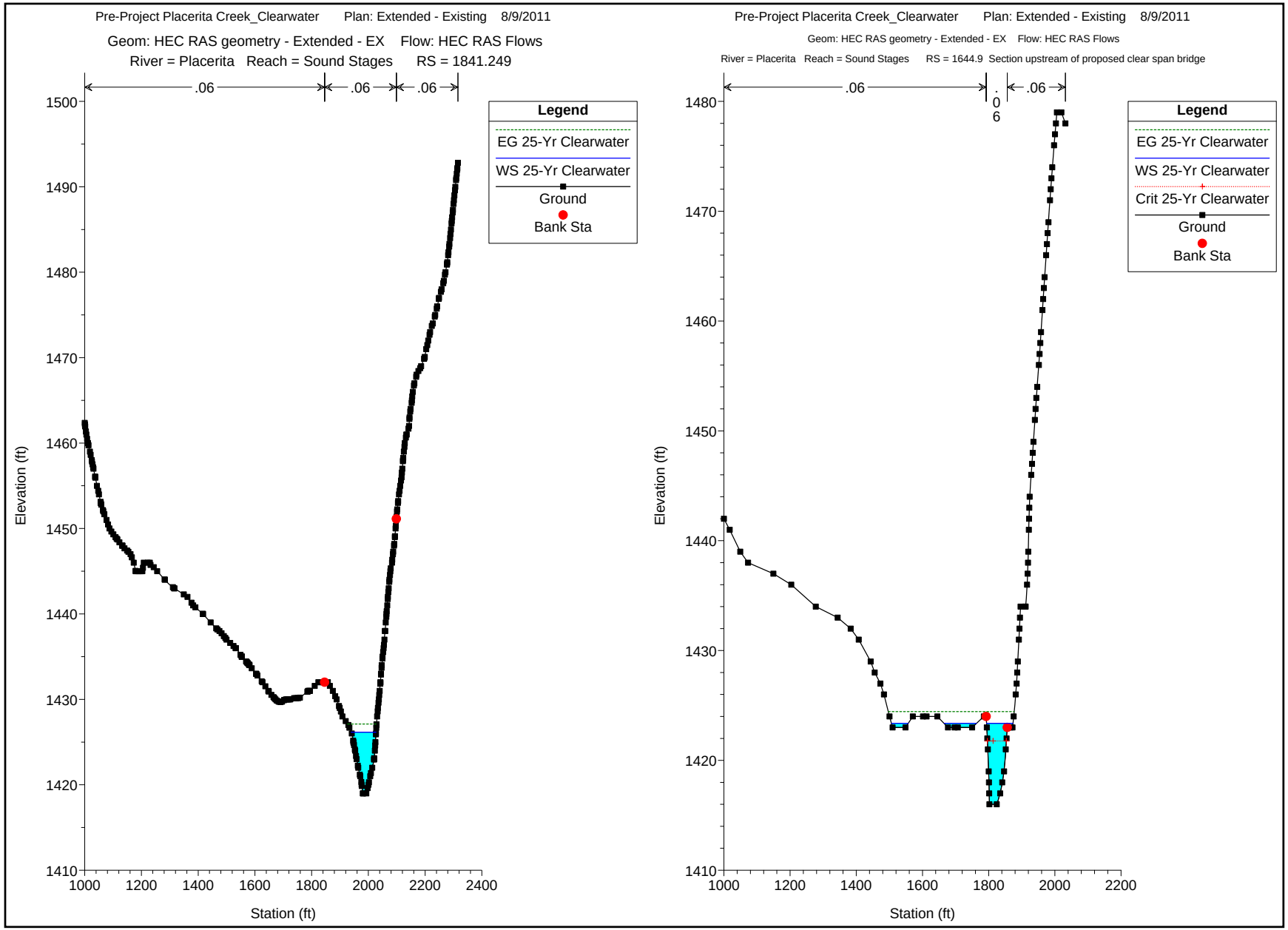

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1300
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1250 New Section added by JLC
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

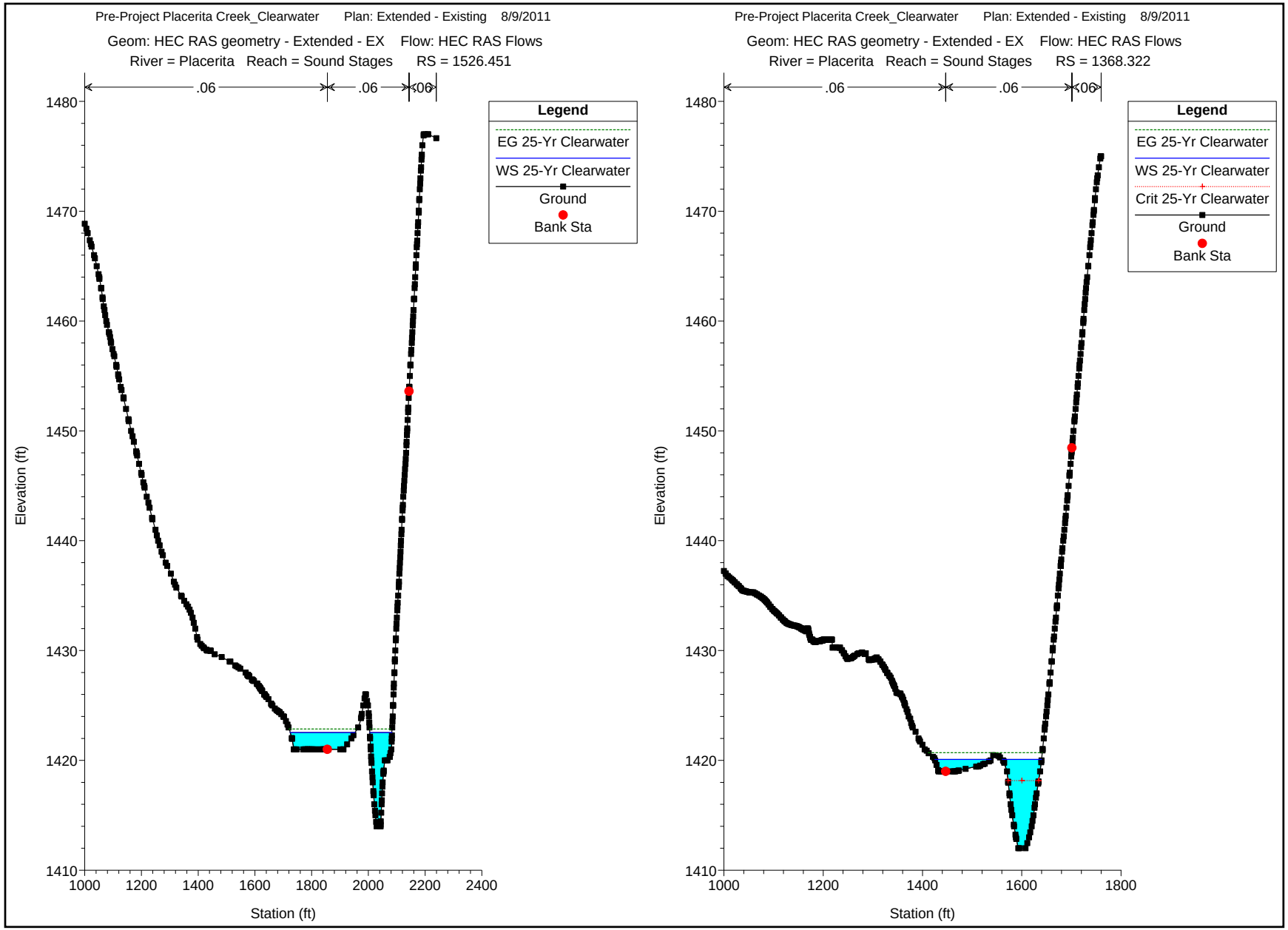

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1200
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1150 New Section added by JLC
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

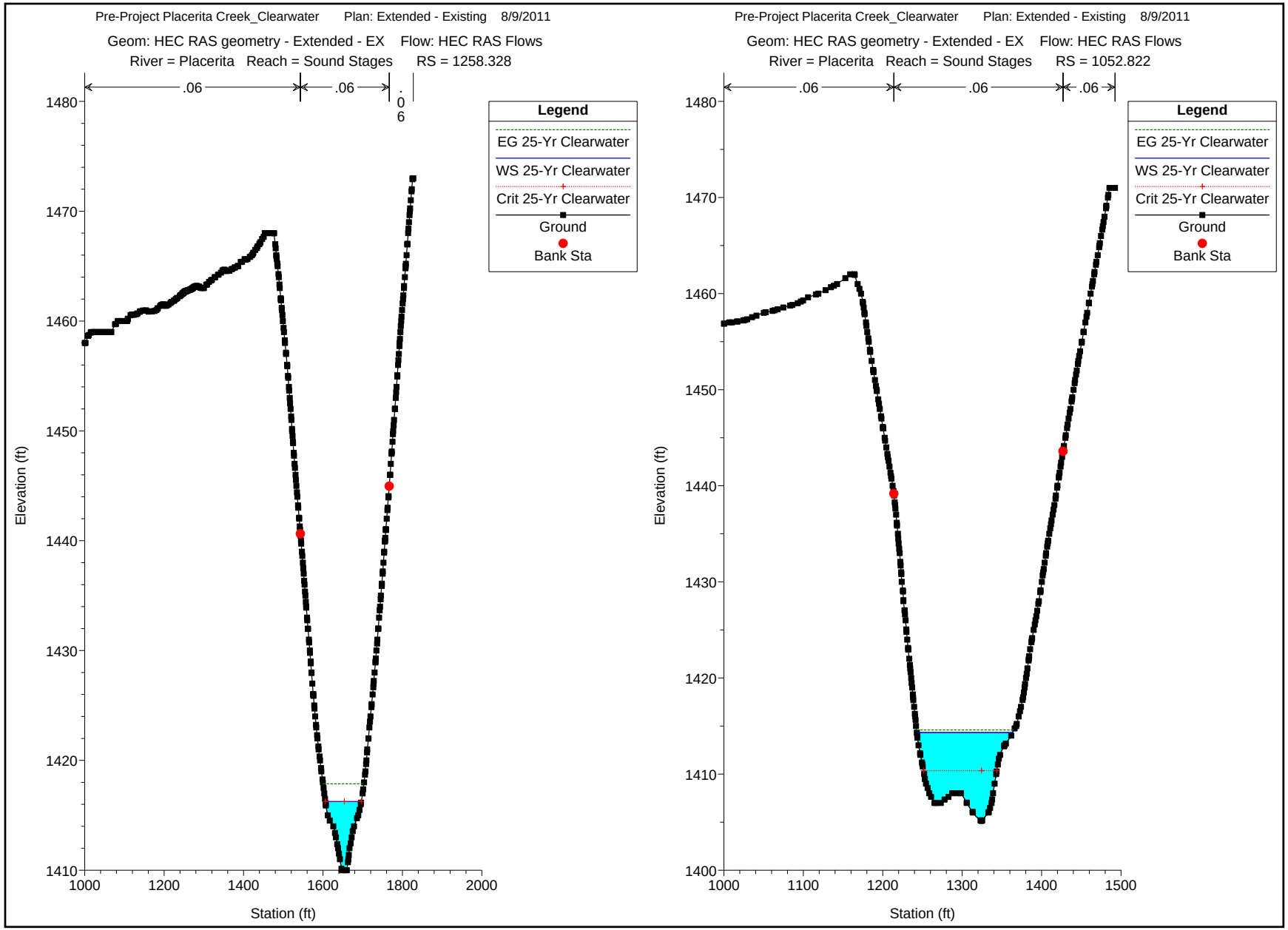

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1100
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1050 New Section added by JLC
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

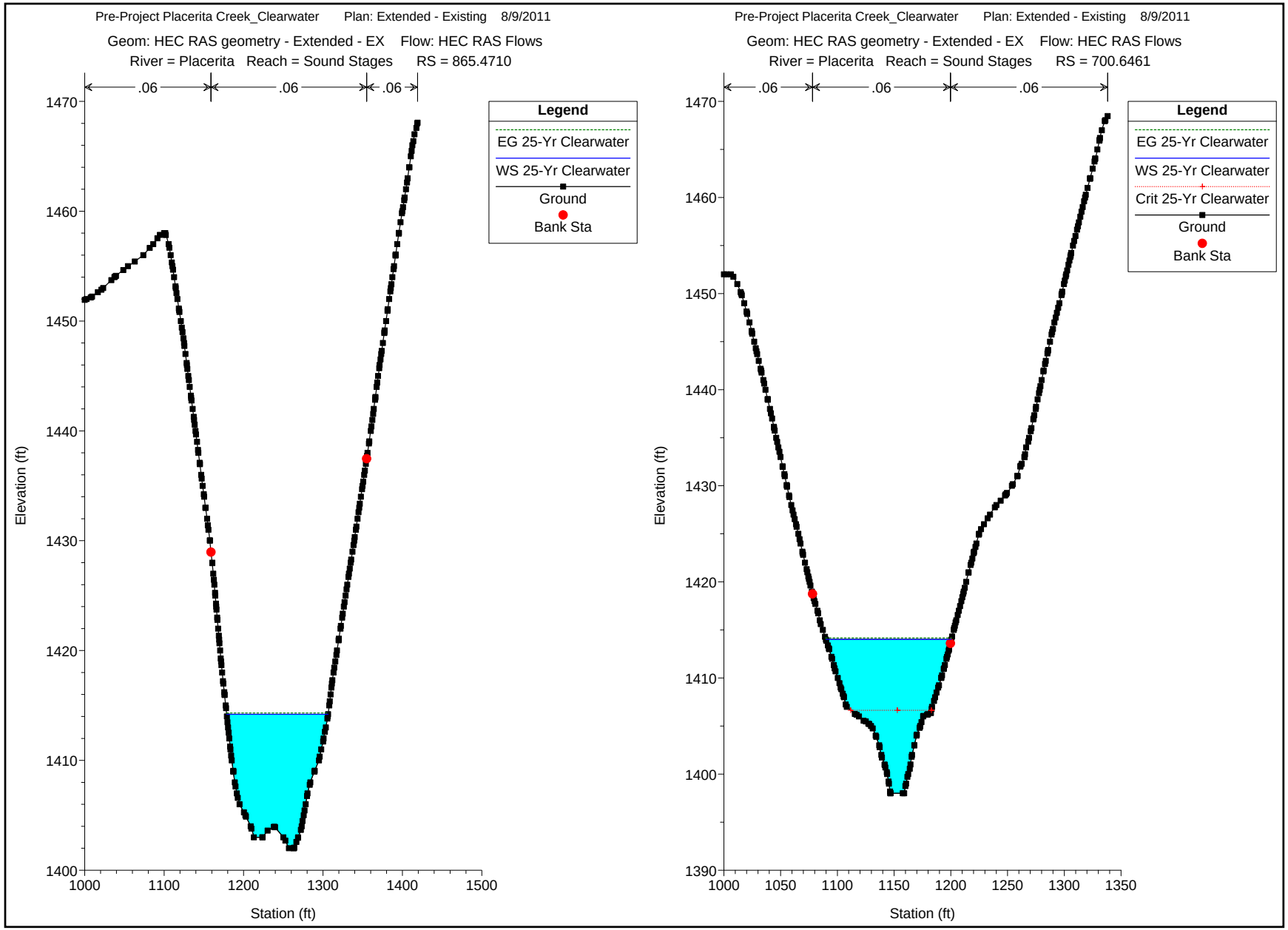

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1000
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2527.261
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

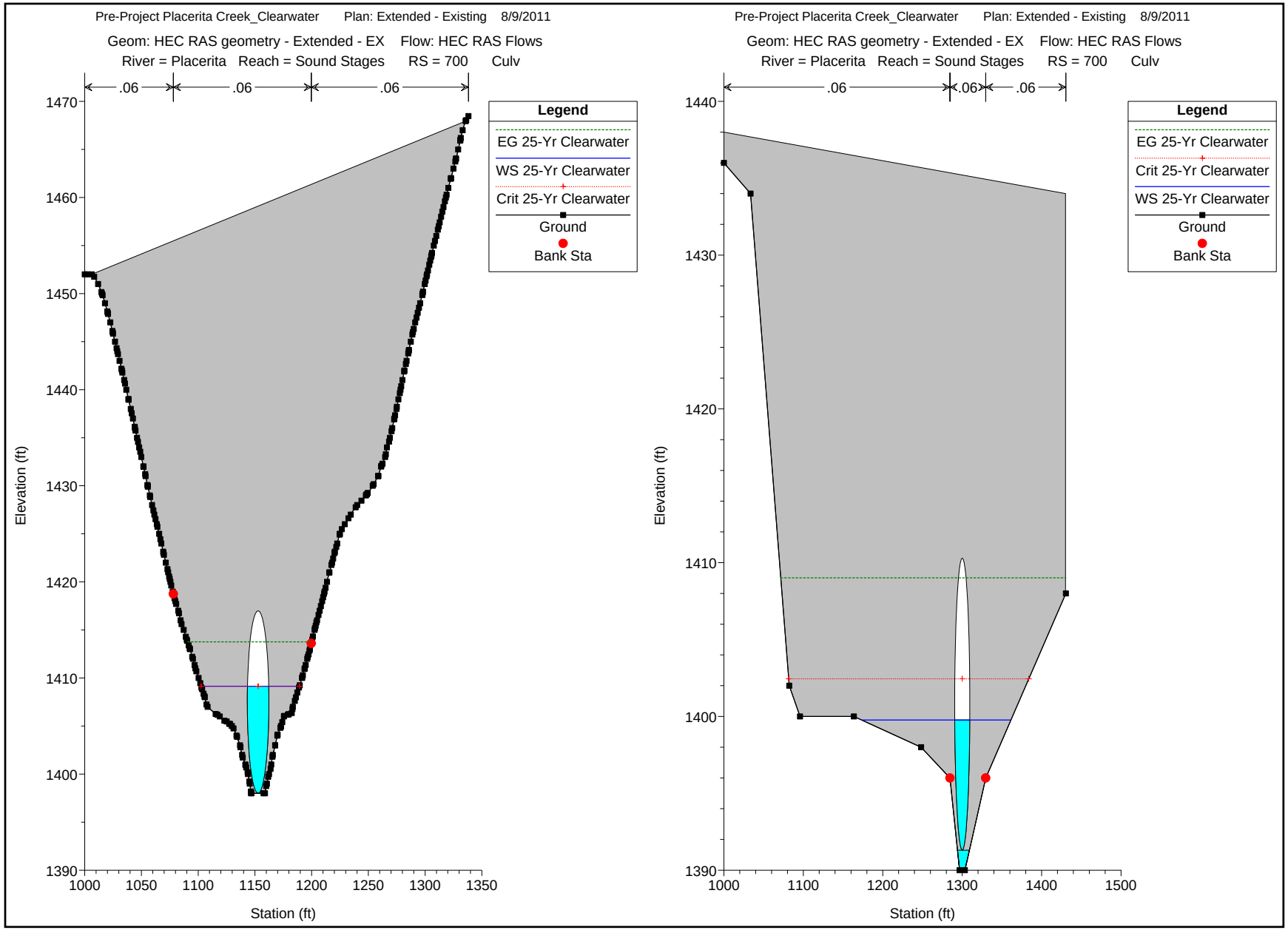

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2268.881
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2007.81 New Section Added by JLC
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

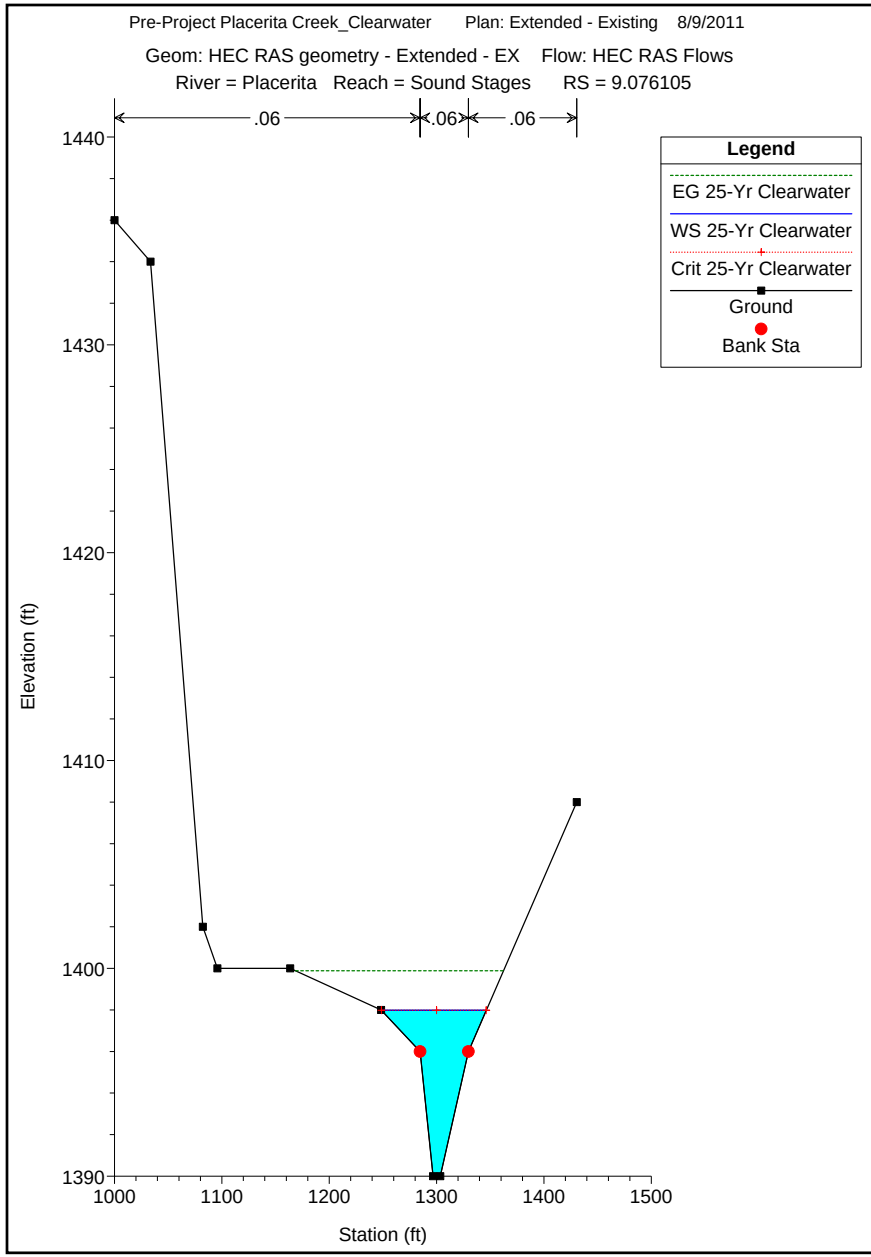

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1841.249
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1644.9 Section upstream of proposed clear span bridge
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

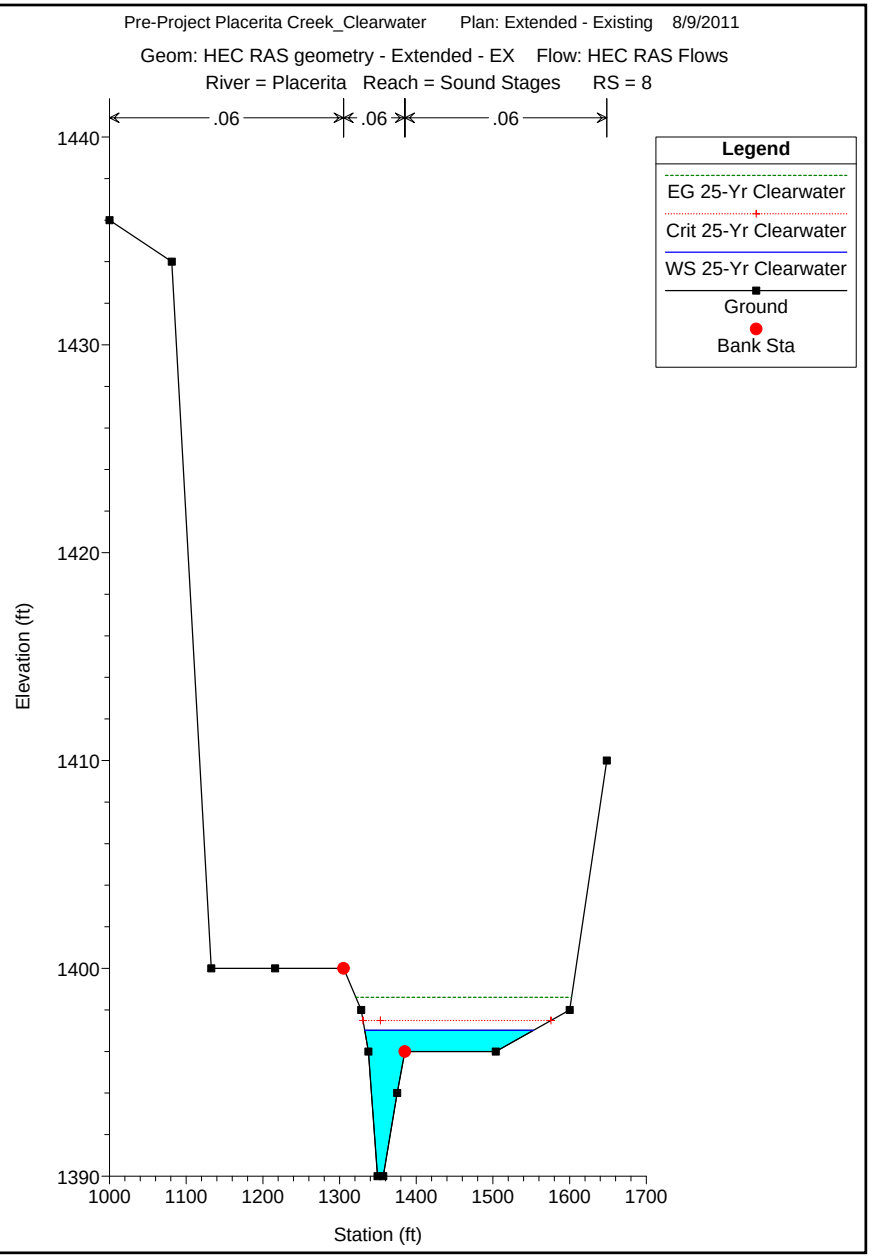

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1526.451
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1368.322
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

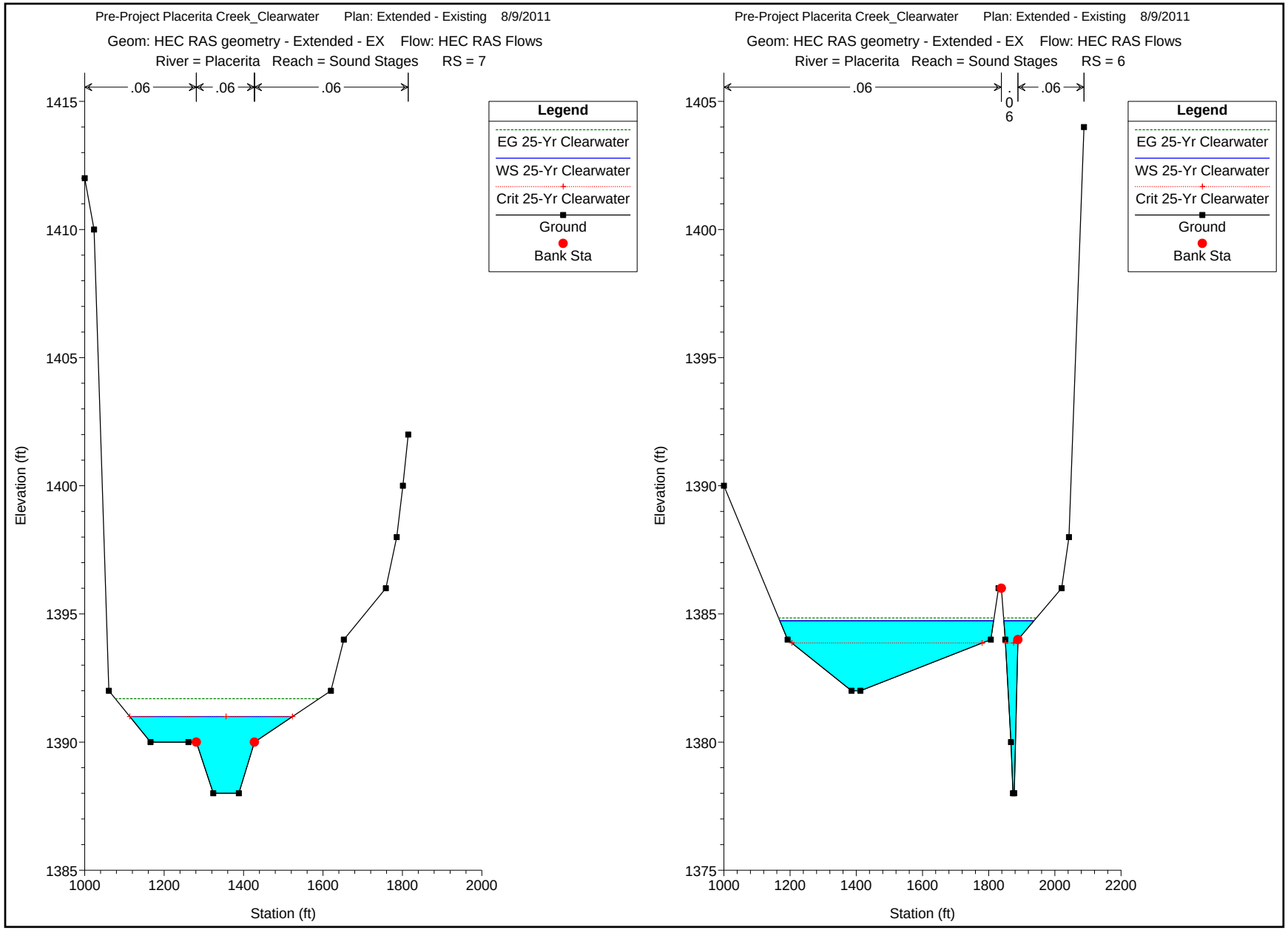

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1258.328
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1052.822
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

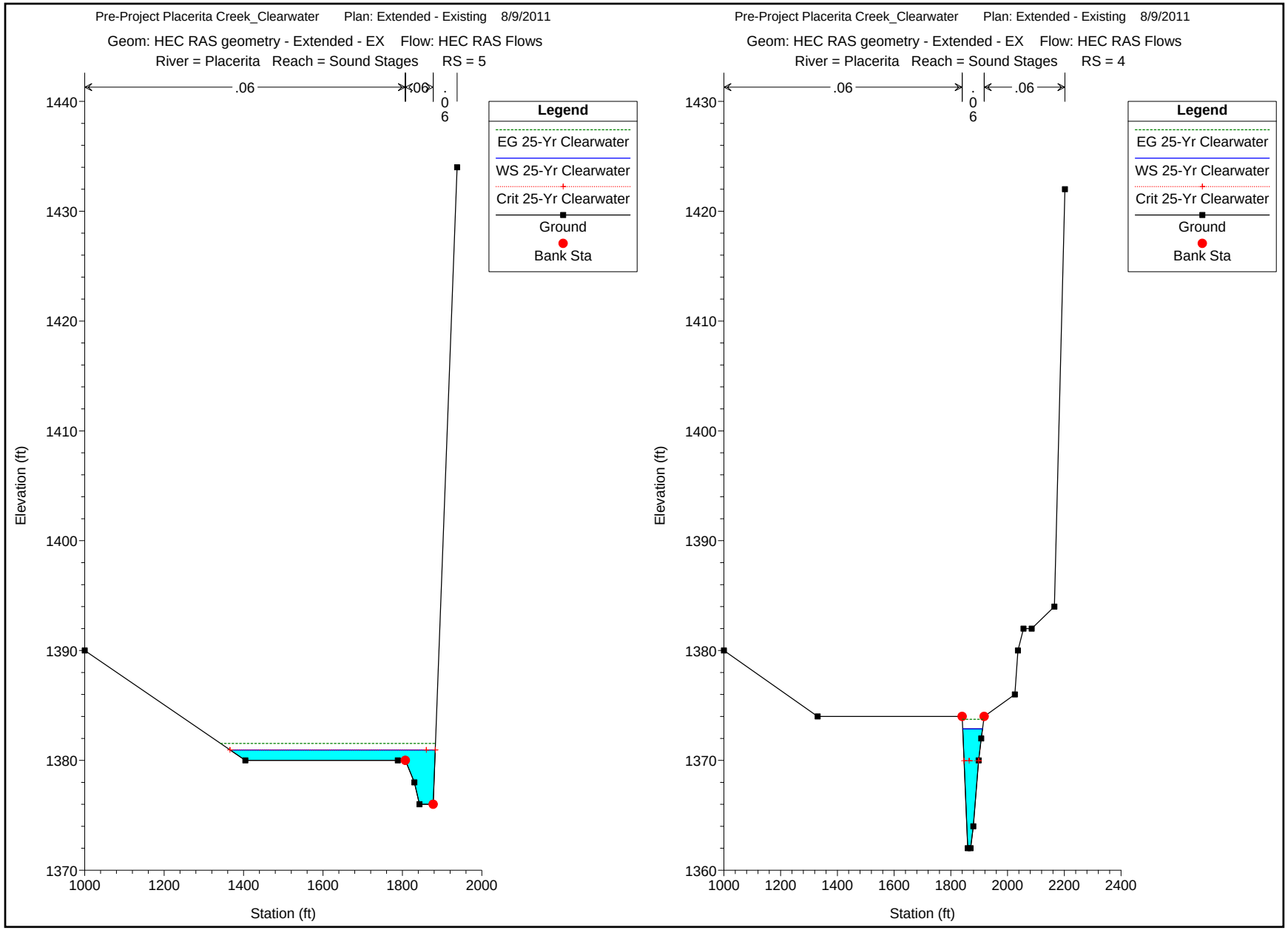

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 865.4710
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1400
1410
1420
1430
1440
1450
1460
1470
1000
1100
1200
1300
1400
1500
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700.6461
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1390
1400
1410
1420
1430
1440
1450
1460
1470
1000
1050
1100
1150
1200
1250
1300
1350

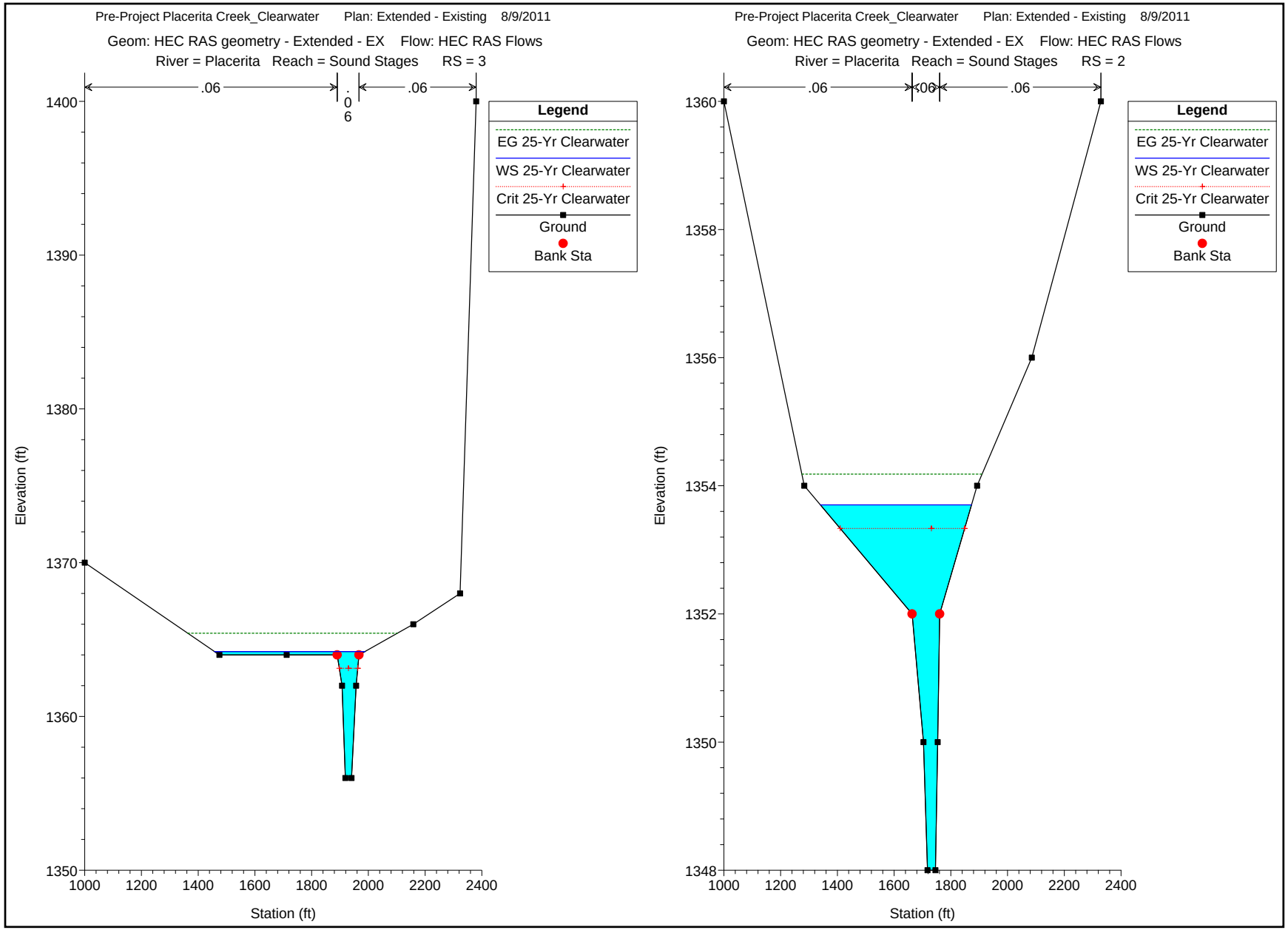

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700 Culv
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700 Culv
.06
.06
.06
Legend
EG 25-Yr Clearwater
Crit 25-Yr Clearwater
WS 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)


Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 9.076105
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500
Station (ft)


Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 8
.06
.06
.06
Legend
EG 25-Yr Clearwater
Crit 25-Yr Clearwater
WS 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500
1600
1700
Station (ft)


Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 7
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 6
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

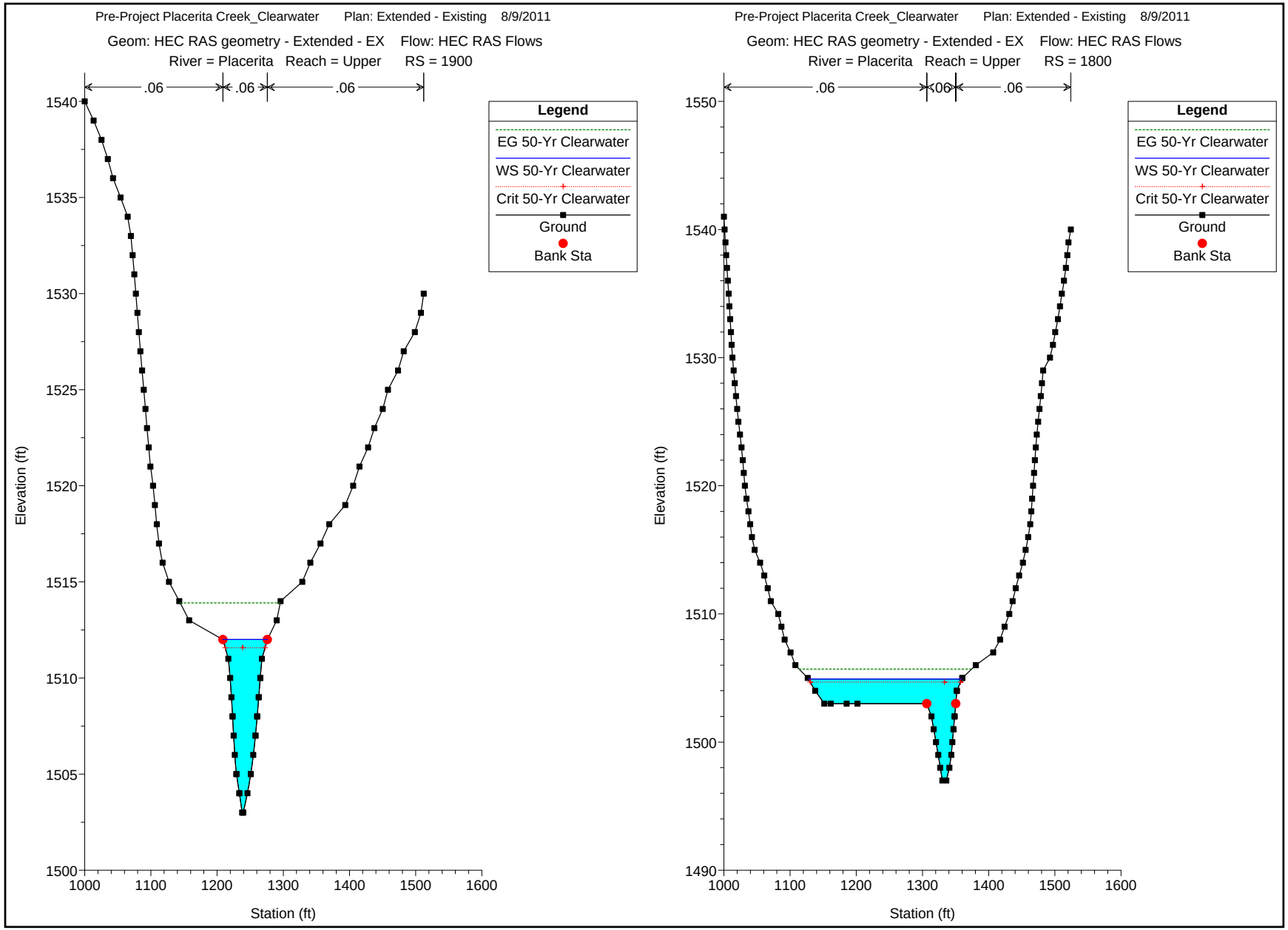

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 5
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 4
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

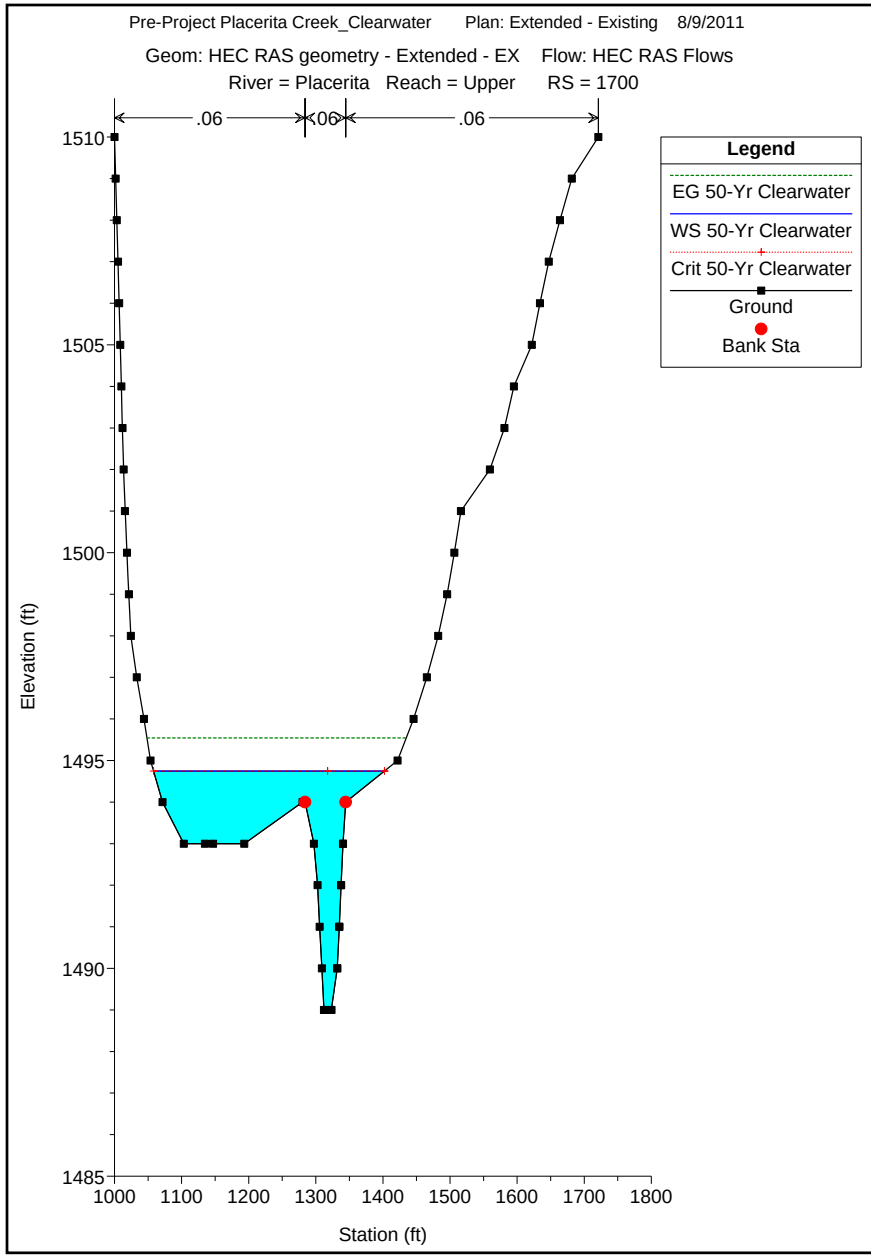

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 3
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

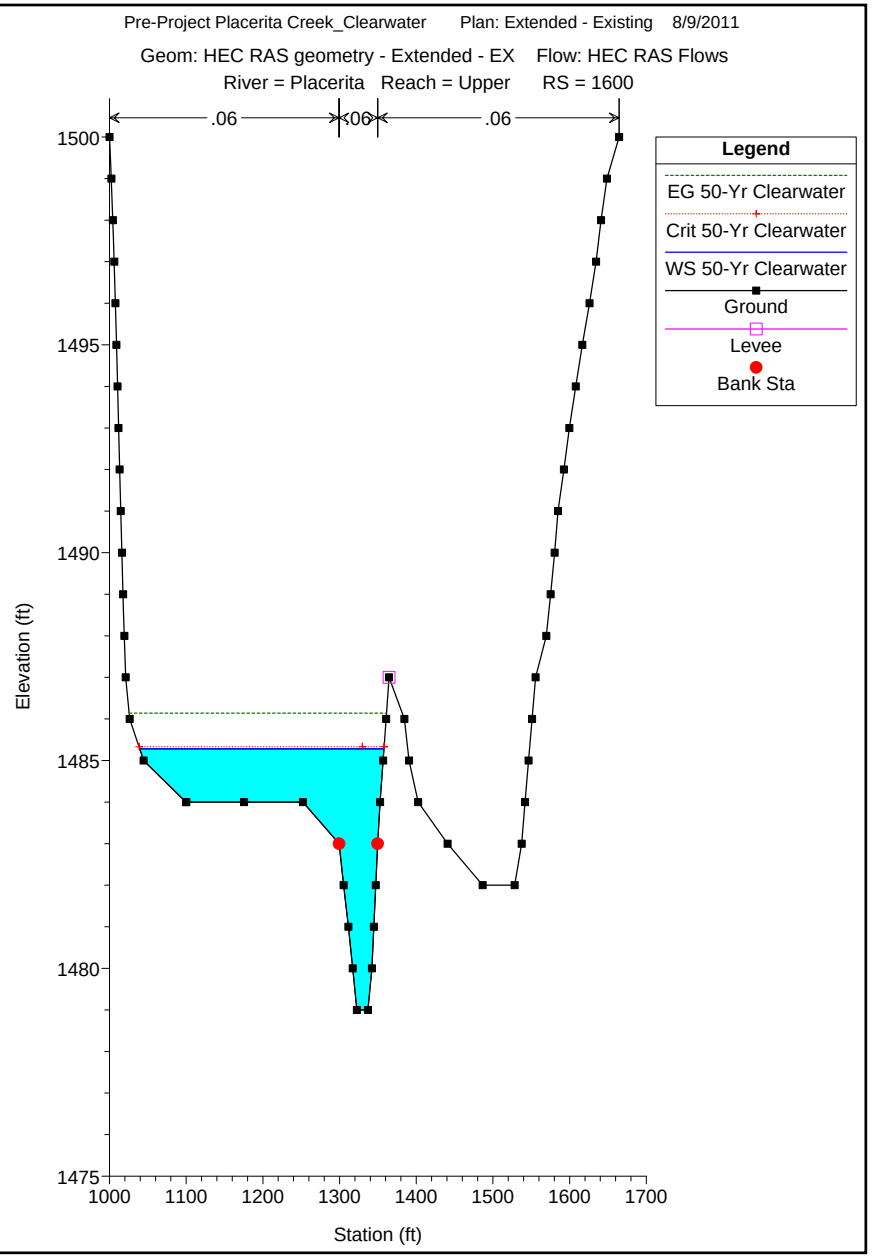
50-Year Storm Event – Pre Project Condition HEC-RAS Output

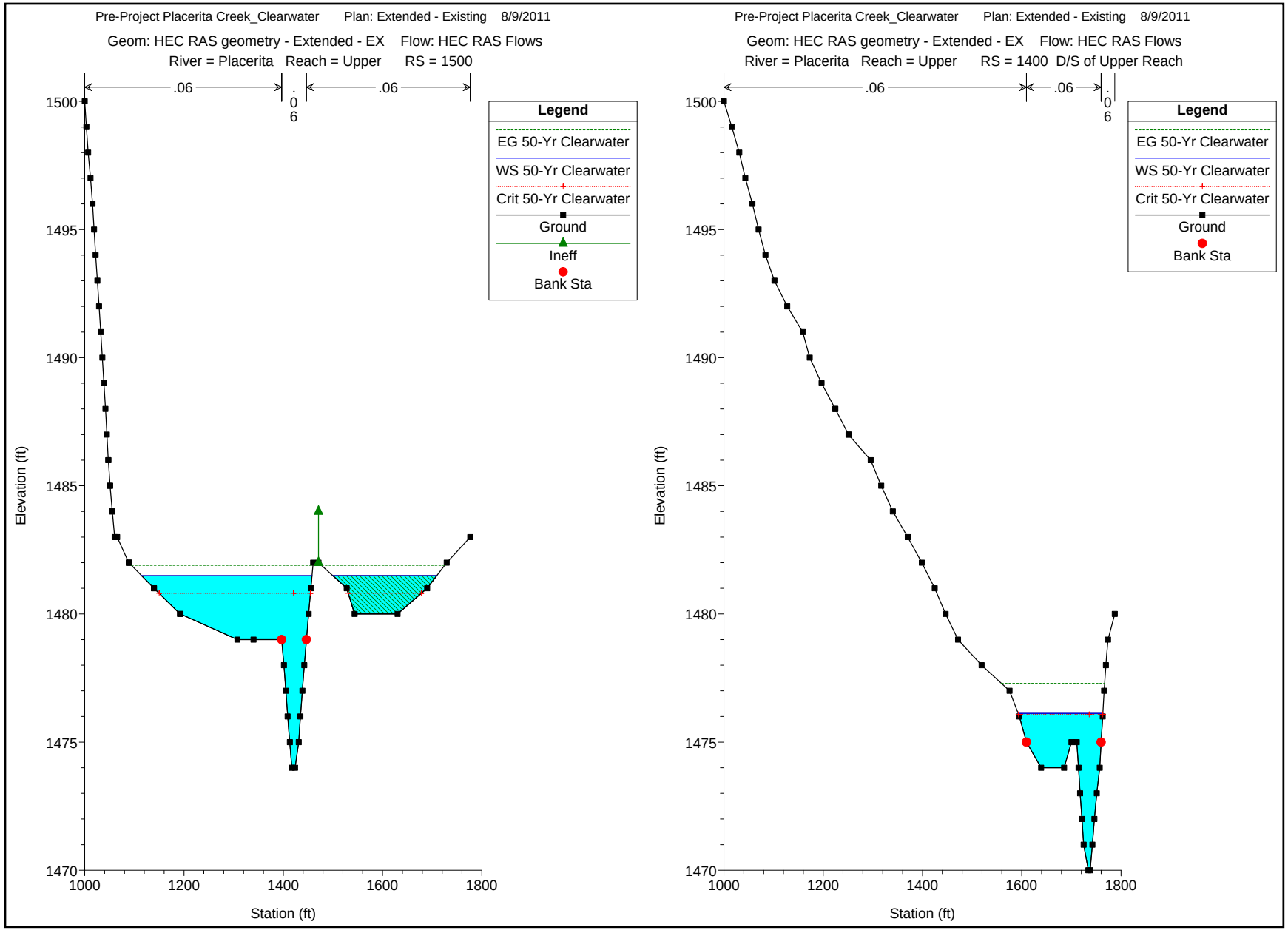
HEC-RAS Plan: EX_Extended Profile: 50-Yr Clearwater

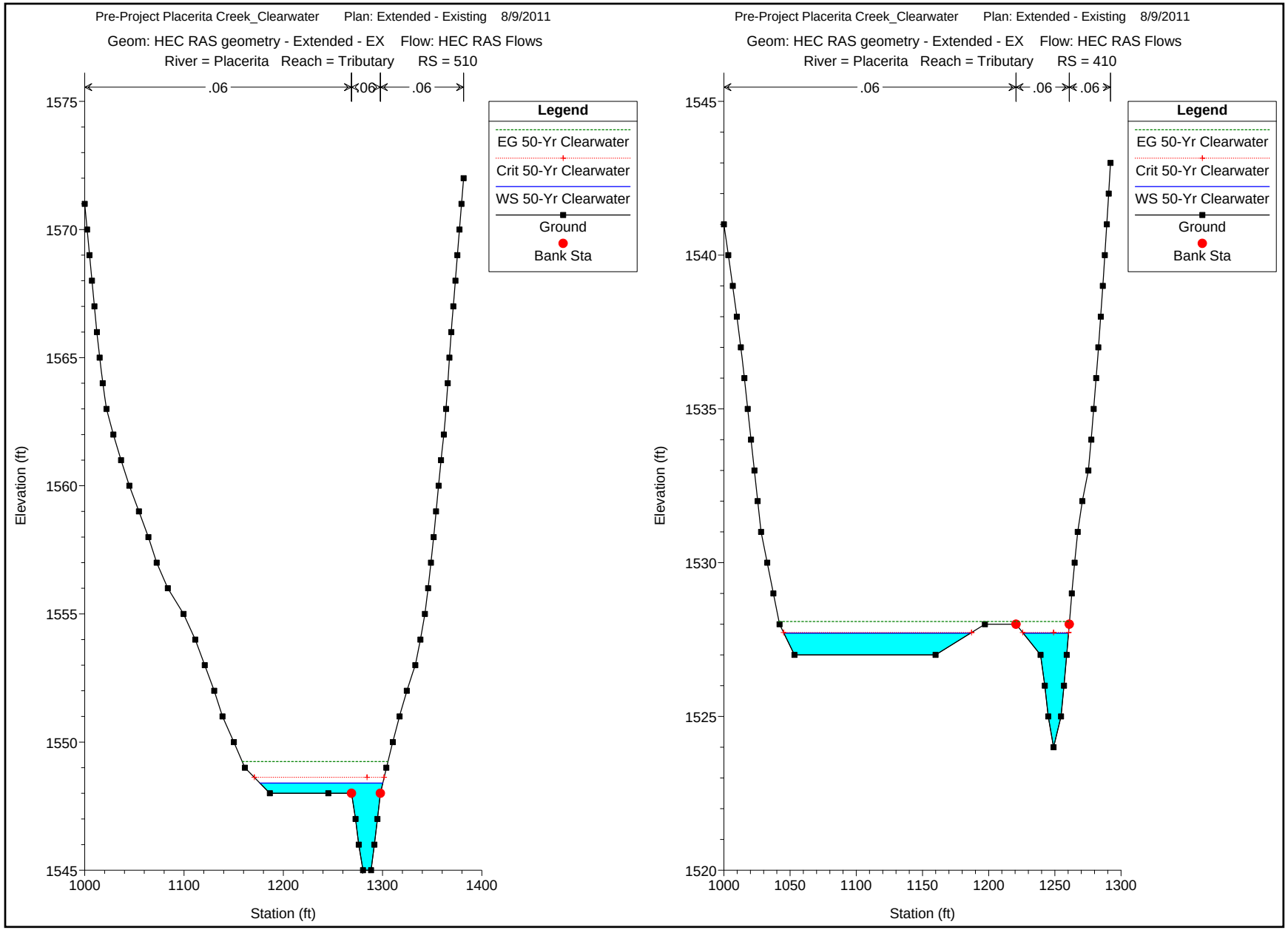
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Upper	1900	50-Yr Clearwater	3369.20	1503.00	1512.00	1511.57	1513.91	0.028291	11.07	304.29	67.40	0.92
Upper	1800	50-Yr Clearwater	3369.20	1497.00	1504.92	1504.68	1505.70	0.013679	8.53	559.60	231.94	0.65
Upper	1700	50-Yr Clearwater	3369.20	1489.00	1494.75	1494.75	1495.54	0.023908	8.69	545.83	344.02	0.82
Upper	1600	50-Yr Clearwater	3369.20	1479.00	1485.28	1485.33	1486.14	0.015620	8.84	579.40	318.46	0.70
Upper	1500	50-Yr Clearwater	3369.20	1474.00	1481.49	1480.80	1481.90	0.007249	6.41	795.55	552.91	0.48
Upper	1400	50-Yr Clearwater	3369.20	1470.00	1476.12	1476.08	1477.29	0.036074	8.72	393.63	170.61	0.96
Tributary	510	50-Yr Clearwater	616.70	1545.00	1548.40	1548.62	1549.24	0.033813	7.86	103.07	123.71	0.91
Tributary	410	50-Yr Clearwater	616.70	1524.00	1527.71	1527.73	1528.09	0.034358	6.03	141.38	175.37	0.85
Tributary	310	50-Yr Clearwater	616.70	1503.00	1505.90	1505.56	1506.17	0.016541	4.34	159.50	148.53	0.61
Tributary	210	50-Yr Clearwater	616.70	1486.00	1489.11	1489.11	1490.05	0.044311	7.75	79.61	43.25	1.01
Tributary	110	50-Yr Clearwater	616.70	1479.00	1483.30	1483.06	1483.53	0.008400	4.81	212.61	211.19	0.47
Tributary	10	50-Yr Clearwater	616.70	1471.00	1475.80	1475.80	1477.31	0.043234	9.86	62.52	20.79	1.00
Sound Stages	2527.261	50-Yr Clearwater	3950.40	1432.00	1441.14	1440.18	1443.09	0.020863	11.21	352.32	58.99	0.81
Sound Stages	2268.881	50-Yr Clearwater	3950.40	1425.00	1434.28	1434.07	1436.62	0.030148	12.28	321.68	61.02	0.94
Sound Stages	2007.81	50-Yr Clearwater	3950.40	1422.00	1429.79	1428.57	1430.79	0.015213	8.00	493.94	114.03	0.68
Sound Stages	1841.249	50-Yr Clearwater	3950.40	1419.00	1427.11		1428.22	0.015514	8.43	468.60	101.79	0.69
Sound Stages	1644.9	50-Yr Clearwater	3950.40	1416.00	1423.82	1422.76	1425.16	0.015495	9.69	512.99	274.91	0.70
Sound Stages	1526.451	50-Yr Clearwater	3950.40	1414.00	1423.07		1423.43	0.009727	5.10	844.70	327.57	0.51
Sound Stages	1368.322	50-Yr Clearwater	3950.40	1412.00	1420.71	1419.95	1421.39	0.017415	6.67	611.08	229.95	0.68
Sound Stages	1258.328	50-Yr Clearwater	3950.40	1410.00	1417.21	1416.97	1418.86	0.028840	10.33	382.46	97.96	0.92
Sound Stages	1052.822	50-Yr Clearwater	3950.40	1405.12	1417.51		1417.71	0.001280	3.52	1120.99	136.67	0.22
Sound Stages	865.4710	50-Yr Clearwater	3950.40	1402.00	1417.44		1417.54	0.000479	2.60	1518.62	138.28	0.14
Sound Stages	700.6461	50-Yr Clearwater	3950.40	1398.00	1417.31	1407.50	1417.45	0.000616	2.97	1341.77	126.18	0.16
Sound Stages	700		Culvert									
Sound Stages	9.076105	50-Yr Clearwater	3950.40	1390.00	1399.21	1399.21	1400.88	0.017110	11.13	454.60	159.65	0.76
Sound Stages	8	50-Yr Clearwater	3950.40	1390.00	1397.12	1397.99	1399.59	0.050527	14.01	382.57	225.34	1.21
Sound Stages	7	50-Yr Clearwater	4122.10	1388.00	1391.30	1391.30	1392.05	0.025440	7.73	674.46	454.39	0.82
Sound Stages	6	50-Yr Clearwater	4122.10	1378.00	1384.93	1384.11	1385.07	0.005442	4.17	1418.83	759.68	0.39
Sound Stages	5	50-Yr Clearwater	4122.10	1376.00	1381.48	1381.18	1381.91	0.010418	6.71	962.28	538.89	0.57
Sound Stages	4	50-Yr Clearwater	4122.10	1362.00	1372.84		1374.29	0.014648	9.64	427.41	69.57	0.69
Sound Stages	3	50-Yr Clearwater	4167.40	1356.00	1364.94	1364.94	1365.63	0.010477	7.59	877.77	655.92	0.58
Sound Stages	2	50-Yr Clearwater	4167.40	1348.00	1354.04	1353.68	1354.53	0.010209	6.64	955.13	614.75	0.56
Lower	1300	50-Yr Clearwater	3890.30	1468.00	1474.54	1473.64	1475.21	0.009449	7.24	658.52	207.38	0.55
Lower	1250	50-Yr Clearwater	3890.30	1463.00	1469.00	1469.00	1470.40	0.031838	11.08	475.06	234.83	0.97
Lower	1200	50-Yr Clearwater	3890.30	1459.00	1465.85	1465.11	1466.11	0.005189	5.46	1140.66	507.33	0.41
Lower	1150	50-Yr Clearwater	3890.30	1453.00	1462.08	1462.08	1462.81	0.009692	7.91	806.12	516.11	0.56
Lower	1100	50-Yr Clearwater	3890.30	1447.00	1454.64	1454.94	1455.99	0.018227	10.16	537.09	307.72	0.76
Lower	1050	50-Yr Clearwater	3890.30	1443.00	1452.87	1451.58	1453.02	0.002196	4.00	1620.23	731.76	0.27
Lower	1000	50-Yr Clearwater	3890.30	1439.00	1448.27	1448.27	1451.30	0.032834	13.98	278.26	45.42	1.00

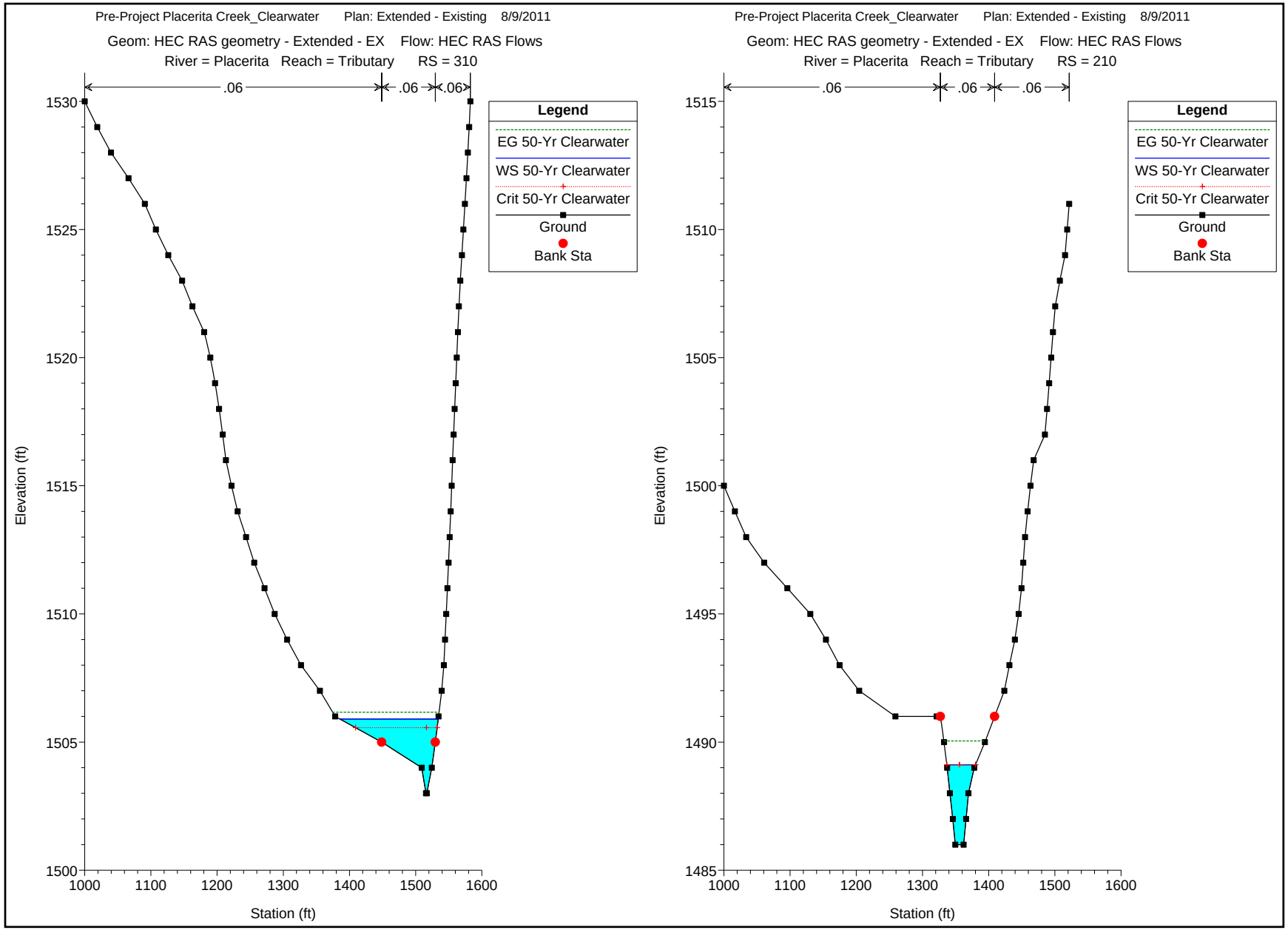

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1900
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1800
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

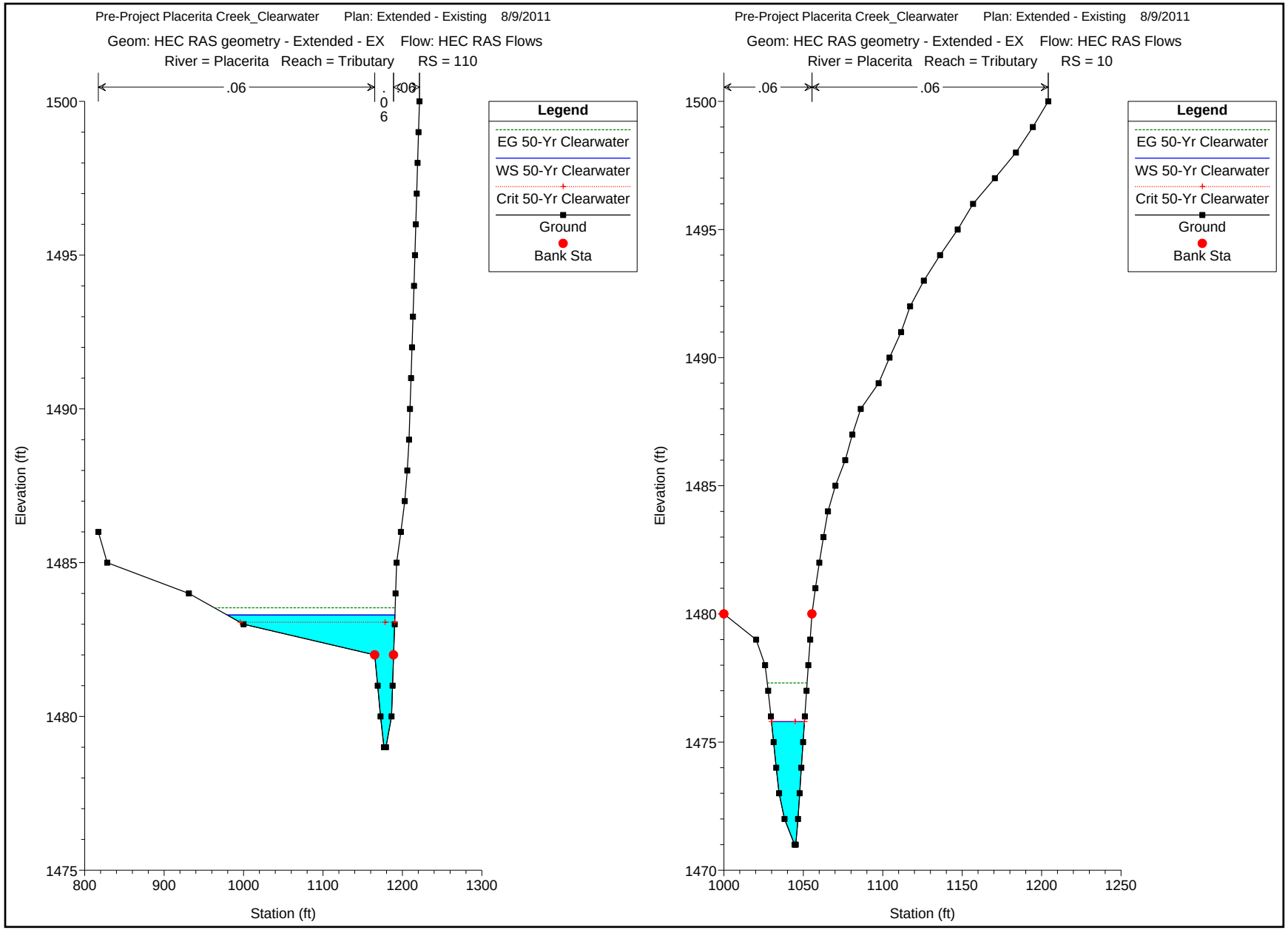

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1700
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1510
1505
1500
1495
1490
1485
1000
1100
1200
1300
1400
1500
1600
1700
1800
Station (ft)

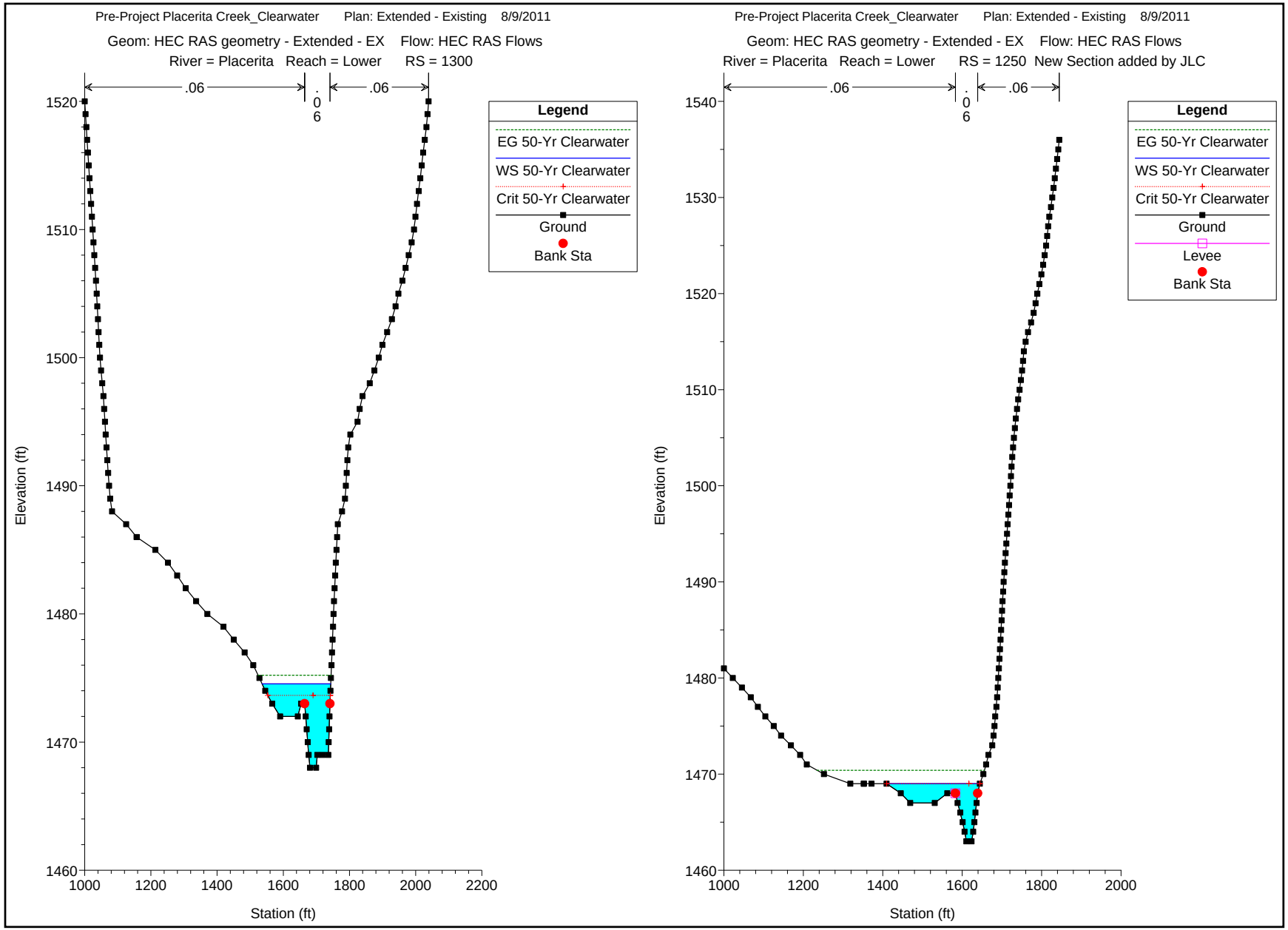

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1600
.06
.06
.06
Legend
EG 50-Yr Clearwater
Crit 50-Yr Clearwater
WS 50-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
1500
1495
1490
1485
1480
1475
1000
1100
1200
1300
1400
1500
1600
1700
Station (ft)

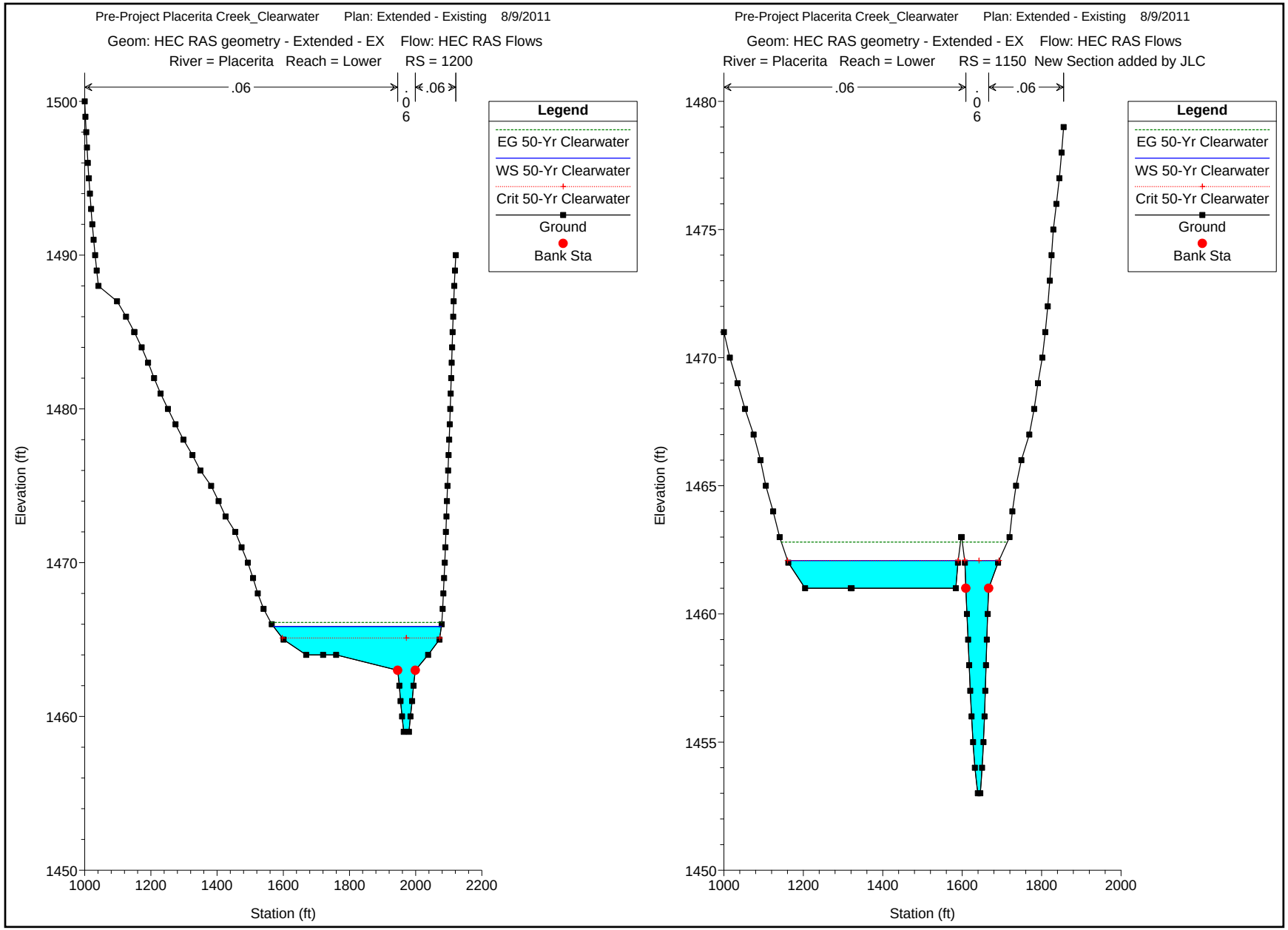

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1500
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1400 D/S of Upper Reach
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

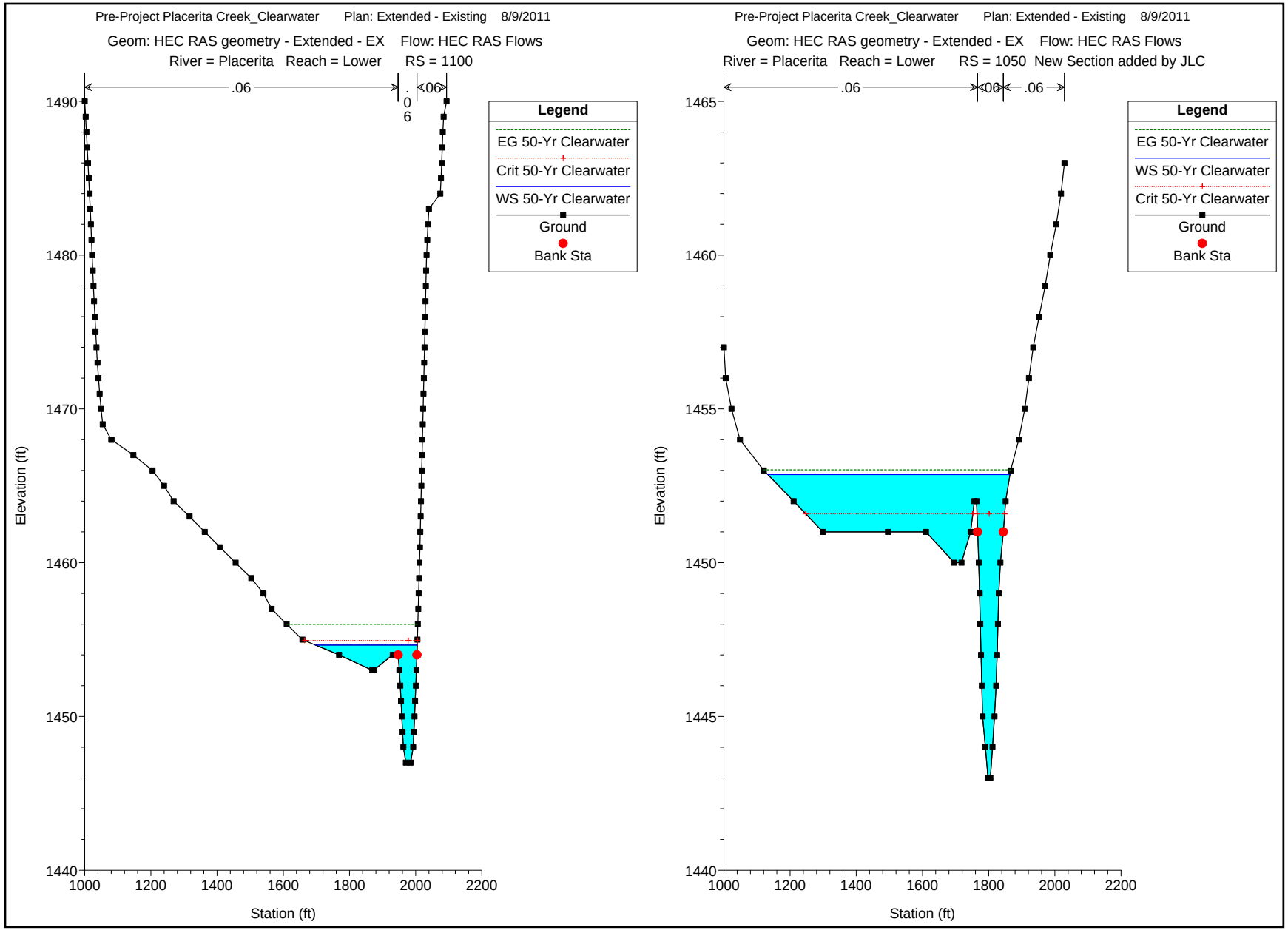

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 510
.06
.06
.06
Legend
EG 50-Yr Clearwater
Crit 50-Yr Clearwater
WS 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1575
1570
1565
1560
1555
1550
1545
1000
1100
1200
1300
1400
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 410
.06
.06
.06
Legend
EG 50-Yr Clearwater
Crit 50-Yr Clearwater
WS 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1545
1540
1535
1530
1525
1520
1000
1050
1100
1150
1200
1250
1300
Station (ft)

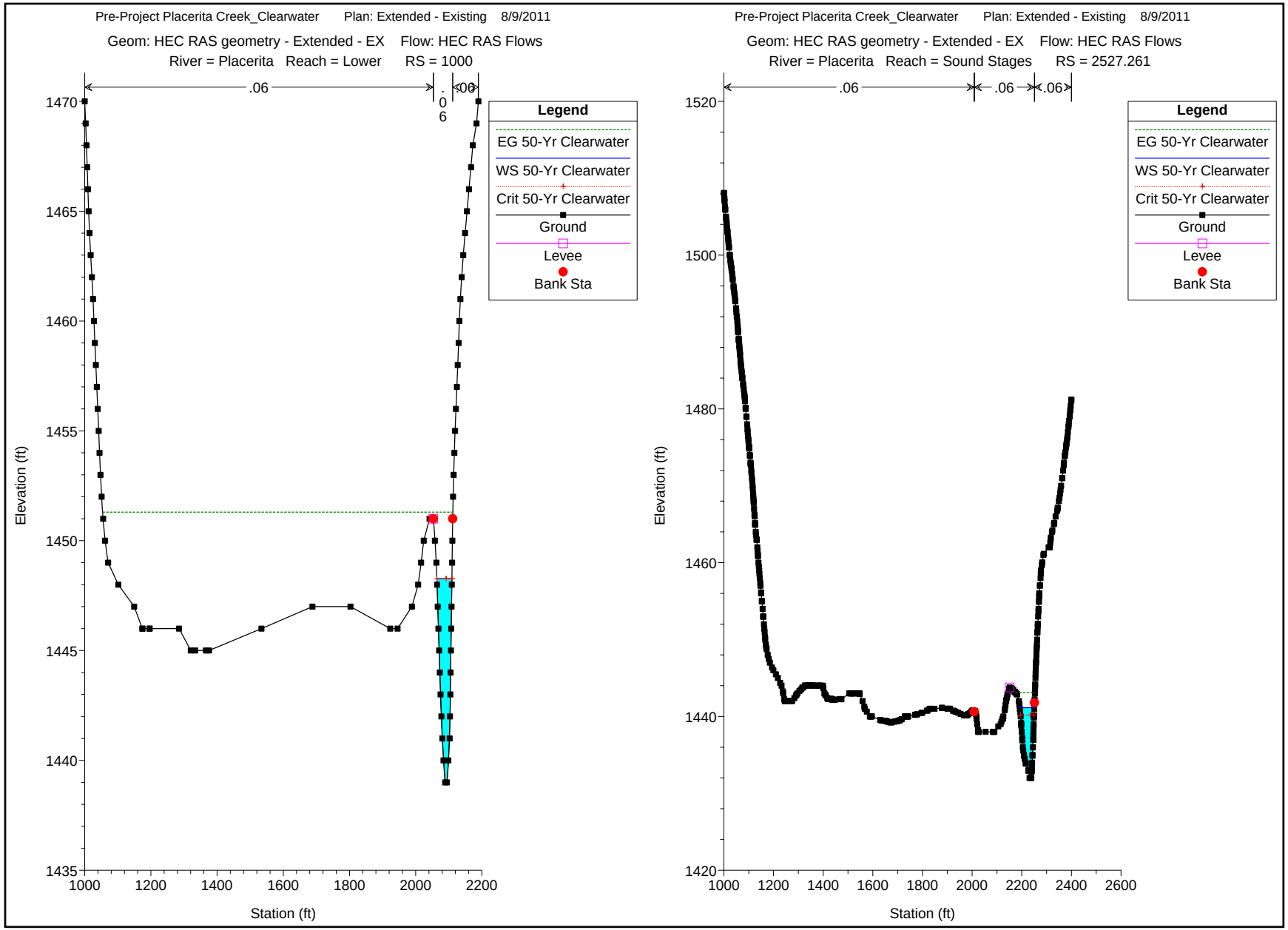

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 310
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 210
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

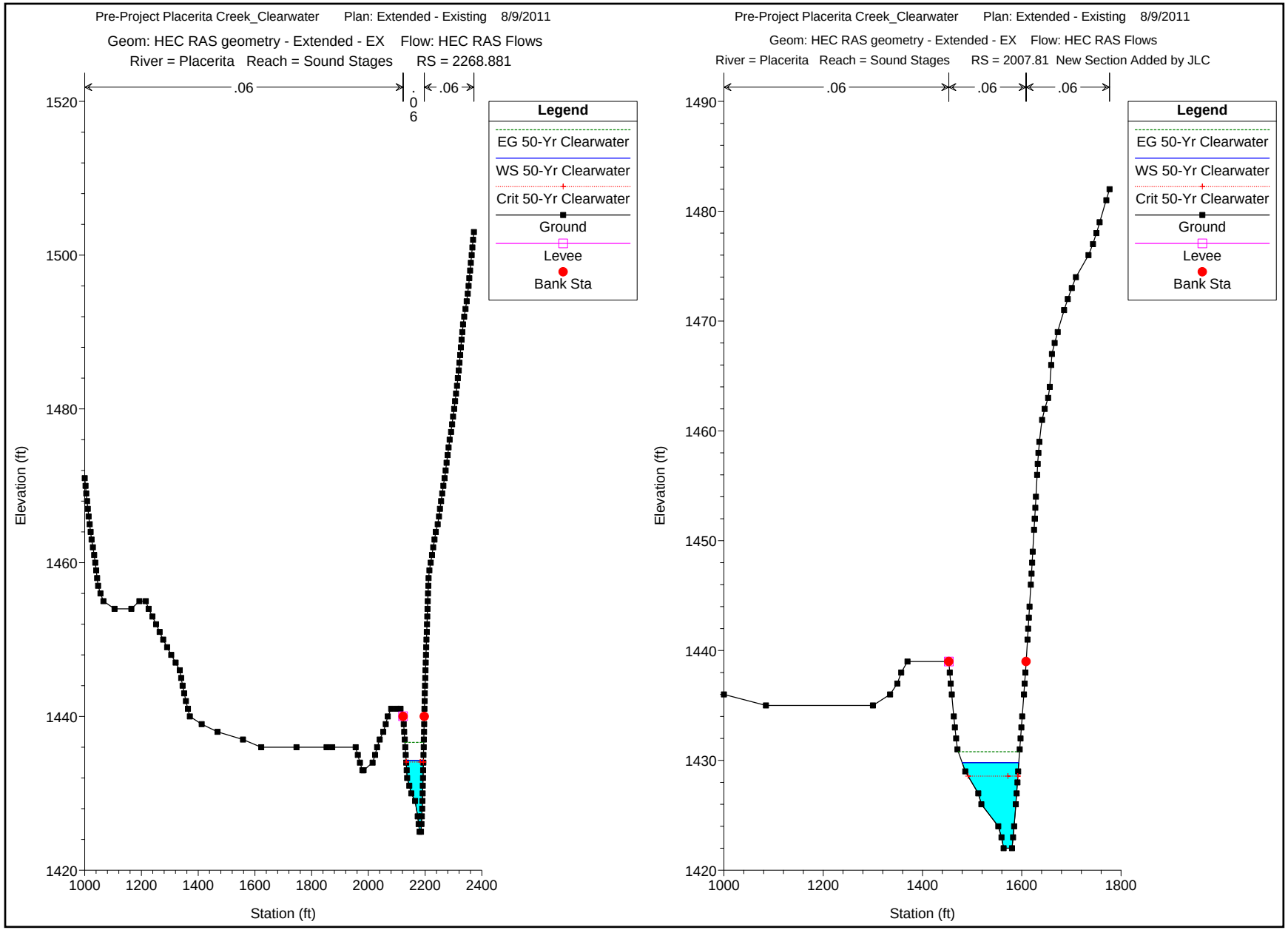

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 110
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
800
900
1000
1100
1200
1300
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 10
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1050
1100
1150
1200
1250

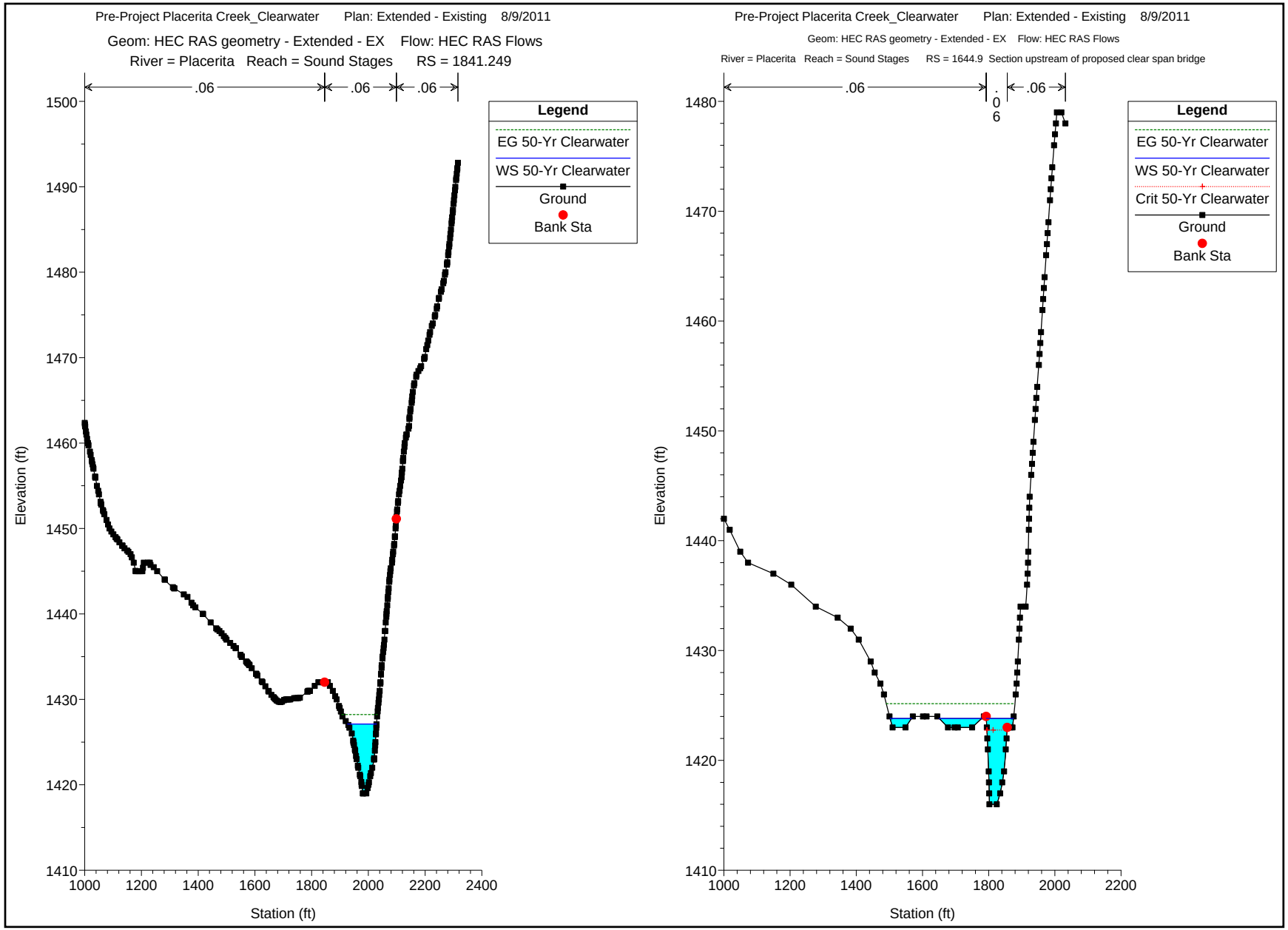

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1300
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1250 New Section added by JLC
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

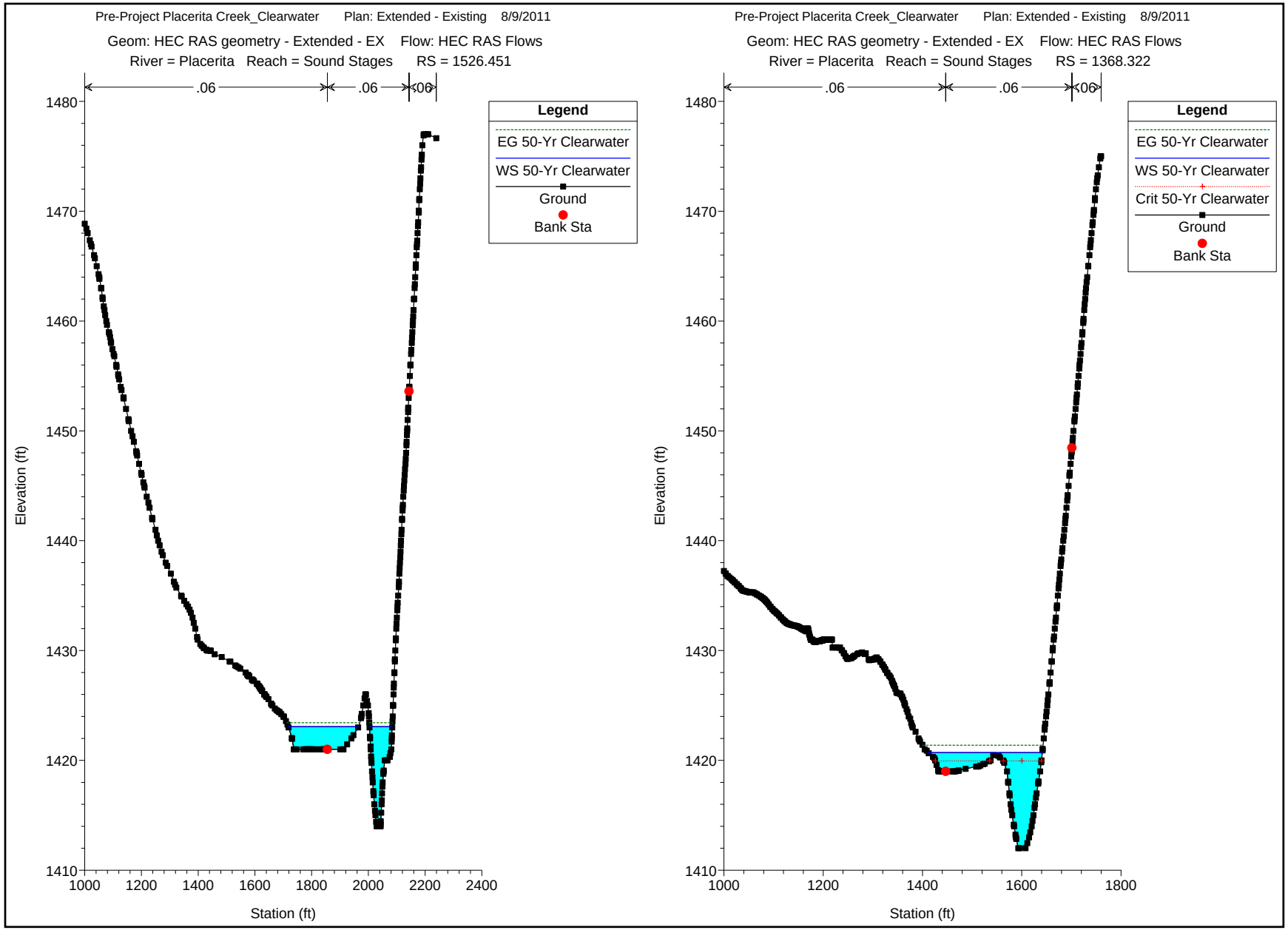

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1200
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1150 New Section added by JLC
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

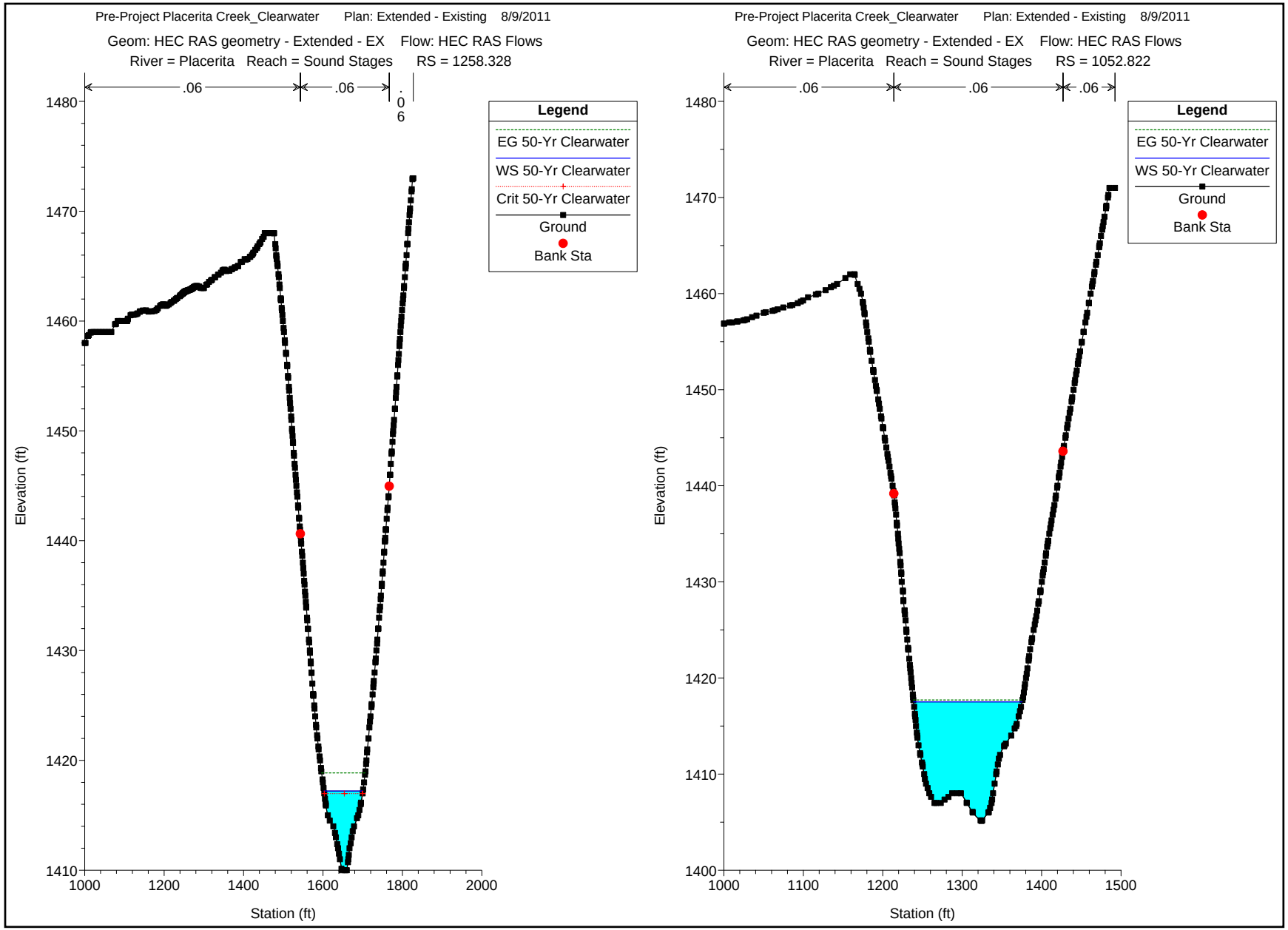

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1100
.06
.06
.06
Legend
EG 50-Yr Clearwater
Crit 50-Yr Clearwater
WS 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1050 New Section added by JLC
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

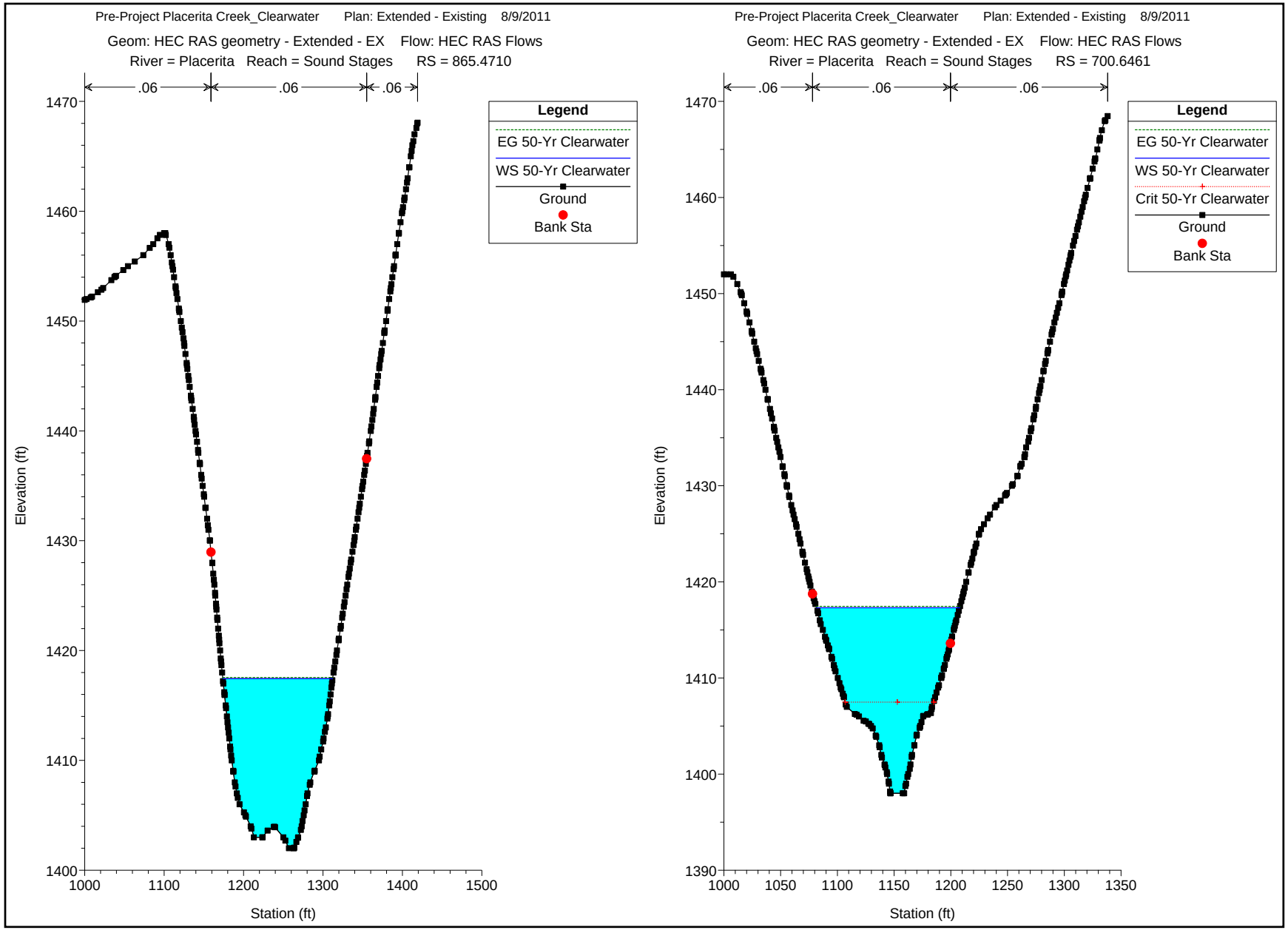

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1000
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2527.261
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

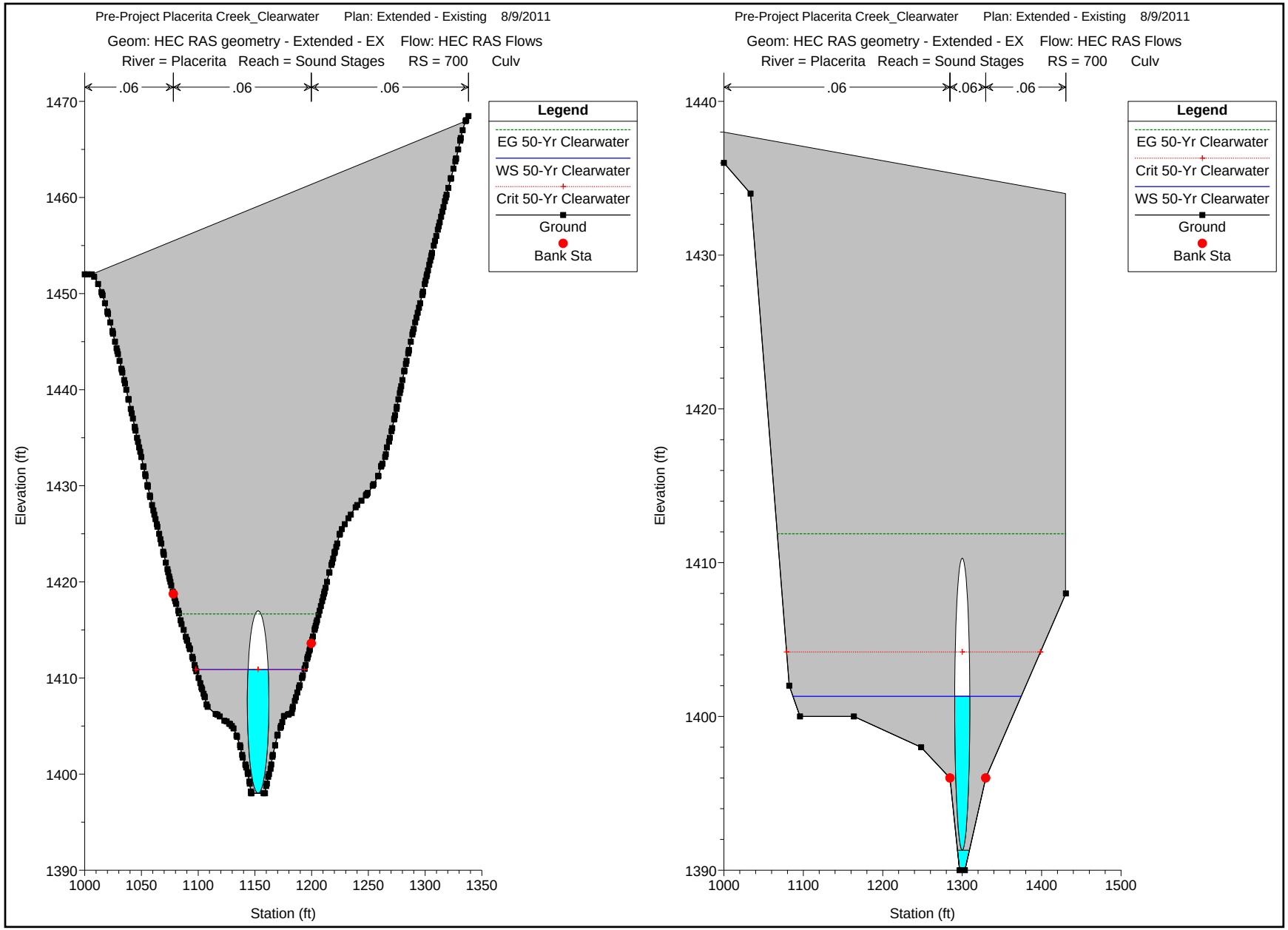

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2268.881
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2007.81 New Section Added by JLC
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

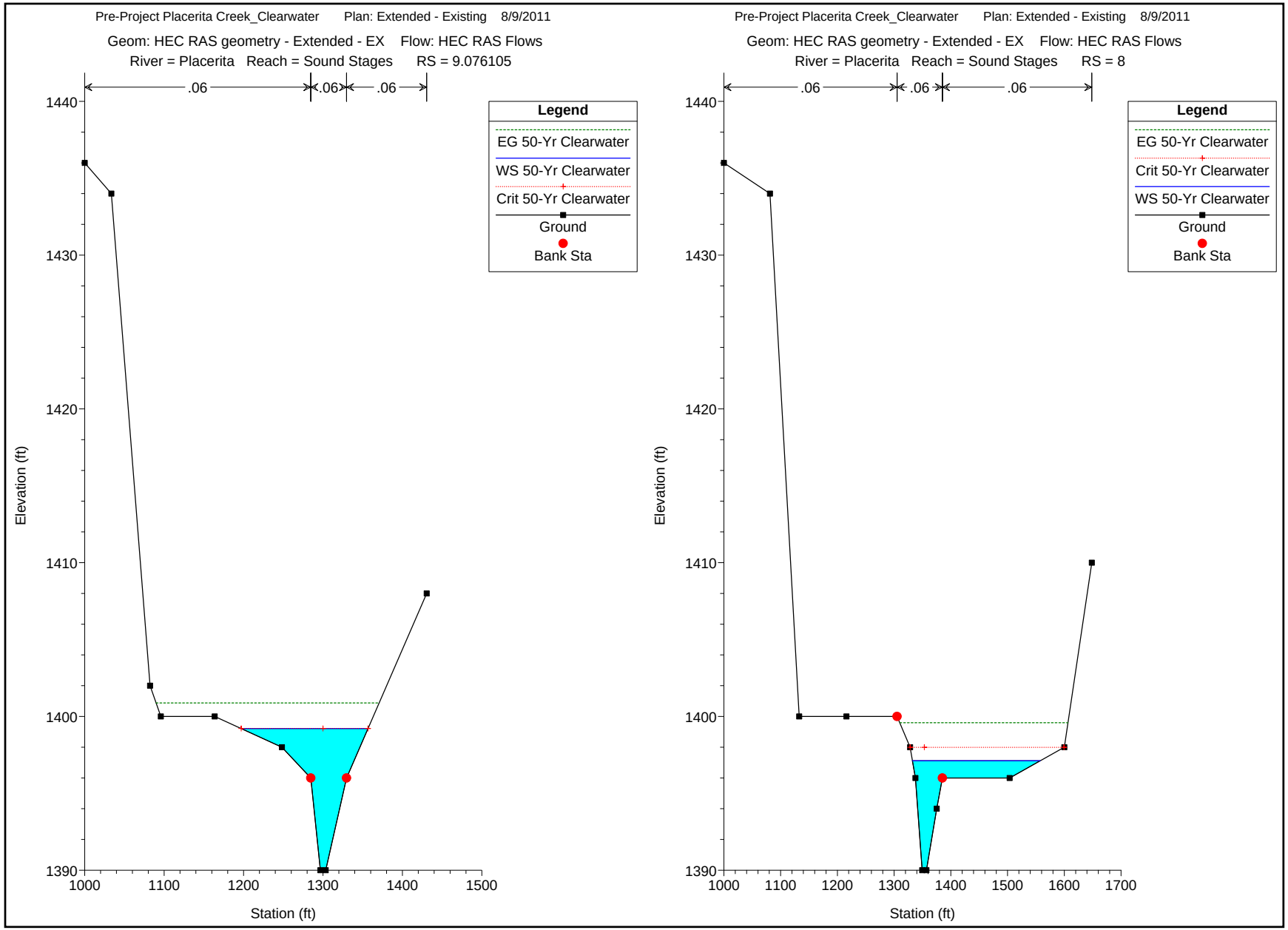

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1841.249
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1644.9 Section upstream of proposed clear span bridge
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

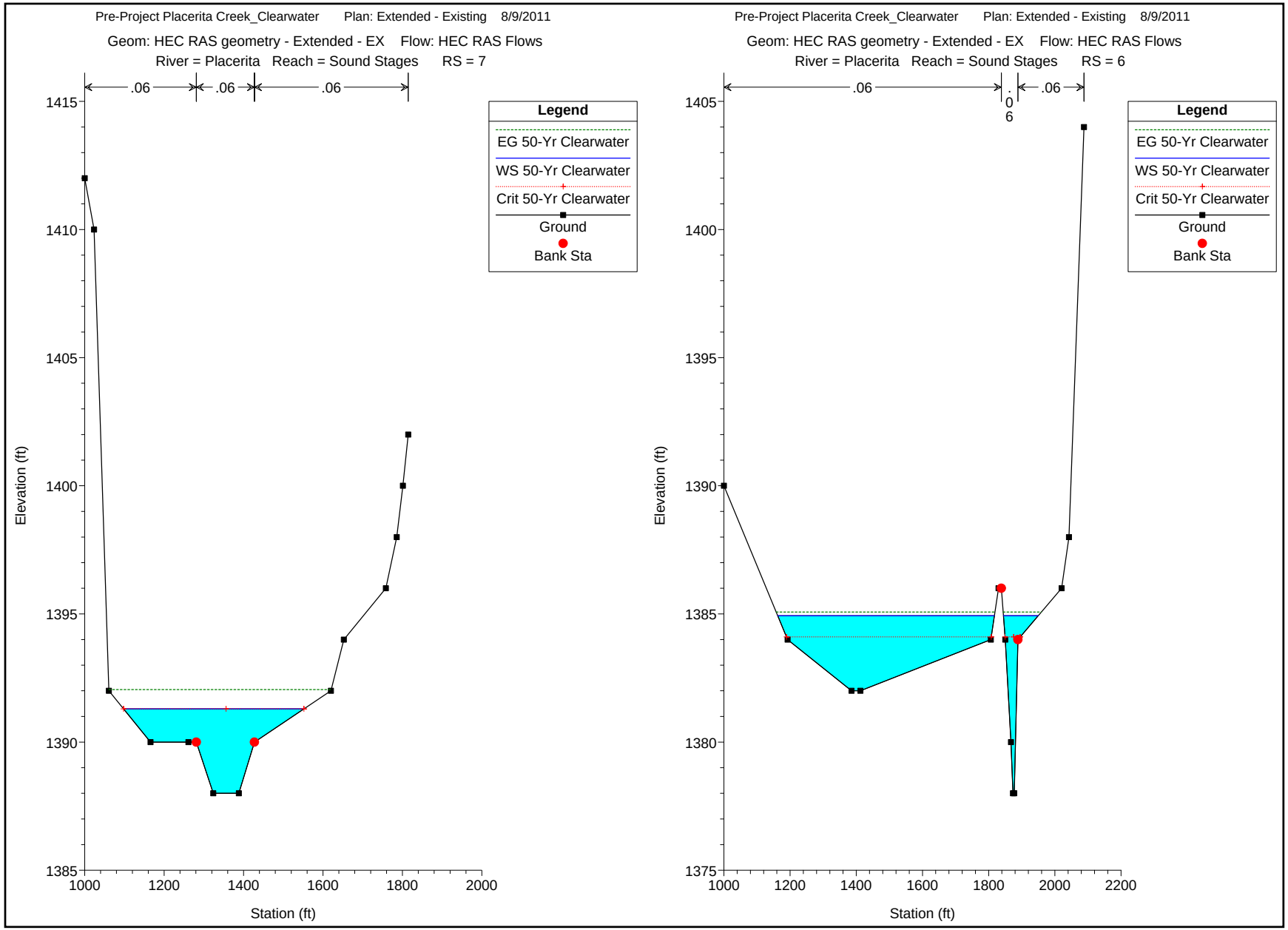

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1526.451
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1368.322
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

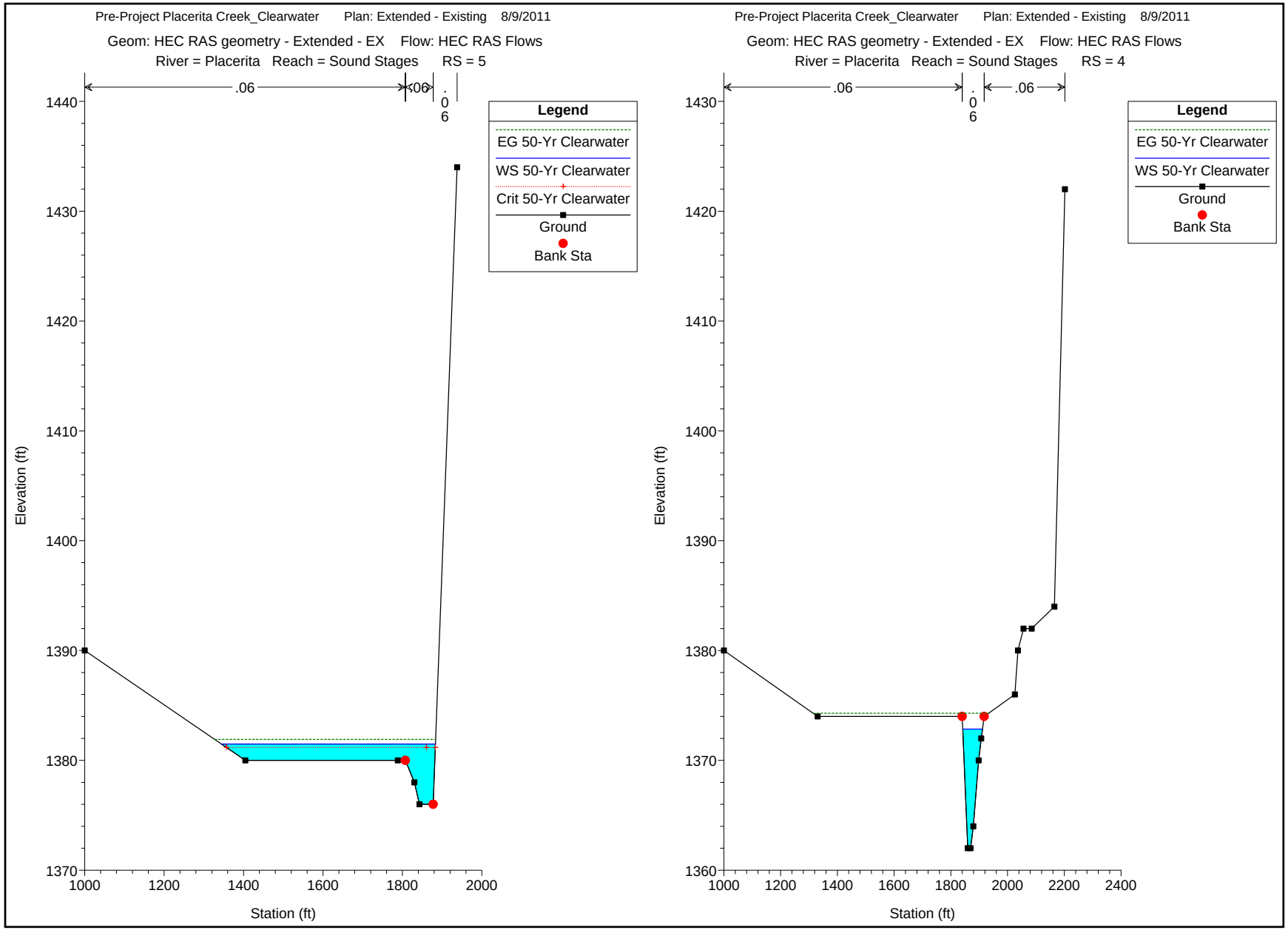

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1258.328
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1052.822
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

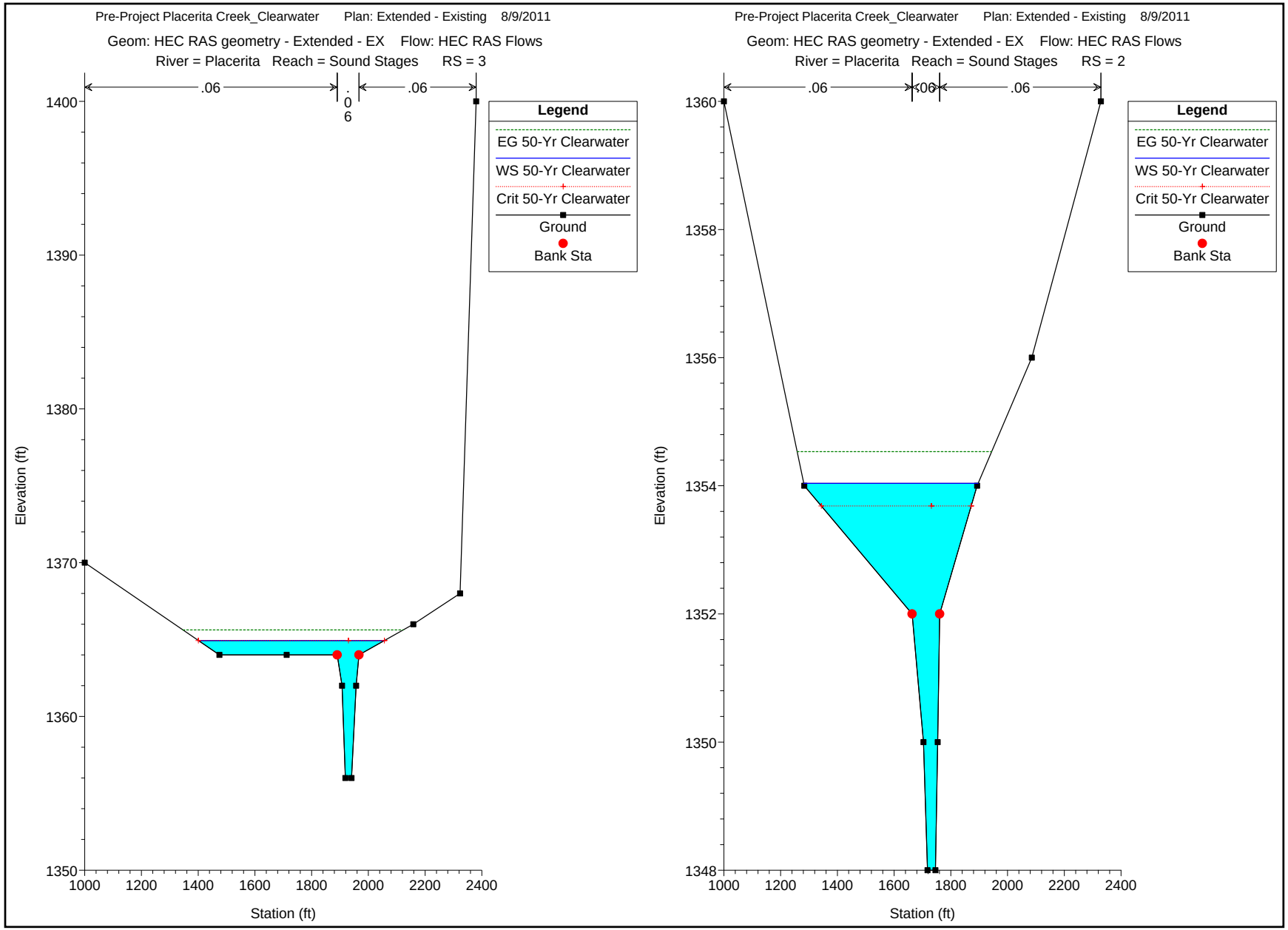

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 865.4710
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1470
1460
1450
1440
1430
1420
1410
1400
1000
1100
1200
1300
1400
1500
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700.6461
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1470
1460
1450
1440
1430
1420
1410
1400
1390
1000
1050
1100
1150
1200
1250
1300
1350


Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700 Culv
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1470
1460
1450
1440
1430
1420
1410
1400
1390
1000
1050
1100
1150
1200
1250
1300
1350
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700 Culv
.06
.06
.06
Legend
EG 50-Yr Clearwater
Crit 50-Yr Clearwater
WS 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500


Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 9.076105
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1390
1400
1410
1420
1430
1440
1000
1100
1200
1300
1400
1500
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 8
.06
.06
.06
Legend
EG 50-Yr Clearwater
Crit 50-Yr Clearwater
WS 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1390
1400
1410
1420
1430
1440
1000
1100
1200
1300
1400
1500
1600
1700


Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 7
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 6
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

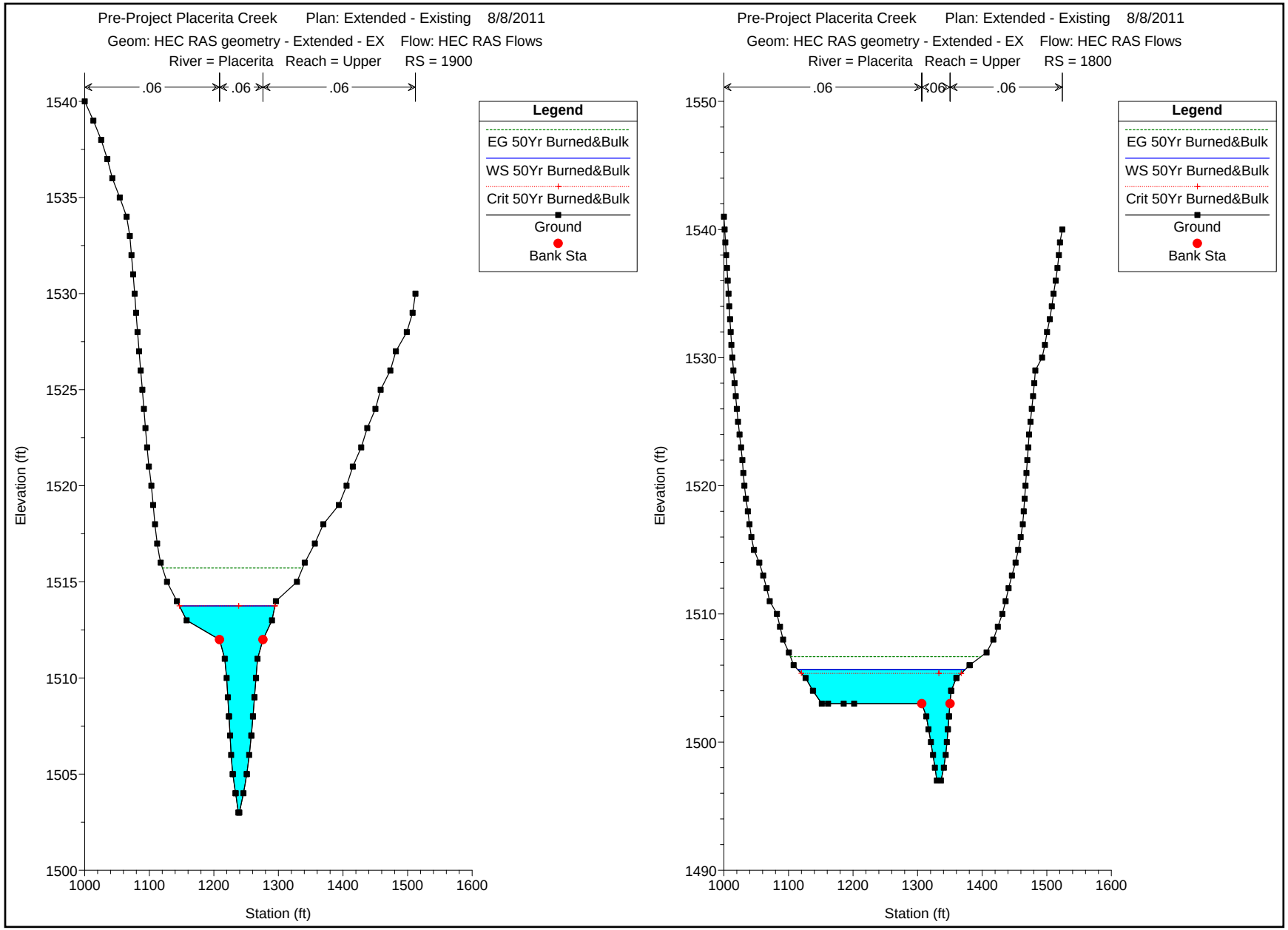

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 5
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 4
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

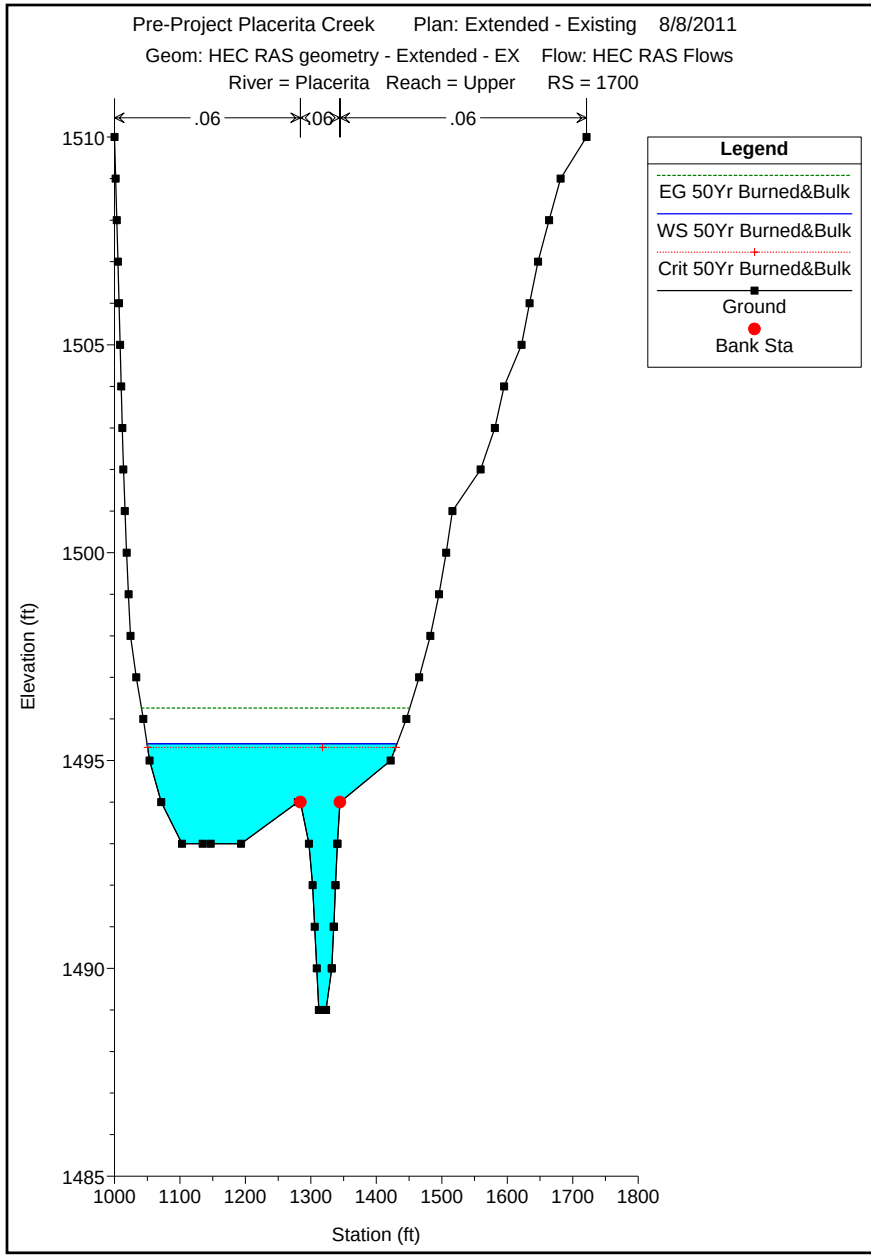

Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 3
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek_Clearwater Plan: Extended - Existing 8/9/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

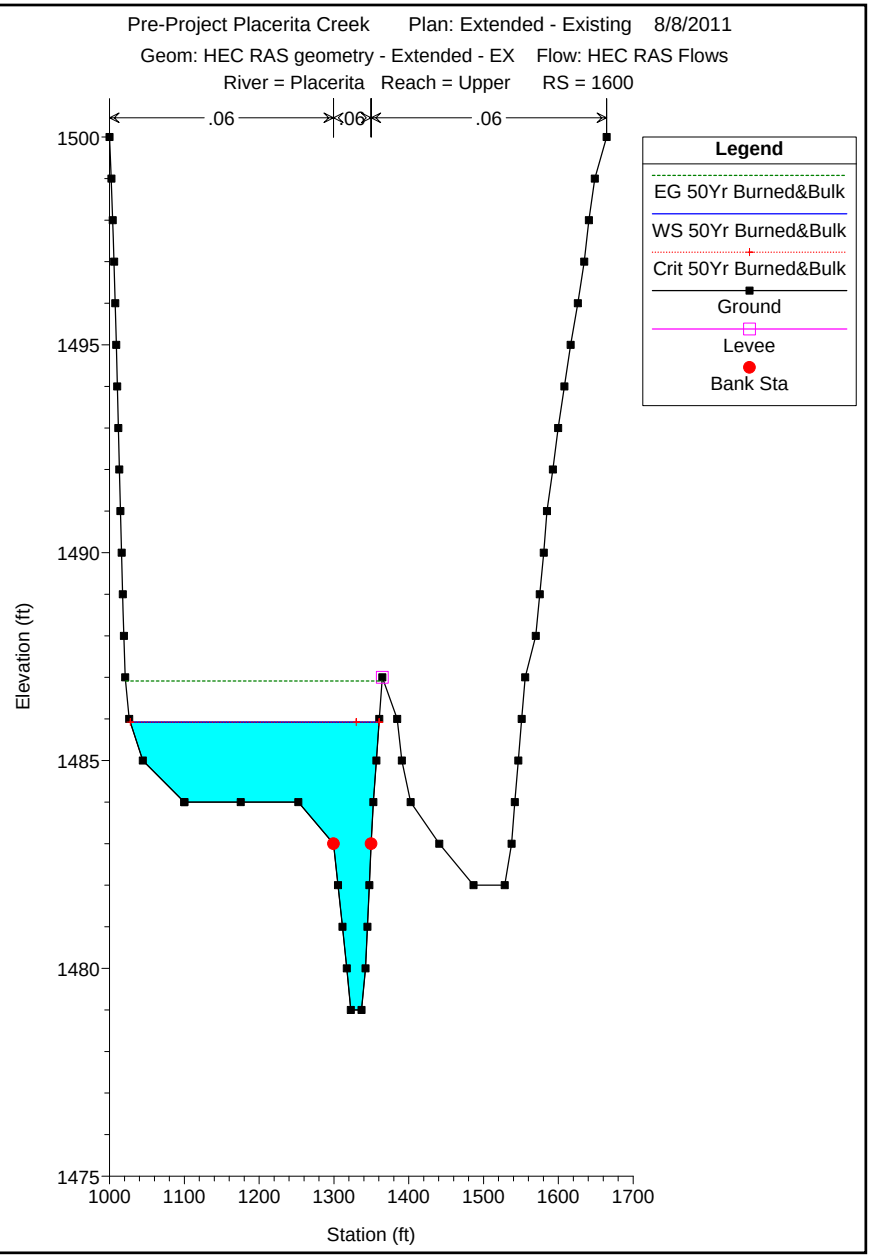
50-YEAR STORM EVENT BURNED AND BULK – PRE PROJECT CONDITION HEC-RAS OUTPUT

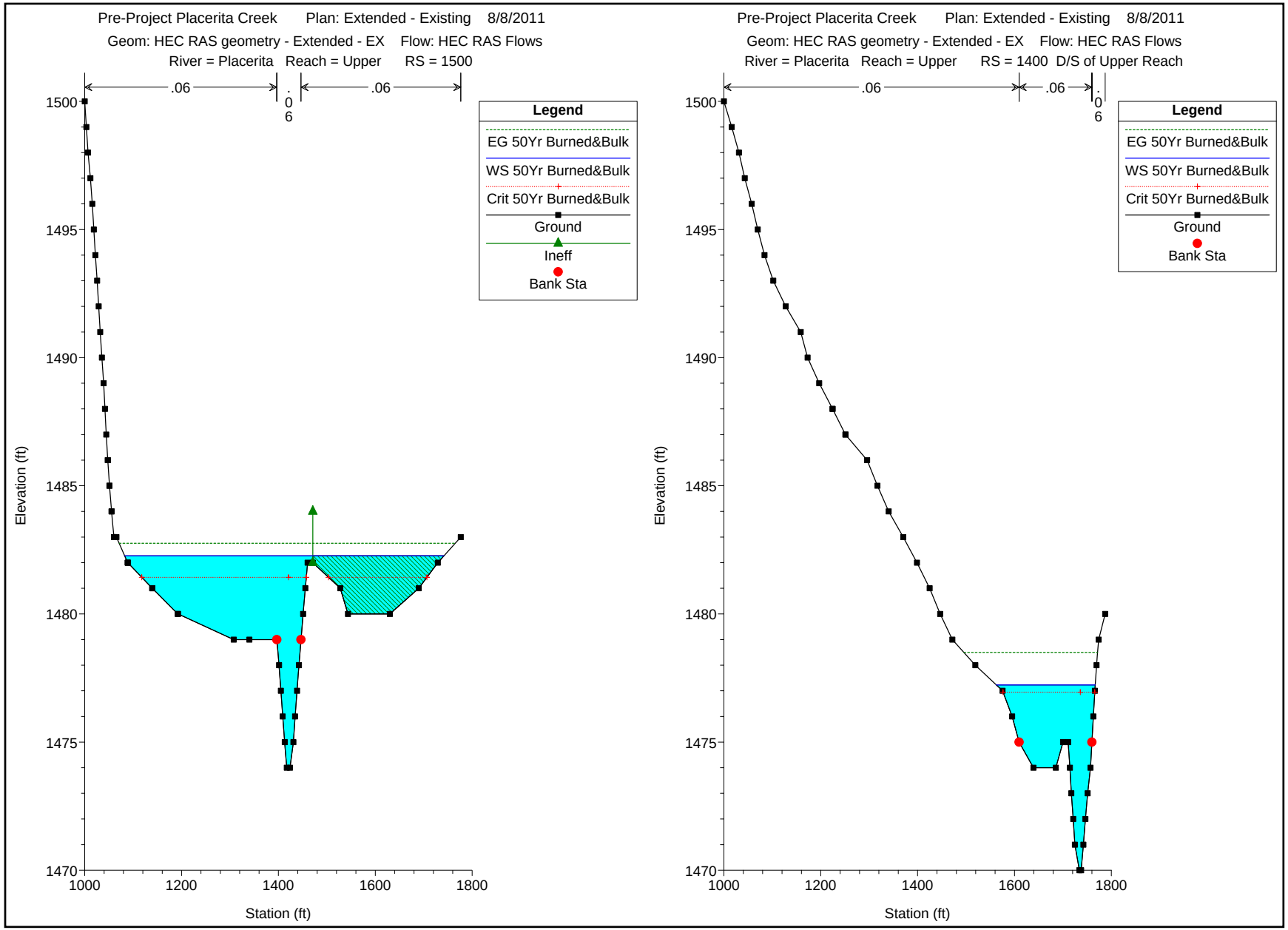
HEC-RAS Plan: EX_Extended Profile: 50Yr Burned&Bulk

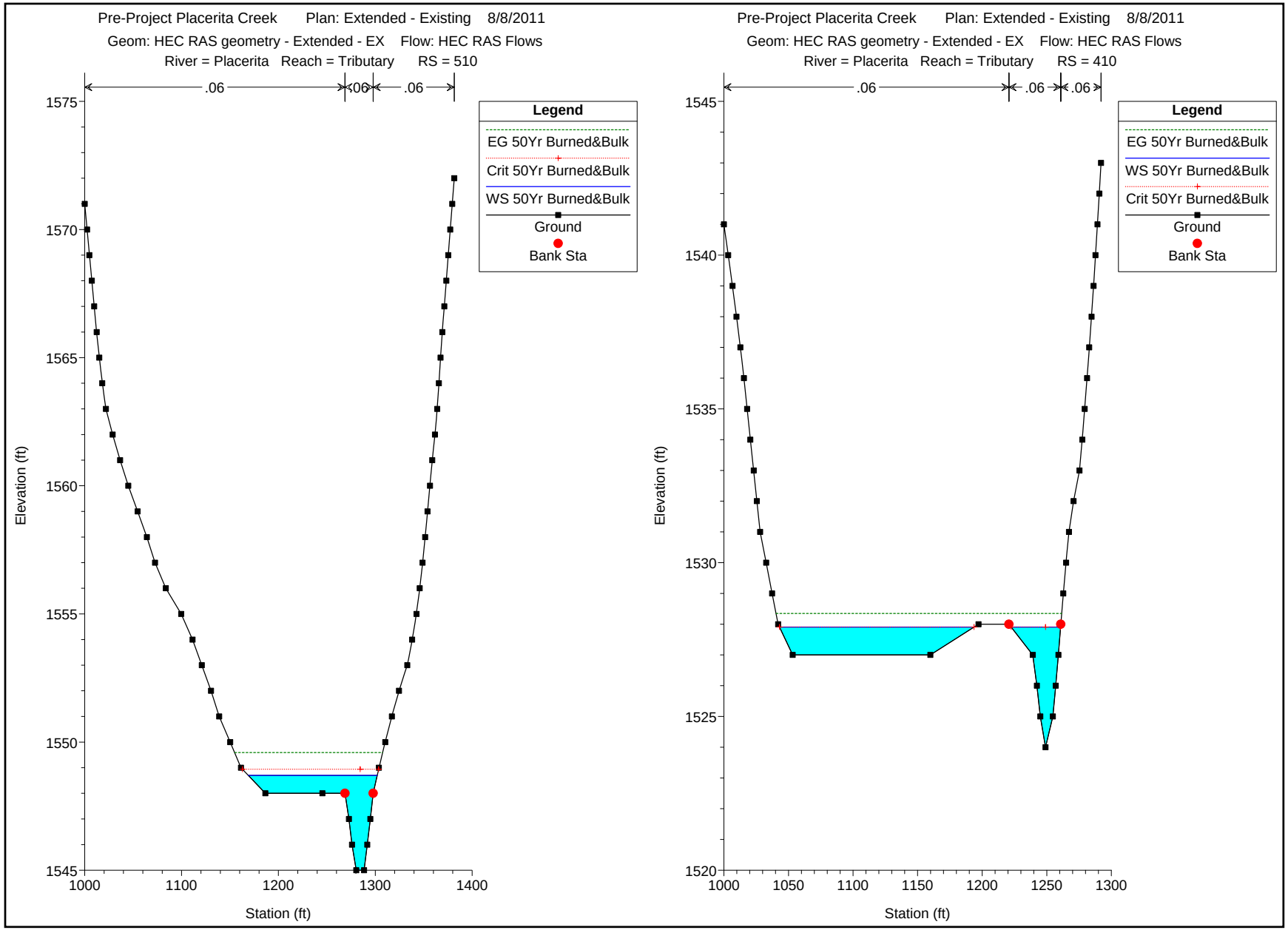
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Upper	1900	50Yr Burned&Bulk	5214.80	1503.00	1513.75	1513.75	1515.73	0.020126	11.61	508.82	147.94	0.82
Upper	1800	50Yr Burned&Bulk	5214.80	1497.00	1505.67	1505.36	1506.67	0.015469	9.91	743.96	259.67	0.71
Upper	1700	50Yr Burned&Bulk	5214.80	1489.00	1495.41	1495.32	1496.26	0.021420	9.23	788.65	381.84	0.80
Upper	1600	50Yr Burned&Bulk	5214.80	1479.00	1485.92	1485.92	1486.92	0.016902	9.98	788.40	332.64	0.75
Upper	1500	50Yr Burned&Bulk	5214.80	1474.00	1482.27	1481.43	1482.76	0.007807	7.27	1077.13	377.71	0.51
Upper	1400	50Yr Burned&Bulk	5214.80	1470.00	1477.23	1476.95	1478.50	0.024717	9.18	597.37	204.24	0.85
Tributary	510	50Yr Burned&Bulk	874.10	1545.00	1548.70	1548.94	1549.59	0.033813	8.53	142.15	133.14	0.93
Tributary	410	50Yr Burned&Bulk	874.10	1524.00	1527.91	1527.91	1528.35	0.039115	6.51	176.94	188.83	0.91
Tributary	310	50Yr Burned&Bulk	874.10	1503.00	1506.20	1505.85	1506.53	0.016410	4.85	207.07	161.80	0.62
Tributary	210	50Yr Burned&Bulk	874.10	1486.00	1489.72	1489.72	1490.71	0.042740	7.96	109.82	55.87	1.00
Tributary	110	50Yr Burned&Bulk	874.10	1479.00	1483.70	1483.29	1483.91	0.006986	4.74	286.50	191.06	0.44
Tributary	10	50Yr Burned&Bulk	874.10	1471.00	1476.68	1476.68	1478.45	0.041428	10.66	81.96	23.26	1.00
Lower	1300	50Yr Burned&Bulk	5943.50	1468.00	1475.01	1474.56	1476.18	0.015123	9.68	757.45	216.25	0.71
Lower	1250	50Yr Burned&Bulk	5943.50	1463.00	1470.17	1470.17	1471.13	0.018583	10.02	906.92	409.87	0.77
Lower	1200	50Yr Burned&Bulk	5943.50	1459.00	1466.66	1465.51	1466.95	0.004907	5.82	1563.00	531.74	0.41
Lower	1150	50Yr Burned&Bulk	5943.50	1453.00	1462.59	1462.59	1463.46	0.012030	9.29	1075.45	550.01	0.64
Lower	1100	50Yr Burned&Bulk	5943.50	1447.00	1455.68	1455.70	1456.78	0.014352	10.10	900.73	380.68	0.69
Lower	1050	50Yr Burned&Bulk	5943.50	1443.00	1454.96	1452.18	1455.03	0.000742	2.80	3346.82	884.54	0.17
Lower	1000	50Yr Burned&Bulk	5943.50	1439.00	1450.62	1450.62	1454.11	0.031572	15.00	396.35	56.42	1.00
Sound Stages	2527.261	50Yr Burned&Bulk	6011.70	1432.00	1442.21	1442.21	1445.41	0.030870	14.37	418.42	65.28	1.00
Sound Stages	2268.881	50Yr Burned&Bulk	6011.70	1427.00	1436.89	1436.89	1440.04	0.031228	14.24	422.16	66.45	1.00
Sound Stages	2007.81	50Yr Burned&Bulk	6011.70	1422.00	1431.71	1429.89	1432.77	0.011332	8.25	728.76	128.34	0.61
Sound Stages	1841.249	50Yr Burned&Bulk	6011.70	1419.00	1427.35	1427.35	1429.66	0.032426	12.20	492.74	106.91	1.00
Sound Stages	1644.9	50Yr Burned&Bulk	6011.70	1416.00	1426.01	1424.91	1426.47	0.004796	6.63	1343.63	398.16	0.41
Sound Stages	1526.451	50Yr Burned&Bulk	6011.70	1414.00	1425.84		1426.00	0.002292	3.45	1903.73	444.78	0.27
Sound Stages	1368.322	50Yr Burned&Bulk	6011.70	1412.00	1425.57		1425.73	0.001288	3.37	1898.34	291.67	0.22
Sound Stages	1258.328	50Yr Burned&Bulk	6011.70	1410.00	1425.27		1425.56	0.001617	4.37	1376.59	145.76	0.25
Sound Stages	1052.822	50Yr Burned&Bulk	6011.70	1405.12	1425.26		1425.37	0.000361	2.64	2273.41	161.23	0.12
Sound Stages	865.4710	50Yr Burned&Bulk	6011.70	1402.00	1425.23		1425.31	0.000211	2.23	2700.94	164.88	0.10
Sound Stages	700.6461	50Yr Burned&Bulk	6011.70	1398.00	1425.17	1409.00	1425.27	0.000230	2.55	2467.45	160.22	0.10
Sound Stages	700		Culvert									
Sound Stages	9.076105	50Yr Burned&Bulk	6011.70	1390.00	1400.84	1400.84	1402.19	0.012305	10.92	826.31	280.23	0.67
Sound Stages	8	50Yr Burned&Bulk	6011.70	1390.00	1397.58	1398.59	1400.93	0.067532	16.94	491.96	249.68	1.42
Sound Stages	7	50Yr Burned&Bulk	6229.50	1388.00	1391.81	1391.81	1392.72	0.026002	8.76	928.16	531.04	0.86
Sound Stages	6	50Yr Burned&Bulk	6229.50	1378.00	1385.41	1384.41	1385.61	0.006250	4.68	1797.08	815.20	0.42
Sound Stages	5	50Yr Burned&Bulk	6229.50	1376.00	1382.42		1382.77	0.007043	6.28	1485.43	577.75	0.48
Sound Stages	4	50Yr Burned&Bulk	6229.50	1362.00	1374.28	1373.01	1376.19	0.017207	11.28	681.09	617.82	0.76
Sound Stages	3	50Yr Burned&Bulk	6276.60	1356.00	1365.46	1365.46	1366.21	0.011691	8.53	1243.79	747.21	0.62
Sound Stages	2	50Yr Burned&Bulk	6276.60	1348.00	1354.64	1354.29	1355.16	0.010201	7.24	1351.09	701.13	0.57

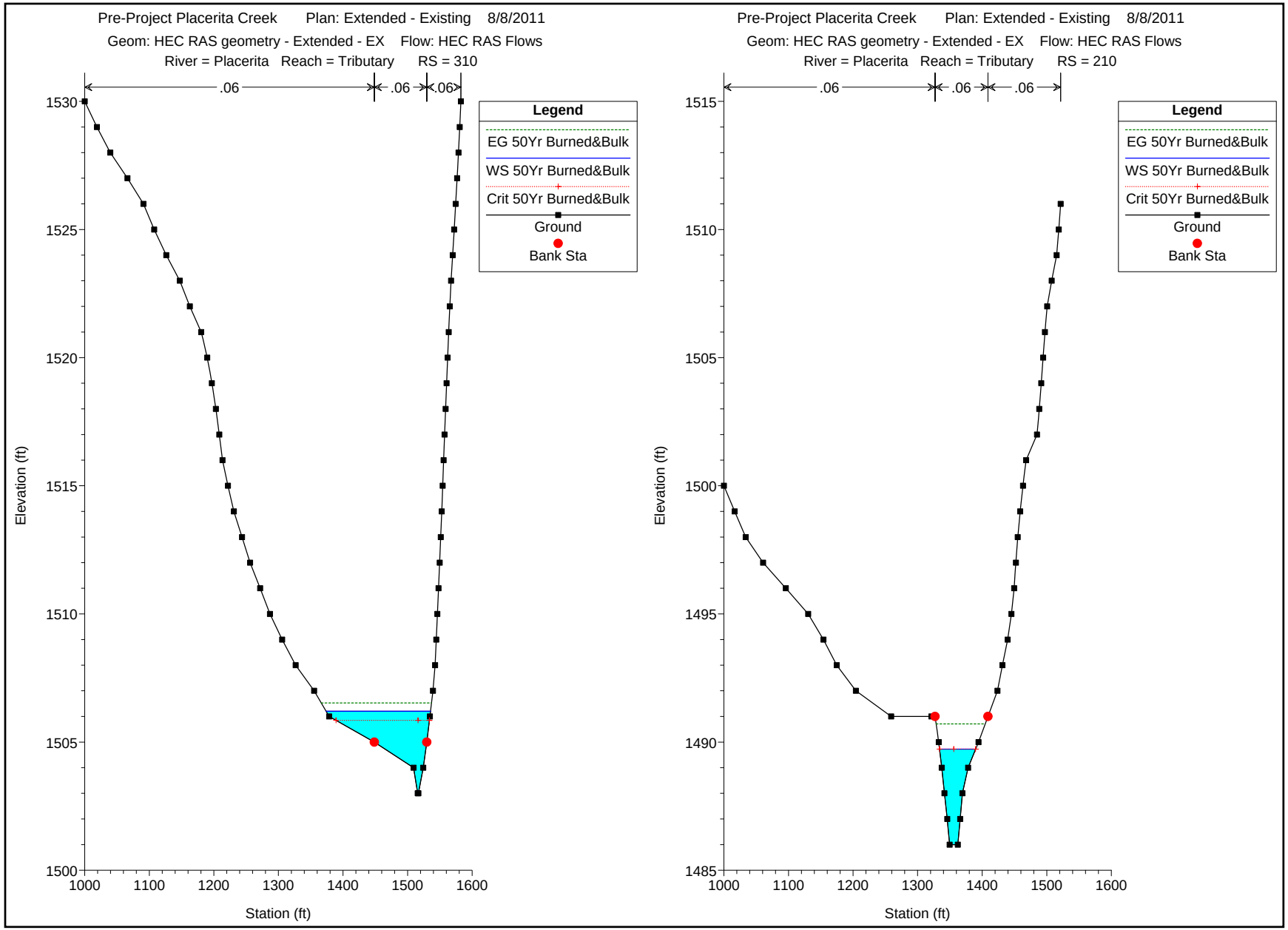

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1900
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1800
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
Station (ft)

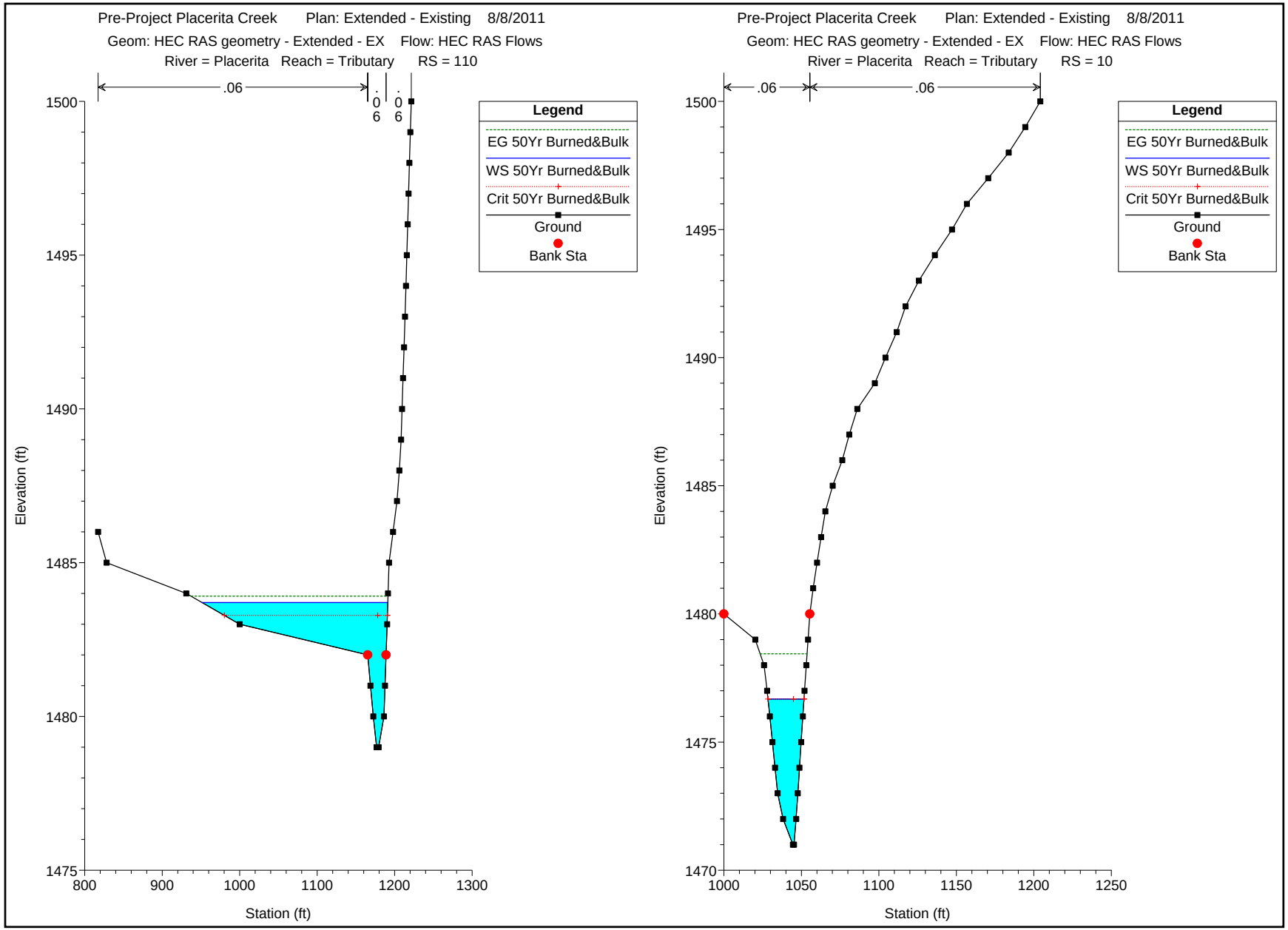

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1700
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
1510
1505
1500
1495
1490
1485
1000
1100
1200
1300
1400
1500
1600
1700
1800
Station (ft)

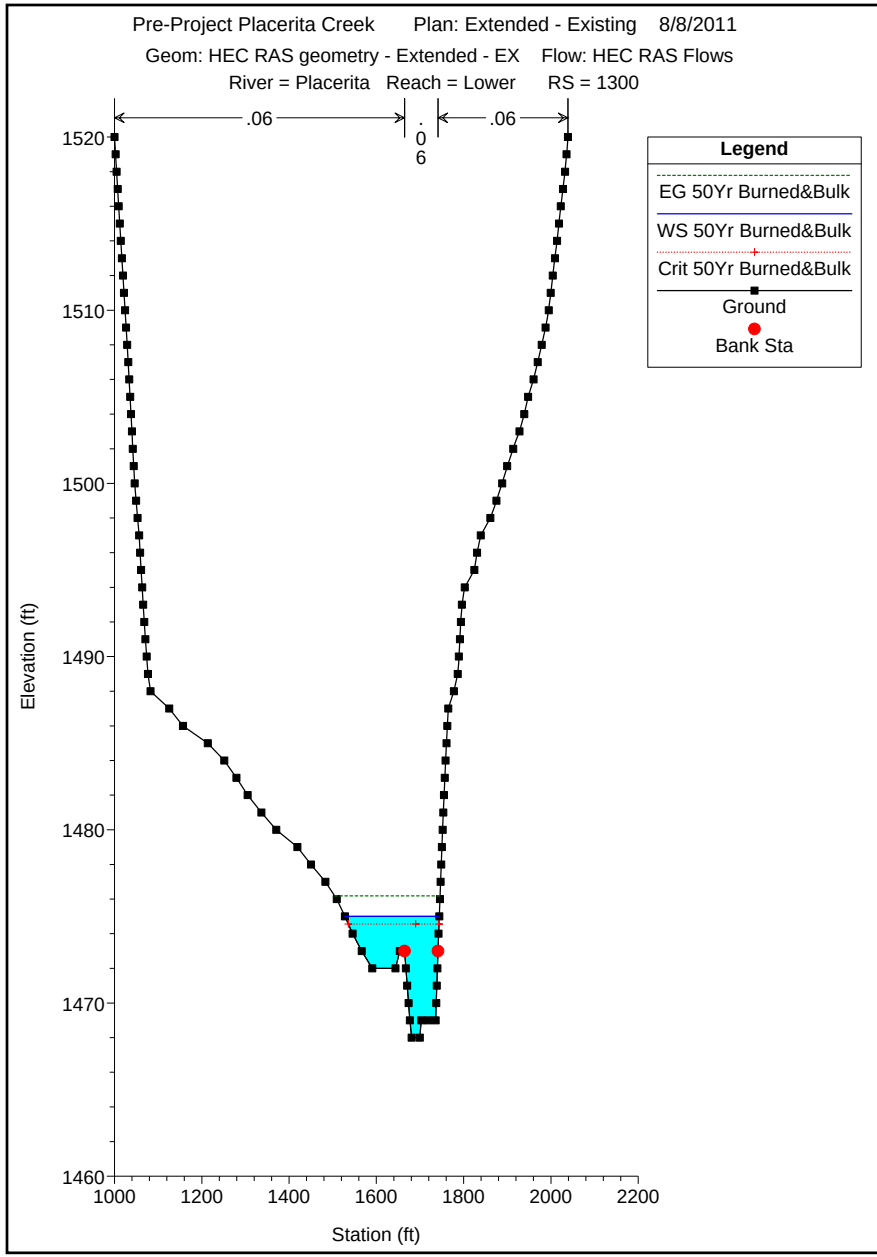

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1600
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Levee
Bank Sta
Elevation (ft)
1500
1495
1490
1485
1480
1475
1000
1100
1200
1300
1400
1500
1600
1700
Station (ft)

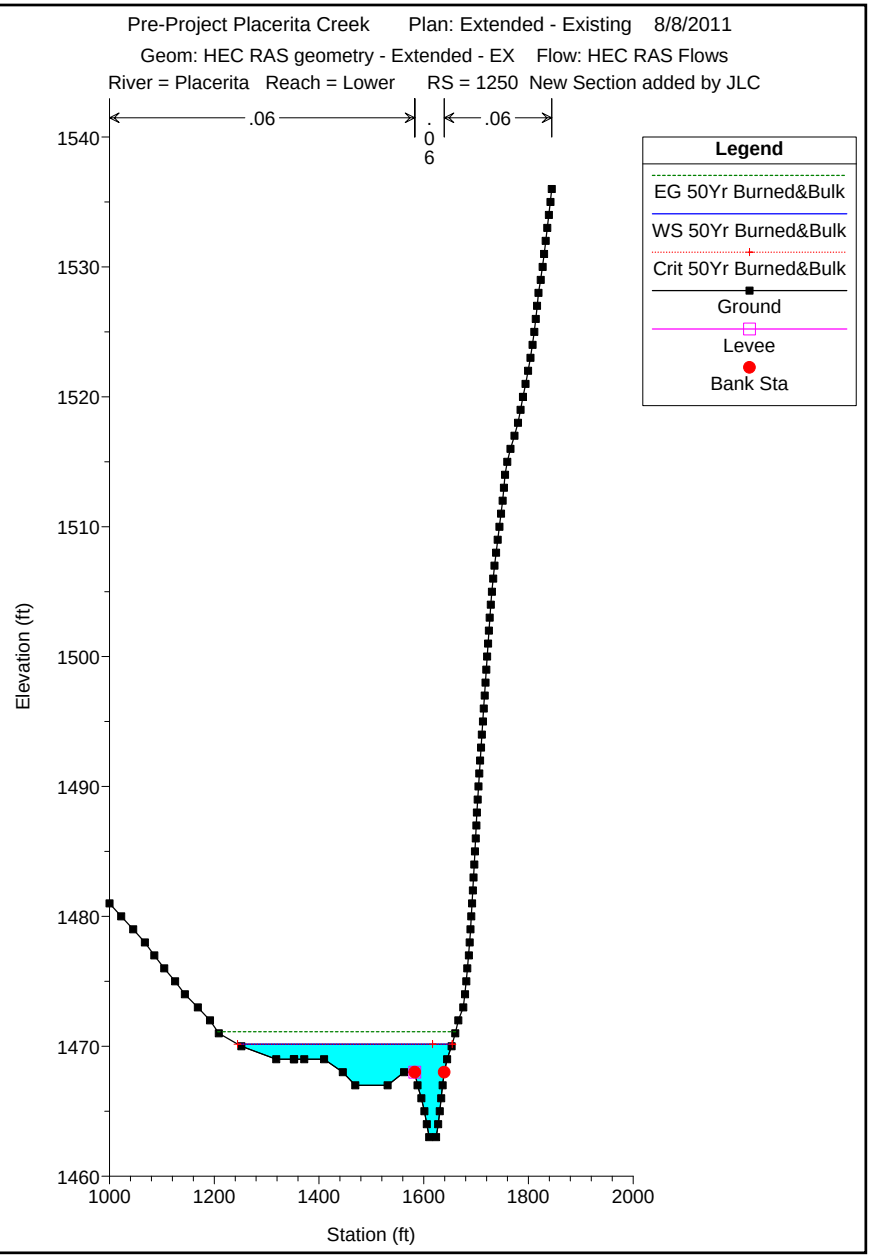

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1500
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1400 D/S of Upper Reach
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
Station (ft)

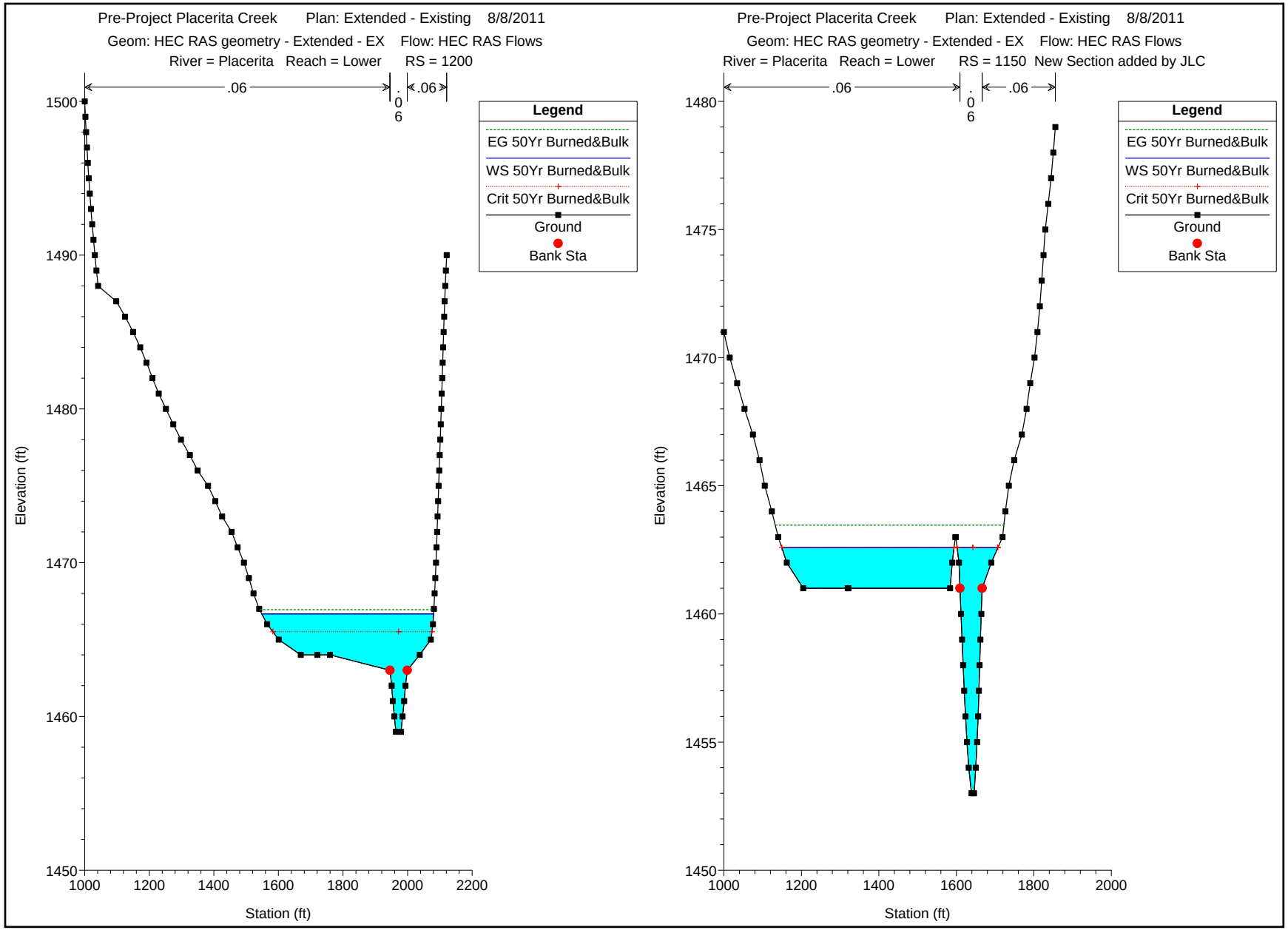

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 510
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
1575
1570
1565
1560
1555
1550
1545
1000
1100
1200
1300
1400
Station (ft)
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 410
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
1545
1540
1535
1530
1525
1520
1000
1050
1100
1150
1200
1250
1300
Station (ft)

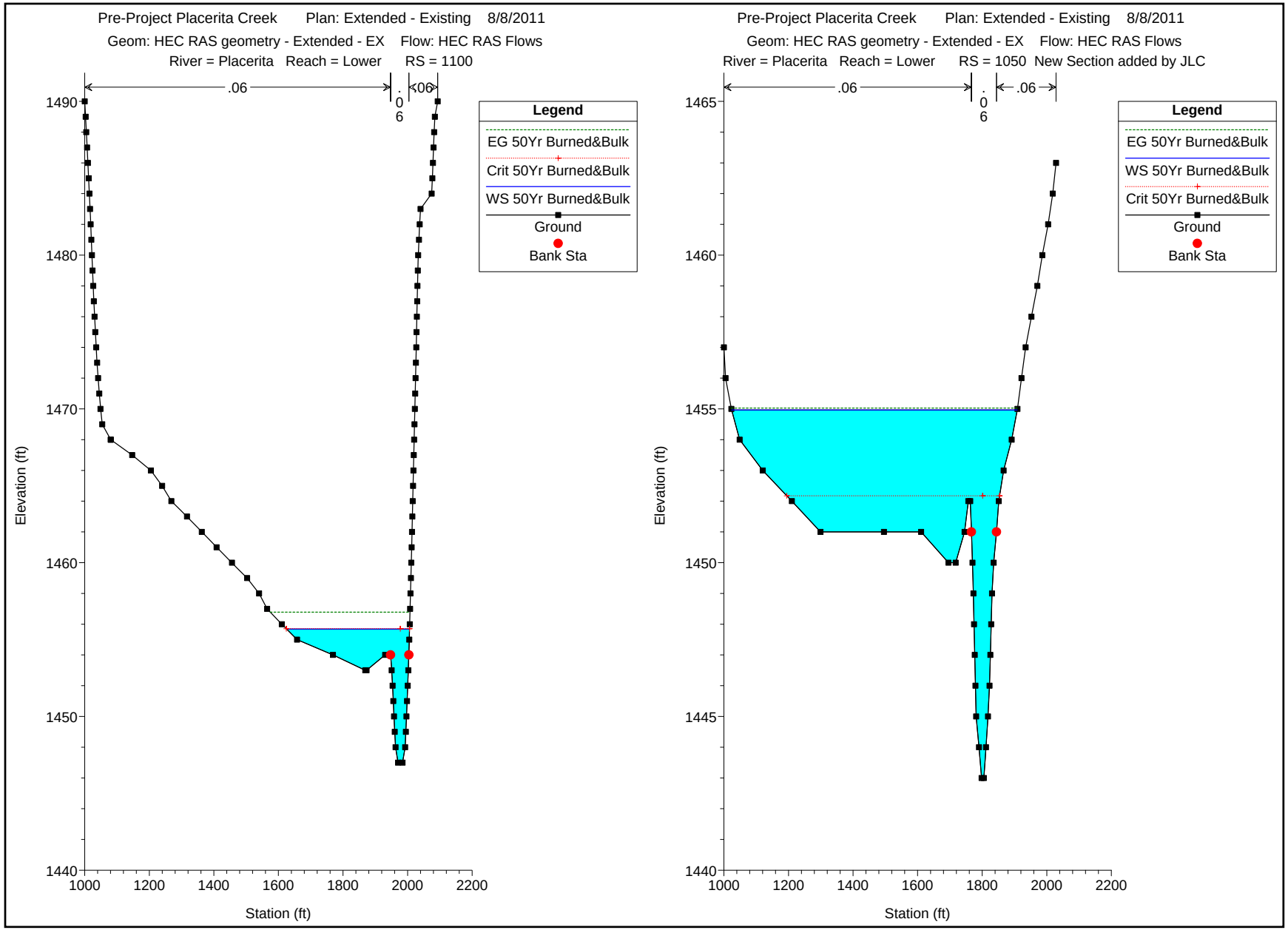

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 310
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 210
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
Station (ft)

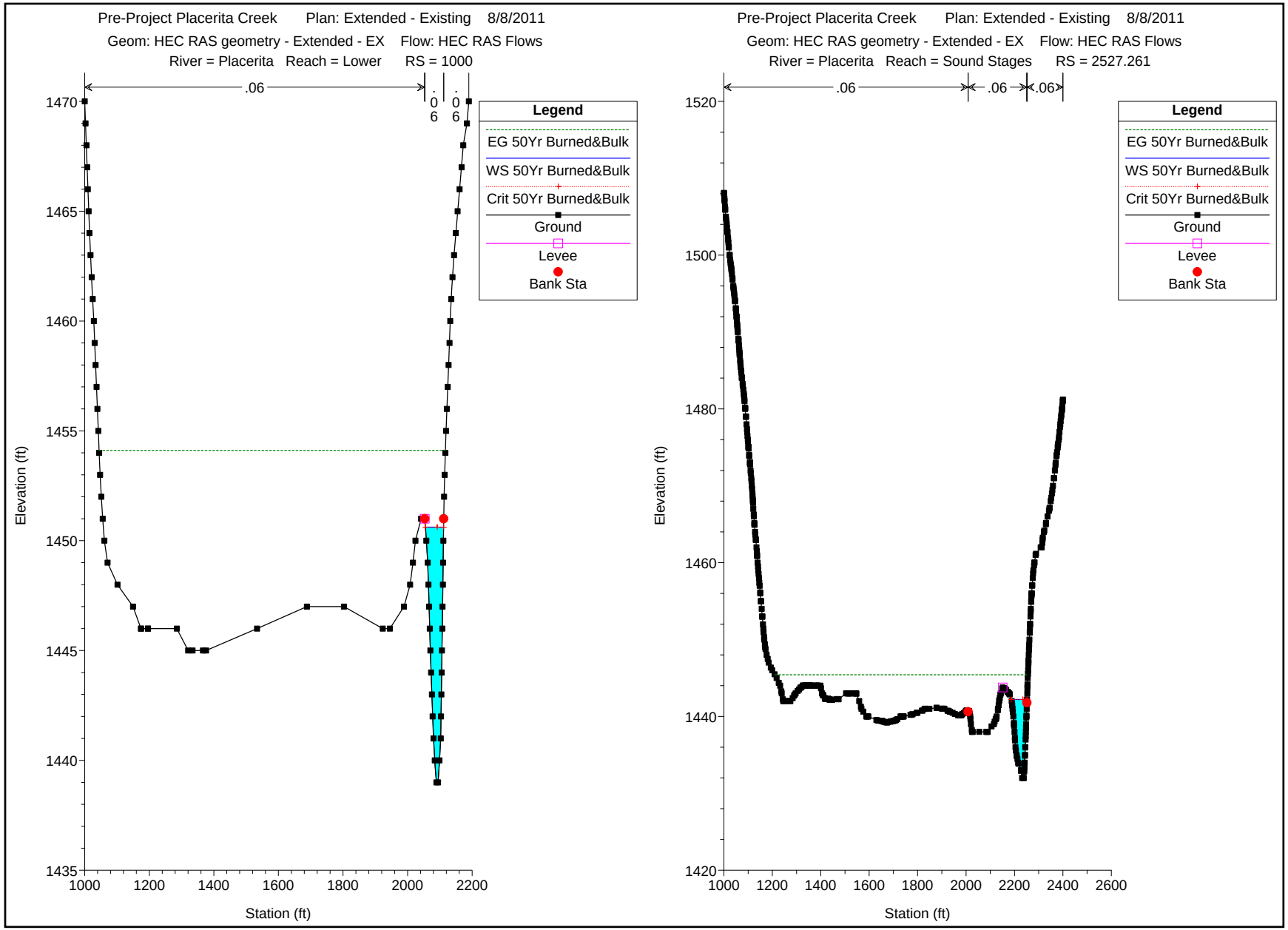

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 110
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
800
900
1000
1100
1200
1300
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 10
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1050
1100
1150
1200
1250

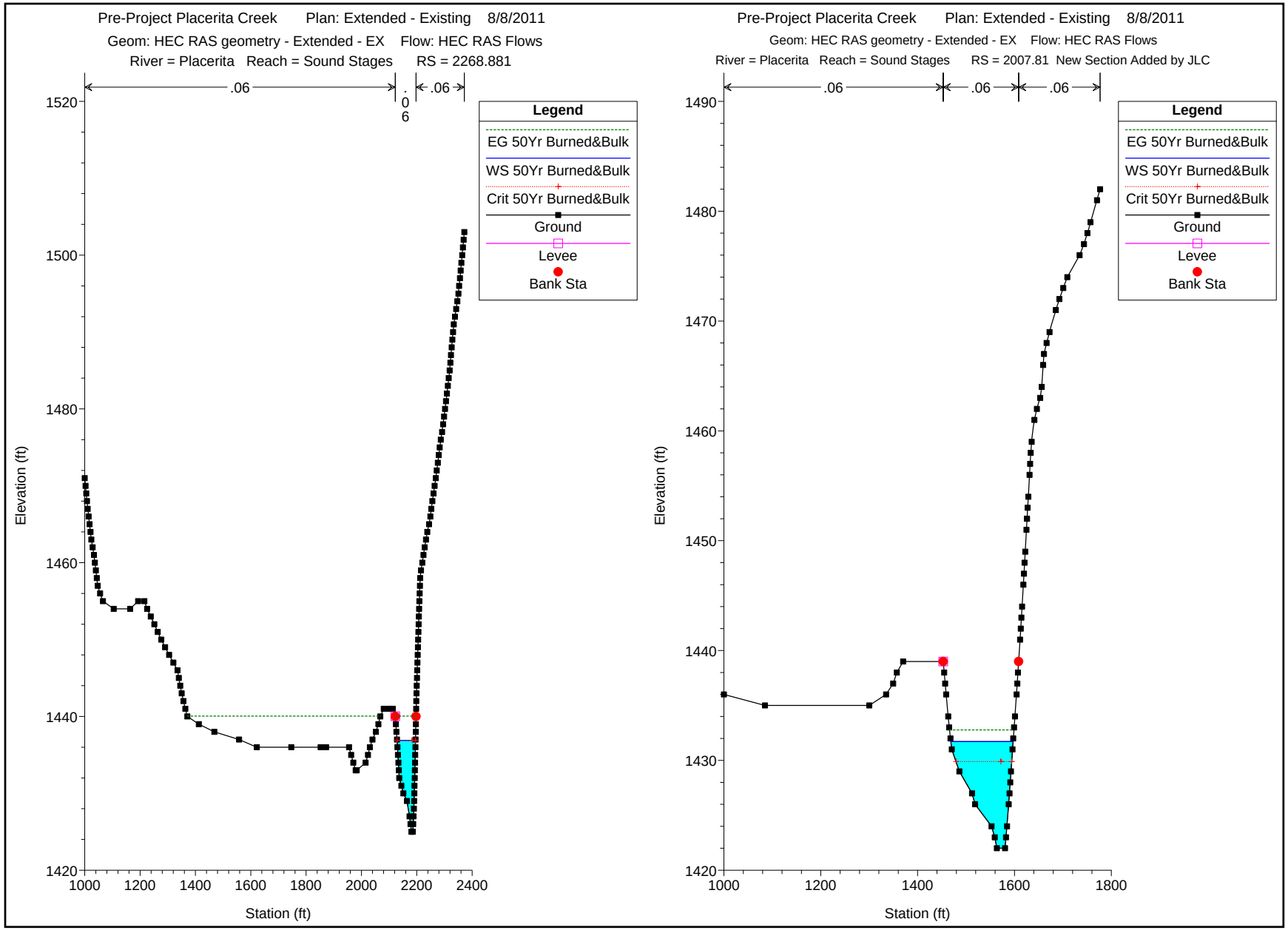

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1300
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
Station (ft)
1520
1510
1500
1490
1480
1470
1460
1000
1200
1400
1600
1800
2000
2200

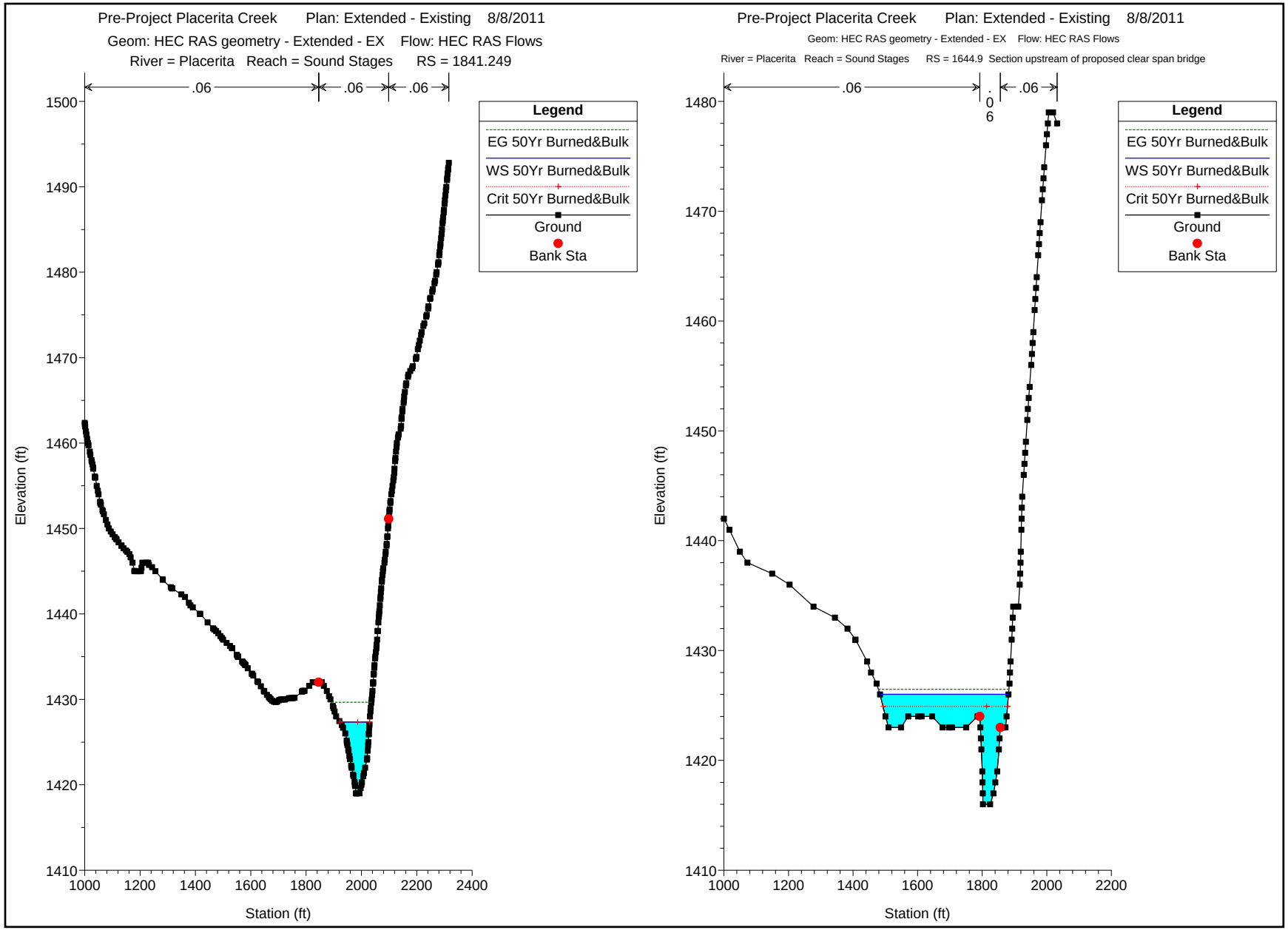

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1250 New Section added by JLC
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
1540
1530
1520
1510
1500
1490
1480
1470
1460
1000
1200
1400
1600
1800
2000

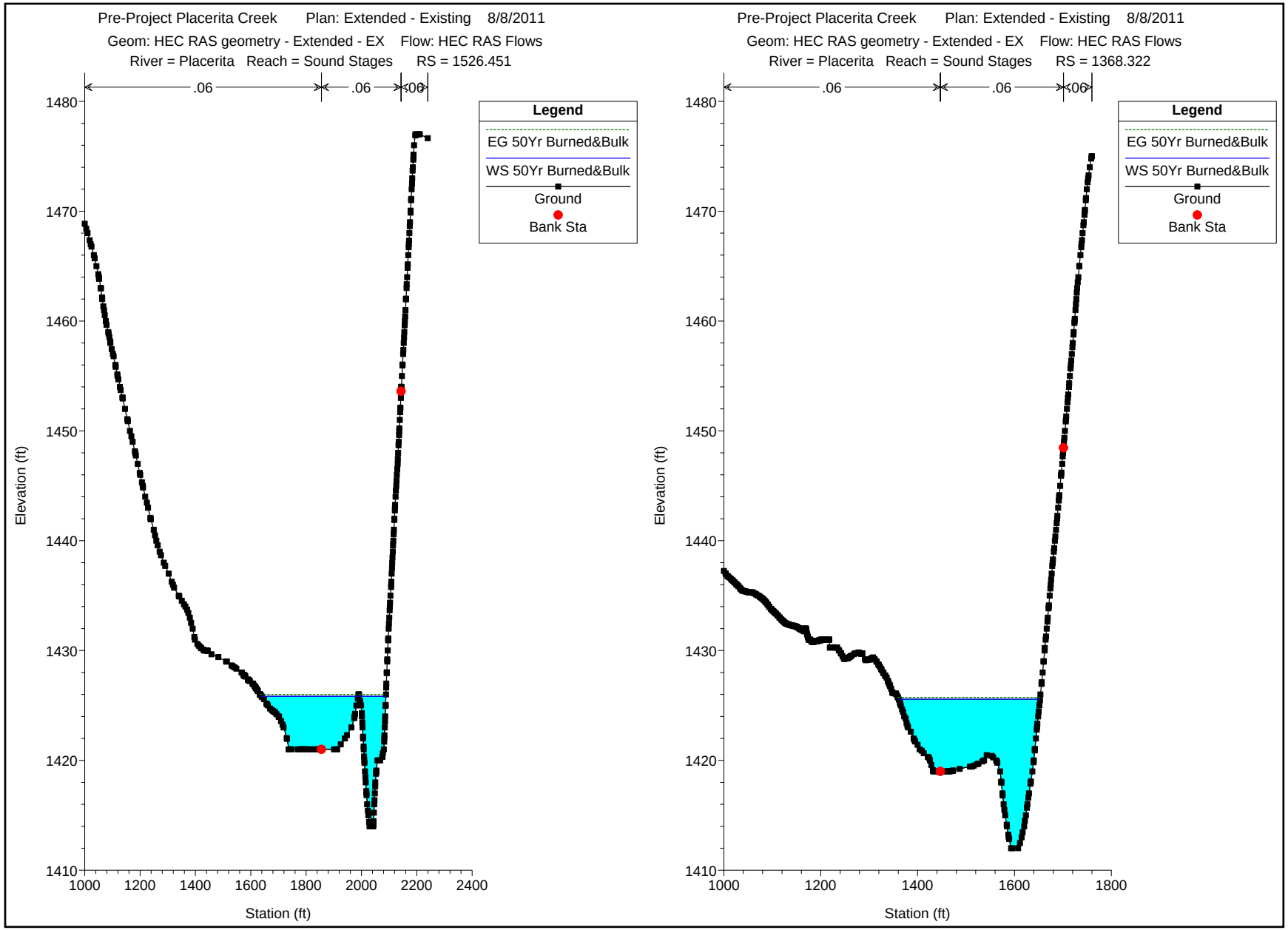

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1200
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1150 New Section added by JLC
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
Station (ft)

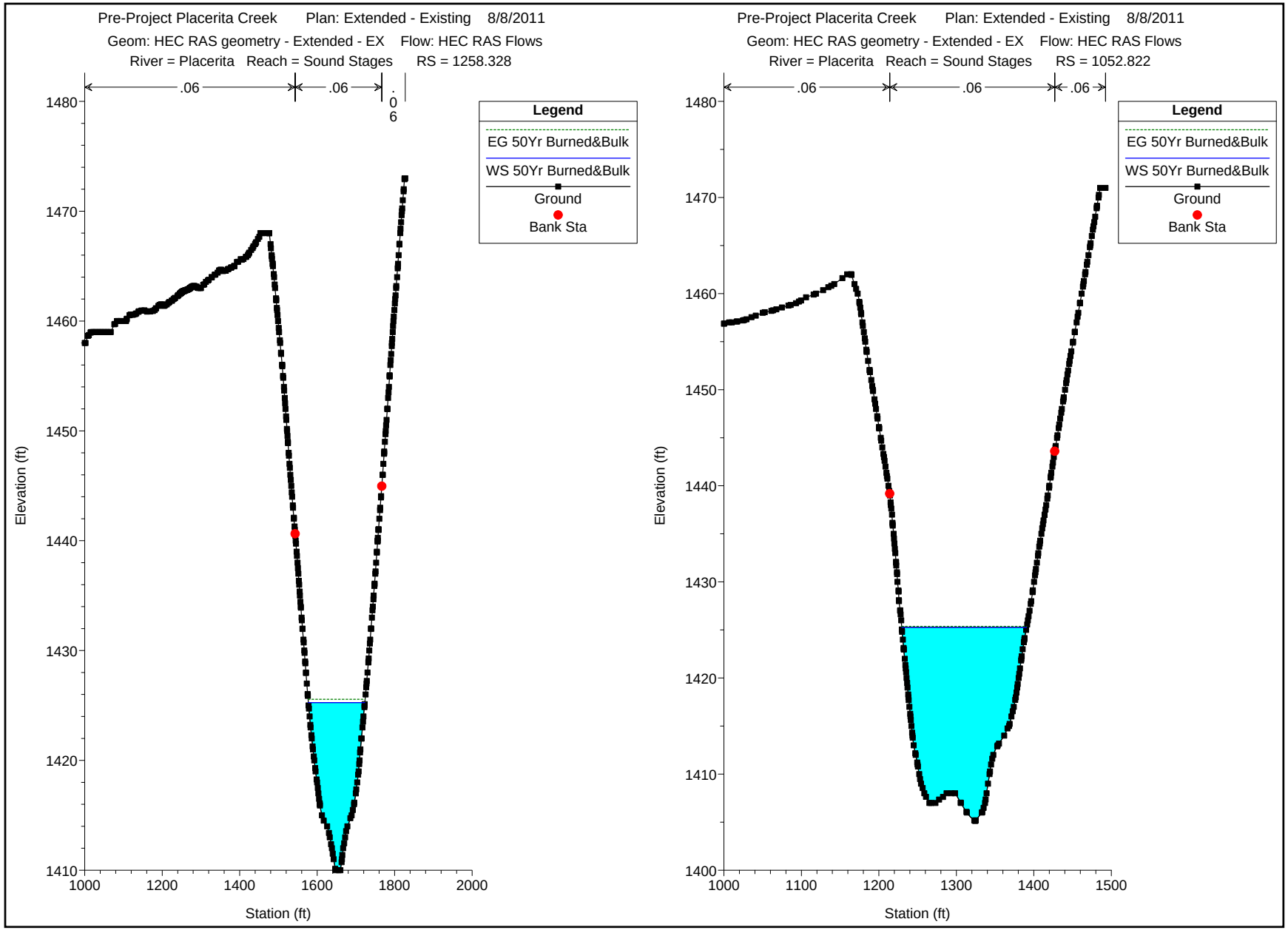

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1100
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1050 New Section added by JLC
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
Station (ft)

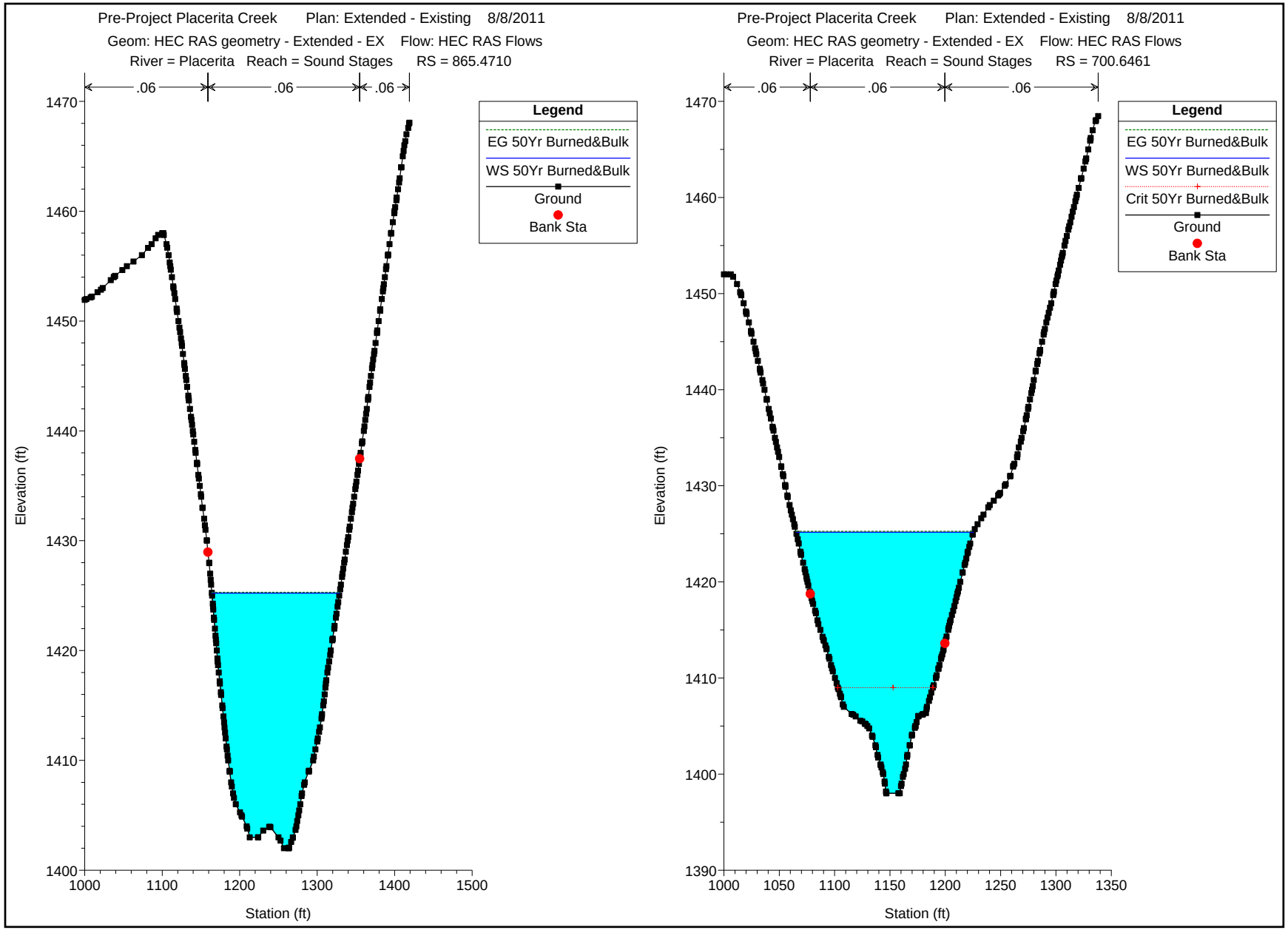

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1000
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2527.261
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

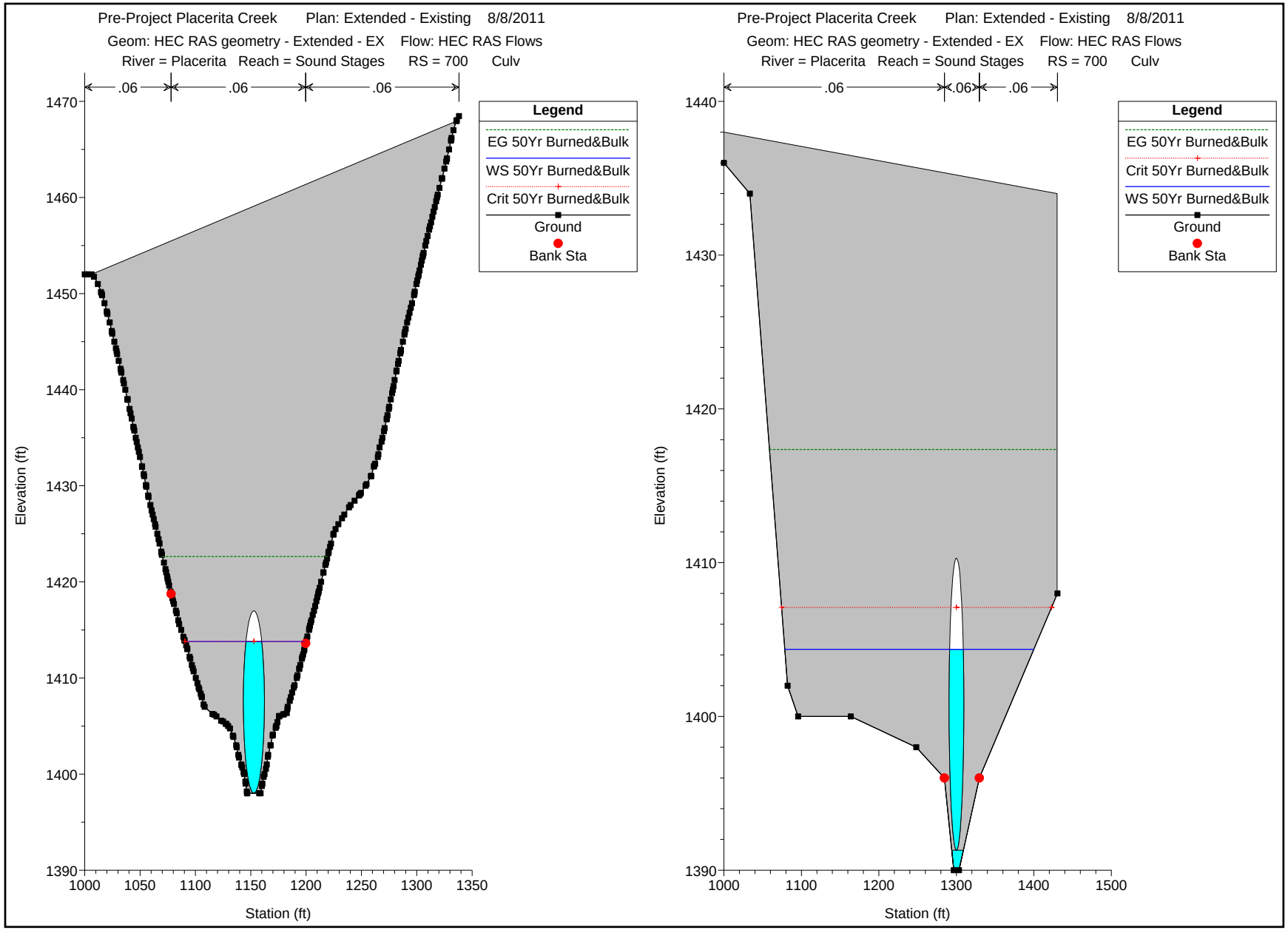

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2268.881
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2007.81 New Section Added by JLC
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

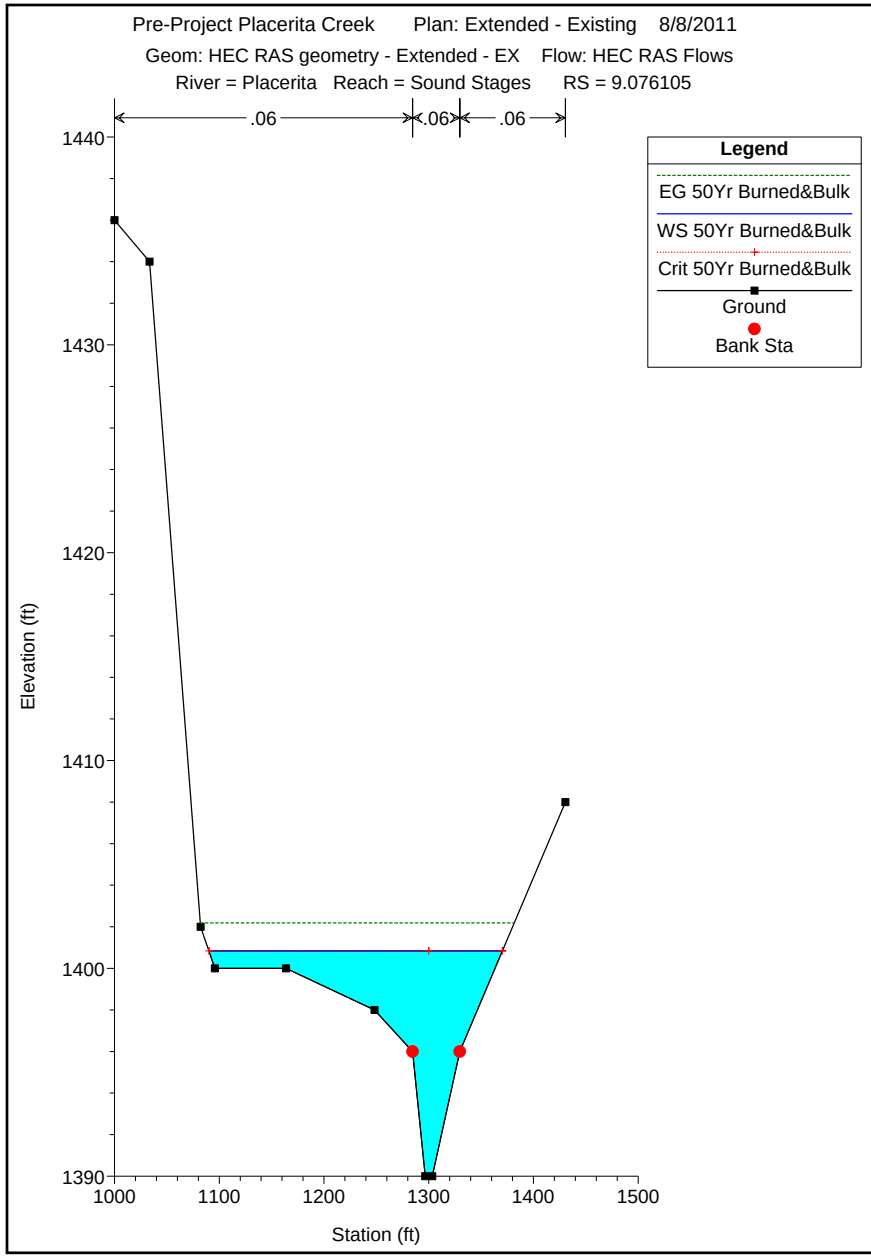

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1841.249
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1644.9 Section upstream of proposed clear span bridge
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
Station (ft)

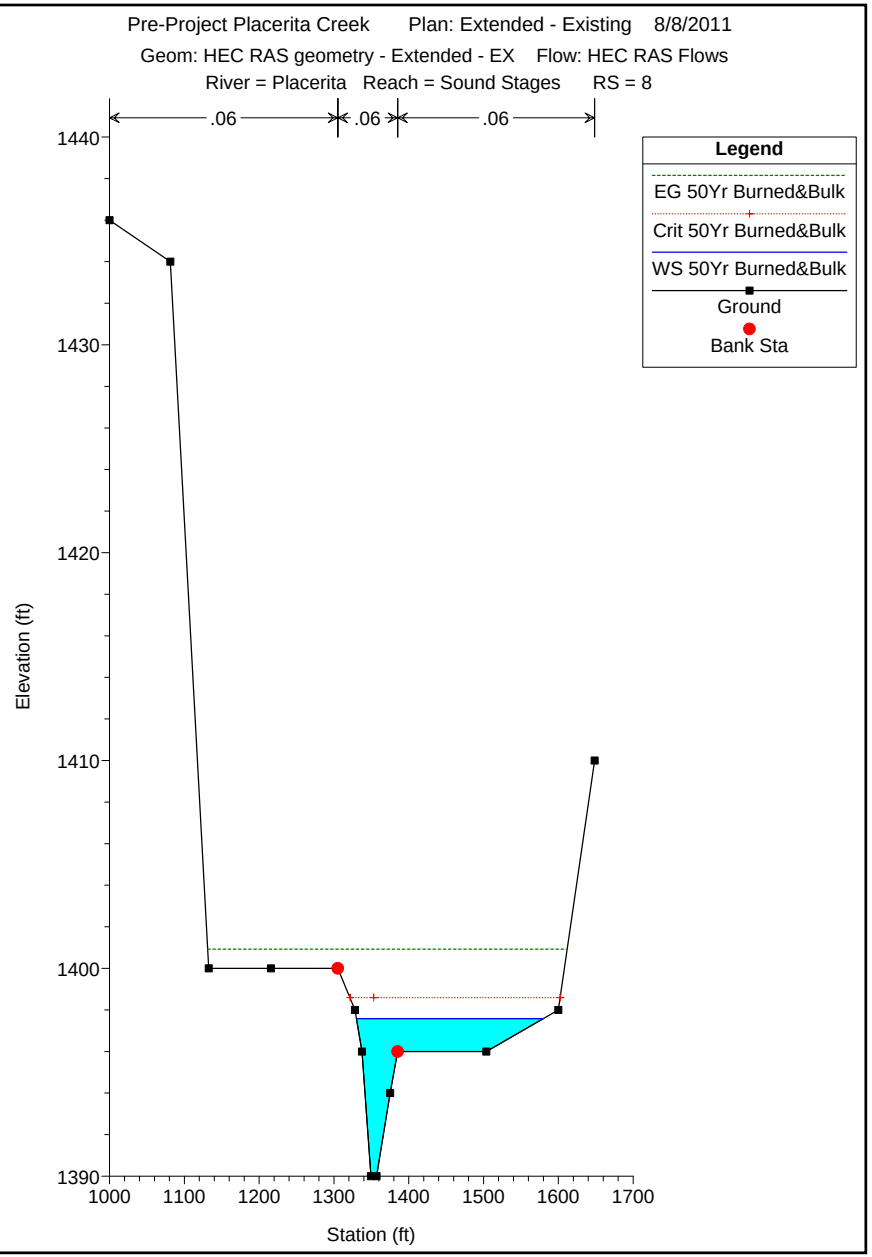

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1526.451
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
Station (ft)
1410
1420
1430
1440
1450
1460
1470
1480
1000
1200
1400
1600
1800
2000
2200
2400
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1368.322
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
Station (ft)
1410
1420
1430
1440
1450
1460
1470
1480
1000
1200
1400
1600
1800

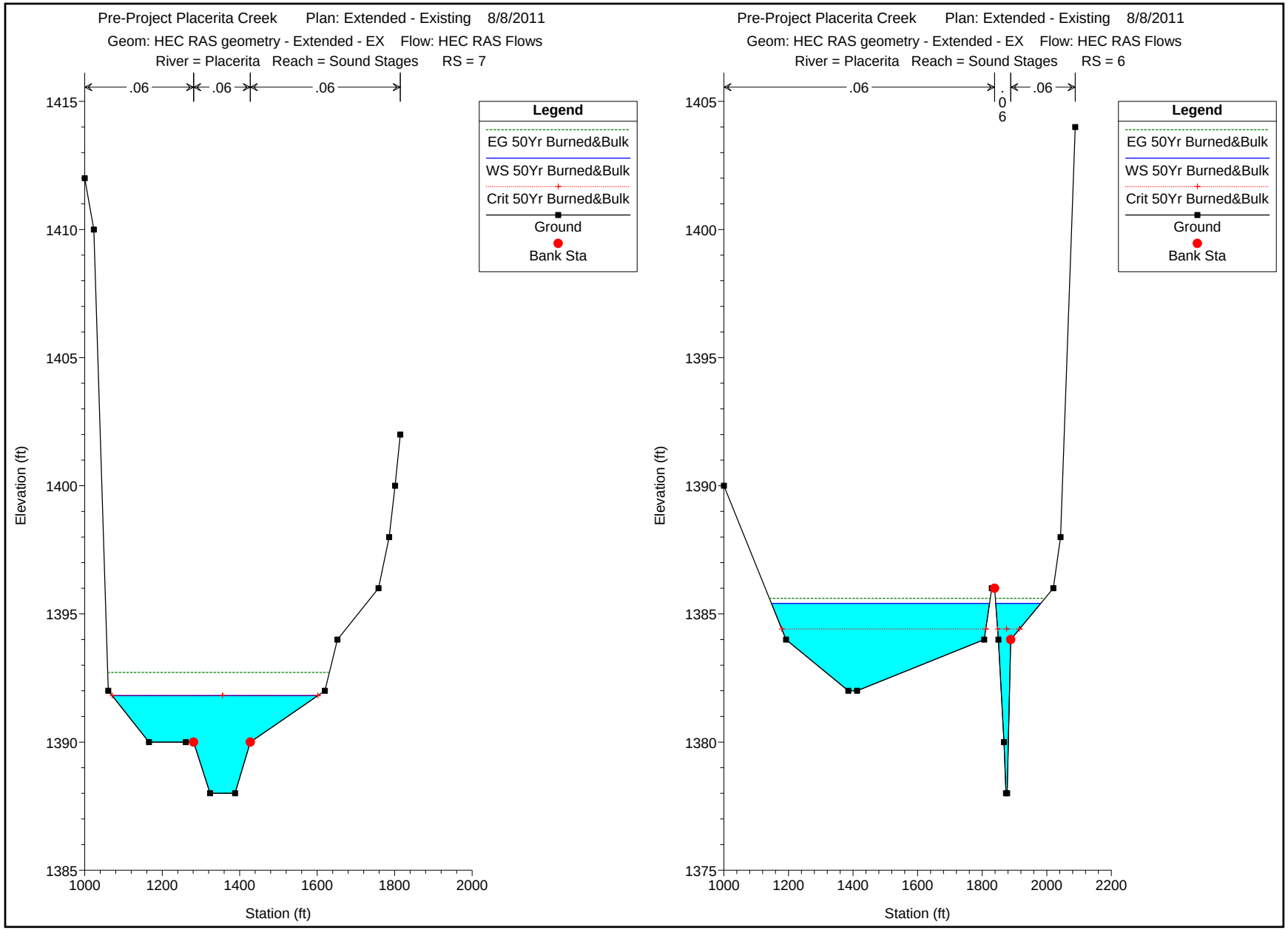

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1258.328
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
Station (ft)
1410
1420
1430
1440
1450
1460
1470
1480
1000
1200
1400
1600
1800
2000
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1052.822
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
Station (ft)
1400
1410
1420
1430
1440
1450
1460
1470
1480
1000
1100
1200
1300
1400
1500

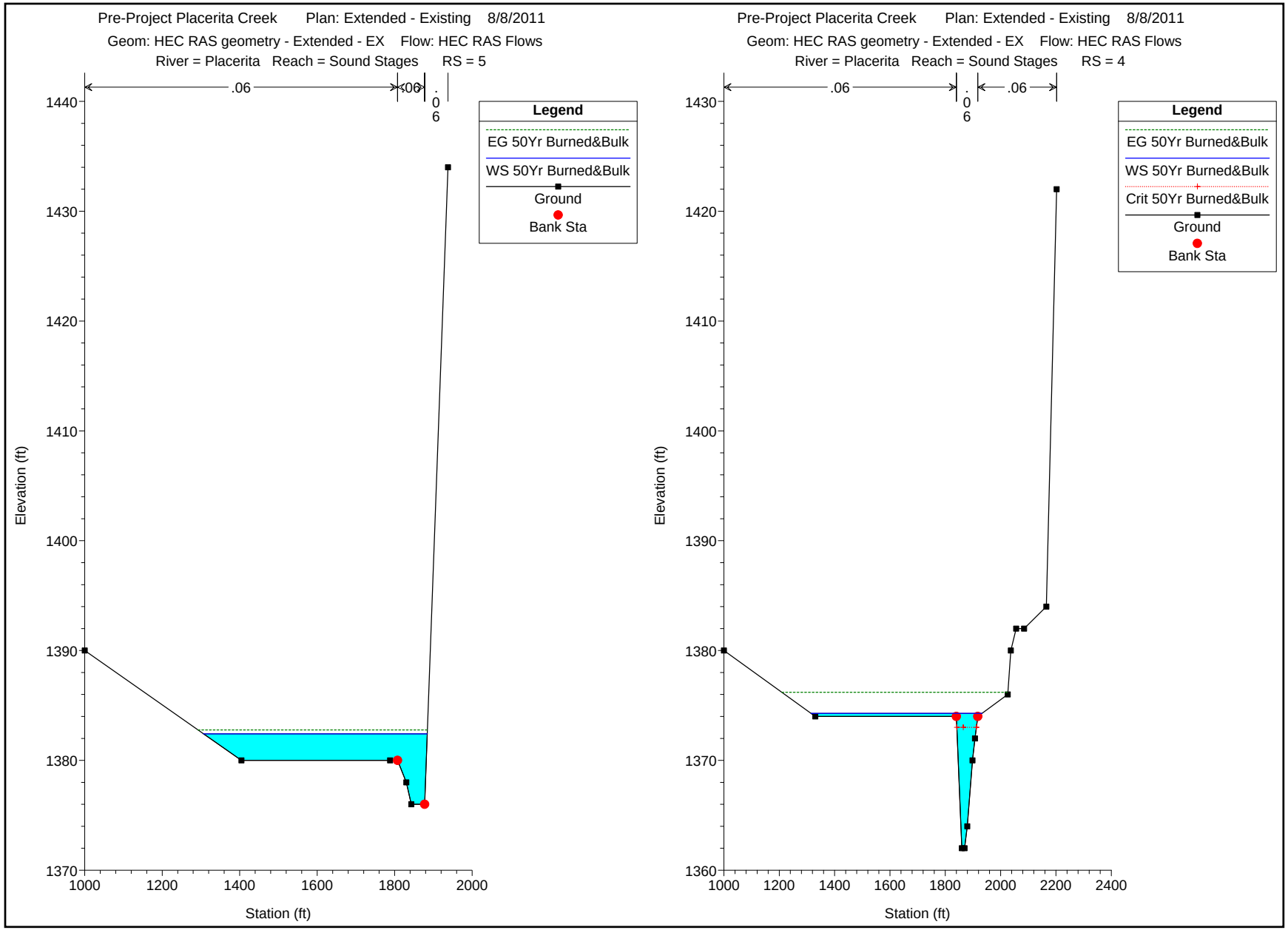

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 865.4710
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700.6461
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
Station (ft)

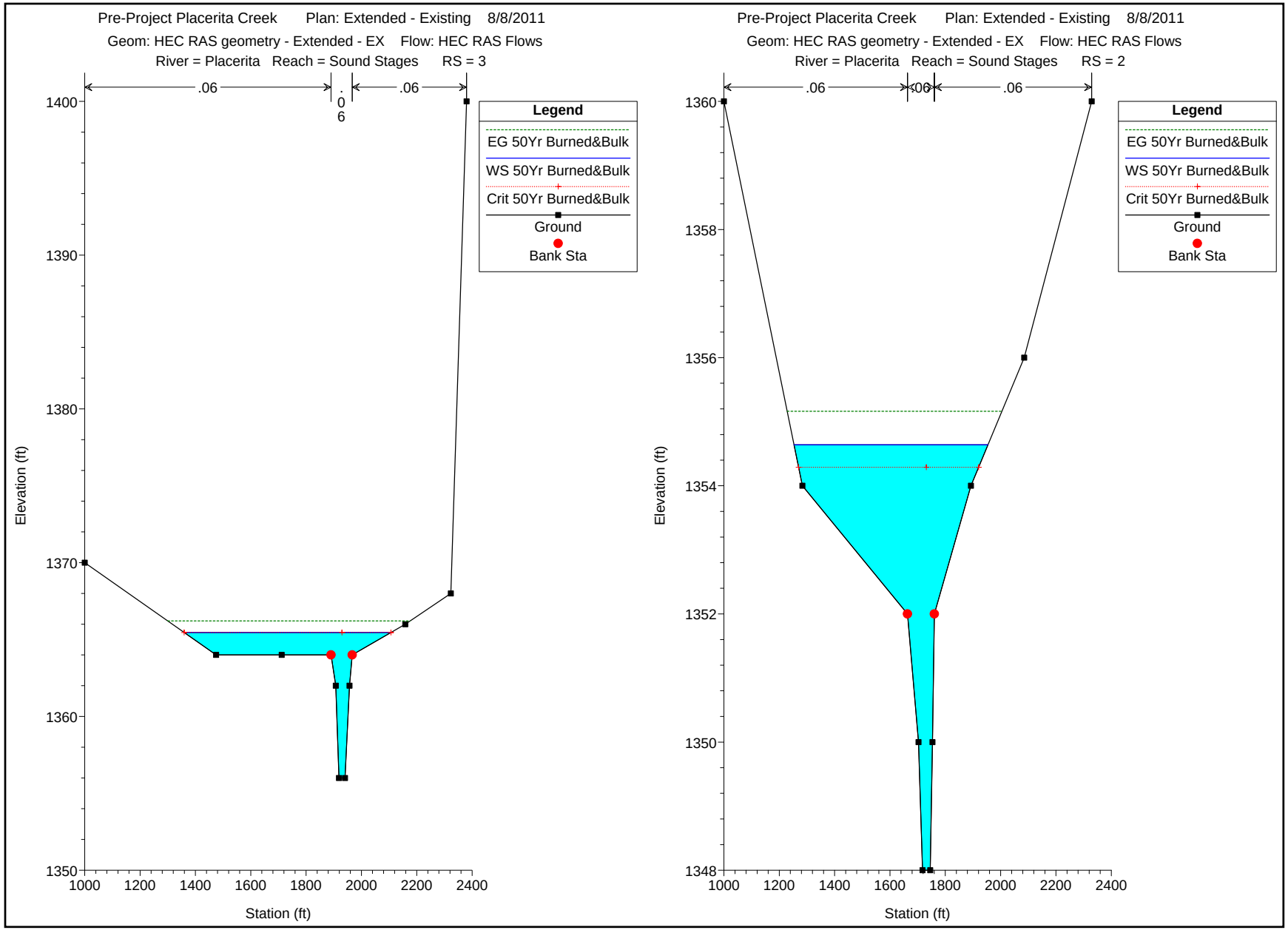

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700 Culv
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
Station (ft)
1470
1460
1450
1440
1430
1420
1410
1400
1390
1000
1050
1100
1150
1200
1250
1300
1350
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700 Culv
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
Station (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500


Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 9.076105
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500
Station (ft)


Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 8
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500
1600
1700
Station (ft)


Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 7
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 6
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
Station (ft)

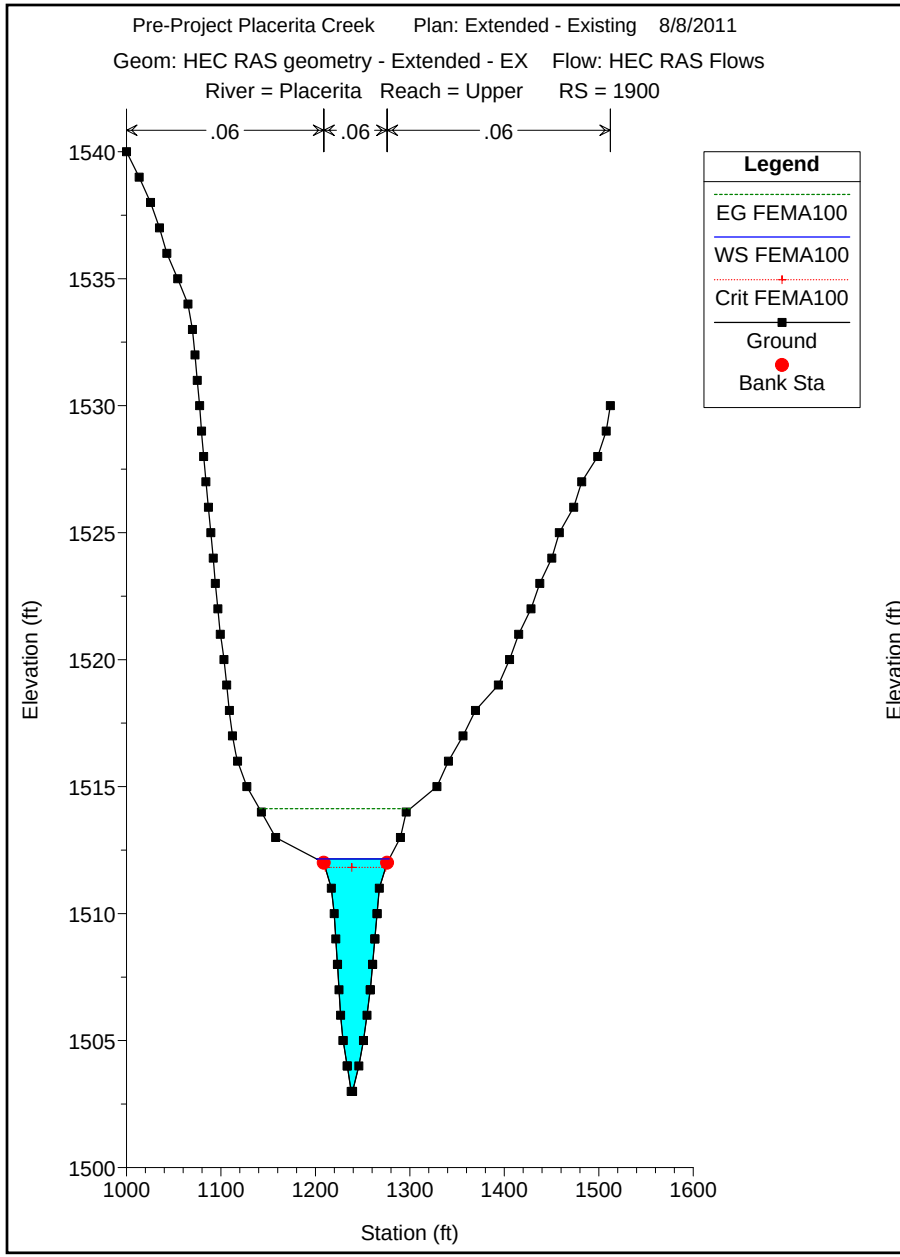

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 5
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 4
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
Station (ft)

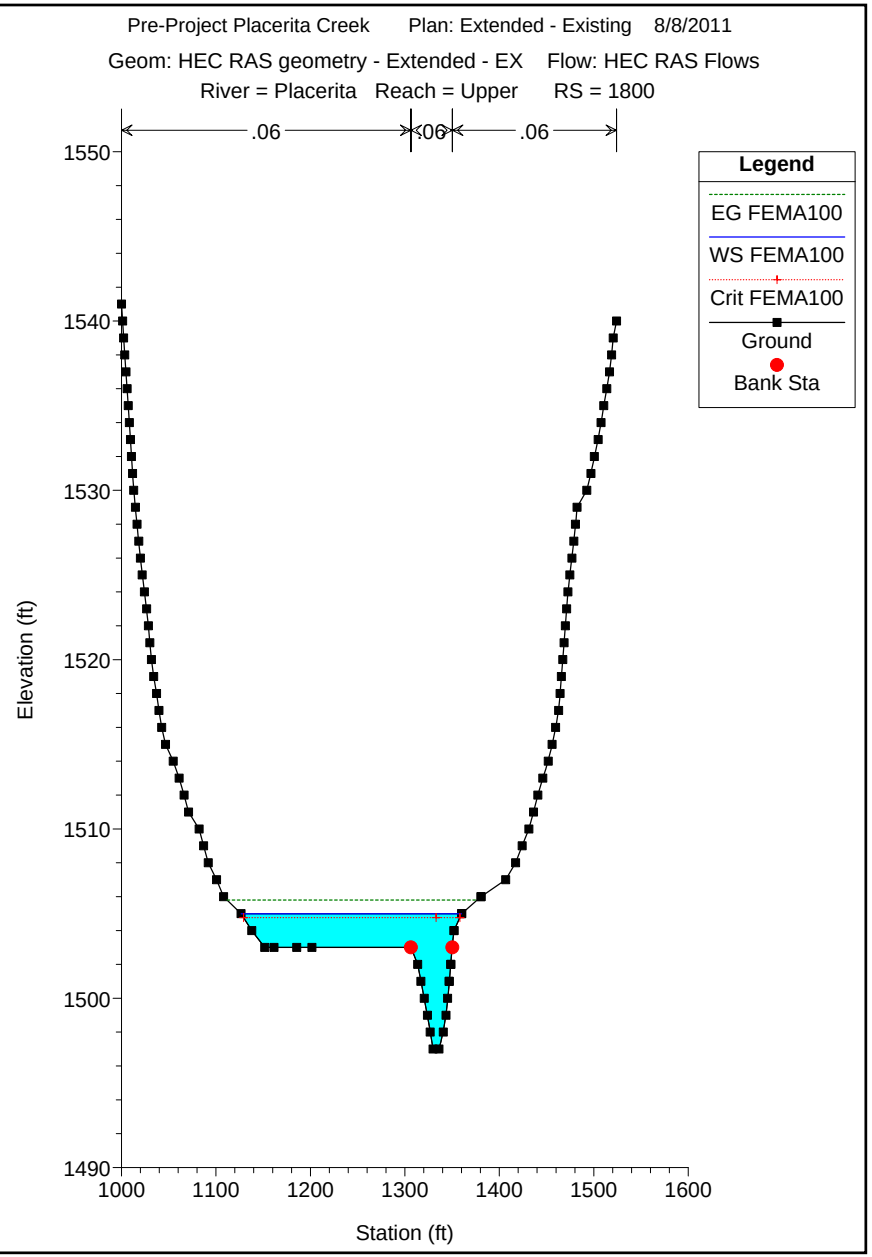

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 3
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2
.06
.06
.06
Legend
EG 50Yr Burned&Bulk
WS 50Yr Burned&Bulk
Crit 50Yr Burned&Bulk
Ground
Bank Sta
Elevation (ft)
Station (ft)

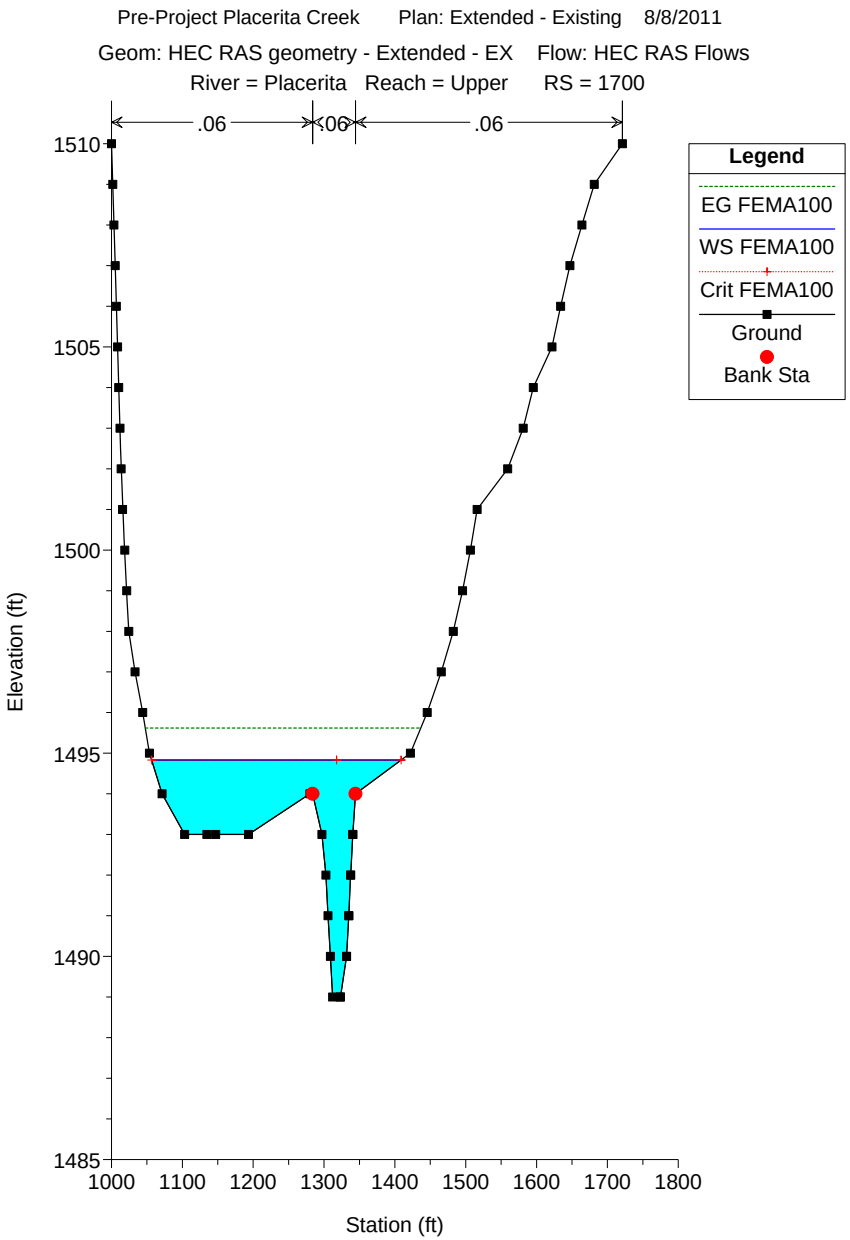
100 YEAR STORM EVENT FEMA – PRE PROJECT CONDTION HEC-RAS OUTPUT

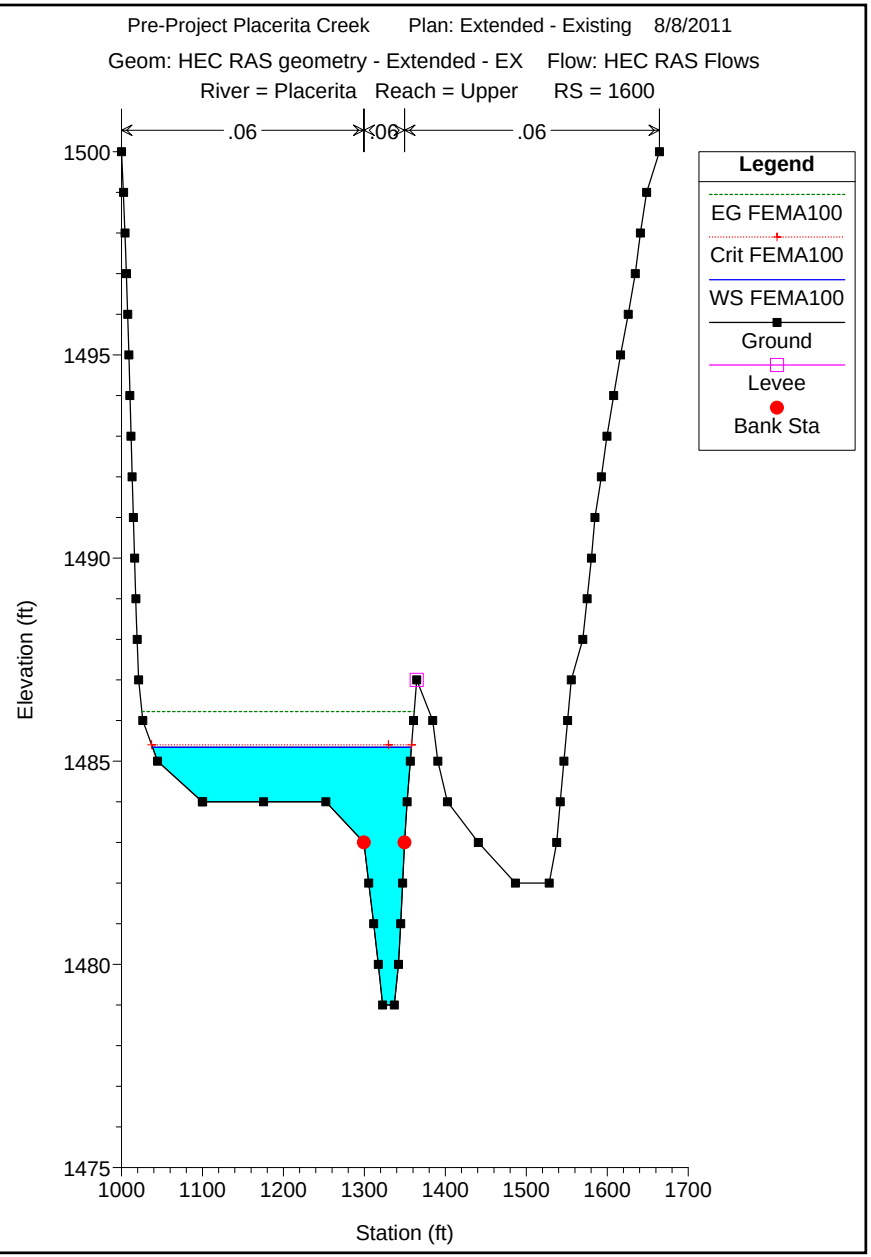
HEC-RAS Plan: EX_Extended Profile: FEMA100

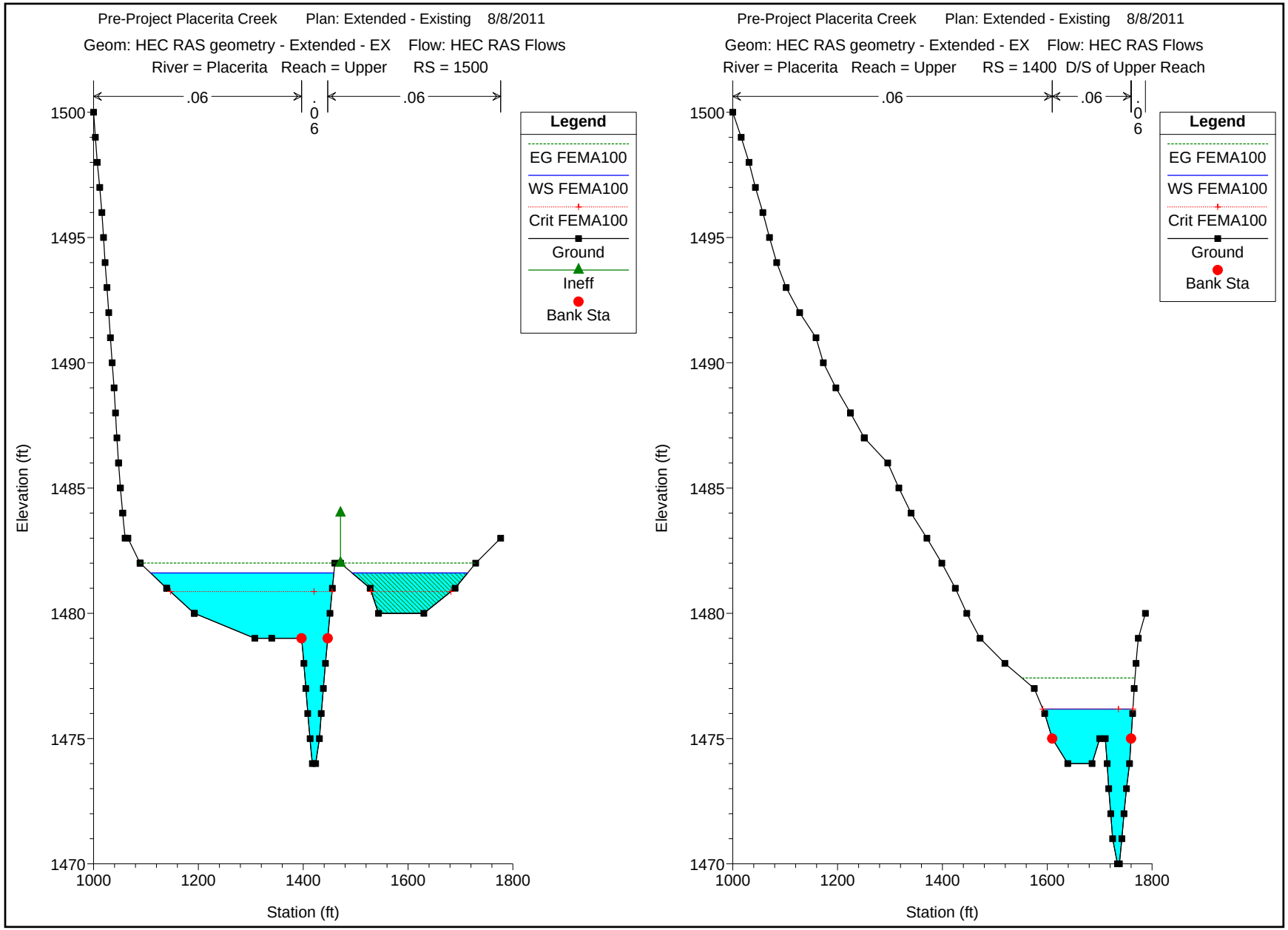
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Upper	1900	FEMA100	3550.00	1503.00	1512.15	1511.82	1514.13	0.028180	11.29	315.09	77.12	0.92
Upper	1800	FEMA100	3550.00	1497.00	1504.99	1504.76	1505.80	0.014046	8.72	576.16	233.32	0.66
Upper	1700	FEMA100	3550.00	1489.00	1494.83	1494.83	1495.62	0.023153	8.69	575.45	352.11	0.81
Upper	1600	FEMA100	3550.00	1479.00	1485.34	1485.40	1486.22	0.016000	9.02	598.61	319.79	0.71
Upper	1500	FEMA100	3550.00	1474.00	1481.61	1480.87	1482.01	0.007113	6.44	834.98	349.66	0.48
Upper	1400	FEMA100	3550.00	1470.00	1476.18	1476.18	1477.42	0.037280	8.98	402.85	171.84	0.98
Tributary	510	FEMA100	860.00	1545.00	1548.69	1548.93	1549.58	0.033814	8.50	140.17	132.68	0.92
Tributary	410	FEMA100	860.00	1524.00	1527.90	1527.90	1528.33	0.038509	6.45	175.79	188.41	0.90
Tributary	310	FEMA100	860.00	1503.00	1506.19	1505.83	1506.51	0.016392	4.82	204.74	161.39	0.62
Tributary	210	FEMA100	860.00	1486.00	1489.70	1489.70	1490.68	0.042797	7.94	108.26	55.29	1.00
Tributary	110	FEMA100	860.00	1479.00	1483.68	1483.30	1483.89	0.007045	4.74	282.42	191.04	0.44
Tributary	10	FEMA100	860.00	1471.00	1476.63	1476.63	1478.39	0.041522	10.63	80.92	23.13	1.00
Lower	1300	FEMA100	3550.00	1468.00	1474.22	1473.46	1474.91	0.010410	7.29	592.78	201.27	0.57
Lower	1250	FEMA100	3550.00	1463.00	1469.00	1469.00	1470.17	0.026512	10.11	475.06	234.83	0.88
Lower	1200	FEMA100	3550.00	1459.00	1465.72	1464.98	1465.97	0.005107	5.32	1073.53	501.71	0.41
Lower	1150	FEMA100	3550.00	1453.00	1461.94	1461.94	1462.67	0.009791	7.82	730.69	505.79	0.56
Lower	1100	FEMA100	3550.00	1447.00	1454.41	1454.76	1455.83	0.019485	10.20	467.19	281.05	0.78
Lower	1050	FEMA100	3550.00	1443.00	1452.84	1450.54	1452.97	0.001883	3.70	1600.79	728.96	0.25
Lower	1000	FEMA100	3550.00	1439.00	1450.65	1447.83	1451.89	0.011122	8.91	398.44	56.62	0.59
Sound Stages	2527.261	FEMA100	3550.00	1432.00	1441.38	1439.77	1442.83	0.015072	9.67	366.96	60.02	0.69
Sound Stages	2268.881	FEMA100	3550.00	1427.00	1434.74	1434.74	1437.13	0.033904	12.40	286.18	59.84	1.00
Sound Stages	2007.81	FEMA100	3550.00	1422.00	1429.42	1428.30	1430.38	0.015875	7.86	451.54	110.48	0.69
Sound Stages	1841.249	FEMA100	3550.00	1419.00	1426.75		1427.79	0.015045	8.21	432.61	95.60	0.68
Sound Stages	1644.9	FEMA100	3550.00	1416.00	1423.64	1422.35	1424.89	0.014477	9.21	466.44	256.58	0.68
Sound Stages	1526.451	FEMA100	3550.00	1414.00	1422.86		1423.21	0.009953	5.01	776.86	320.07	0.51
Sound Stages	1368.322	FEMA100	3550.00	1412.00	1420.55	1419.69	1421.17	0.016963	6.35	574.88	226.02	0.67
Sound Stages	1258.328	FEMA100	3550.00	1410.00	1416.69	1416.69	1418.46	0.035133	10.68	332.42	93.99	1.00
Sound Stages	1052.822	FEMA100	3550.00	1405.12	1416.20	1410.78	1416.41	0.001725	3.76	944.28	131.13	0.25
Sound Stages	865.4710	FEMA100	3550.00	1402.00	1416.10		1416.21	0.000564	2.66	1336.79	133.90	0.15
Sound Stages	700.6461	FEMA100	3550.00	1398.00	1415.96	1407.17	1416.10	0.000736	3.03	1175.06	120.03	0.17
Sound Stages	700		Culvert									
Sound Stages	9.076105	FEMA100	3550.00	1390.00	1398.79	1398.79	1400.52	0.018679	11.13	392.00	138.34	0.79
Sound Stages	8	FEMA100	3550.00	1390.00	1397.03	1397.76	1399.25	0.045452	13.17	363.13	220.73	1.15
Sound Stages	7	FEMA100	3550.00	1388.00	1391.11	1391.11	1391.83	0.026288	7.48	590.48	425.99	0.83
Sound Stages	6	FEMA100	3550.00	1378.00	1384.87	1383.96	1384.98	0.004470	3.76	1370.02	752.22	0.35
Sound Stages	5	FEMA100	3550.00	1376.00	1381.04	1381.04	1381.66	0.016027	7.74	727.43	520.50	0.69
Sound Stages	4	FEMA100	3550.00	1362.00	1373.20	1370.37	1374.15	0.009413	7.85	452.35	72.02	0.55
Sound Stages	3	FEMA100	3550.00	1356.00	1364.34	1363.40	1365.53	0.017497	9.07	516.26	551.10	0.73
Sound Stages	2	FEMA100	3550.00	1348.00	1353.81	1353.43	1354.29	0.010219	6.41	819.49	560.07	0.56

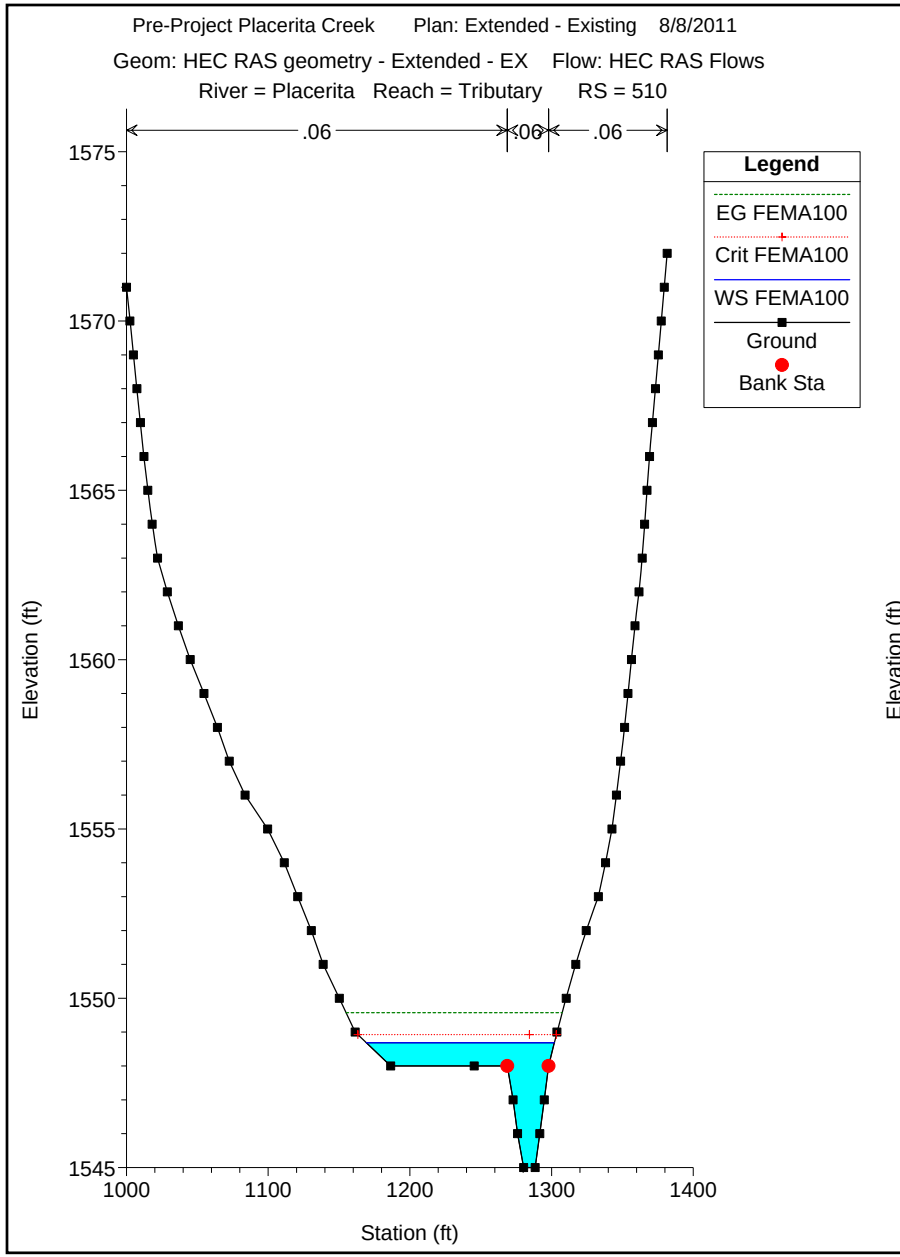

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1900
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1540
1535
1530
1525
1520
1515
1510
1505
1500
1000
1100
1200
1300
1400
1500
1600

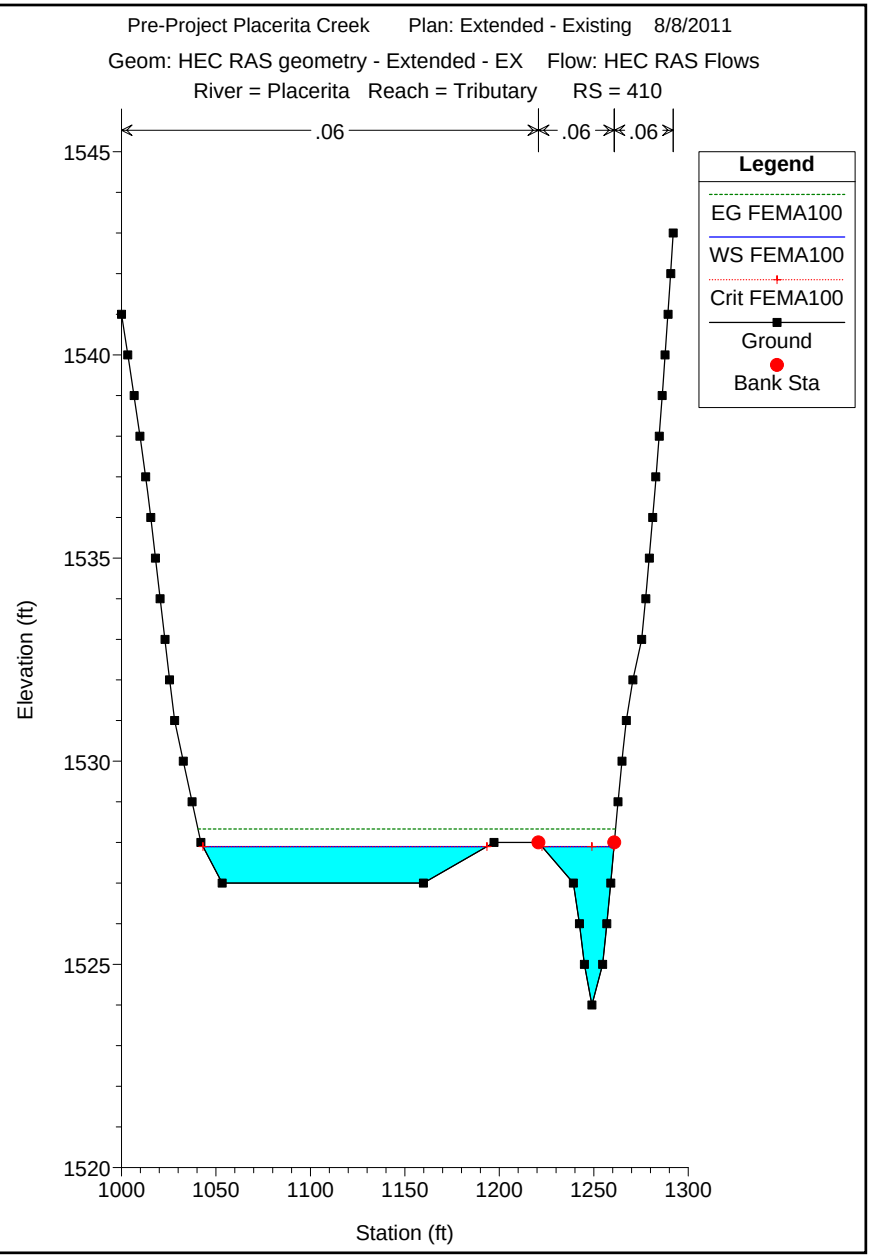

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1800
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1550
1540
1530
1520
1510
1500
1490
1000
1100
1200
1300
1400
1500
1600

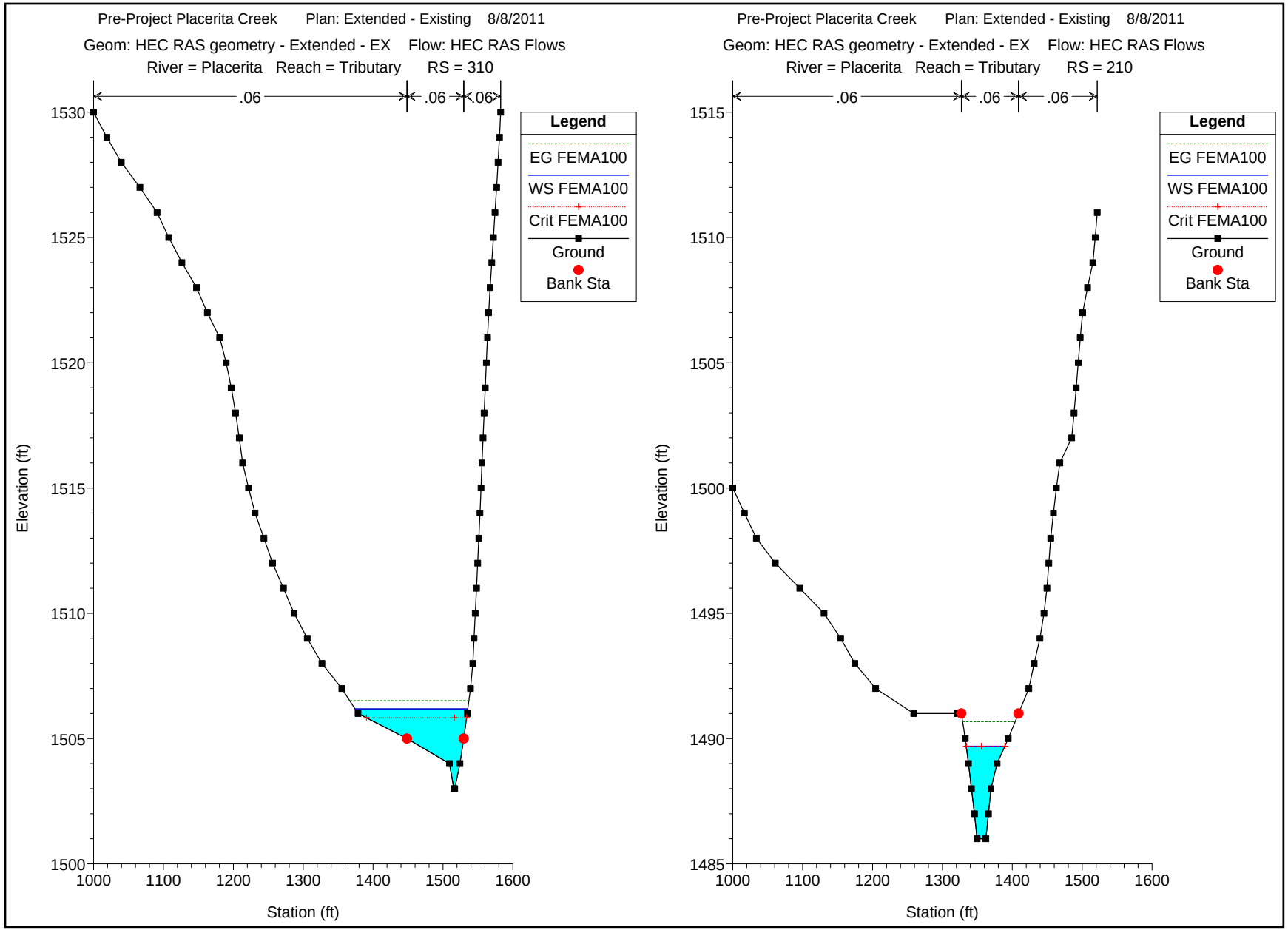

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1700
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1510
1505
1500
1495
1490
1485
1000
1100
1200
1300
1400
1500
1600
1700
1800

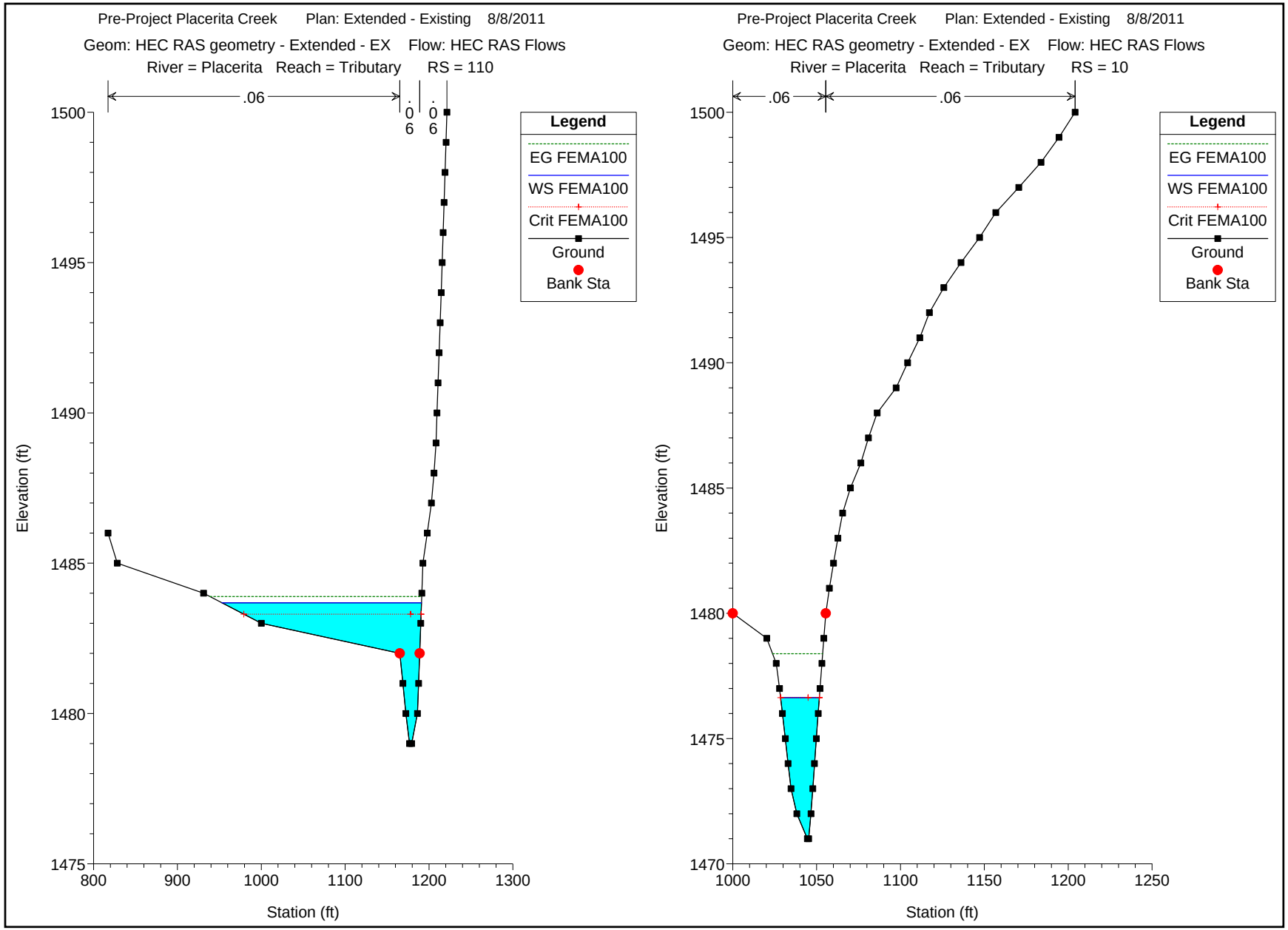

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1600
.06
.06
.06
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1000
1100
1200
1300
1400
1500
1600
1700

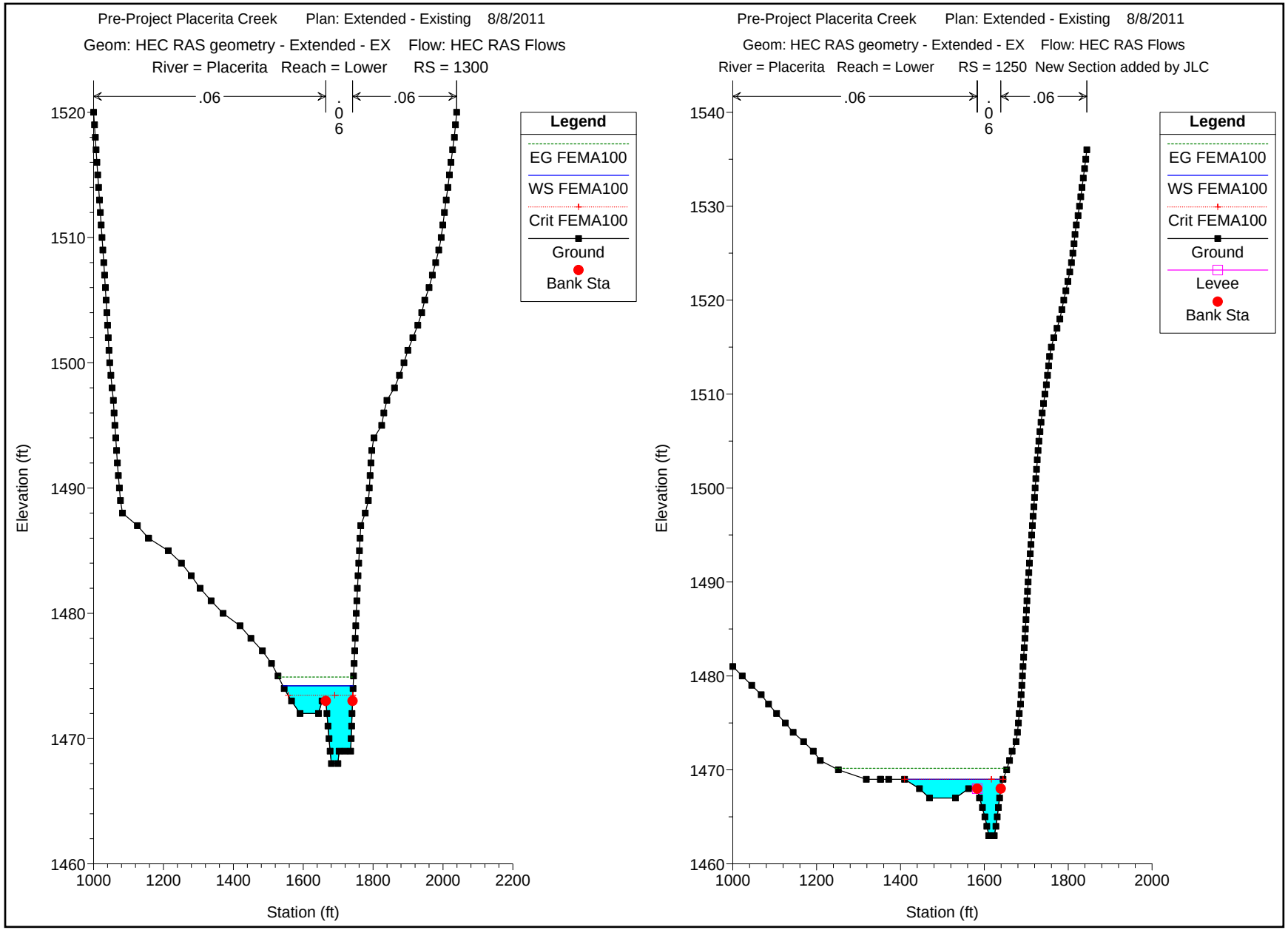

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1500
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1400 D/S of Upper Reach
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)

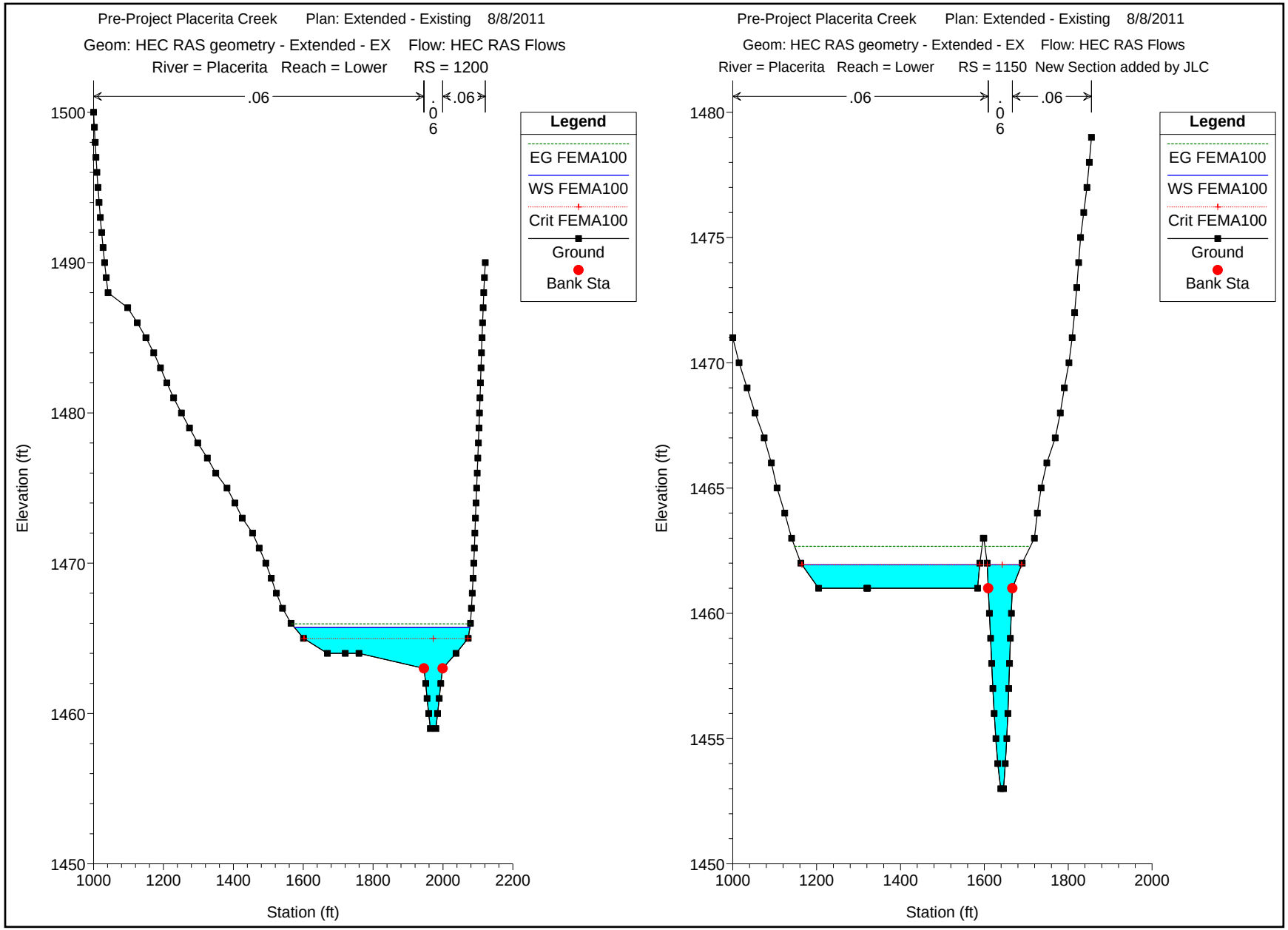

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 510
.06
.06
.06
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
1575
1570
1565
1560
1555
1550
1545
1000
1100
1200
1300
1400
Station (ft)

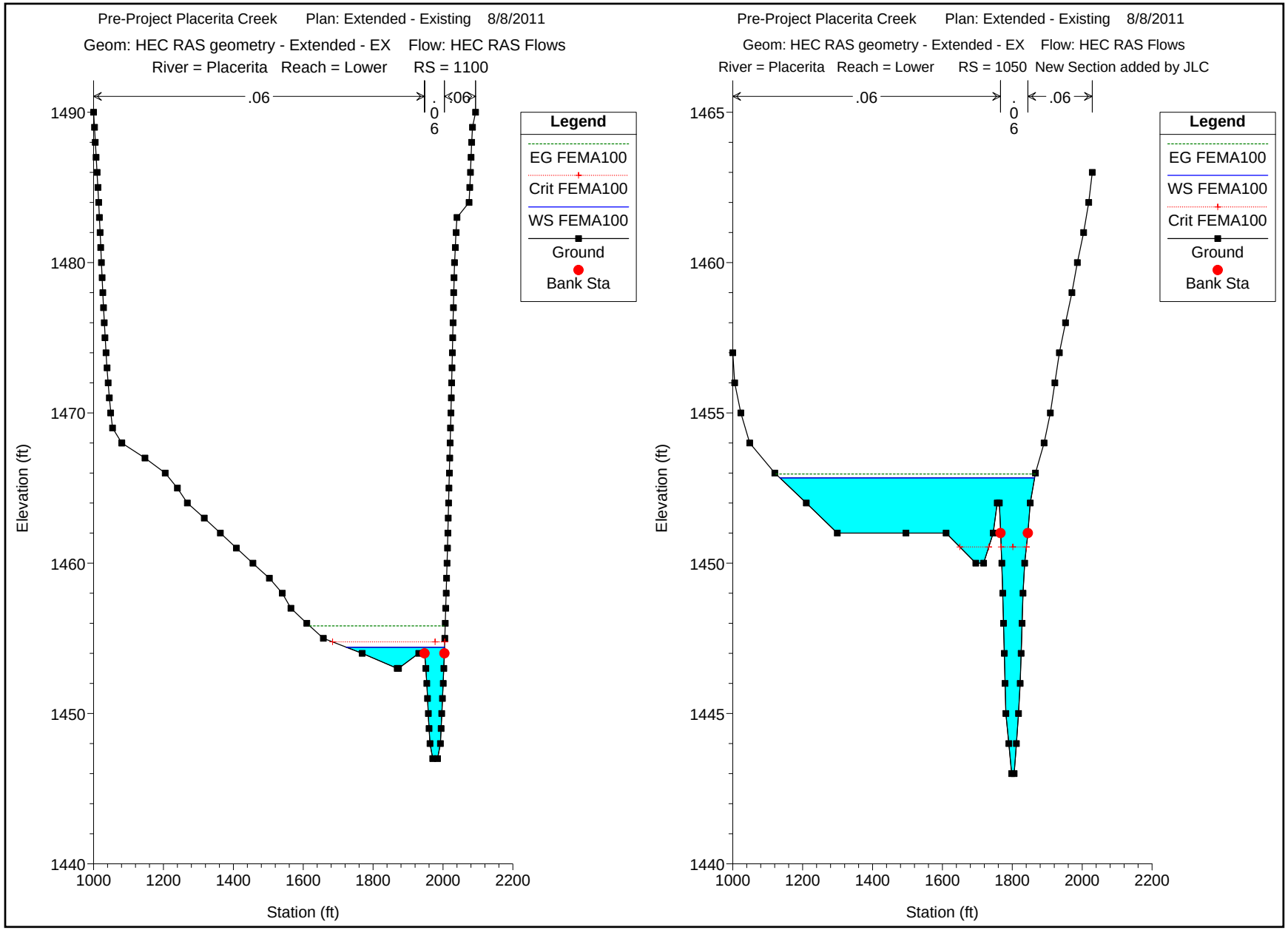

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 410
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
1545
1540
1535
1530
1525
1520
1000
1050
1100
1150
1200
1250
1300
Station (ft)

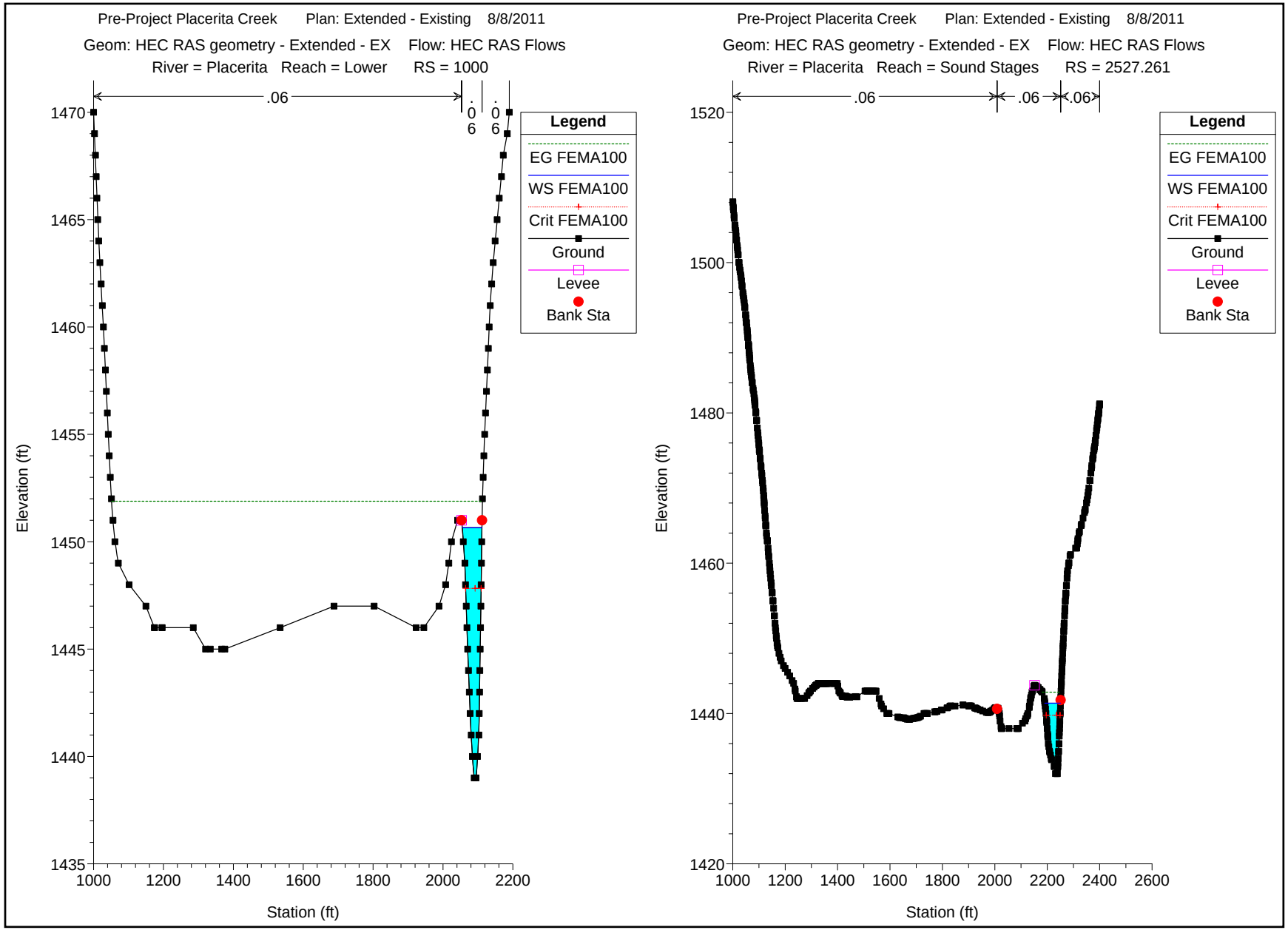

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 310
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1530
1525
1520
1515
1510
1505
1500
1000
1100
1200
1300
1400
1500
1600
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 210
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1515
1510
1505
1500
1495
1490
1485
1000
1100
1200
1300
1400
1500
1600

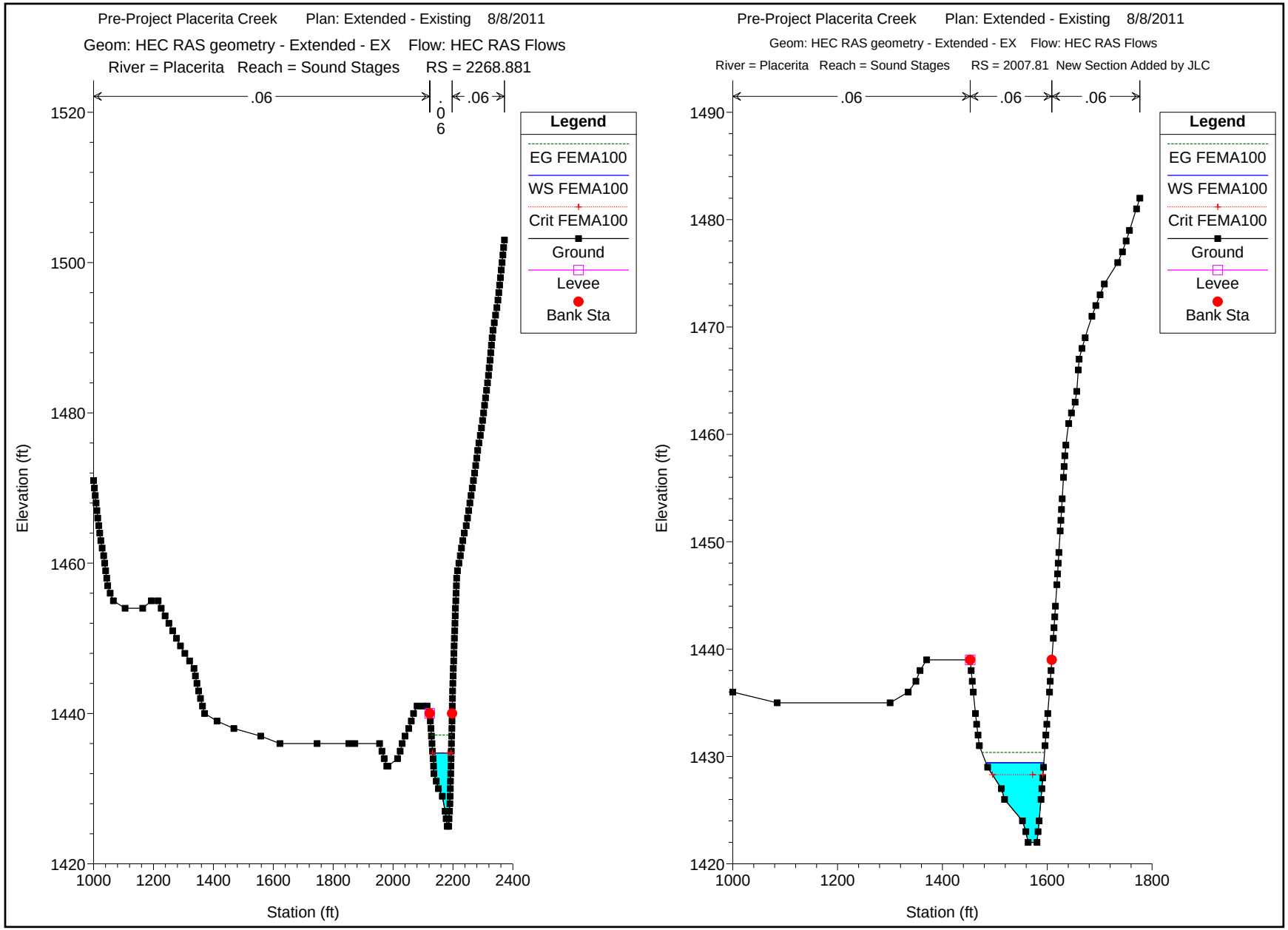

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 110
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
800
900
1000
1100
1200
1300
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 10
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1050
1100
1150
1200
1250

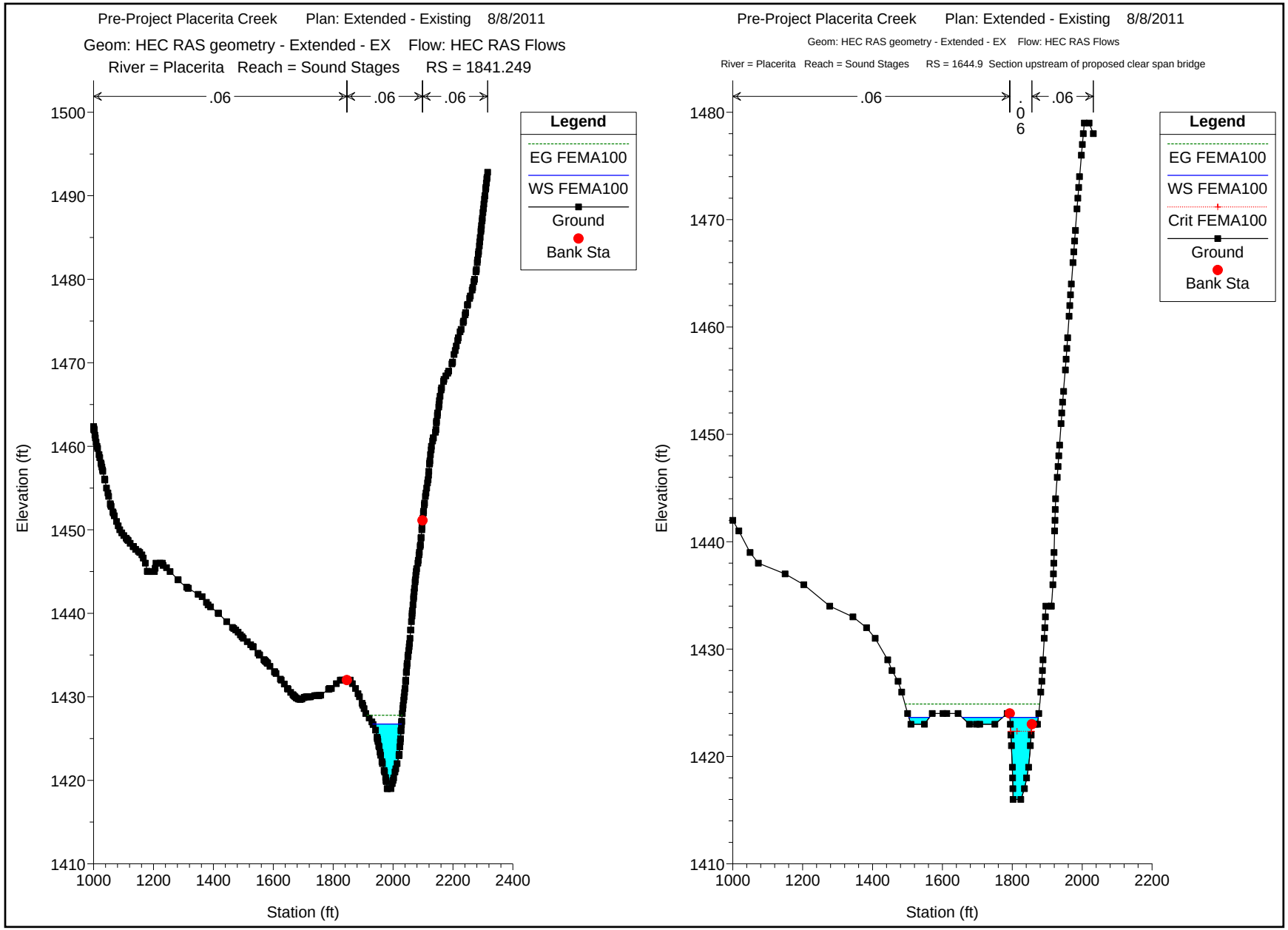

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1300
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1250 New Section added by JLC
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

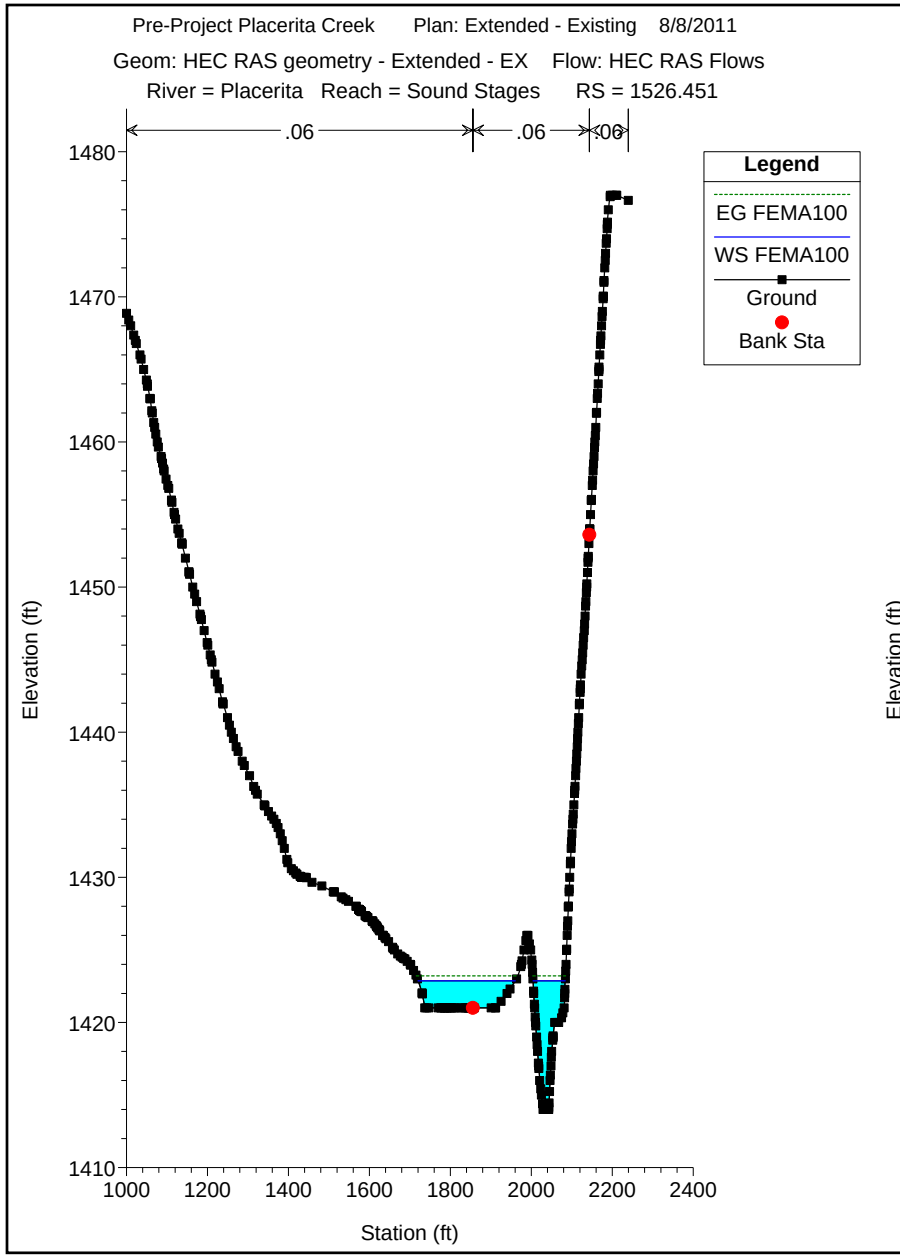

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1200
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1150 New Section added by JLC
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)

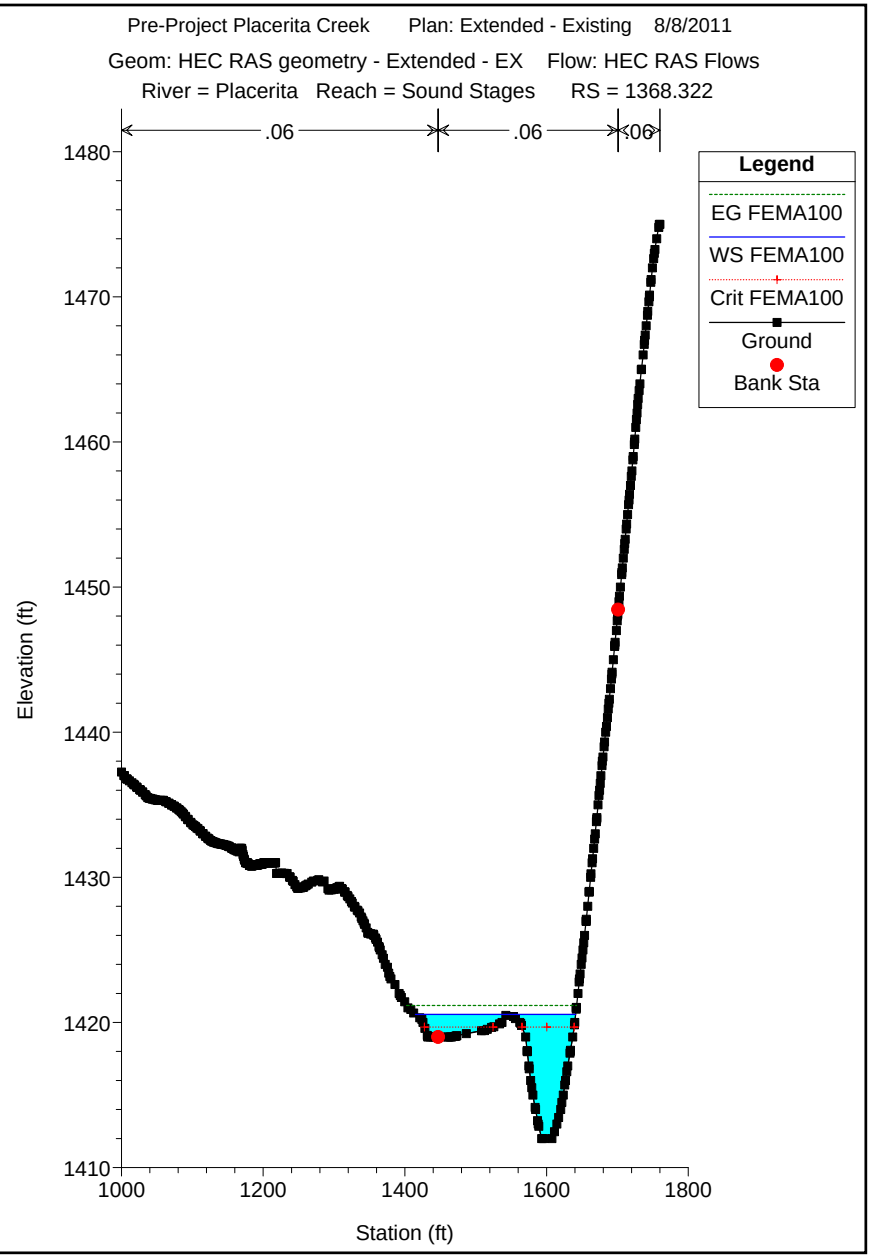

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1100
.06
.06
.06
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1050 New Section added by JLC
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)

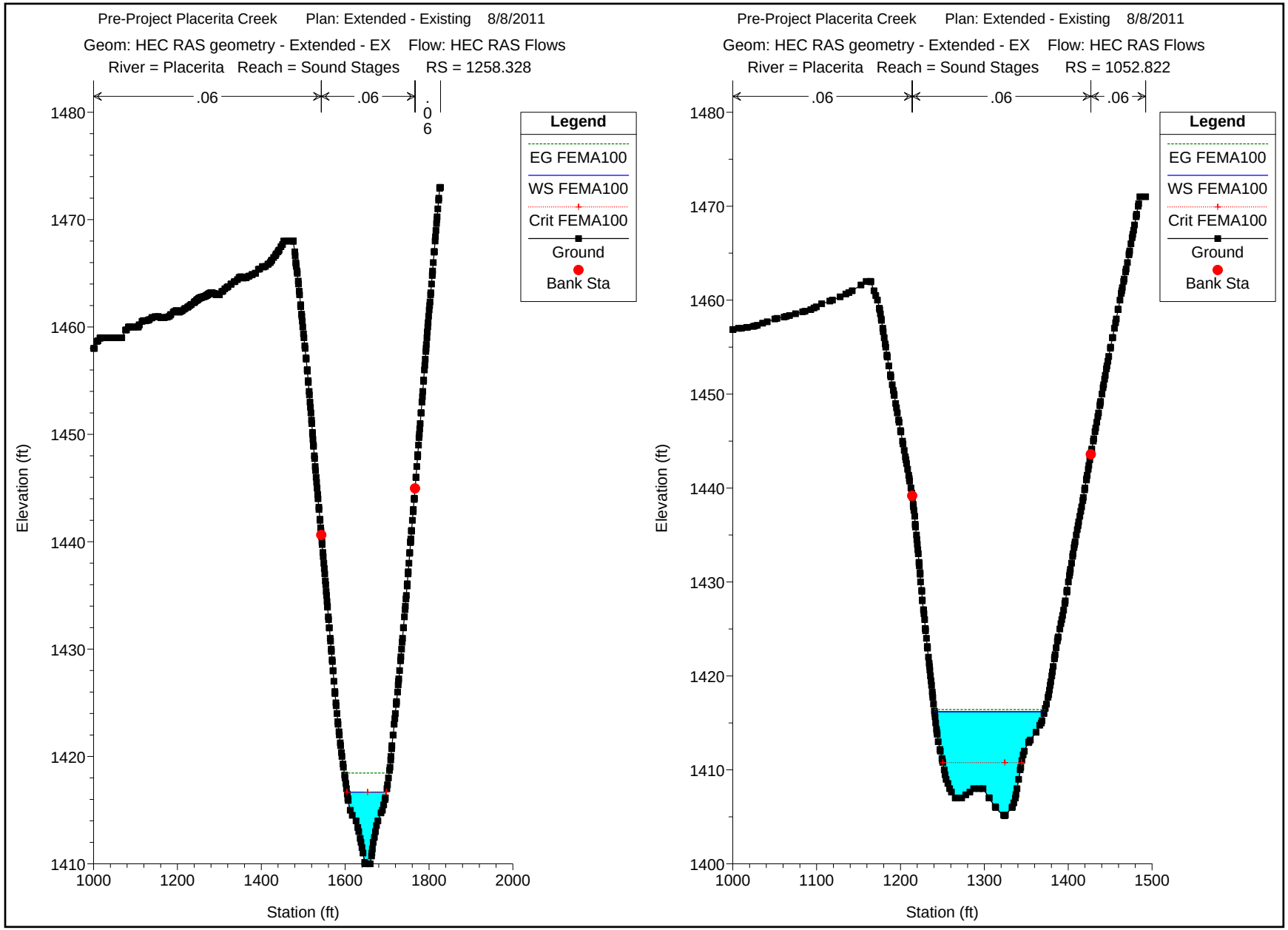

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1000
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2527.261
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

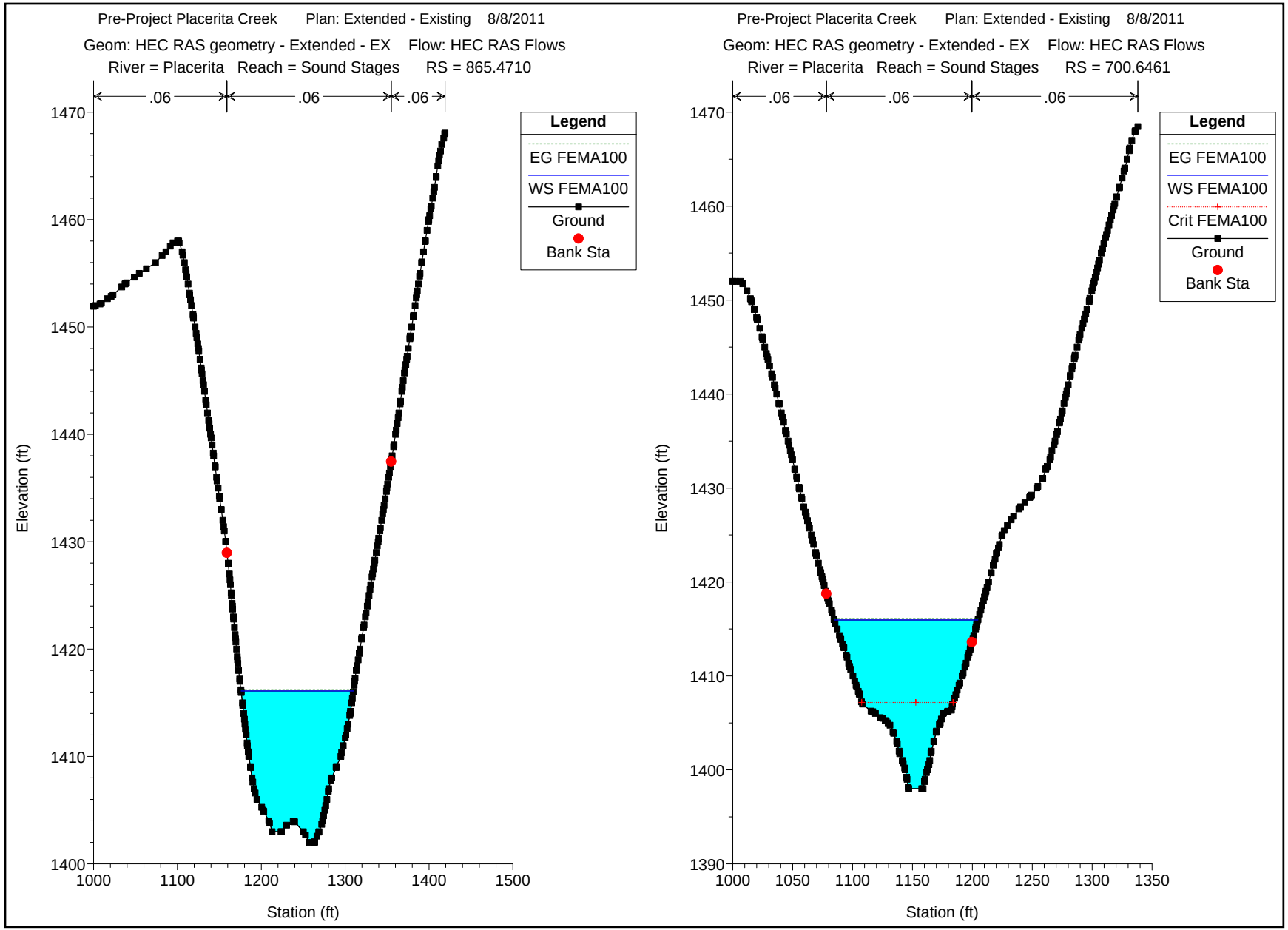

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2268.881
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2007.81 New Section Added by JLC
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)


Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1841.249
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1644.9 Section upstream of proposed clear span bridge
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)


Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1526.451
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1410
1420
1430
1440
1450
1460
1470
1480
1000
1200
1400
1600
1800
2000
2200
2400


Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1368.322
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1410
1420
1430
1440
1450
1460
1470
1480
1000
1200
1400
1600
1800


Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1258.328
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1052.822
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)


Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 865.4710
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1470
1460
1450
1440
1430
1420
1410
1400
1000
1100
1200
1300
1400
1500
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700.6461
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1470
1460
1450
1440
1430
1420
1410
1400
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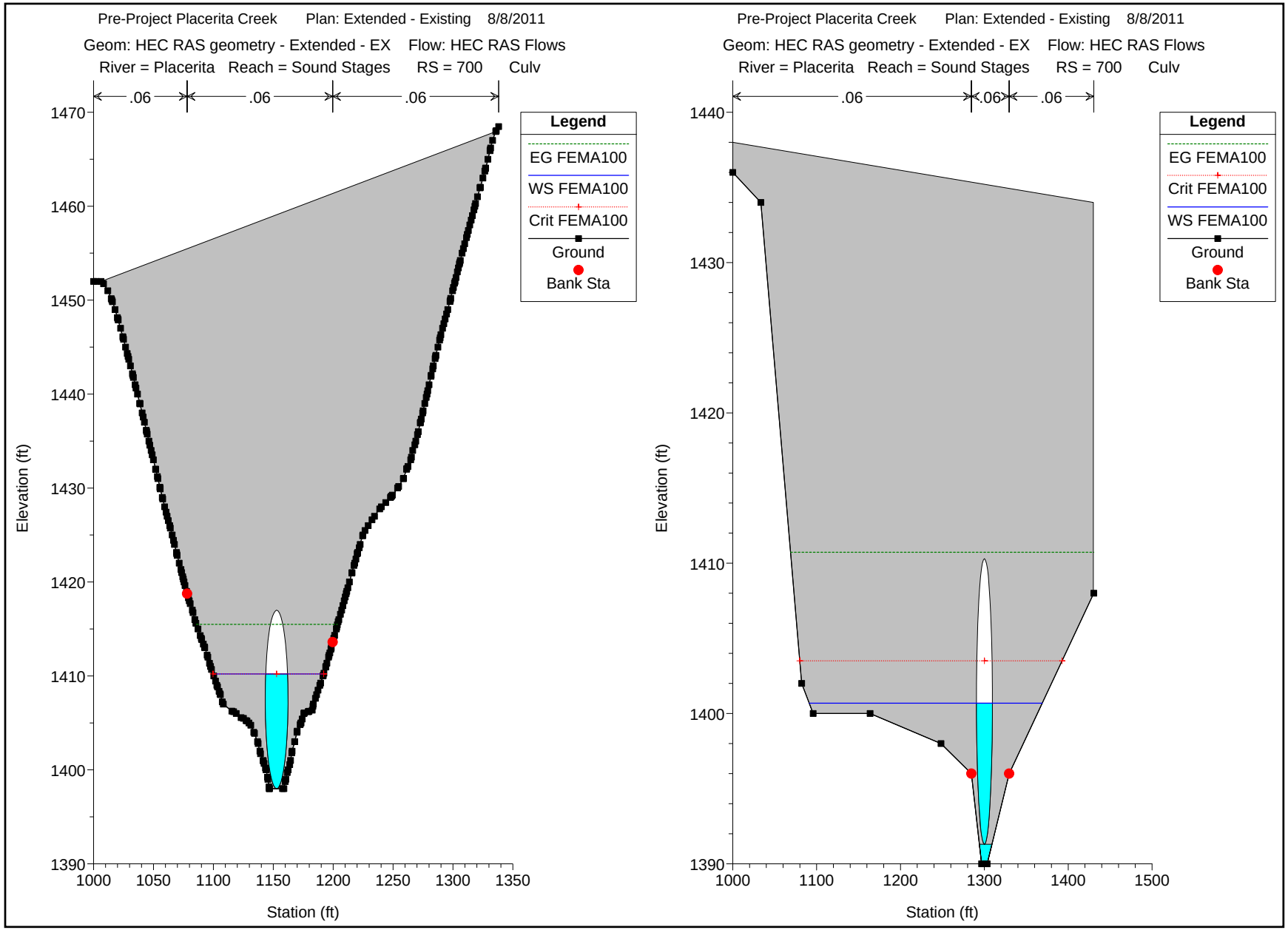
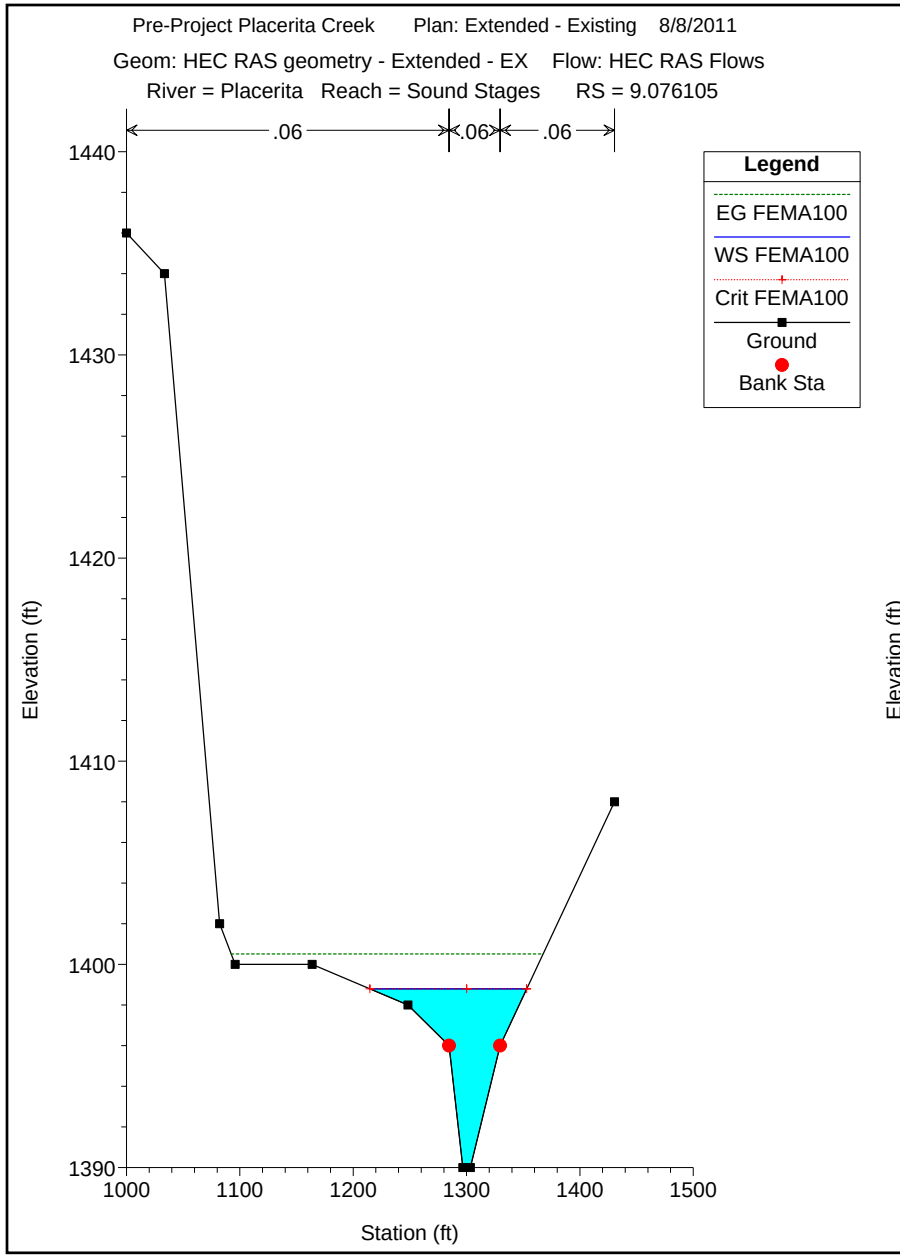
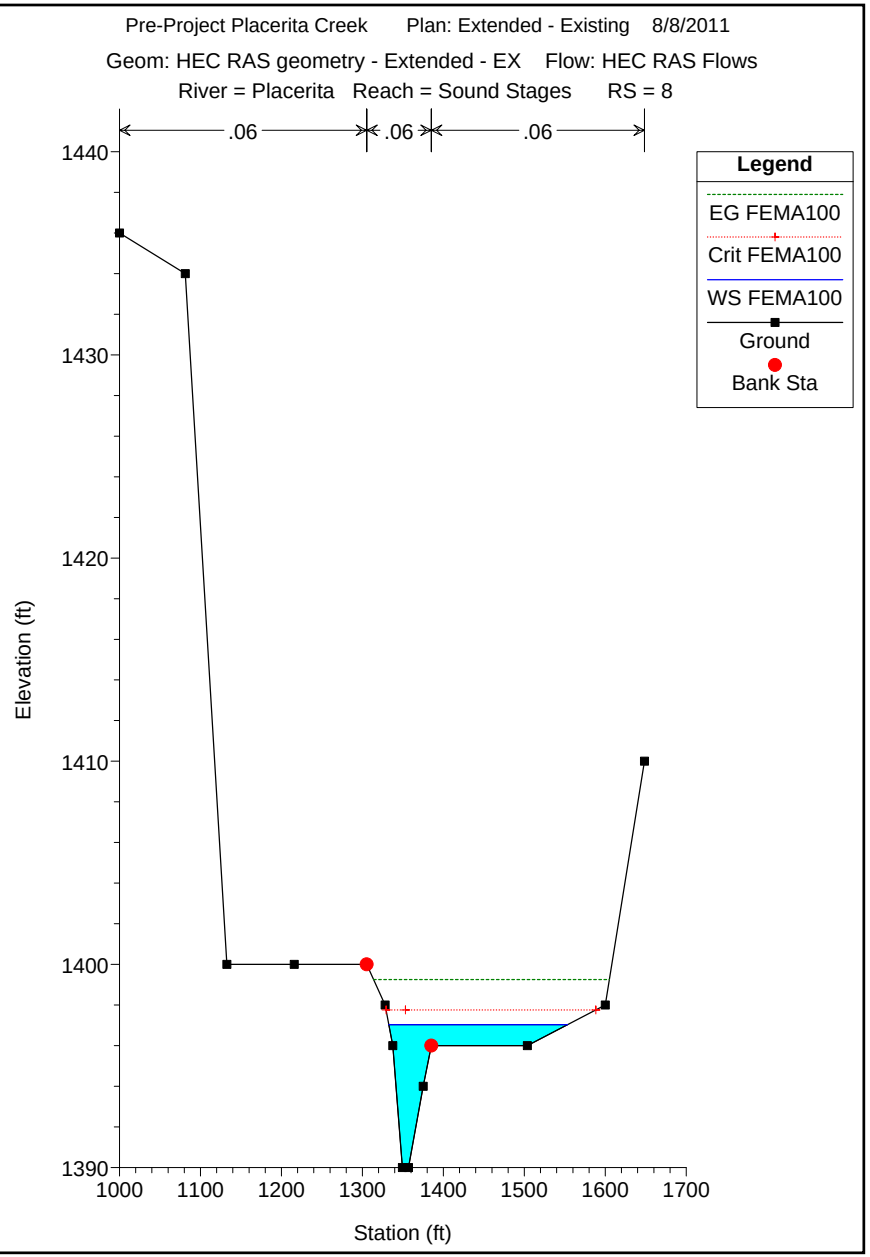
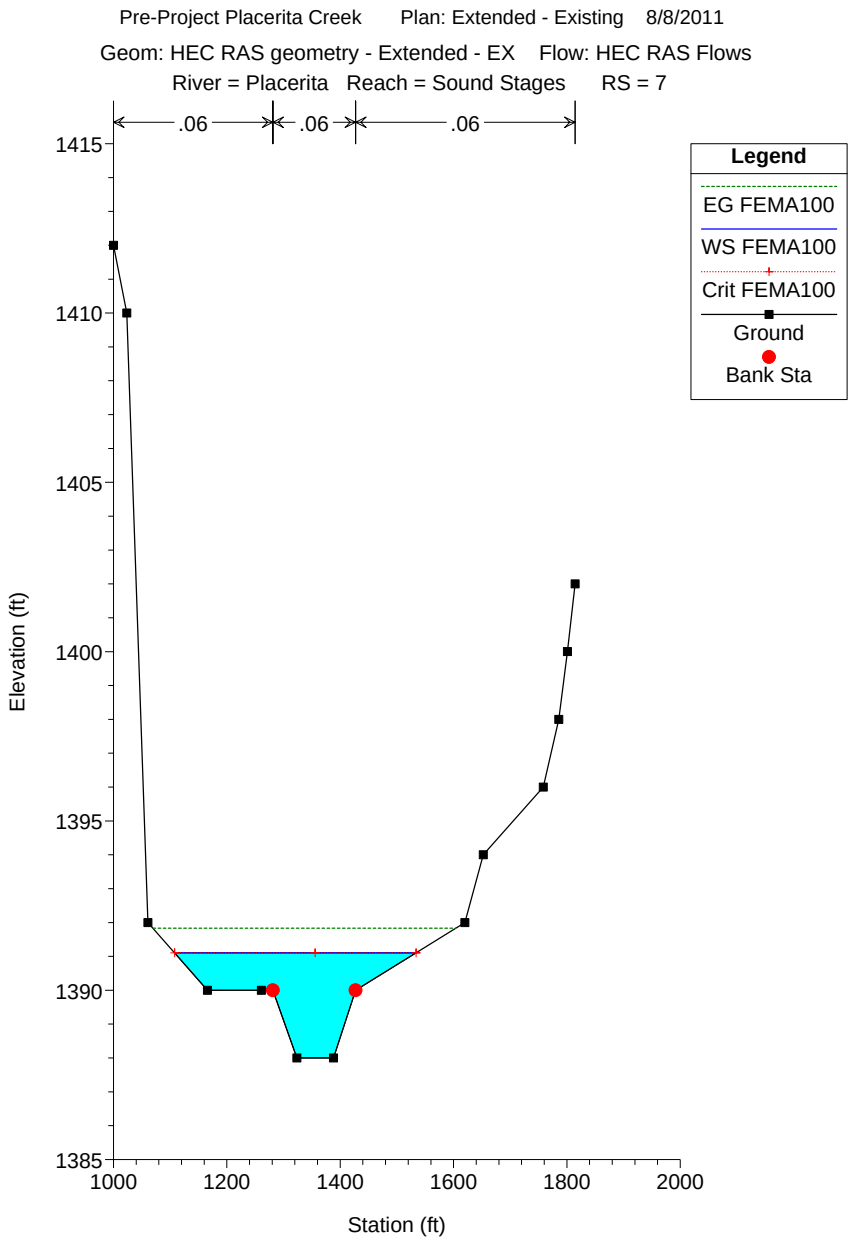
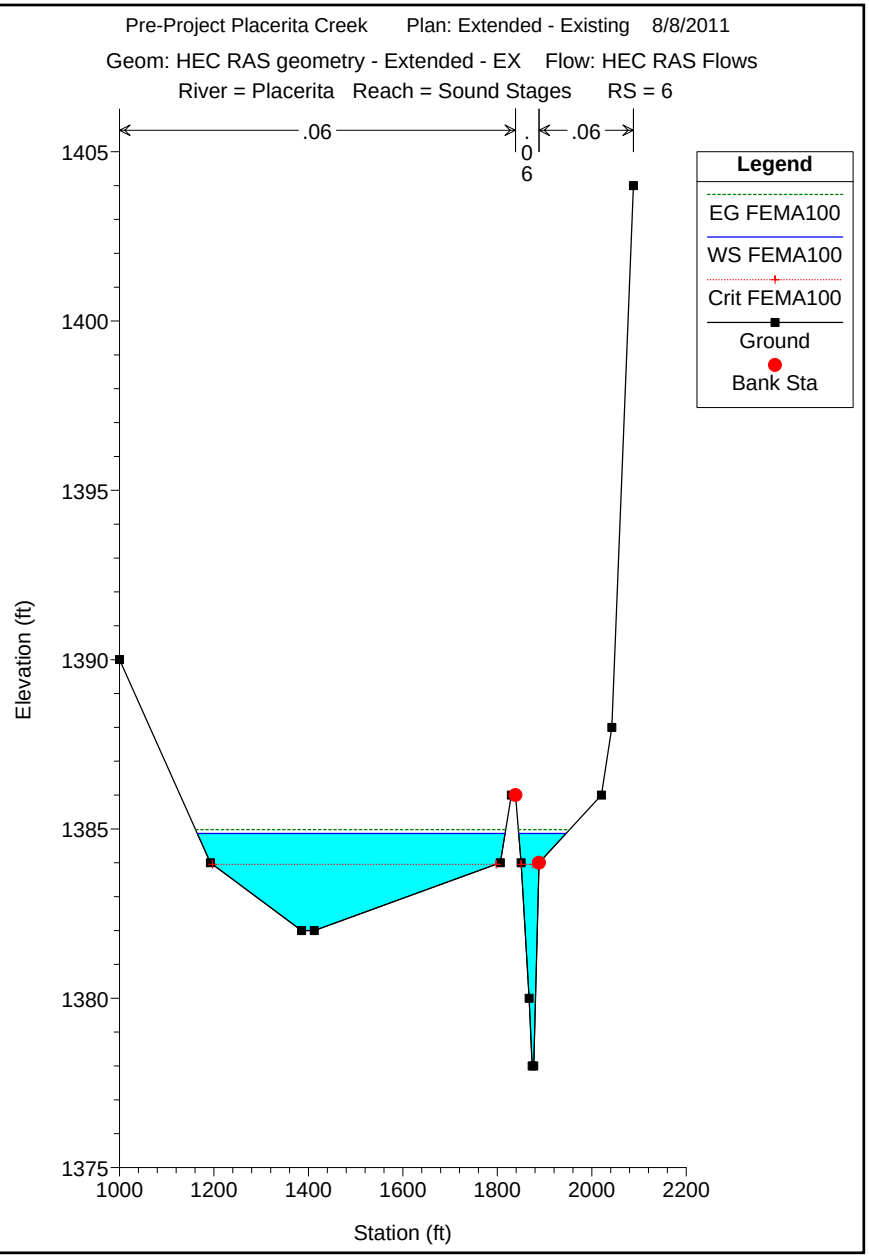
1050
1100
1150
1200
1250
1300
1350

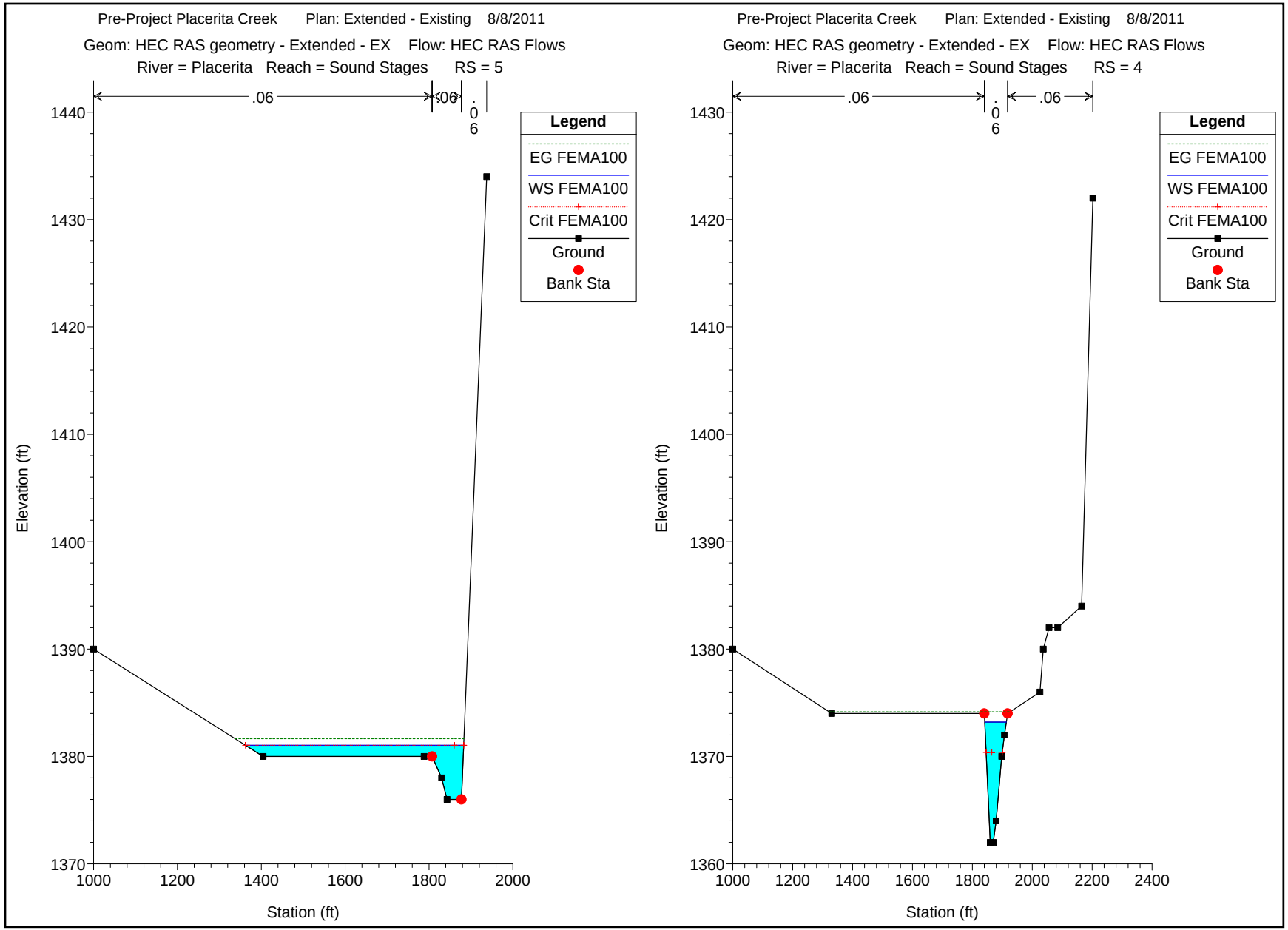

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700 Culv
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700 Culv
.06
.06
.06
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)

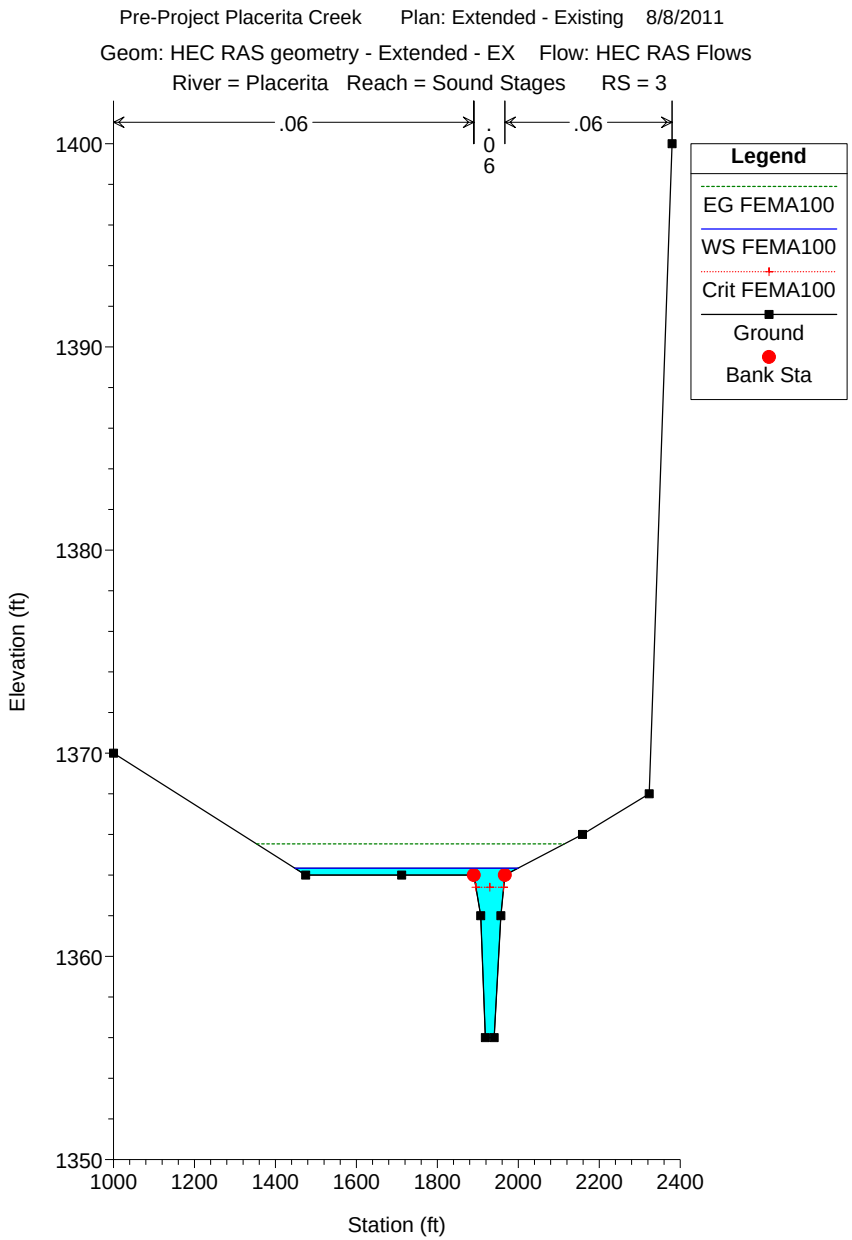

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 9.076105
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500
Station (ft)

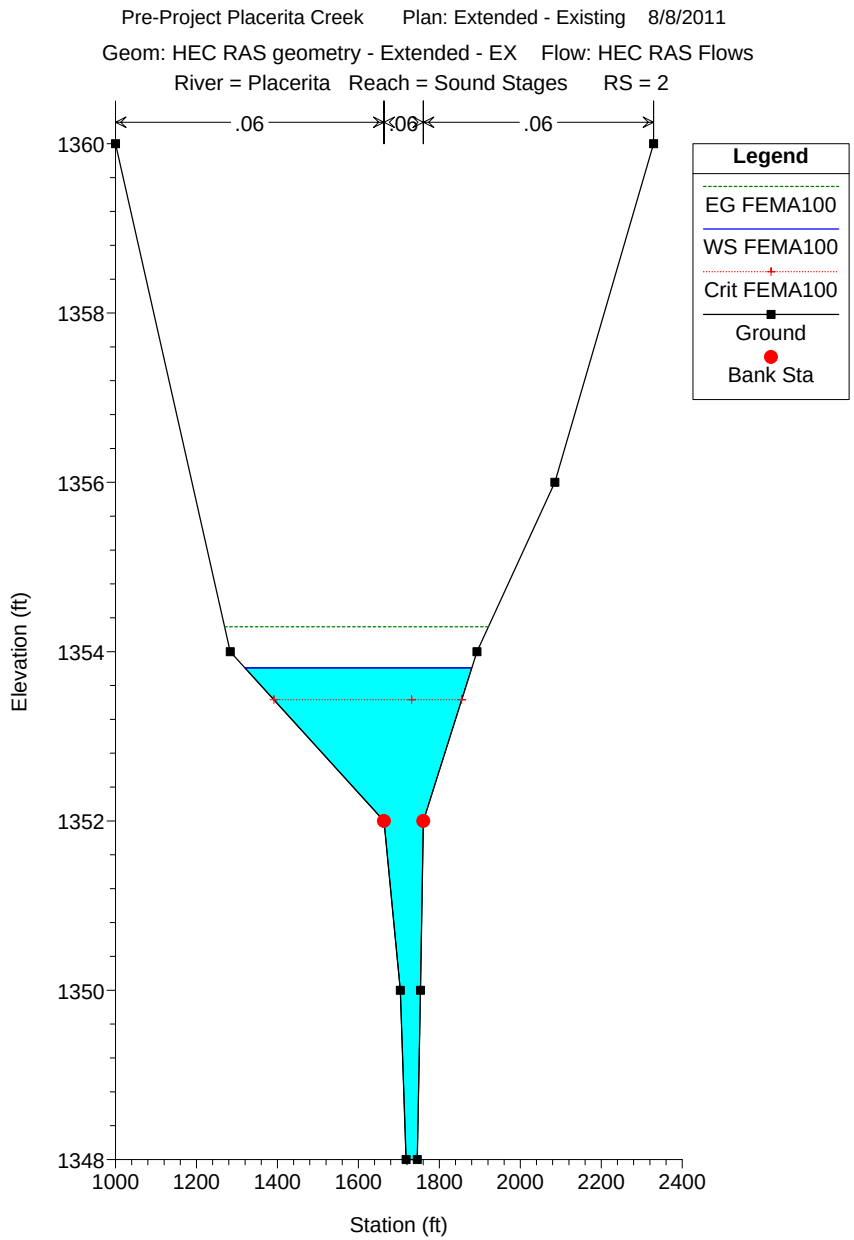

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 8
.06
.06
.06
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500
1600
1700
Station (ft)


Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 7
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
1415
1410
1405
1400
1395
1390
1385
1000
1200
1400
1600
1800
2000
Station (ft)


Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 6
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
1405
1400
1395
1390
1385
1380
1375
1000
1200
1400
1600
1800
2000
2200
Station (ft)


Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 5
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 4
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)


Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 3
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1400
1390
1380
1370
1360
1350
1000
1200
1400
1600
1800
2000
2200
2400

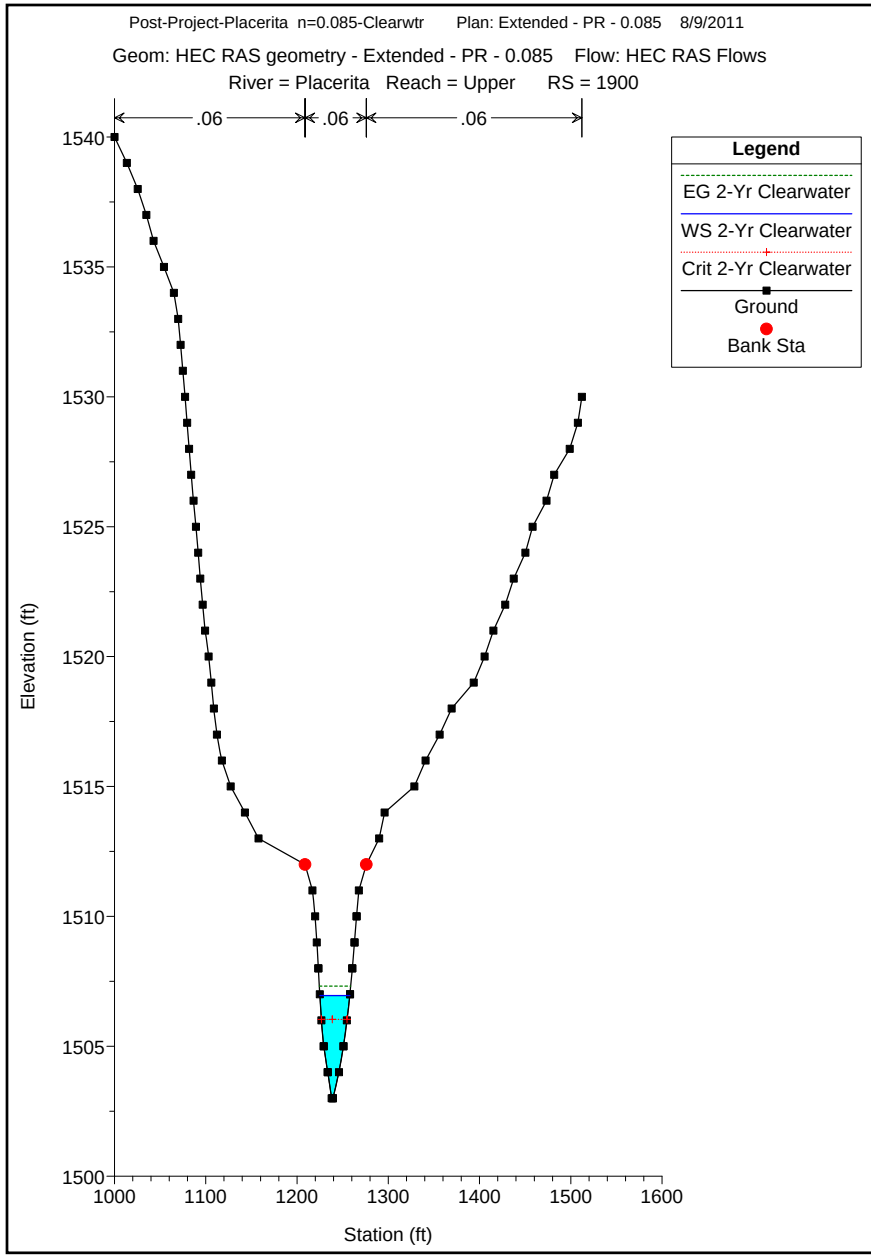

Pre-Project Placerita Creek Plan: Extended - Existing 8/8/2011
Geom: HEC RAS geometry - Extended - EX Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2
.06
.06
.06
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1360
1358
1356
1354
1352
1350
1348
1000
1200
1400
1600
1800
2000
2200
2400

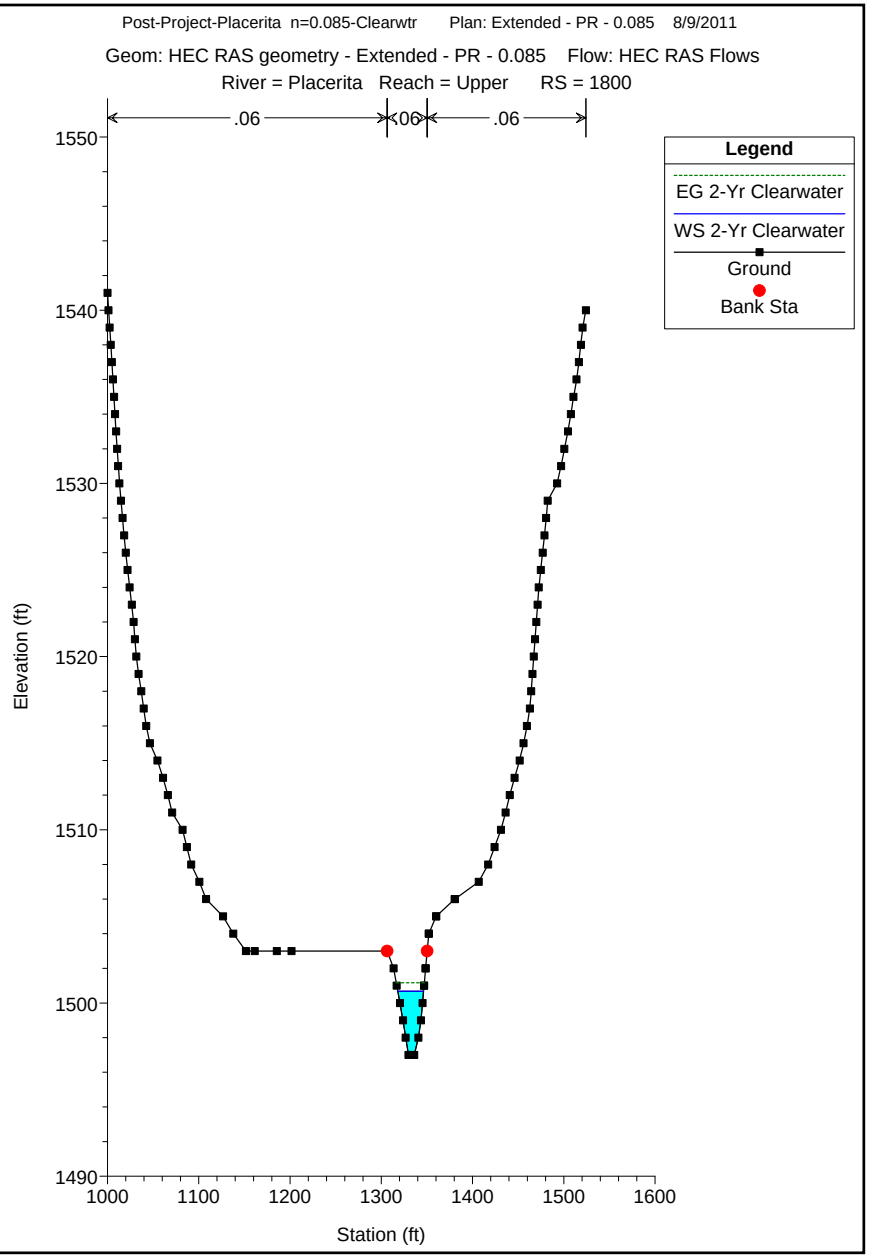
Post Project Condition HEC-RAS Output

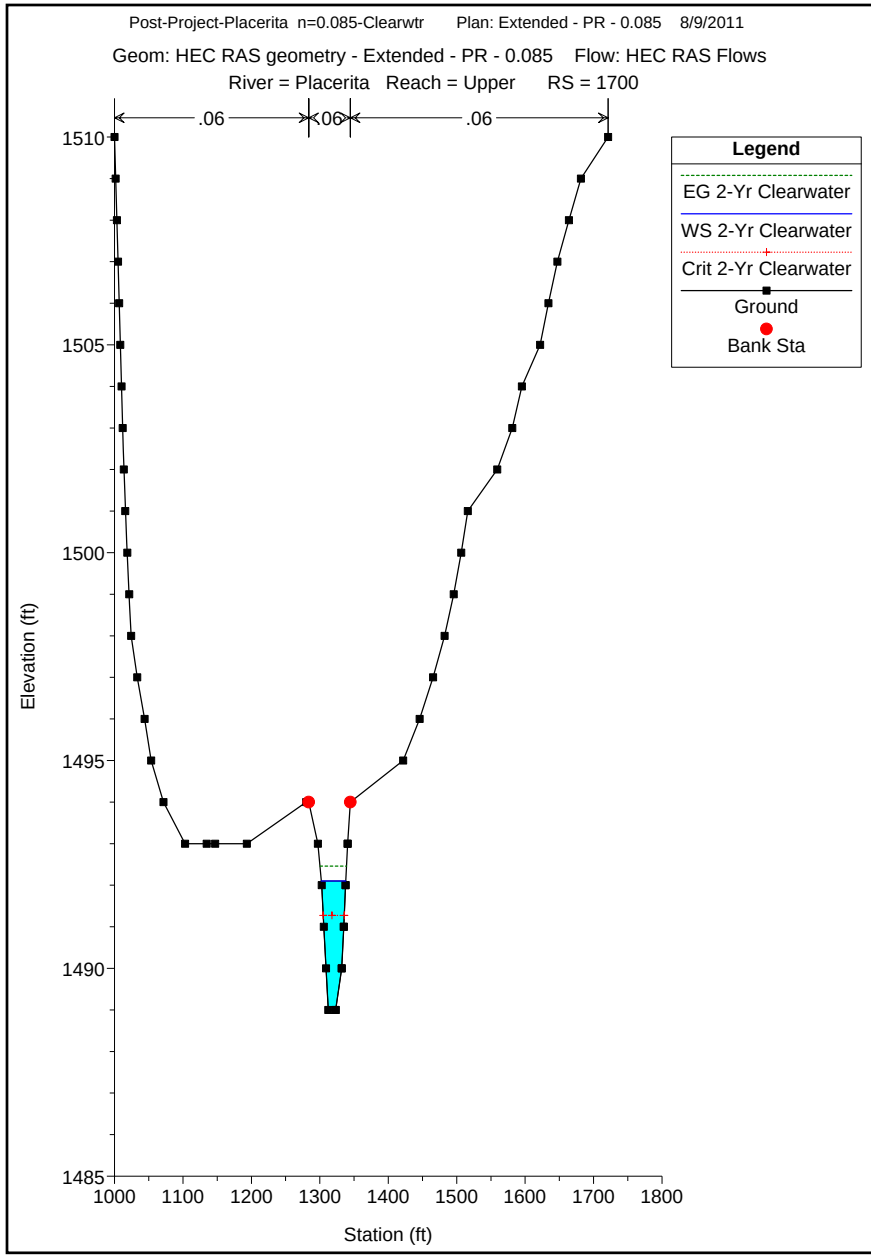
2-Year Storm Event – Post Project Condition HEC-RAS Output

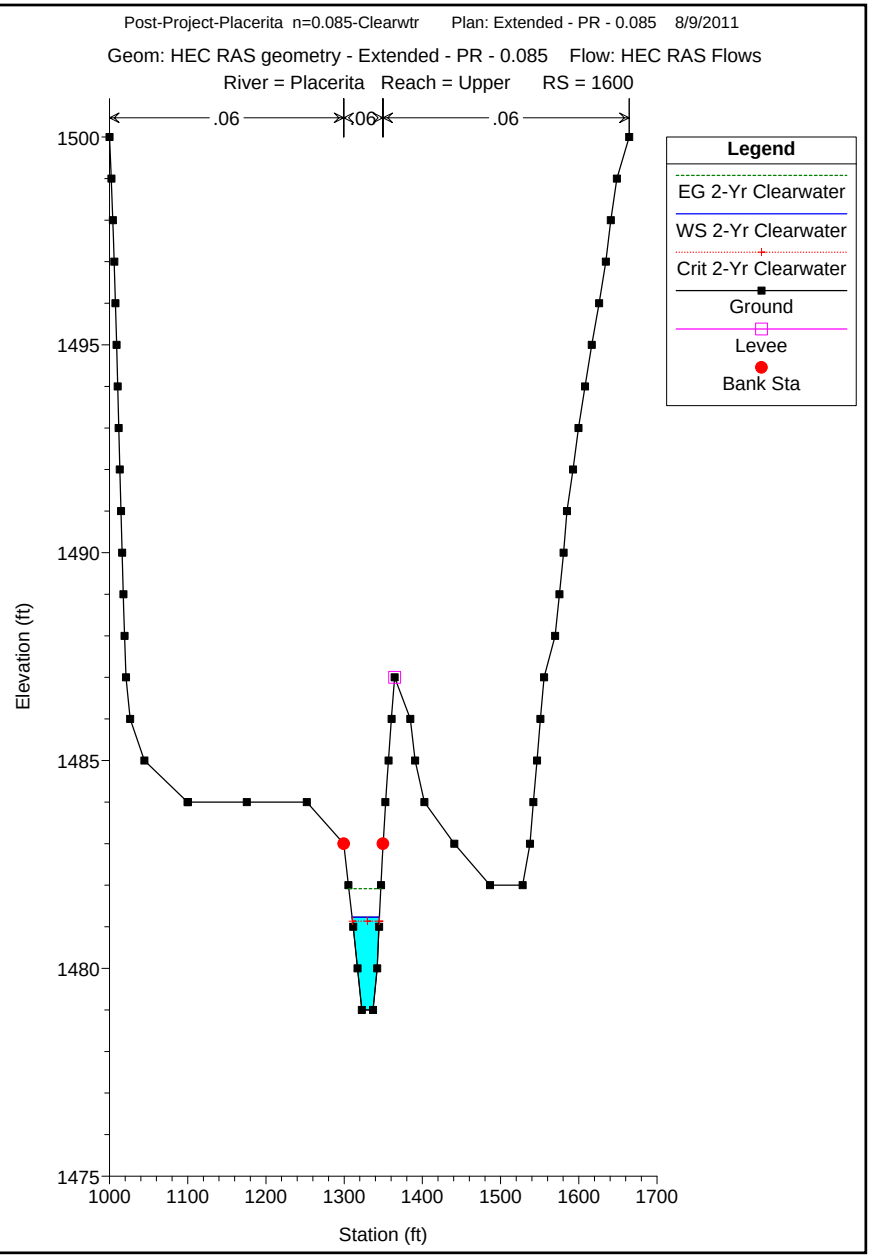
HEC-RAS Plan: Ex_PR_0.085 Profile: 2-Yr Clearwater

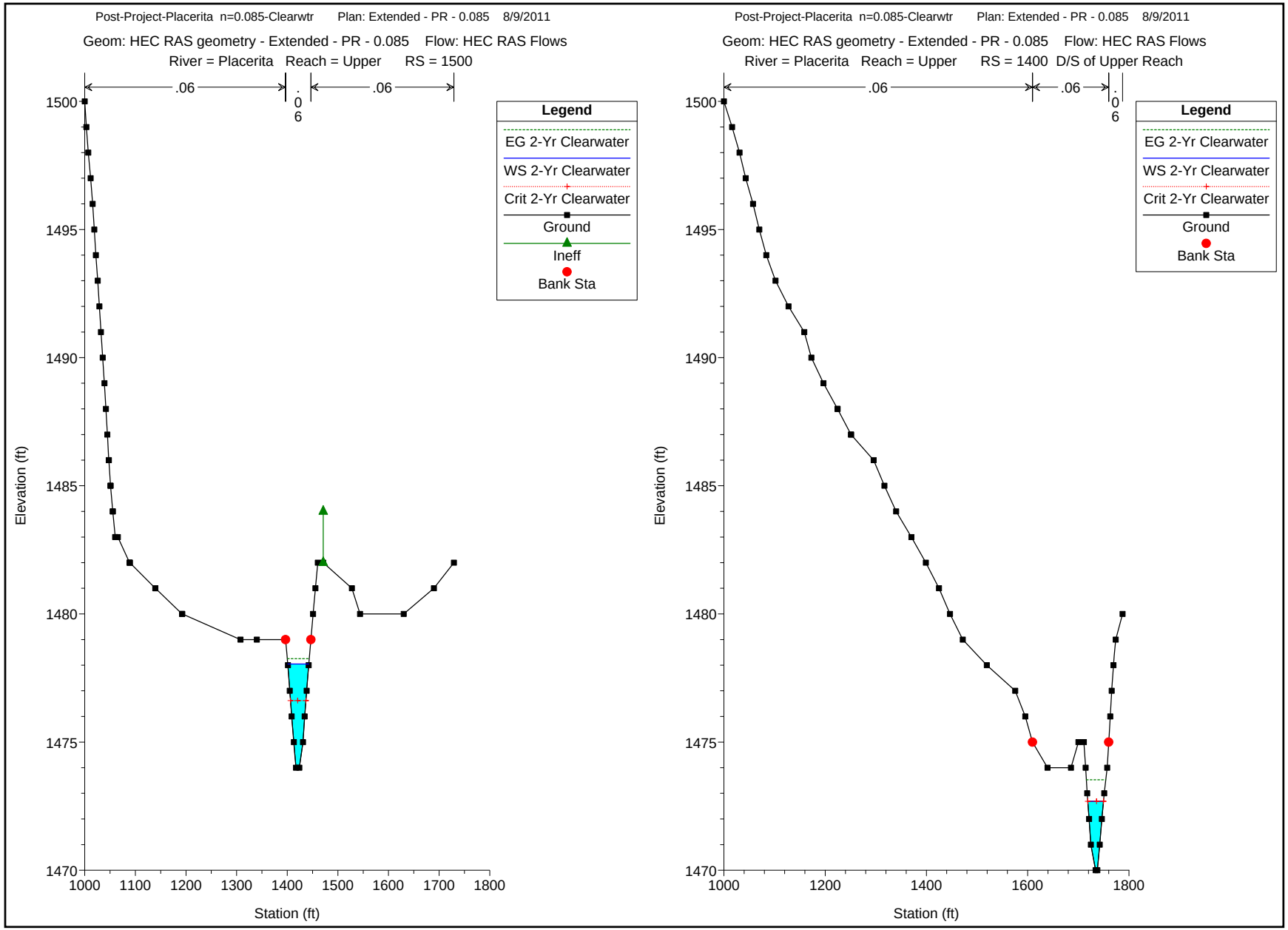
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Upper	1900	2-Yr Clearwater	377.20	1503.00	1506.95	1506.04	1507.32	0.012828	4.87	77.48	32.75	0.56
Upper	1800	2-Yr Clearwater	377.20	1497.00	1500.68		1501.17	0.017407	5.63	66.97	28.29	0.65
Upper	1700	2-Yr Clearwater	377.20	1489.00	1492.10	1491.27	1492.46	0.013497	4.79	78.76	35.79	0.57
Upper	1600	2-Yr Clearwater	377.20	1479.00	1481.23	1481.13	1481.92	0.039000	6.65	56.74	35.28	0.92
Upper	1500	2-Yr Clearwater	377.20	1474.00	1478.05	1476.62	1478.26	0.006776	3.67	102.71	41.51	0.41
Upper	1400	2-Yr Clearwater	377.20	1470.00	1472.69	1472.69	1473.53	0.046527	7.36	51.22	31.06	1.01
Tributary	510	2-Yr Clearwater	108.00	1545.00	1546.61	1546.40	1546.96	0.031381	4.76	22.67	19.59	0.78
Tributary	410	2-Yr Clearwater	108.00	1524.00	1526.22	1526.03	1526.66	0.034634	5.32	20.32	15.71	0.82
Tributary	310	2-Yr Clearwater	108.00	1503.00	1504.79	1504.54	1504.90	0.022310	2.64	40.85	67.39	0.60
Tributary	210	2-Yr Clearwater	108.00	1486.00	1487.33	1487.16	1487.66	0.034233	4.63	23.35	22.68	0.80
Tributary	110	2-Yr Clearwater	108.00	1479.00	1481.39		1481.56	0.010880	3.37	32.03	20.64	0.48
Tributary	10	2-Yr Clearwater	108.00	1471.00	1473.11	1473.11	1473.75	0.054876	6.45	16.75	13.29	1.01
Lower	1300	2-Yr Clearwater	446.40	1468.00	1470.54	1469.82	1470.76	0.010725	3.76	118.73	65.83	0.49
Lower	1250	2-Yr Clearwater	446.40	1463.00	1466.13		1466.59	0.018866	5.46	81.75	39.40	0.67
Lower	1200	2-Yr Clearwater	446.40	1459.00	1462.24		1462.54	0.011532	4.45	100.21	45.52	0.53
Lower	1150	2-Yr Clearwater	446.40	1453.00	1456.87	1455.81	1457.22	0.010946	4.73	94.36	37.16	0.52
Lower	1100	2-Yr Clearwater	446.40	1447.00	1449.77		1450.23	0.017918	5.48	81.48	37.44	0.65
Lower	1050	2-Yr Clearwater	446.40	1443.00	1446.34		1446.66	0.012130	4.54	98.36	45.09	0.54
Lower	1000	2-Yr Clearwater	446.40	1439.00	1443.25	1442.09	1443.66	0.011104	5.10	87.61	30.27	0.53
Sound Stages	2527.261	2-Yr Clearwater	453.40	1432.00	1435.02	1434.97	1435.84	0.041421	7.27	62.38	34.94	0.96
Sound Stages	2268.881	2-Yr Clearwater	453.40	1425.00	1430.10	1428.75	1430.44	0.012034	4.67	97.11	40.53	0.53
Sound Stages	2007.81	2-Yr Clearwater	453.40	1422.00	1424.56	1424.43	1425.24	0.038482	6.61	68.64	42.49	0.92
Sound Stages	1841.25	2-Yr Clearwater	453.40	1419.00	1421.40		1421.52	0.013504	2.71	167.19	108.02	0.38
Sound Stages	1644.9	2-Yr Clearwater	453.40	1416.00	1418.75	1417.51	1418.95	0.012684	3.54	128.23	51.94	0.40
Sound Stages	1615		Bridge									
Sound Stages	1526.5	2-Yr Clearwater	453.40	1414.00	1416.95		1417.35	0.039189	5.13	88.37	48.29	0.67
Sound Stages	1368.35	2-Yr Clearwater	453.40	1412.00	1414.67		1414.80	0.008328	2.88	157.56	63.63	0.32
Sound Stages	1258.35	2-Yr Clearwater	453.40	1410.00	1412.60		1412.98	0.045539	4.96	91.38	59.15	0.70
Sound Stages	1052.85	2-Yr Clearwater	453.40	1405.12	1408.86		1409.00	0.010369	3.00	151.22	68.46	0.36
Sound Stages	865.5	2-Yr Clearwater	453.40	1402.00	1405.78		1406.06	0.026205	4.30	105.50	55.86	0.55
Sound Stages	700.65	2-Yr Clearwater	453.40	1398.00	1403.42	1401.56	1403.58	0.009522	3.26	138.90	51.26	0.35
Sound Stages	700		Culvert									
Sound Stages	9.076105	2-Yr Clearwater	453.40	1390.00	1395.07		1395.31	0.006187	3.91	116.01	39.06	0.40
Sound Stages	8	2-Yr Clearwater	453.40	1390.00	1394.74	1393.15	1395.01	0.007518	4.16	108.99	38.79	0.44
Sound Stages	7	2-Yr Clearwater	488.20	1388.00	1389.07	1389.07	1389.50	0.056090	5.28	92.46	108.19	1.01
Sound Stages	6	2-Yr Clearwater	488.20	1378.00	1383.04	1382.58	1383.13	0.004683	3.16	272.52	363.40	0.34
Sound Stages	5	2-Yr Clearwater	488.20	1376.00	1377.71	1377.71	1378.47	0.046313	6.99	70.49	47.53	1.00
Sound Stages	4	2-Yr Clearwater	488.20	1362.00	1366.38	1365.03	1366.75	0.009711	4.84	100.82	34.27	0.50
Sound Stages	3	2-Yr Clearwater	501.00	1356.00	1359.48		1359.84	0.010449	4.83	103.73	37.89	0.51
Sound Stages	2	2-Yr Clearwater	501.00	1348.00	1350.90	1349.88	1351.12	0.010203	3.77	132.95	71.37	0.49

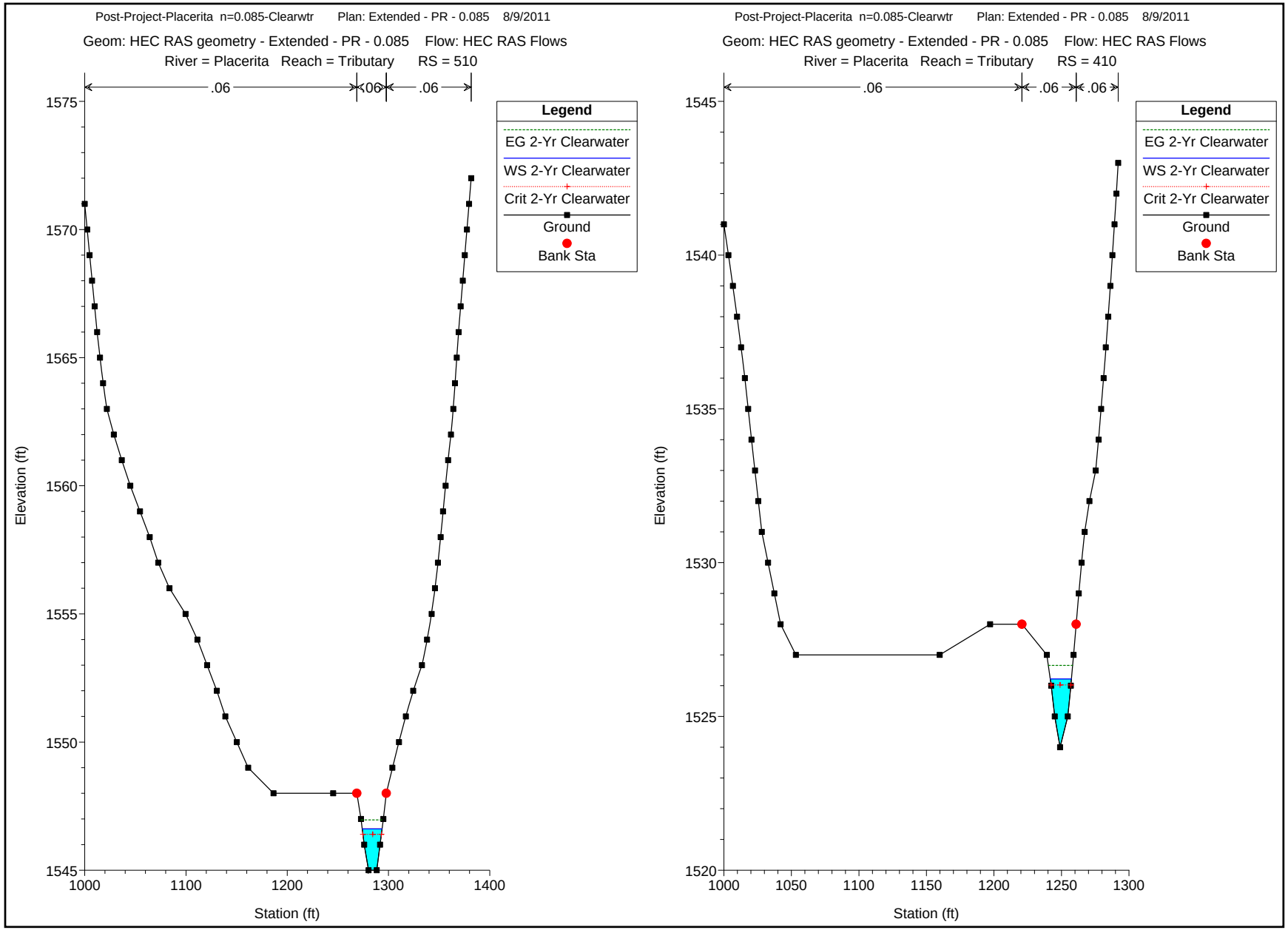

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1900
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1540
1535
1530
1525
1520
1515
1510
1505
1500
1000
1100
1200
1300
1400
1500
1600

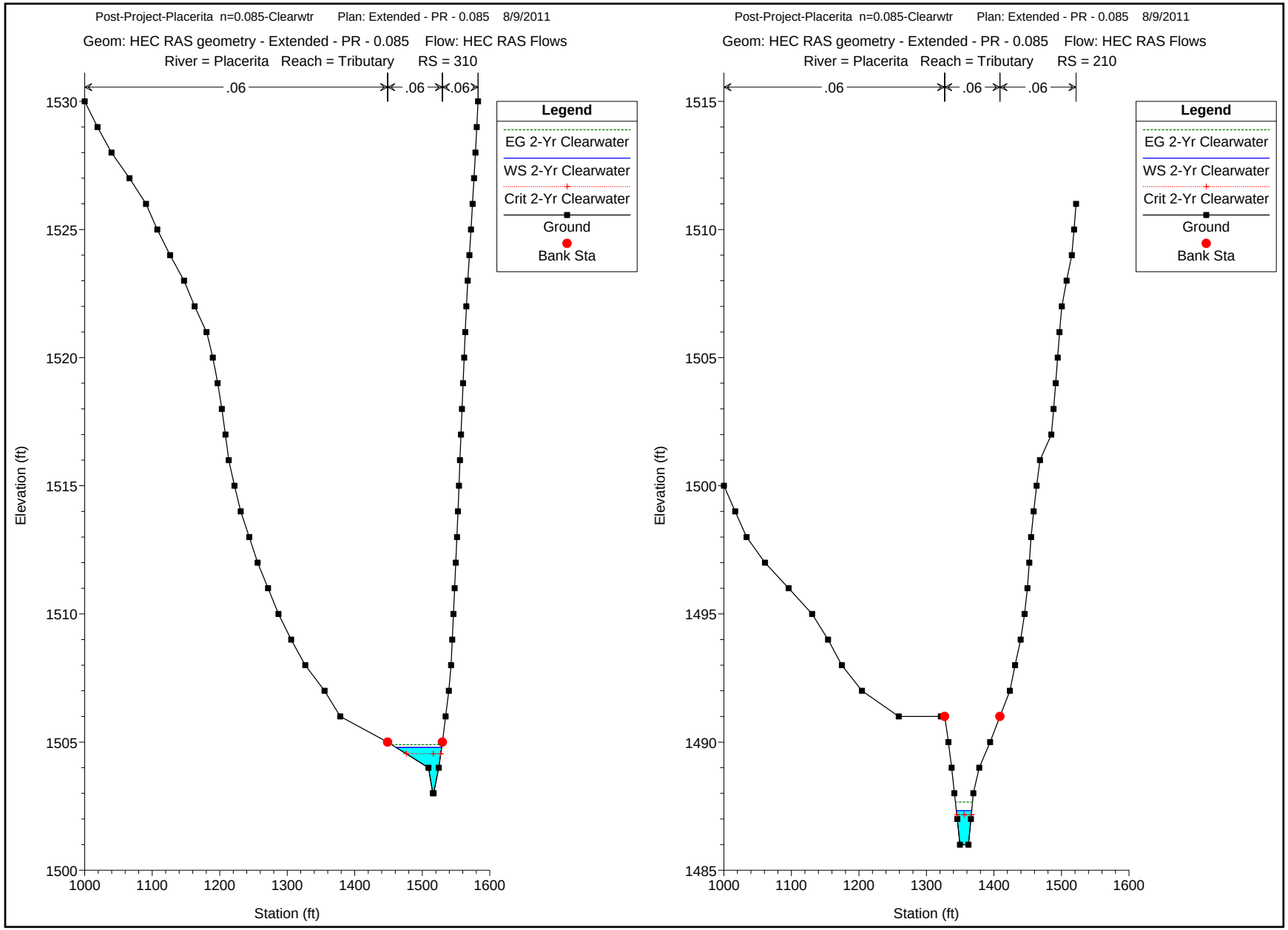

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1800
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1550
1540
1530
1520
1510
1500
1490
1000
1100
1200
1300
1400
1500
1600

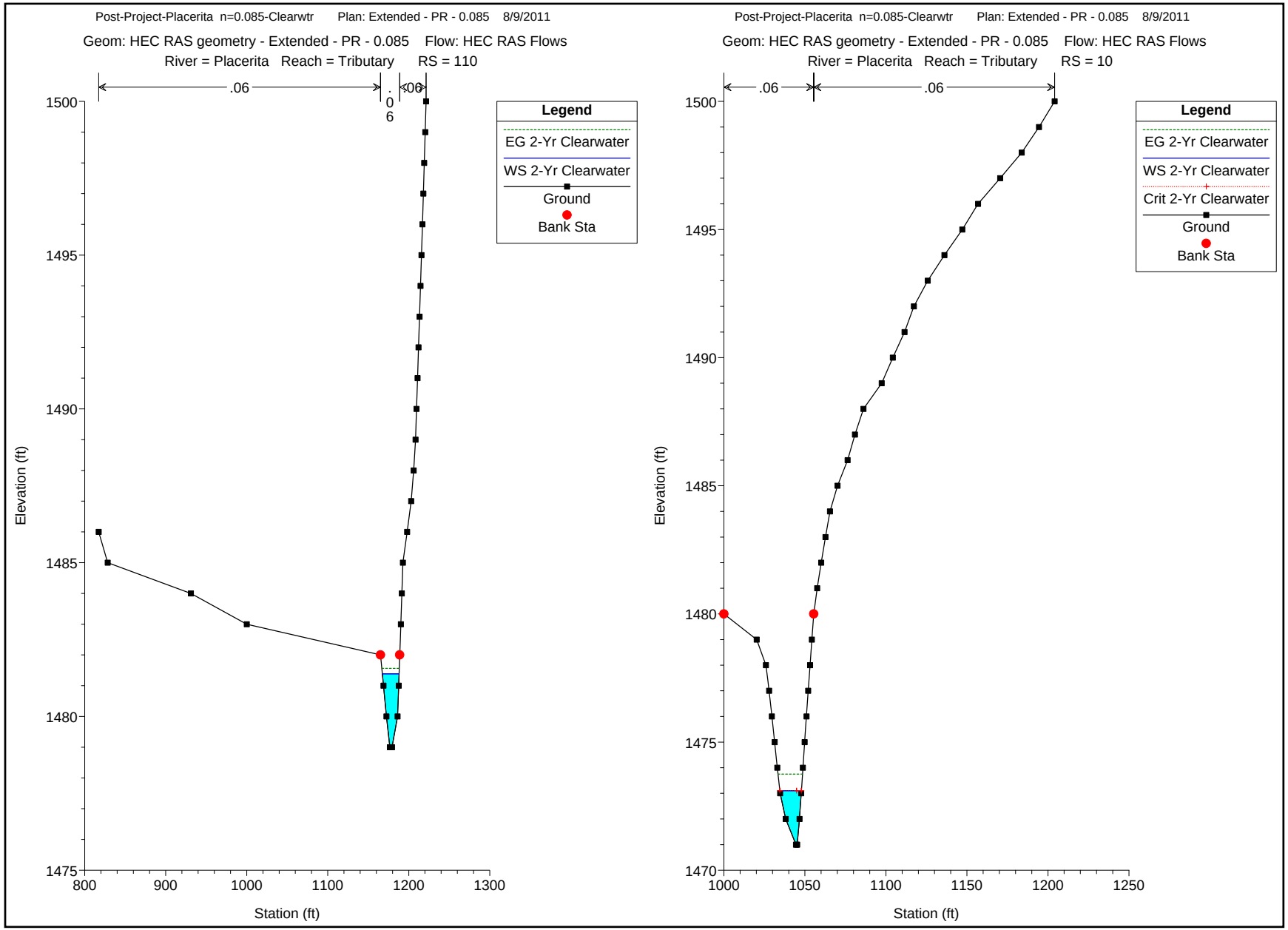

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1700
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1510
1505
1500
1495
1490
1485
1000
1100
1200
1300
1400
1500
1600
1700
1800
Station (ft)

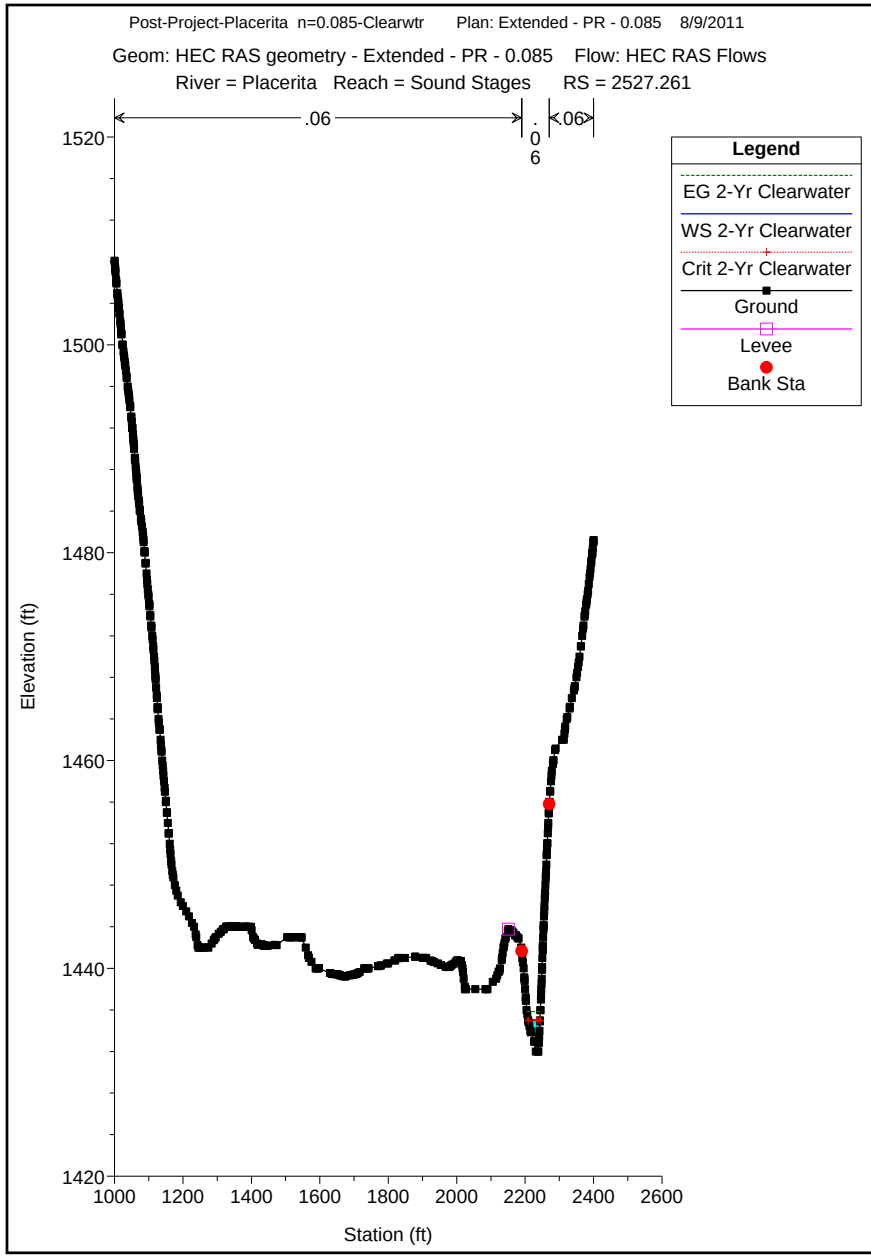

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1600
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
1500
1495
1490
1485
1480
1475
1000
1100
1200
1300
1400
1500
1600
1700
Station (ft)

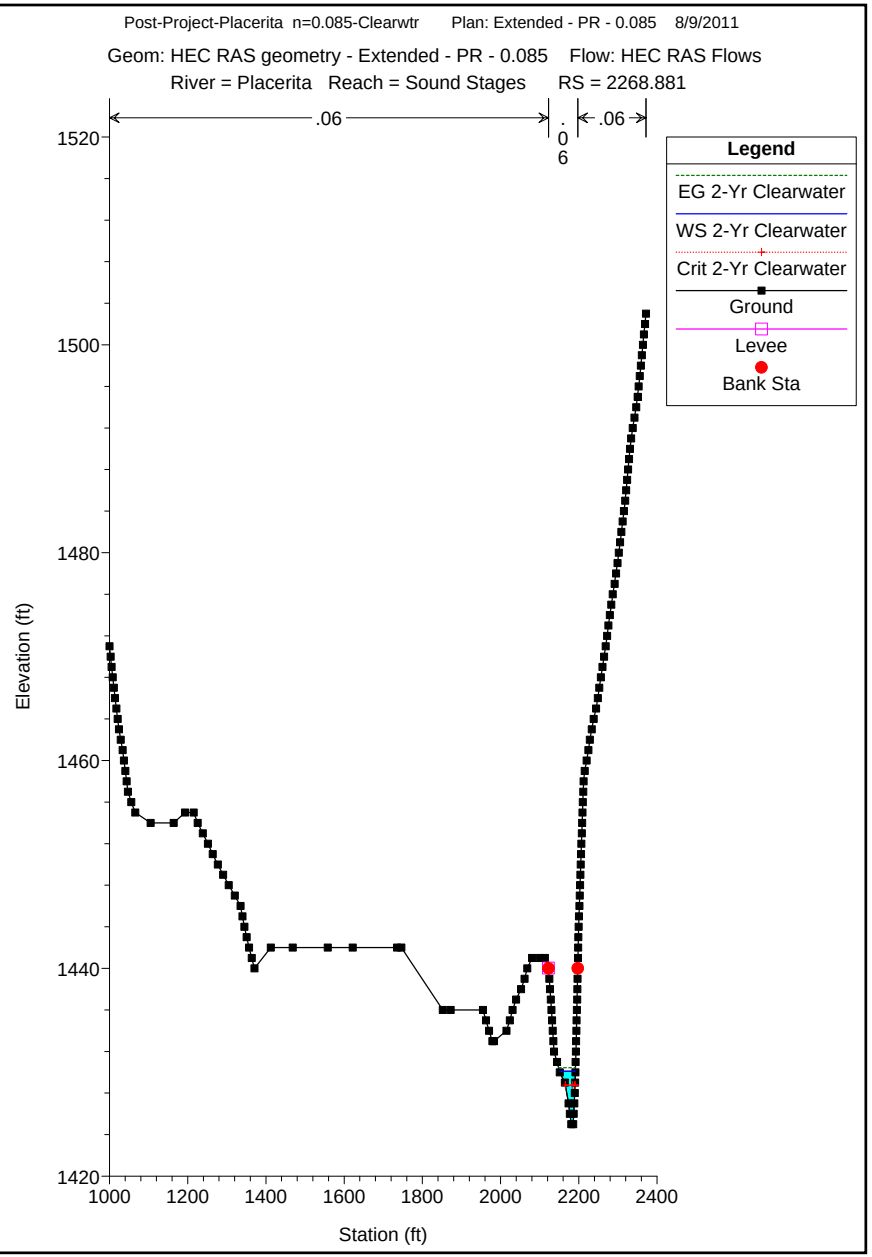

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1500
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1400 D/S of Upper Reach
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

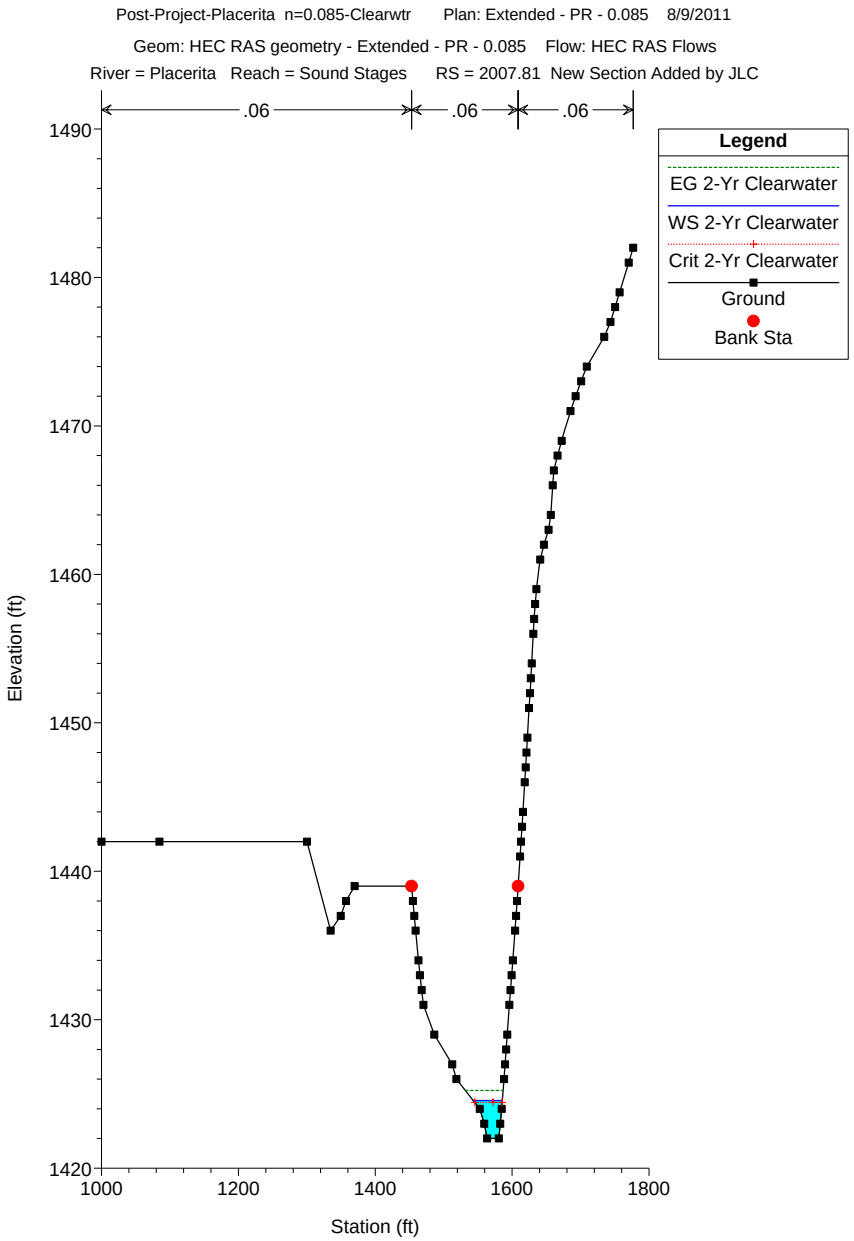

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 510
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1575
1570
1565
1560
1555
1550
1545
1000
1100
1200
1300
1400
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 410
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1545
1540
1535
1530
1525
1520
1000
1050
1100
1150
1200
1250
1300
Station (ft)

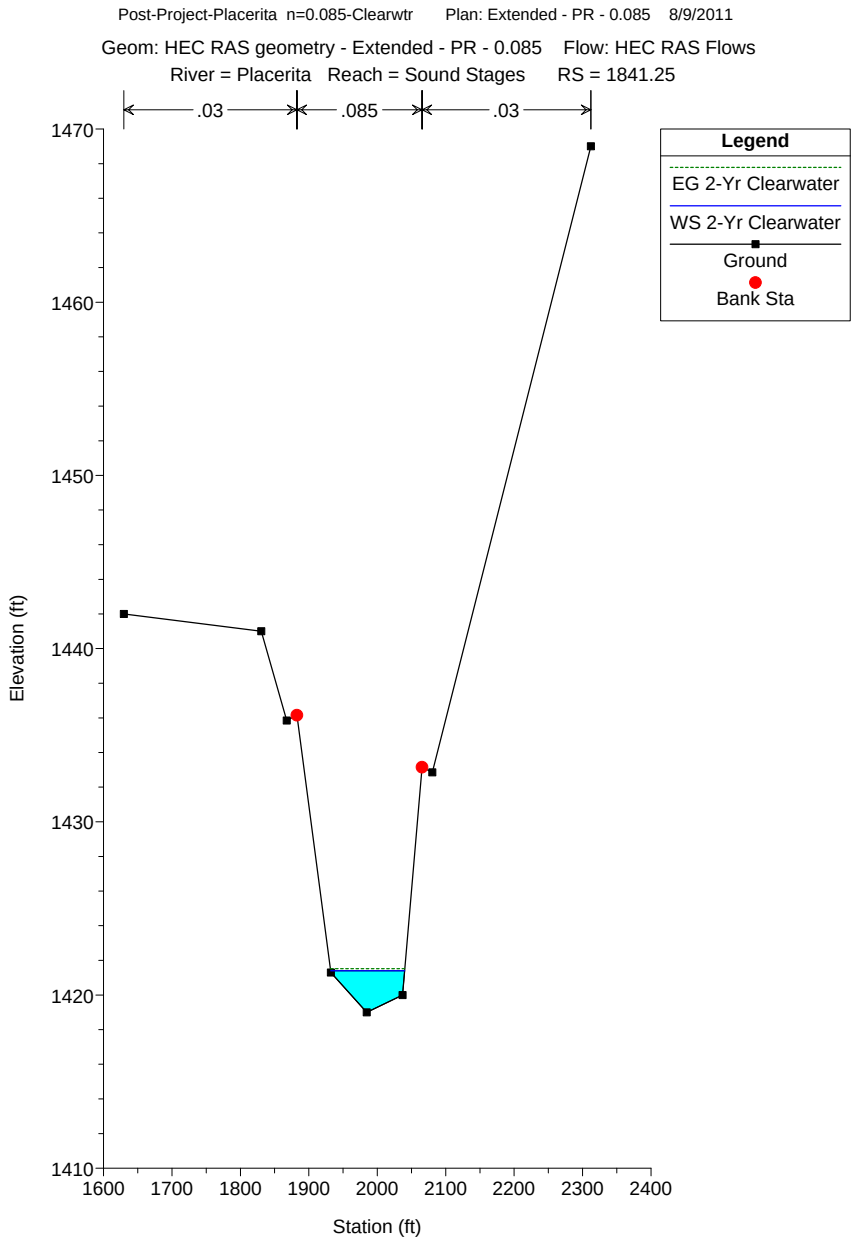

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 310
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1530
1525
1520
1515
1510
1505
1500
1000
1100
1200
1300
1400
1500
1600
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 210
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1515
1510
1505
1500
1495
1490
1485
1000
1100
1200
1300
1400
1500
1600
Station (ft)

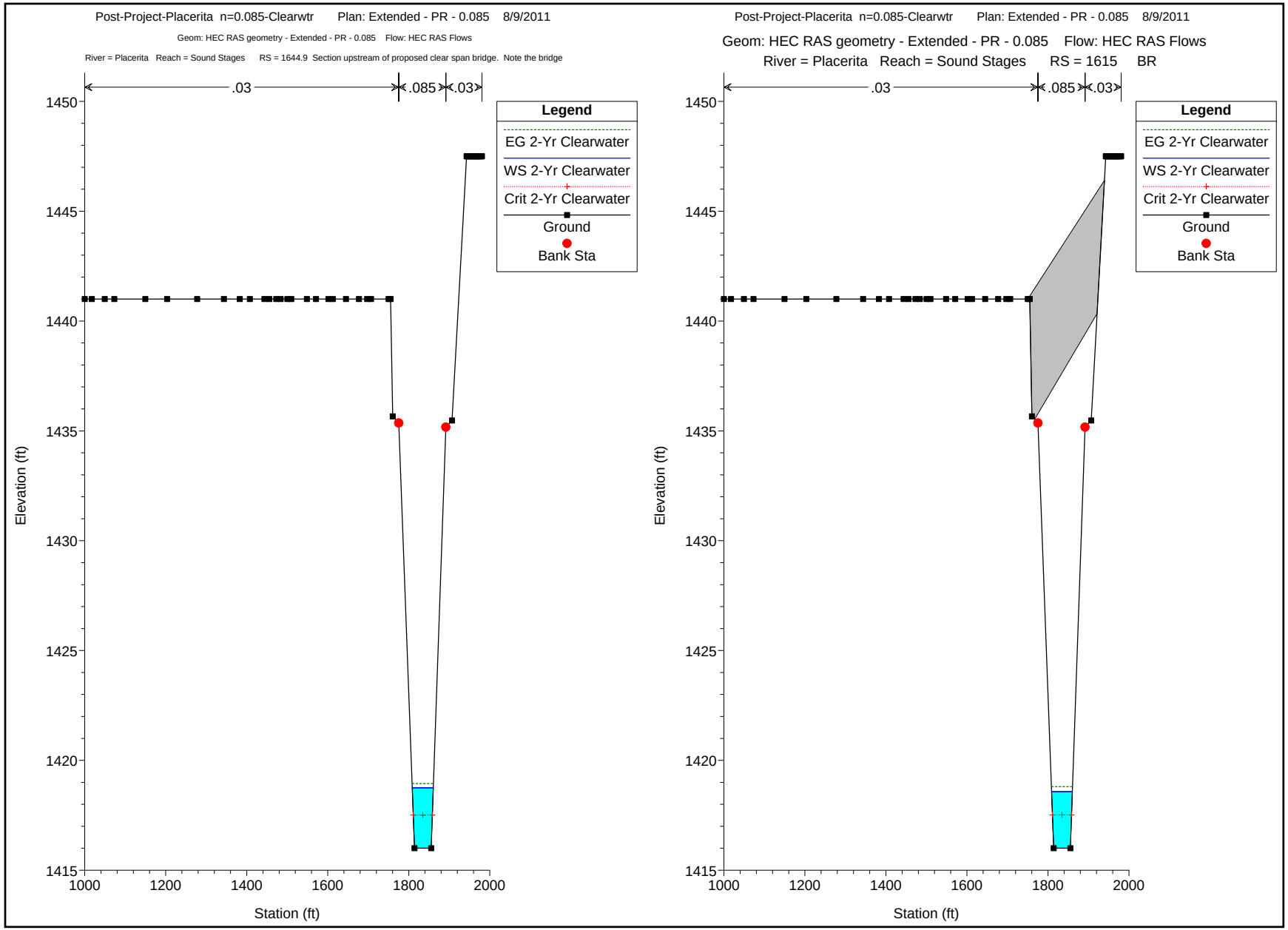

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 110
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
800
900
1000
1100
1200
1300
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 10
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1050
1100
1150
1200
1250

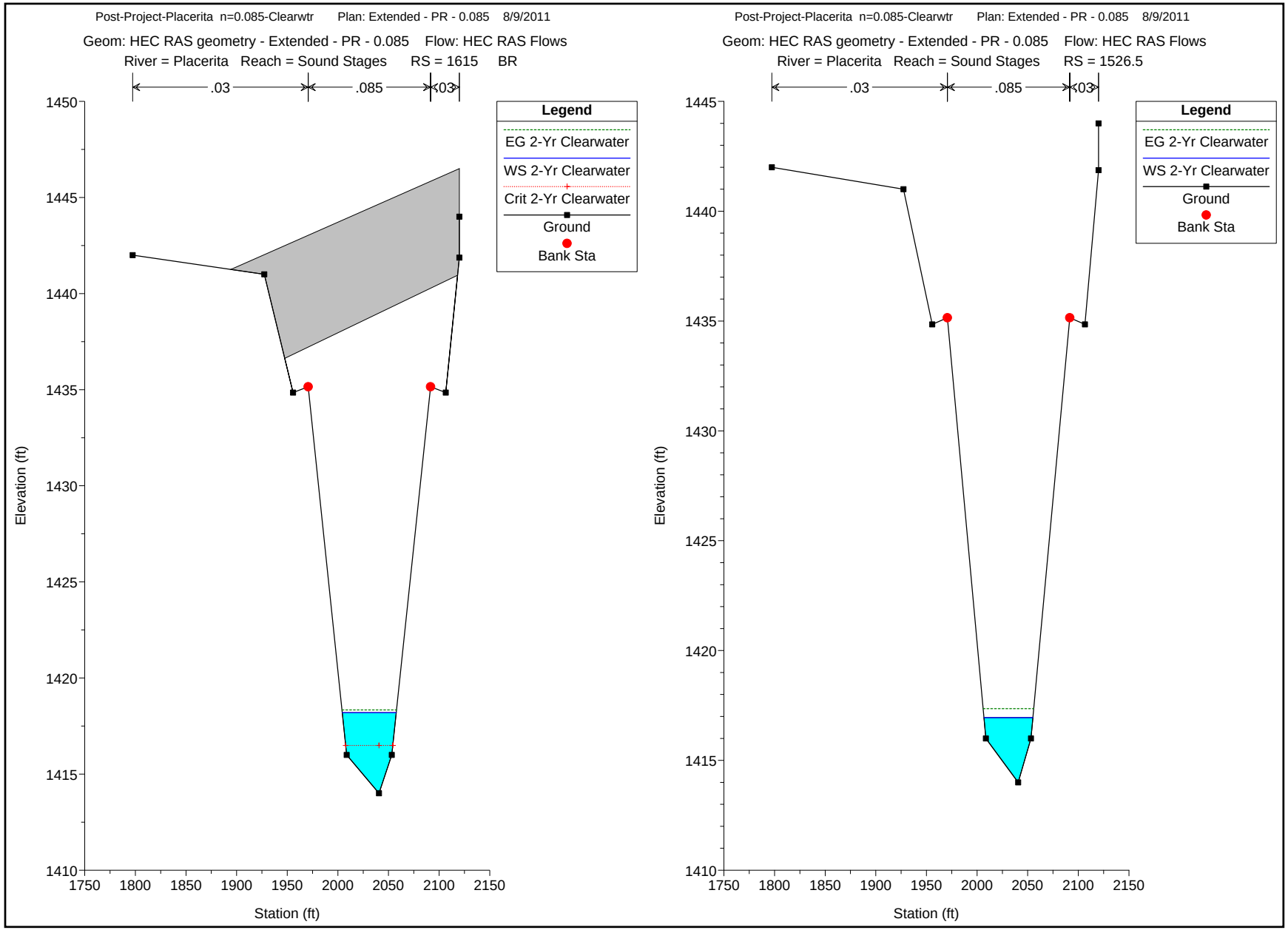

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2527.261
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
1520
1500
1480
1460
1440
1420
1000
1200
1400
1600
1800
2000
2200
2400
2600

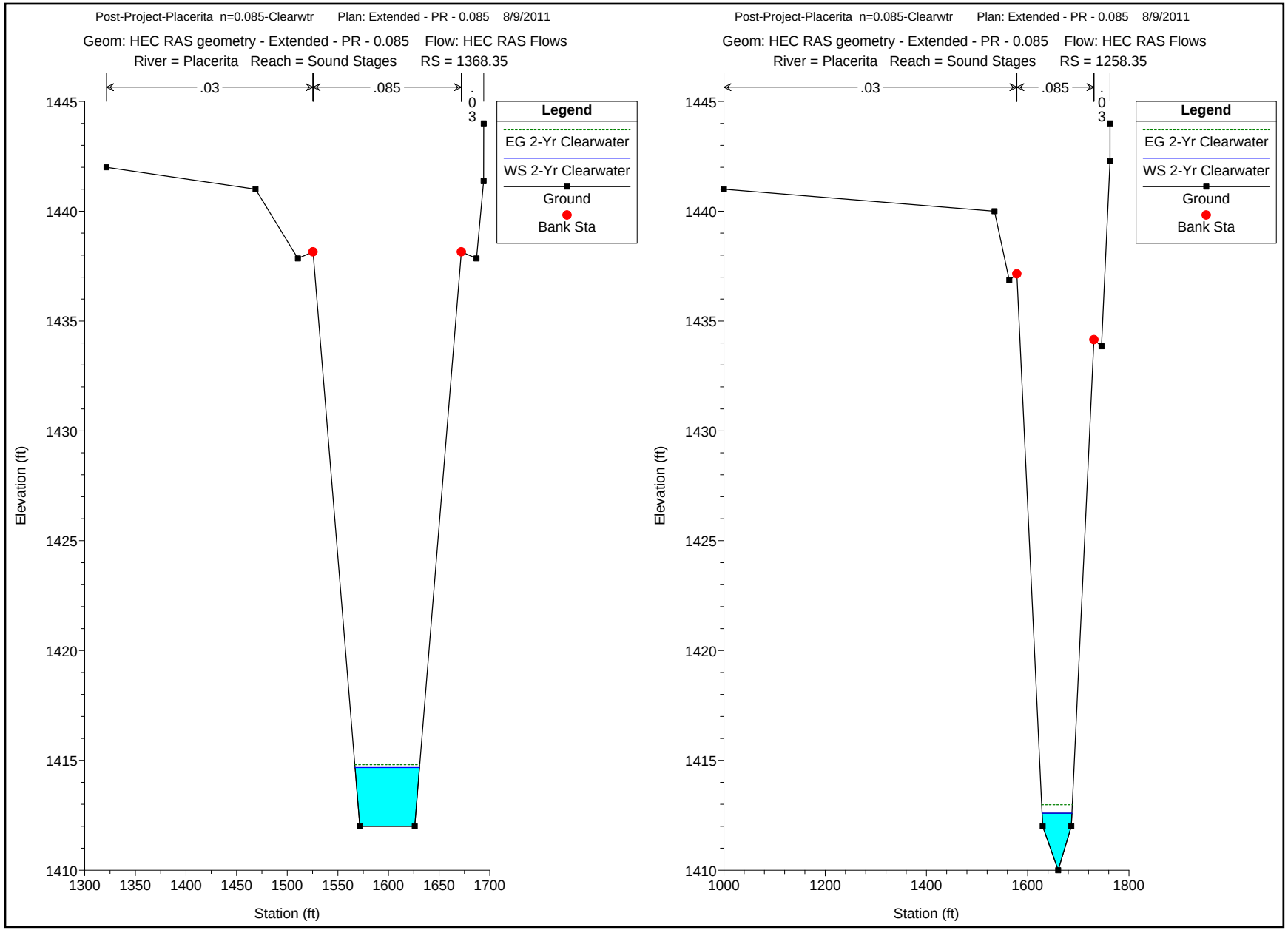

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2268.881
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
1520
1500
1480
1460
1440
1420
1000
1200
1400
1600
1800
2000
2200
2400

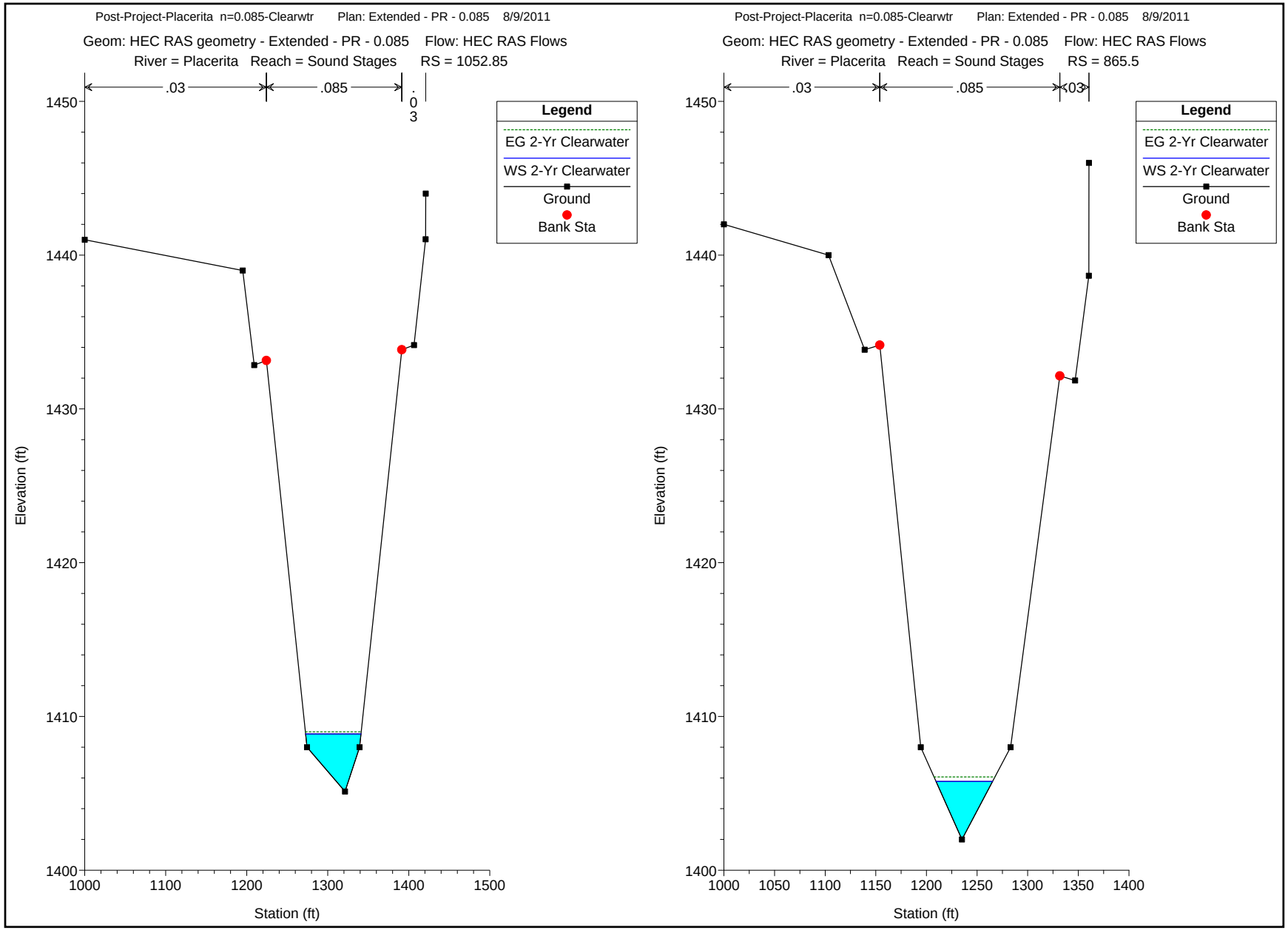

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2007.81 New Section Added by JLC
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1490
1480
1470
1460
1450
1440
1430
1420
1000
1200
1400
1600
1800

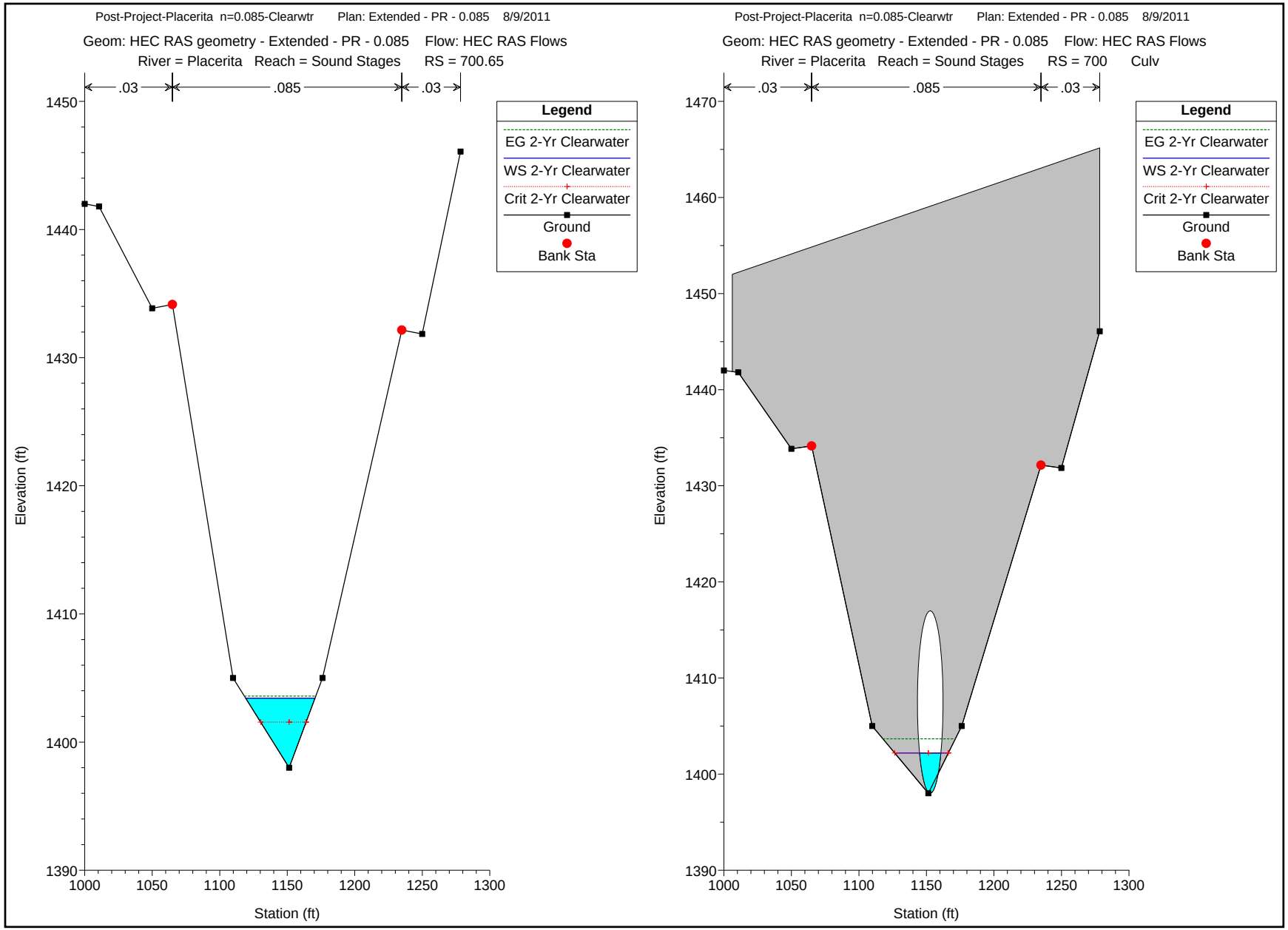

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1841.25
.03
.085
.03
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1470
1460
1450
1440
1430
1420
1410
1600
1700
1800
1900
2000
2100
2200
2300
2400

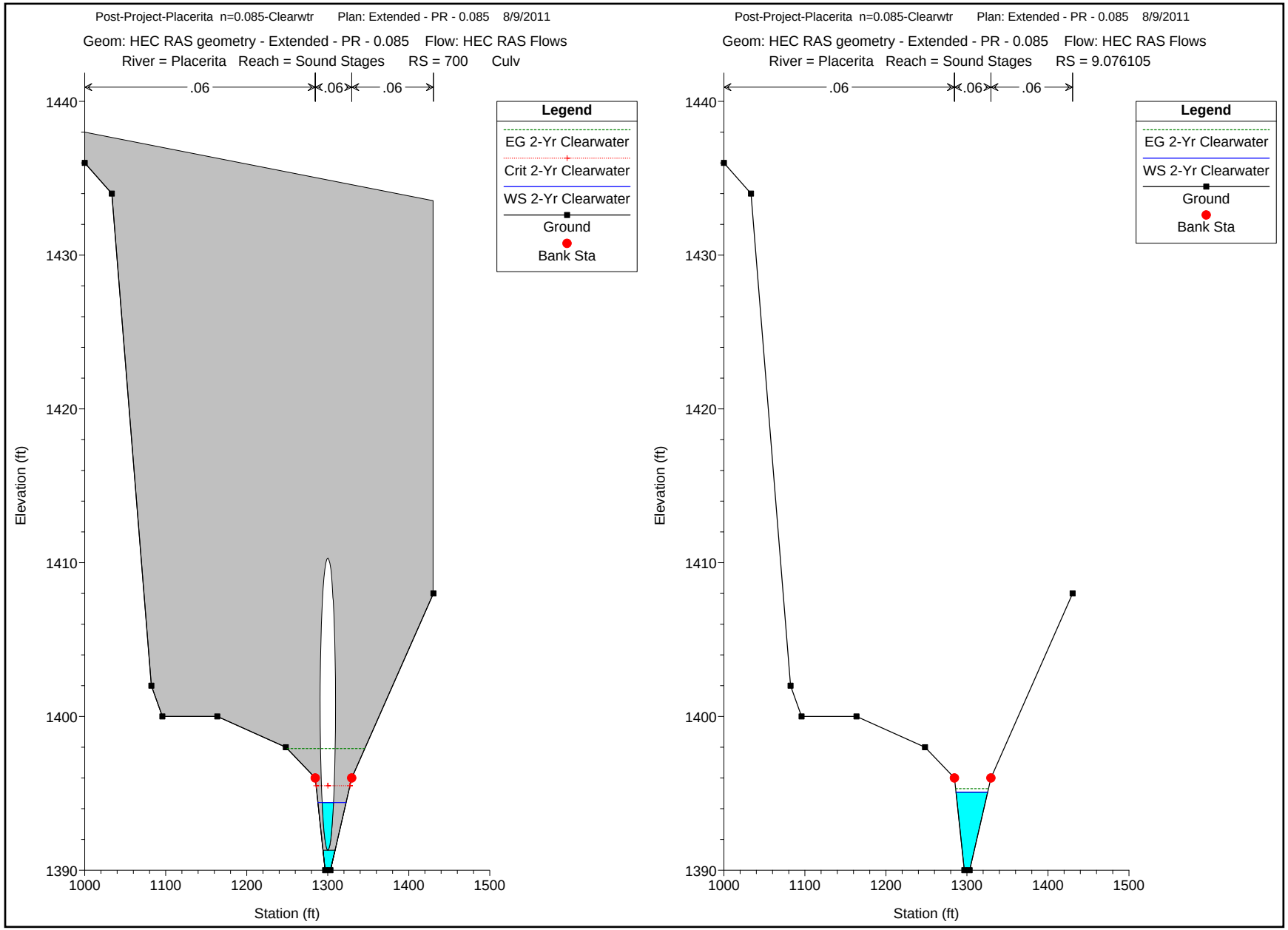

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1644.9 Section upstream of proposed clear span bridge. Note the bridge
.03
.085
.03
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1615 BR
.03
.085
.03
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

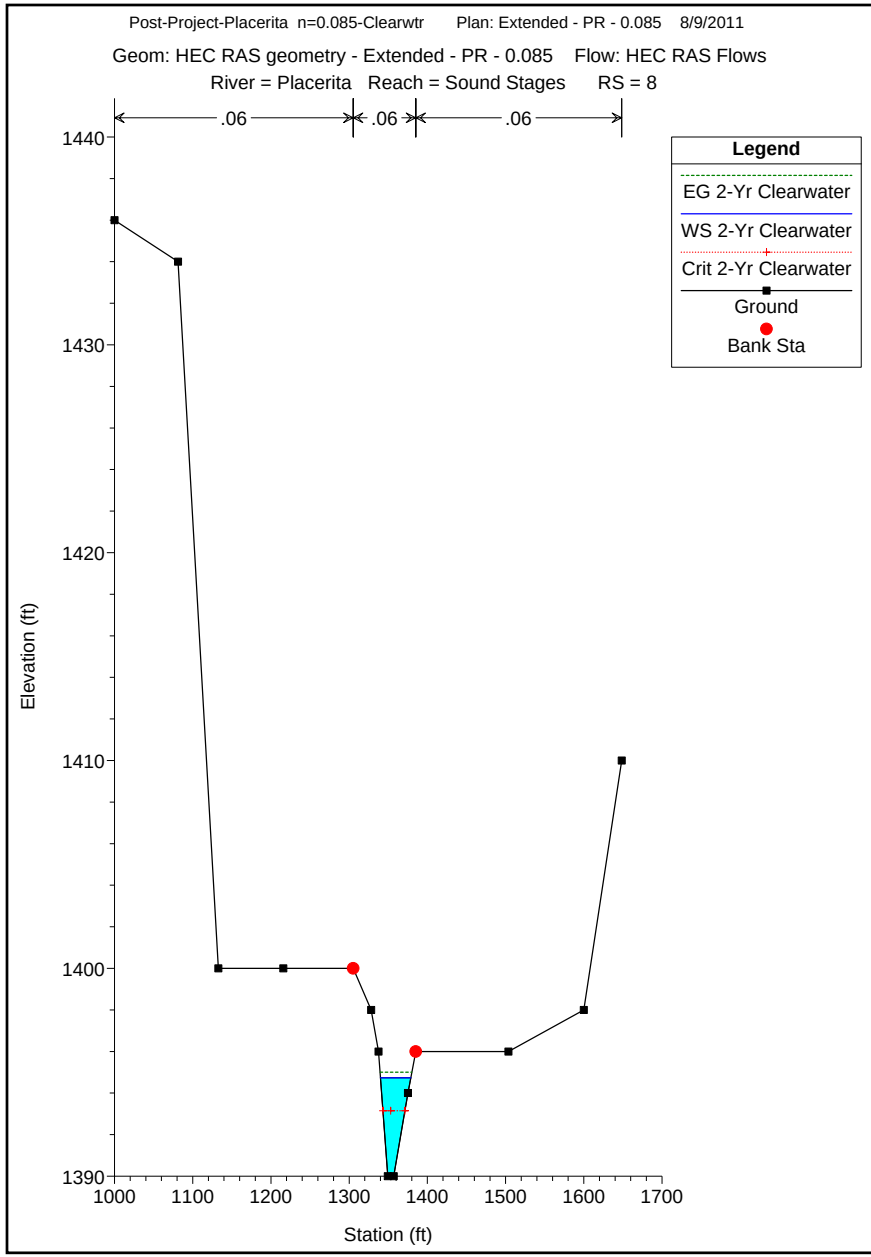

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1615 BR
.03
.085
.03
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1526.5
.03
.085
.03
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

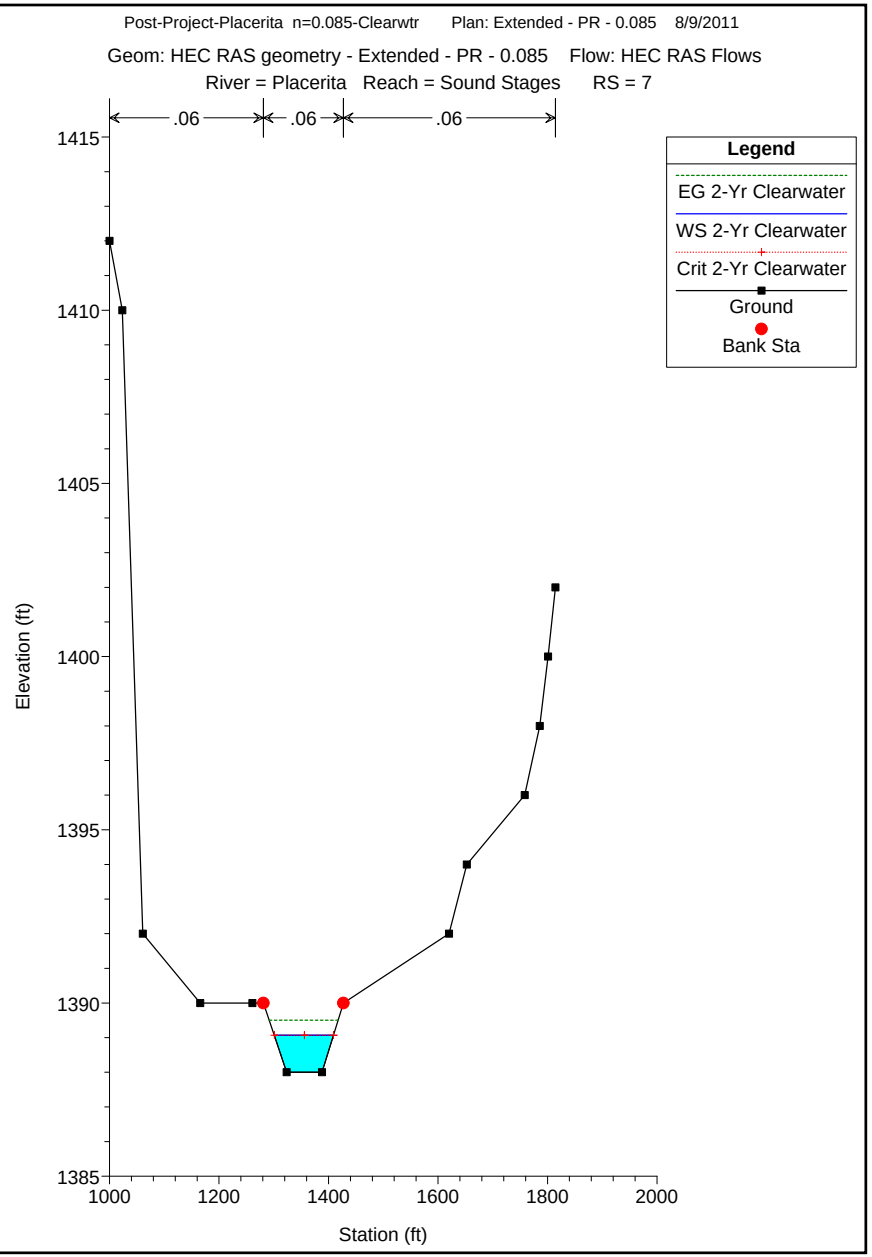

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1368.35
.03
.085
.03
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1445
1440
1435
1430
1425
1420
1415
1410
1300
1350
1400
1450
1500
1550
1600
1650
1700
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1258.35
.03
.085
.03
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1445
1440
1435
1430
1425
1420
1415
1410
1000
1200
1400
1600
1800

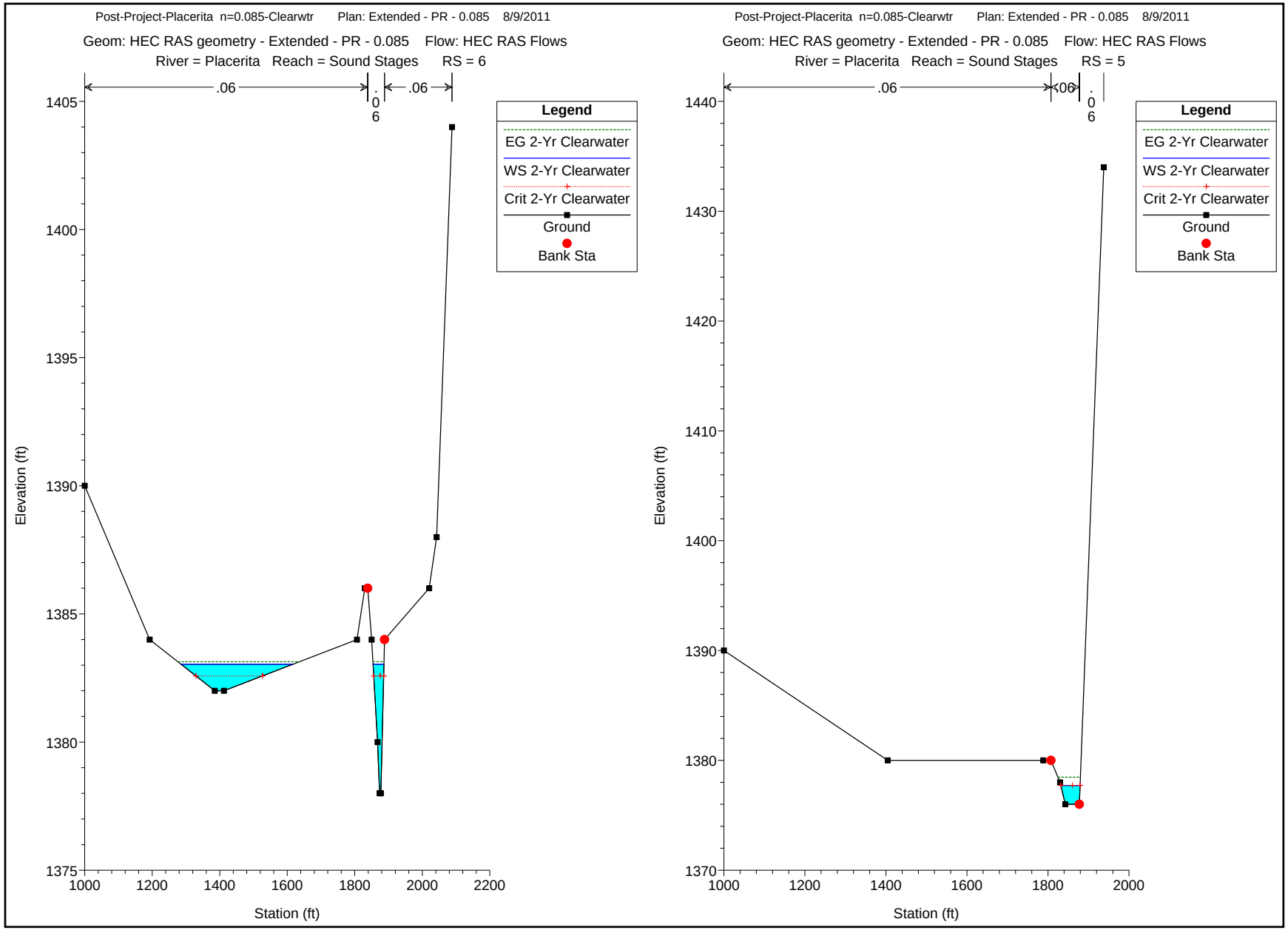

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1052.85
.03
.085
.03
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1440
1430
1420
1410
1400
1000
1100
1200
1300
1400
1500
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 865.5
.03
.085
.03
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1440
1430
1420
1410
1400
1000
1050
1100
1150
1200
1250
1300
1350
1400

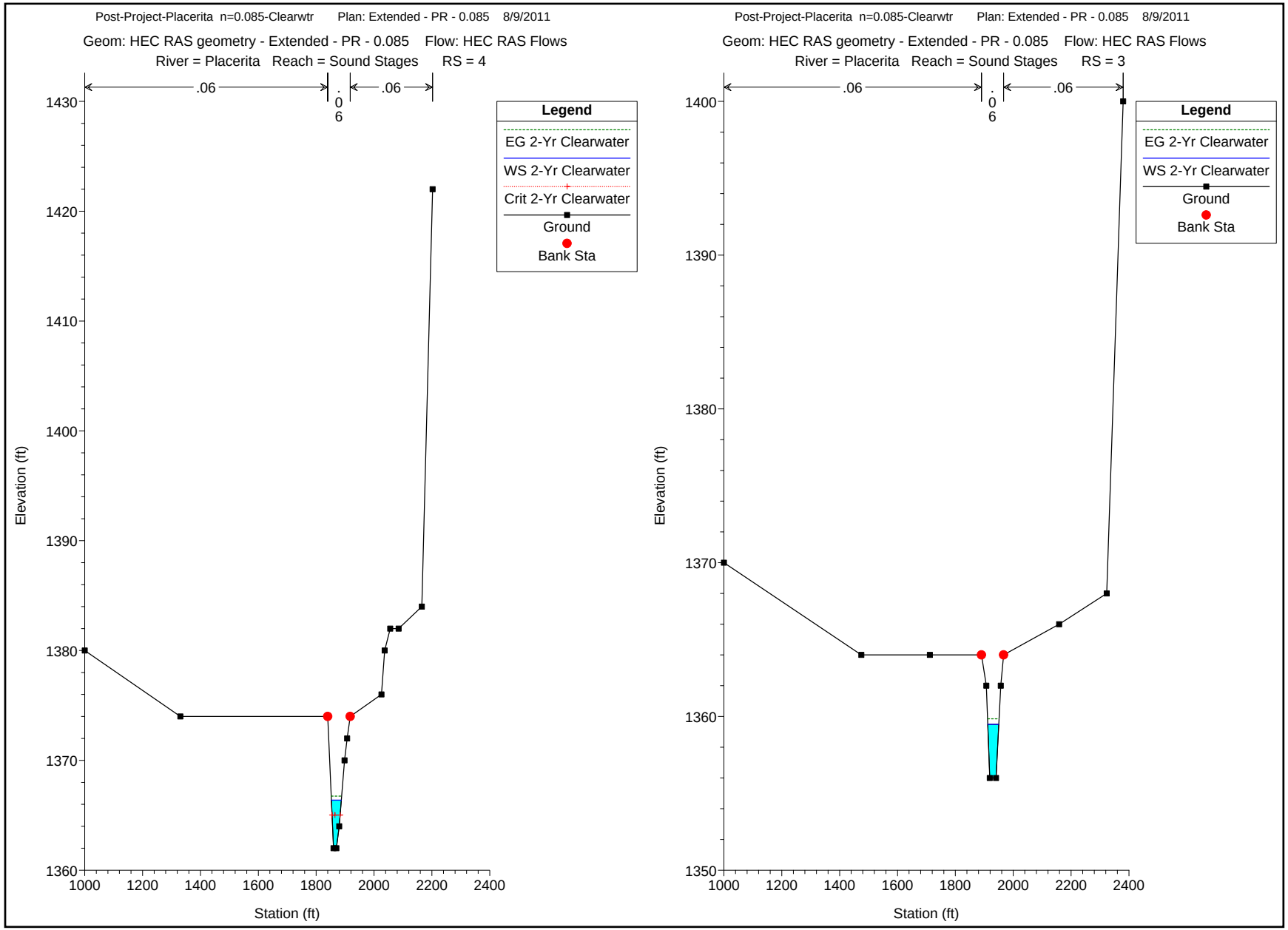

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700.65
.03
.085
.03
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700 Culv
.03
.085
.03
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

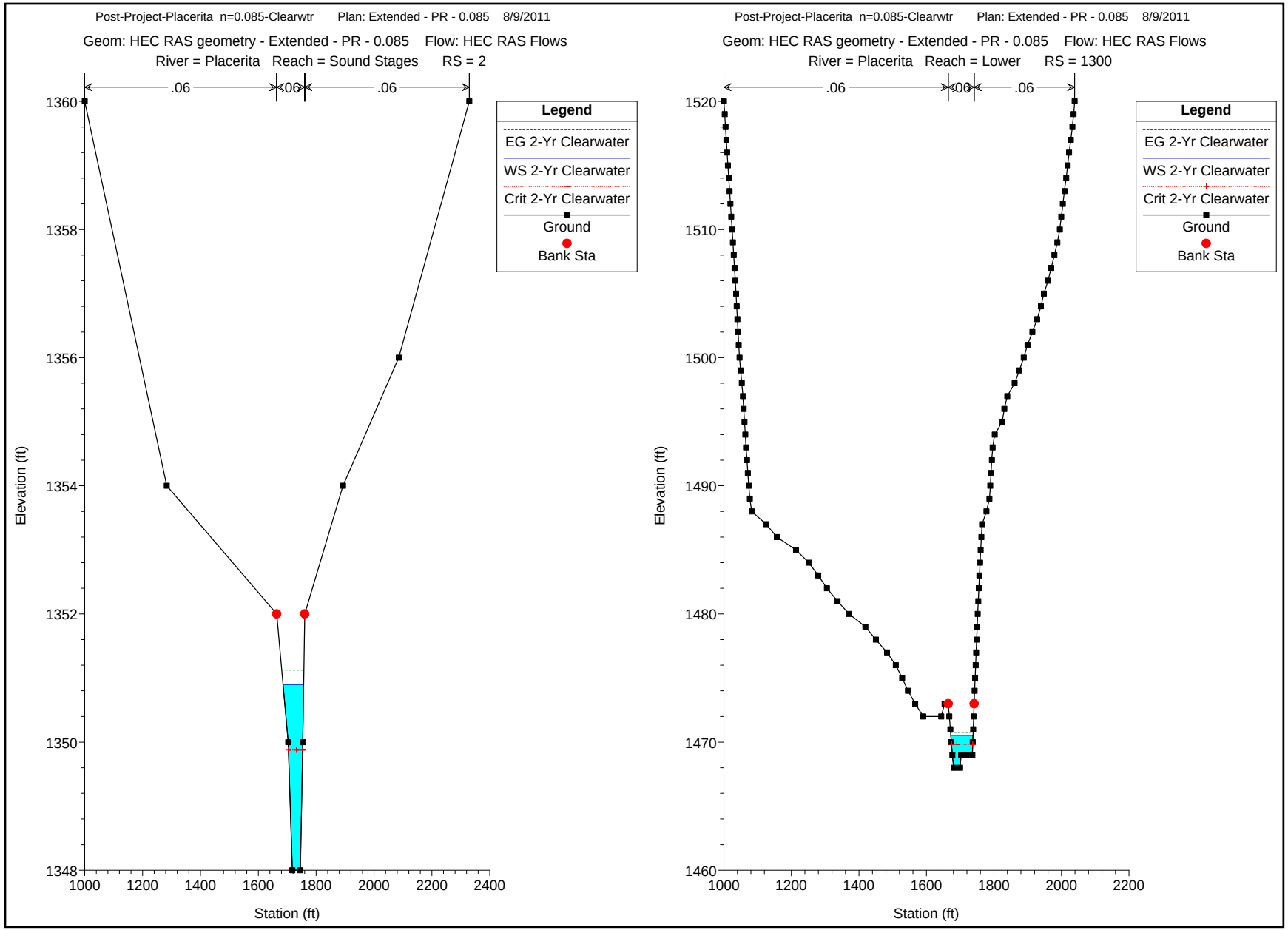

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700 Culv
.06
.06
.06
Legend
EG 2-Yr Clearwater
Crit 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 9.076105
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

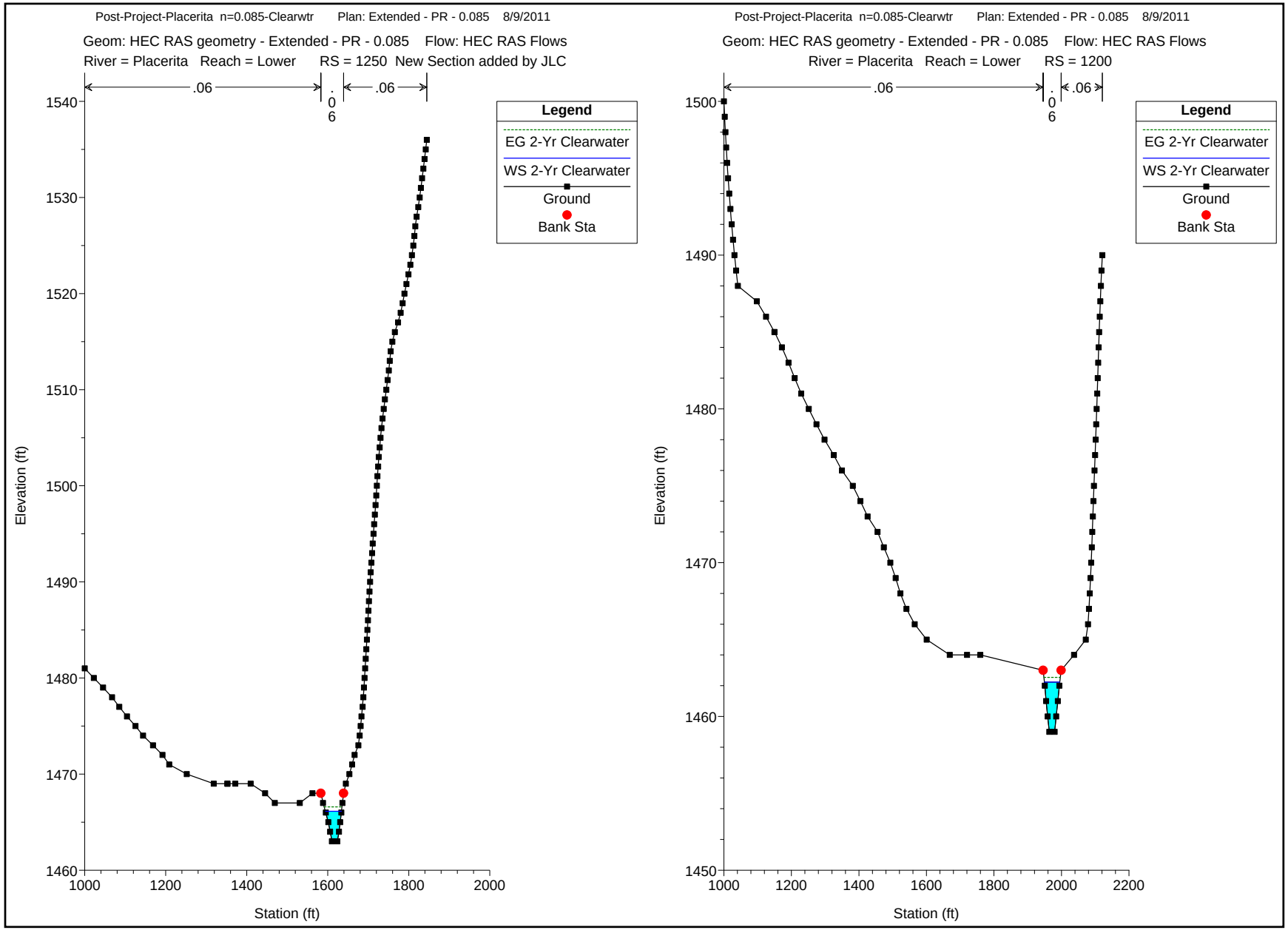

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 8
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500
1600
1700
Station (ft)

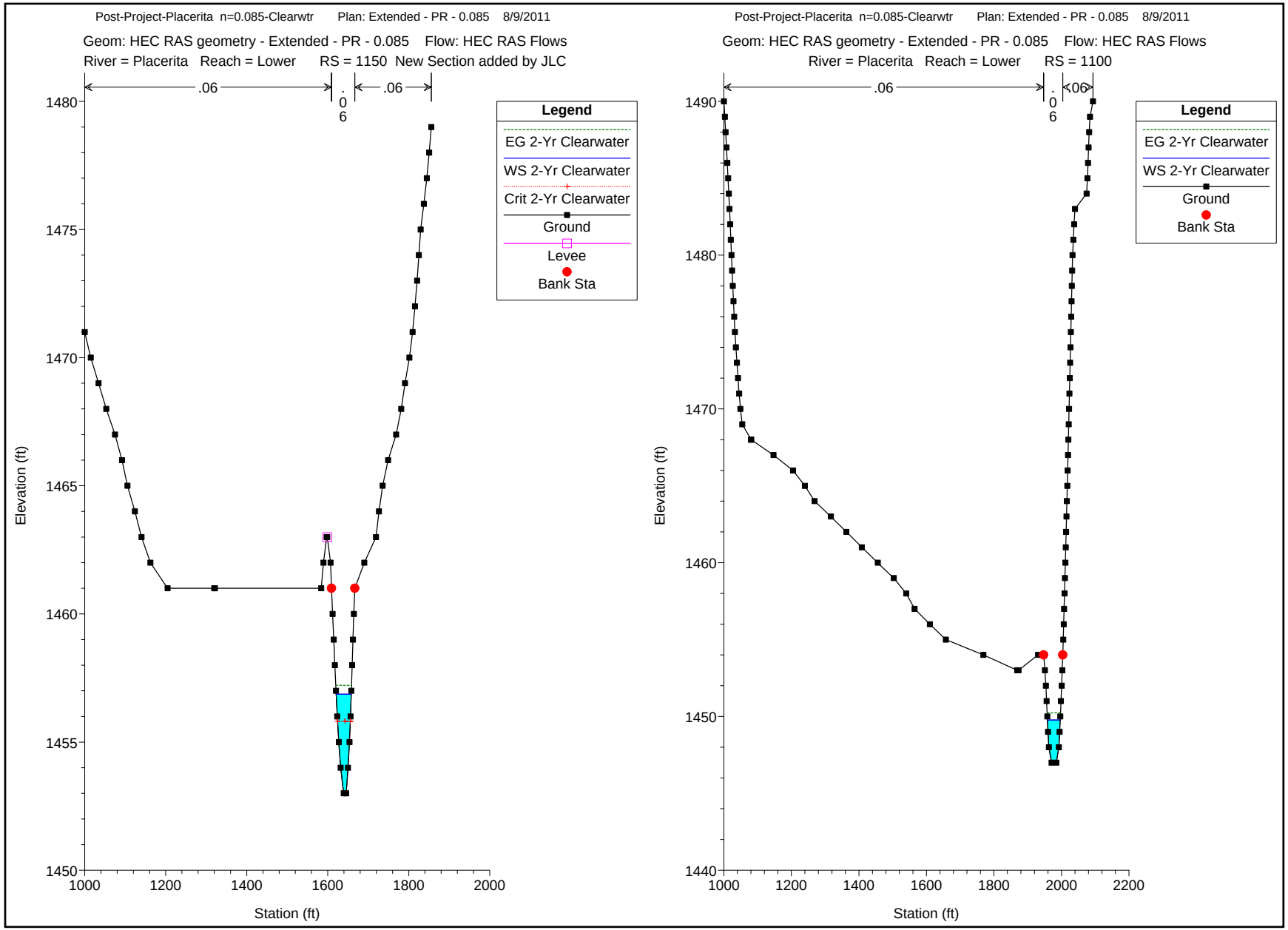

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 7
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1415
1410
1405
1400
1395
1390
1385
1000
1200
1400
1600
1800
2000
Station (ft)

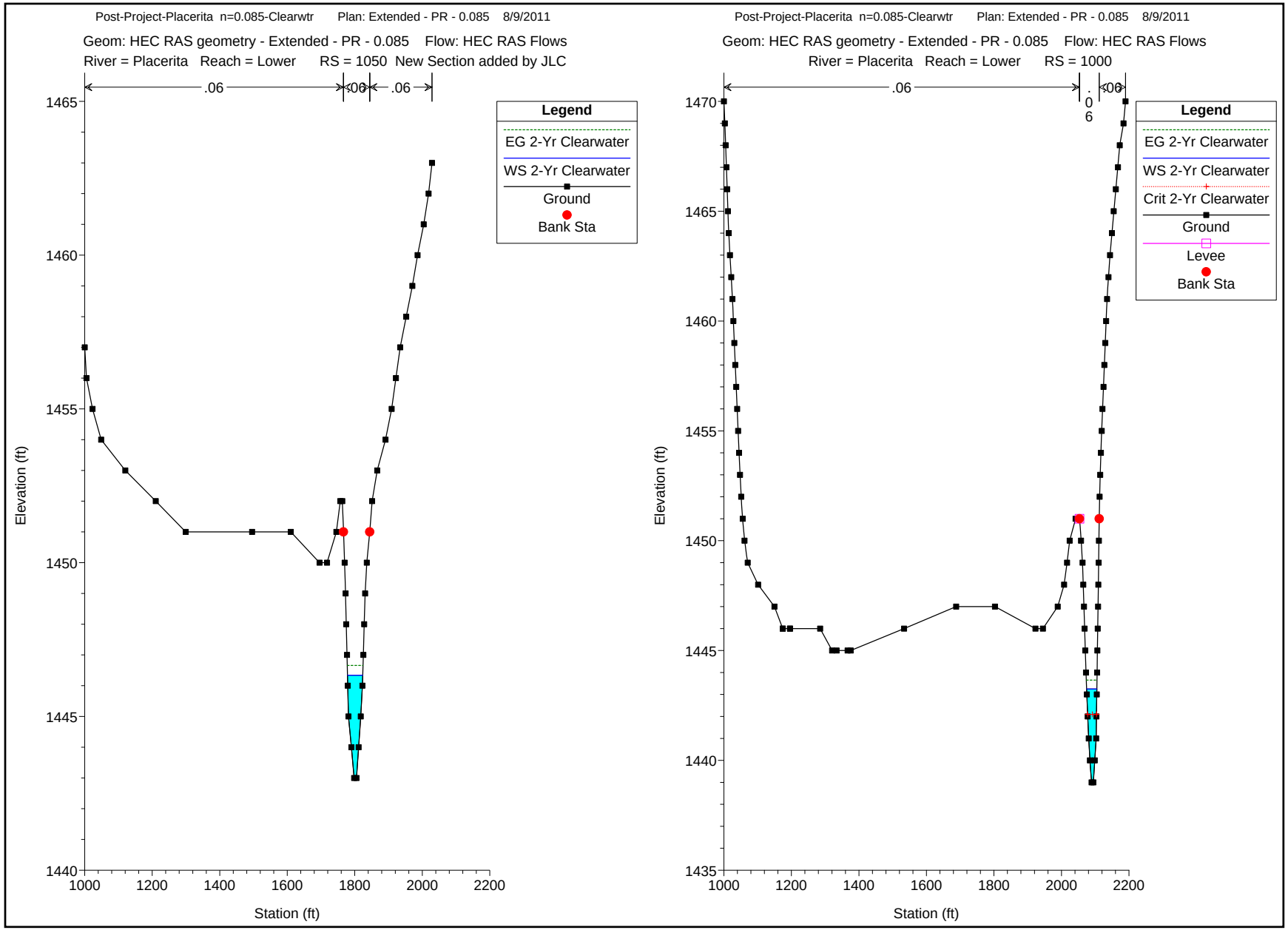

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 6
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 5
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)


Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 4
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 3
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)


Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1300
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)


Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1250 New Section added by JLC
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1200
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

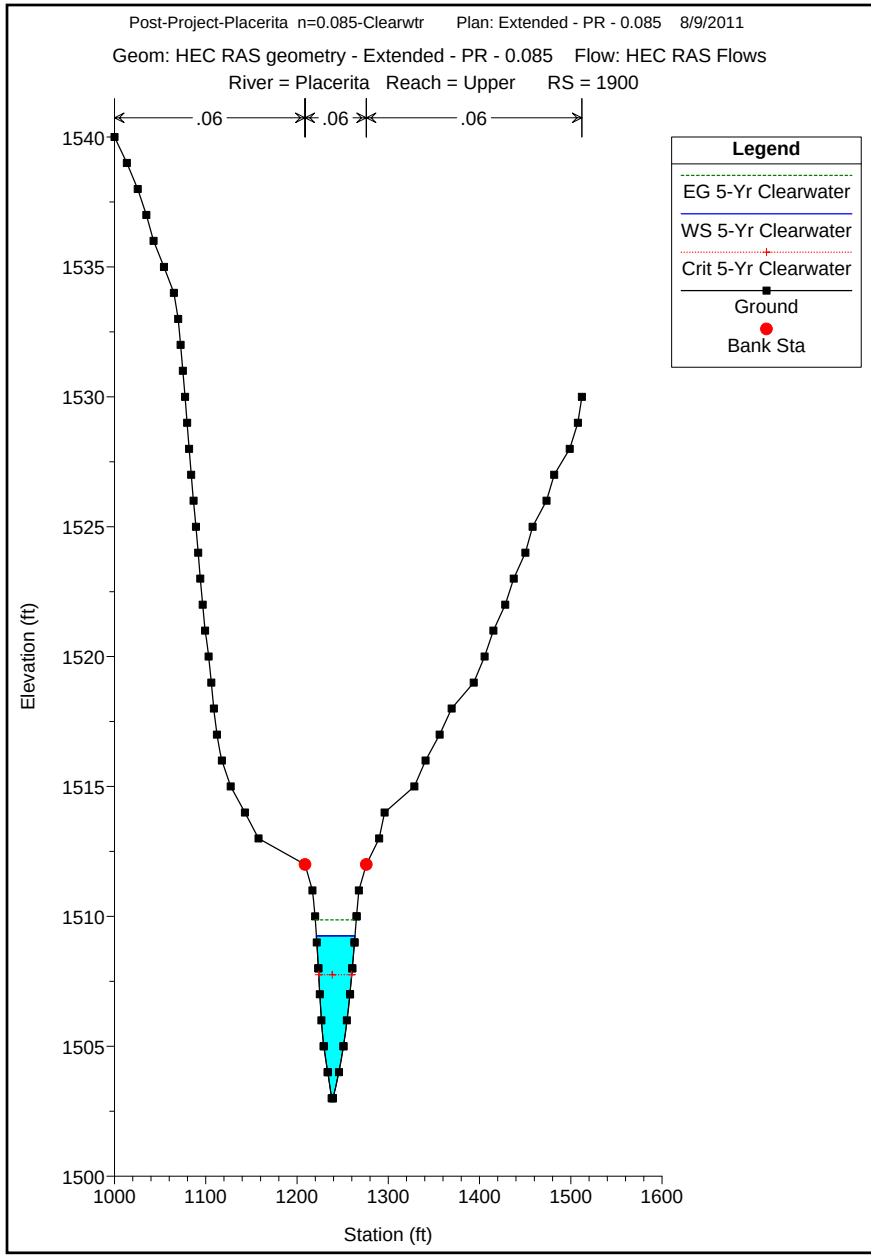

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1150 New Section added by JLC
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1100
.06
.06
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

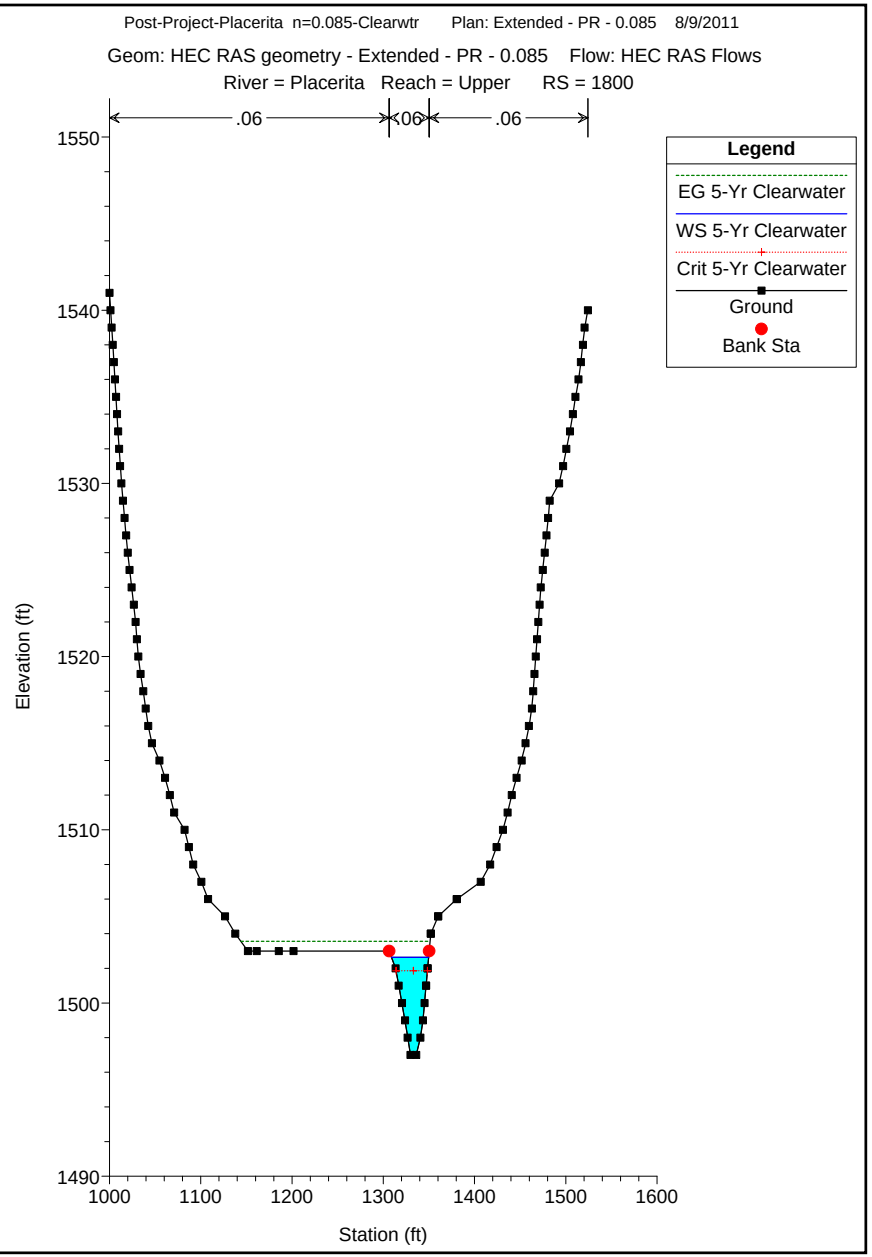

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1050 New Section added by JLC
.06
.00
.06
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1000
.06
.00
Legend
EG 2-Yr Clearwater
WS 2-Yr Clearwater
Crit 2-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

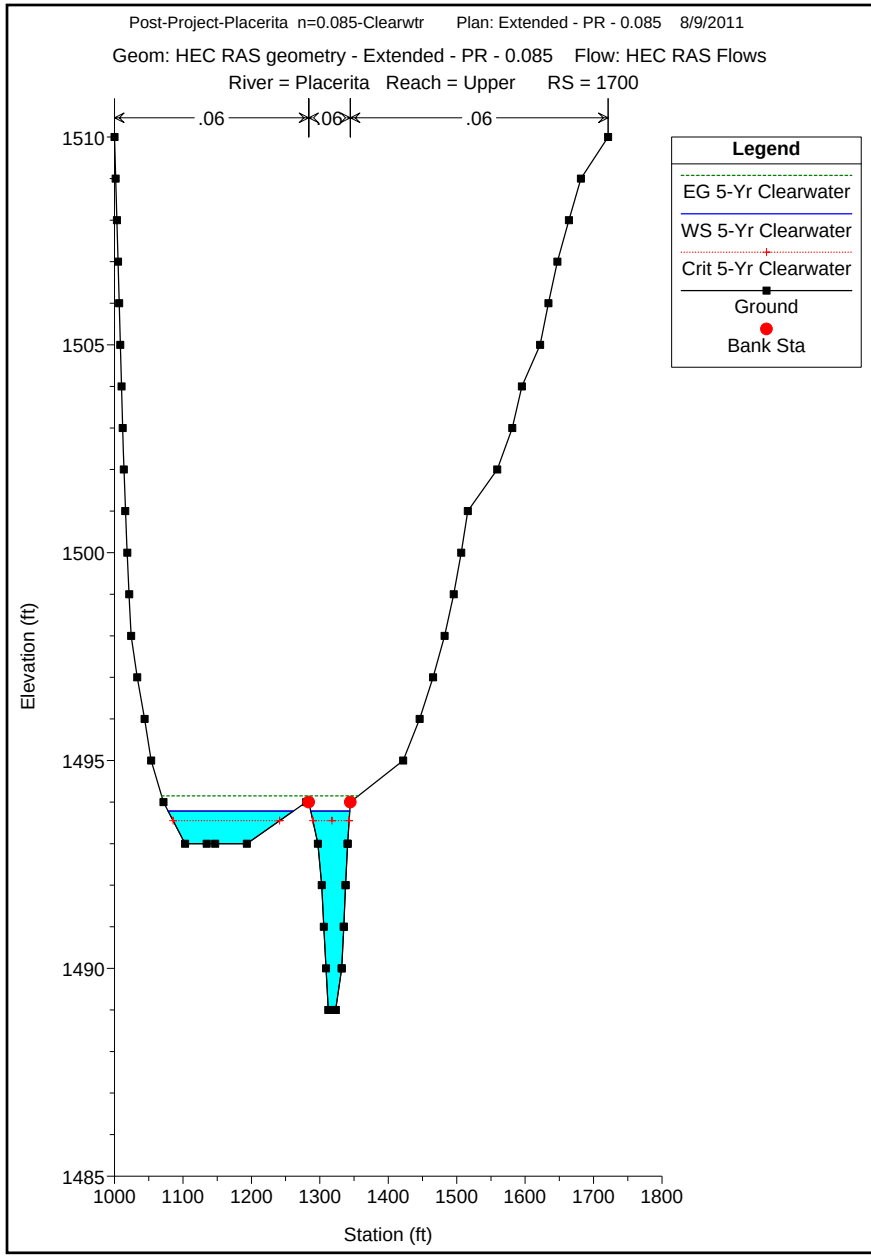
5-Year Storm Event – Post Project Condition HEC-RAS Output

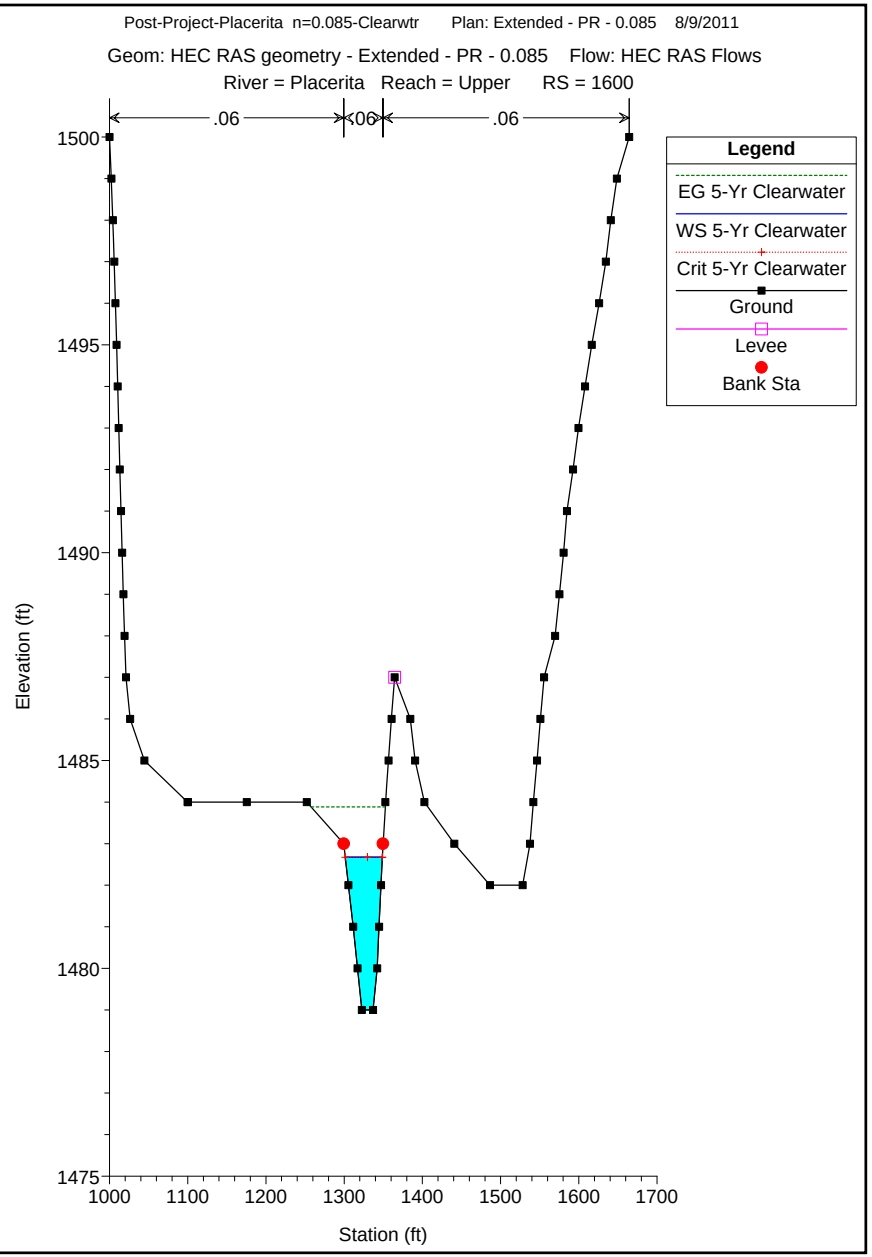
HEC-RAS Plan: Ex_PR_0.085 Profile: 5-Yr Clearwater

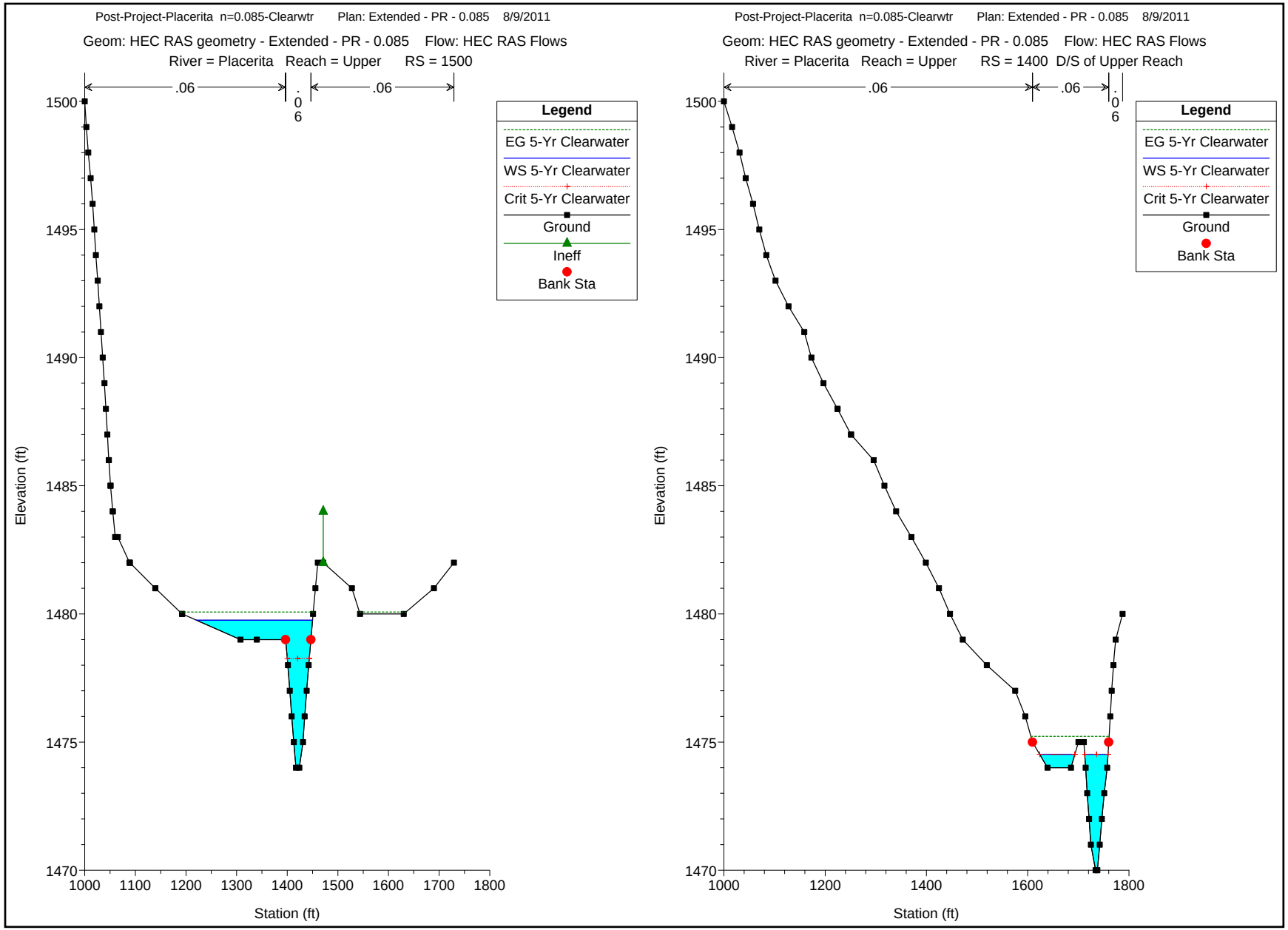
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Upper	1900	5-Yr Clearwater	1029.10	1503.00	1509.25	1507.76	1509.86	0.011302	6.27	164.09	42.41	0.56
Upper	1800	5-Yr Clearwater	1029.10	1497.00	1502.64	1501.86	1503.56	0.021425	7.73	133.15	40.70	0.75
Upper	1700	5-Yr Clearwater	1029.10	1489.00	1493.78	1493.55	1494.15	0.012751	5.34	260.29	239.71	0.57
Upper	1600	5-Yr Clearwater	1029.10	1479.00	1482.68	1482.67	1483.89	0.039329	8.82	116.62	47.50	0.99
Upper	1500	5-Yr Clearwater	1029.10	1474.00	1479.76	1478.26	1480.07	0.006831	4.81	285.90	229.54	0.44
Upper	1400	5-Yr Clearwater	1029.10	1470.00	1474.52	1474.52	1475.23	0.051184	6.72	153.18	115.57	1.03
Tributary	510	5-Yr Clearwater	228.80	1545.00	1547.37	1547.11	1547.89	0.030489	5.81	39.41	24.67	0.81
Tributary	410	5-Yr Clearwater	228.80	1524.00	1527.05	1526.85	1527.68	0.035351	6.40	40.76	129.96	0.87
Tributary	310	5-Yr Clearwater	228.80	1503.00	1505.15		1505.32	0.022971	3.34	69.15	92.24	0.64
Tributary	210	5-Yr Clearwater	228.80	1486.00	1488.03	1487.80	1488.51	0.031246	5.54	41.27	28.44	0.81
Tributary	110	5-Yr Clearwater	228.80	1479.00	1482.29		1482.56	0.010997	4.28	59.16	71.14	0.51
Tributary	10	5-Yr Clearwater	228.80	1471.00	1473.97	1473.97	1474.92	0.049486	7.83	29.23	15.66	1.01
Lower	1300	5-Yr Clearwater	1223.20	1468.00	1472.18	1470.95	1472.60	0.009880	5.24	241.96	131.91	0.52
Lower	1250	5-Yr Clearwater	1223.20	1463.00	1467.64	1467.64	1468.38	0.021631	7.23	203.44	150.51	0.75
Lower	1200	5-Yr Clearwater	1223.20	1459.00	1464.04	1462.92	1464.45	0.009017	5.49	319.22	372.67	0.51
Lower	1150	5-Yr Clearwater	1223.20	1453.00	1459.25	1457.61	1459.85	0.010415	6.24	196.15	48.54	0.55
Lower	1100	5-Yr Clearwater	1223.20	1447.00	1451.50		1452.50	0.021427	8.01	152.70	44.80	0.76
Lower	1050	5-Yr Clearwater	1223.20	1443.00	1448.70		1449.19	0.008786	5.61	218.03	56.34	0.50
Lower	1000	5-Yr Clearwater	1223.20	1439.00	1445.89	1444.14	1446.62	0.011116	6.85	178.66	38.51	0.56
Sound Stages	2527.261	5-Yr Clearwater	1244.80	1432.00	1436.81	1436.65	1438.16	0.033661	9.33	133.36	43.30	0.94
Sound Stages	2268.881	5-Yr Clearwater	1244.80	1425.00	1432.17	1430.87	1432.78	0.013196	6.29	197.86	56.30	0.59
Sound Stages	2007.81	5-Yr Clearwater	1244.80	1422.00	1426.00	1426.00	1427.08	0.042017	8.35	149.12	69.49	1.00
Sound Stages	1841.25	5-Yr Clearwater	1244.80	1419.00	1423.16	1421.45	1423.34	0.008446	3.40	365.90	117.72	0.34
Sound Stages	1644.9	5-Yr Clearwater	1244.80	1416.00	1420.91	1418.90	1421.30	0.012949	4.99	249.35	60.35	0.43
Sound Stages	1615		Bridge									
Sound Stages	1526.5	5-Yr Clearwater	1244.80	1414.00	1418.87		1419.55	0.029221	6.60	188.70	55.96	0.63
Sound Stages	1368.35	5-Yr Clearwater	1244.80	1412.00	1416.51		1416.81	0.010671	4.45	279.96	70.08	0.39
Sound Stages	1258.35	5-Yr Clearwater	1244.80	1410.00	1414.24		1414.88	0.032681	6.42	193.88	65.76	0.66
Sound Stages	1052.85	5-Yr Clearwater	1244.80	1405.12	1410.58		1410.90	0.012334	4.54	274.45	75.33	0.42
Sound Stages	865.5	5-Yr Clearwater	1244.80	1402.00	1408.36		1408.63	0.011666	4.17	298.60	90.01	0.40
Sound Stages	700.65	5-Yr Clearwater	1244.80	1398.00	1407.53	1403.32	1407.67	0.003304	3.03	410.79	75.58	0.23
Sound Stages	700		Culvert									
Sound Stages	9.076105	5-Yr Clearwater	1244.80	1390.00	1396.92		1397.52	0.009523	6.26	207.43	69.31	0.53
Sound Stages	8	5-Yr Clearwater	1244.80	1390.00	1396.57	1395.17	1397.06	0.010070	5.89	265.83	196.06	0.53
Sound Stages	7	5-Yr Clearwater	1340.40	1388.00	1389.92	1389.92	1390.62	0.048025	6.76	198.33	142.63	1.01
Sound Stages	6	5-Yr Clearwater	1340.40	1378.00	1384.00	1383.24	1384.07	0.003504	3.04	764.19	652.52	0.30
Sound Stages	5	5-Yr Clearwater	1340.40	1376.00	1379.21	1379.21	1380.41	0.039593	8.86	153.36	64.52	1.00
Sound Stages	4	5-Yr Clearwater	1340.40	1362.00	1369.18	1367.15	1369.78	0.009181	6.23	215.25	47.62	0.52
Sound Stages	3	5-Yr Clearwater	1375.60	1356.00	1361.70	1360.26	1362.44	0.012528	6.91	199.10	48.19	0.60
Sound Stages	2	5-Yr Clearwater	1375.60	1348.00	1352.48	1351.37	1352.85	0.010208	4.95	301.95	220.57	0.52

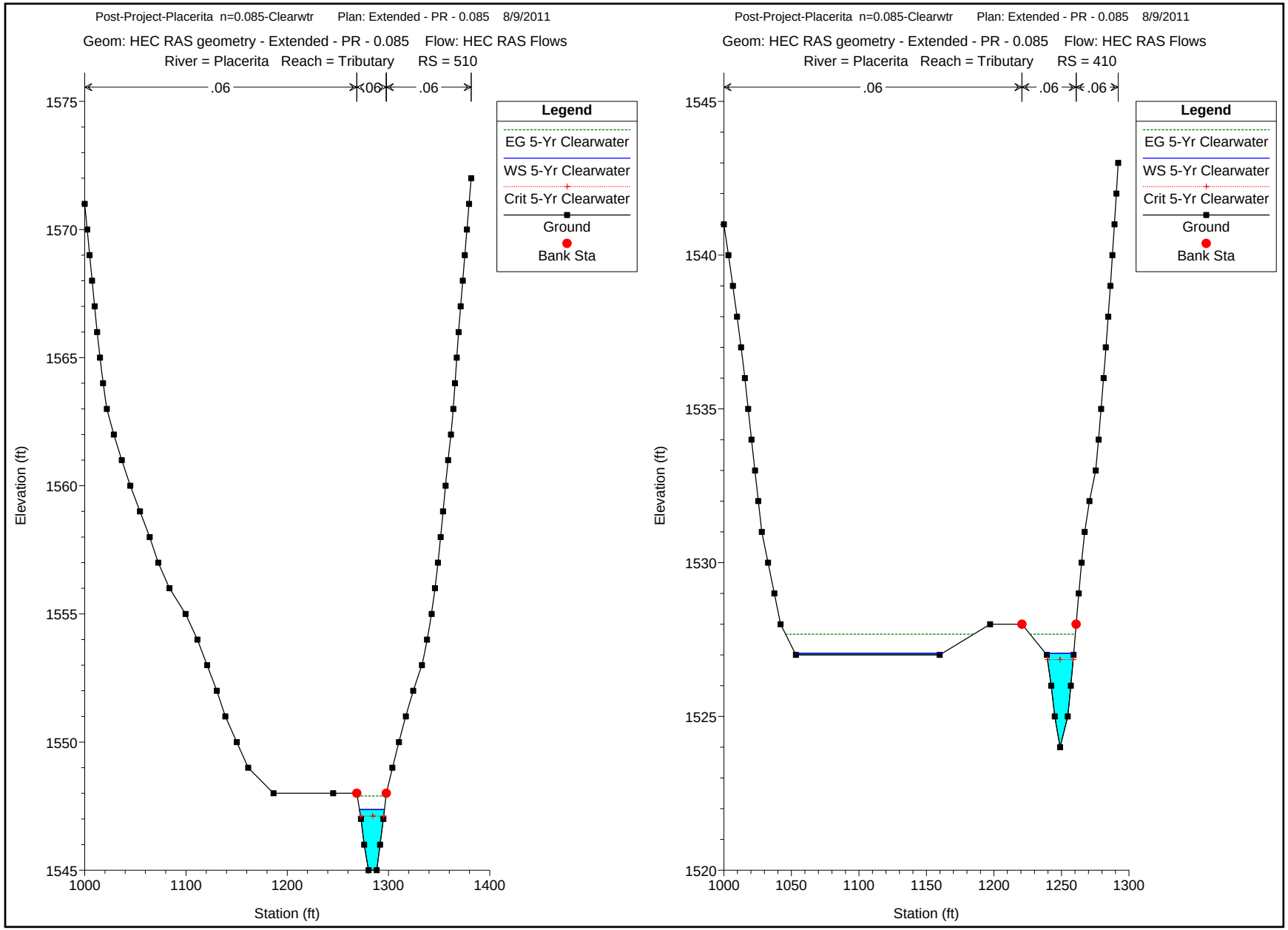

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1900
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1540
1535
1530
1525
1520
1515
1510
1505
1500
1000
1100
1200
1300
1400
1500
1600
Station (ft)

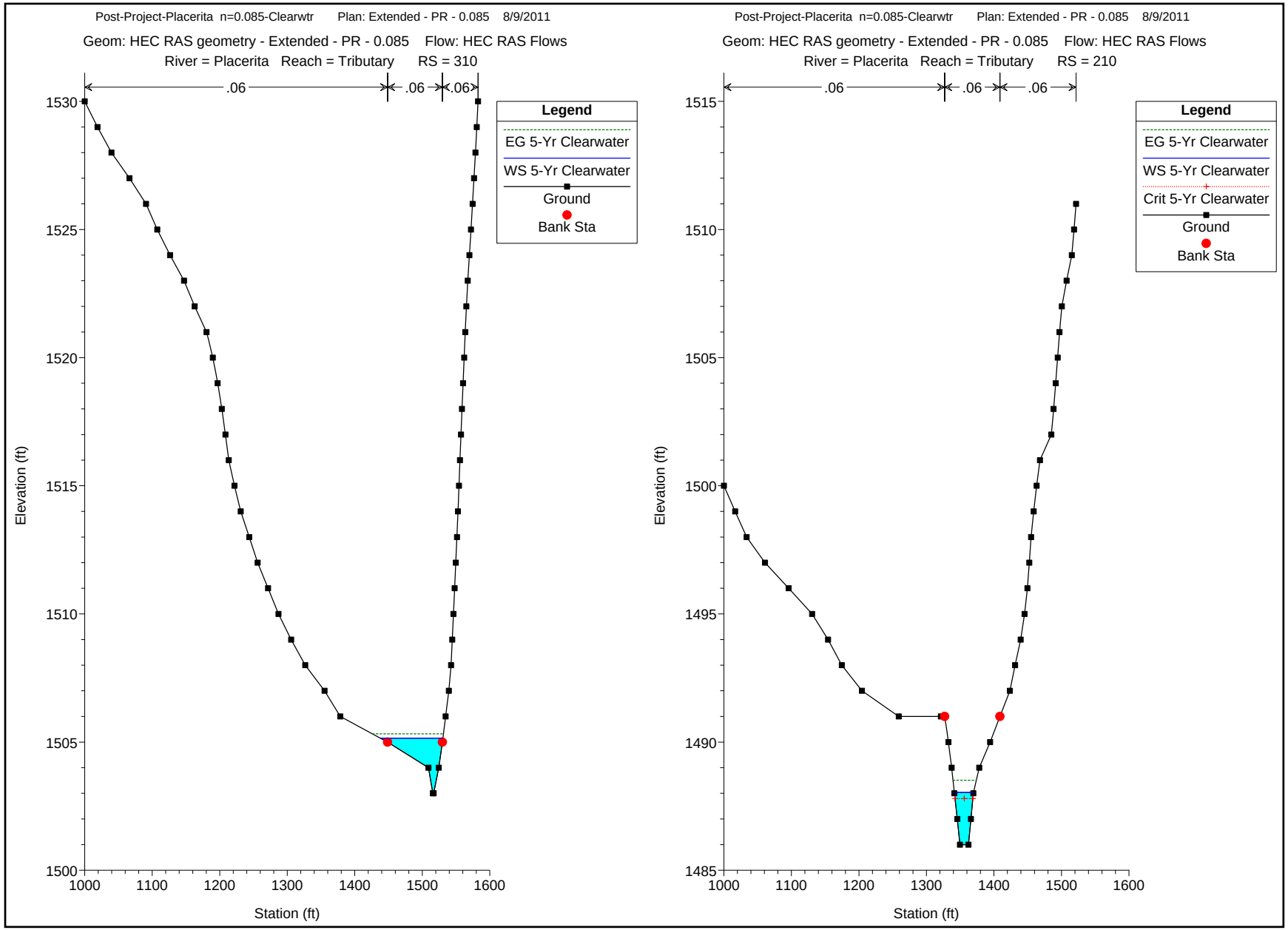

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1800
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1550
1540
1530
1520
1510
1500
1490
1000
1100
1200
1300
1400
1500
1600
Station (ft)

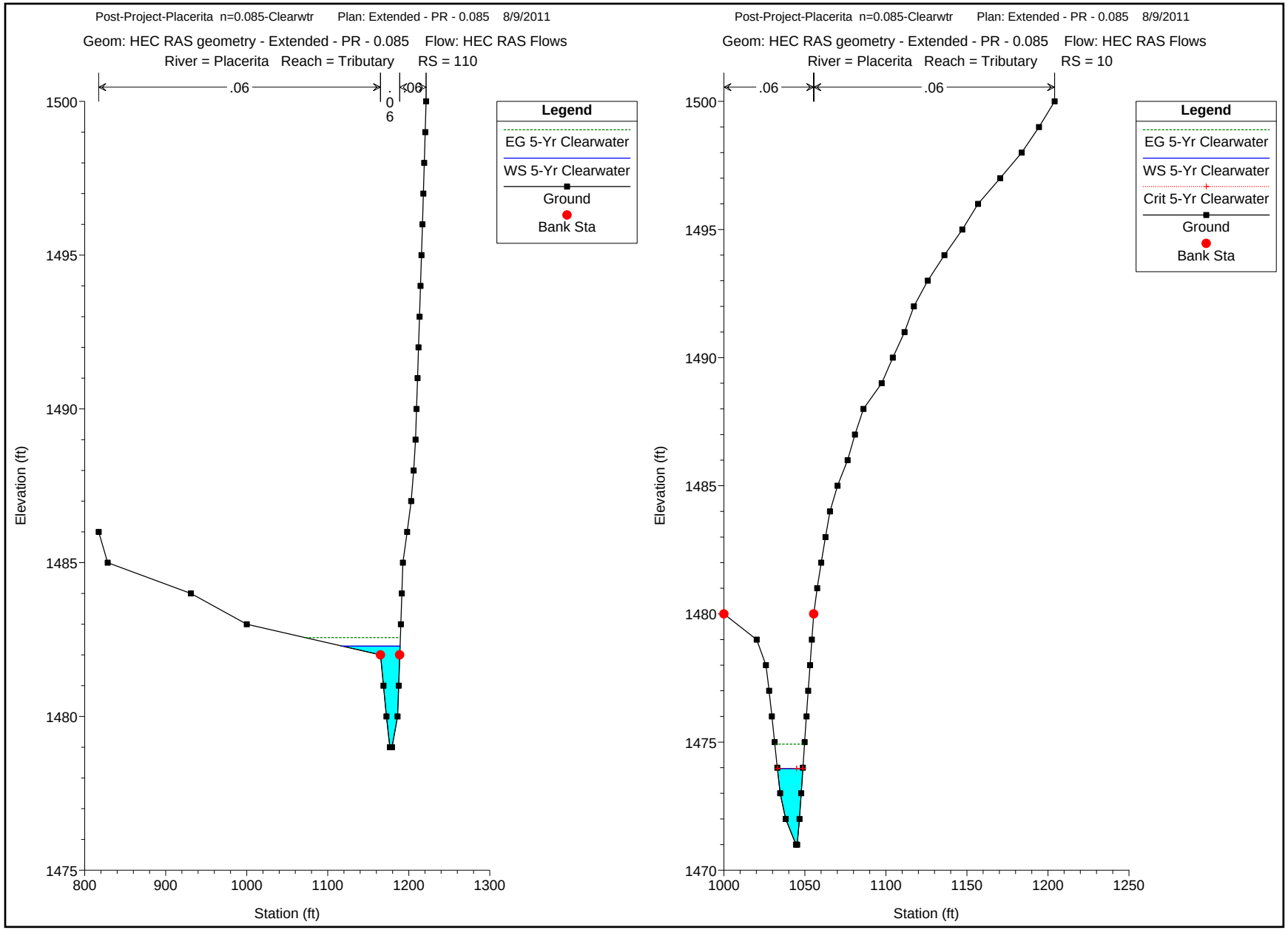

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1700
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1510
1505
1500
1495
1490
1485
1000
1100
1200
1300
1400
1500
1600
1700
1800
Station (ft)

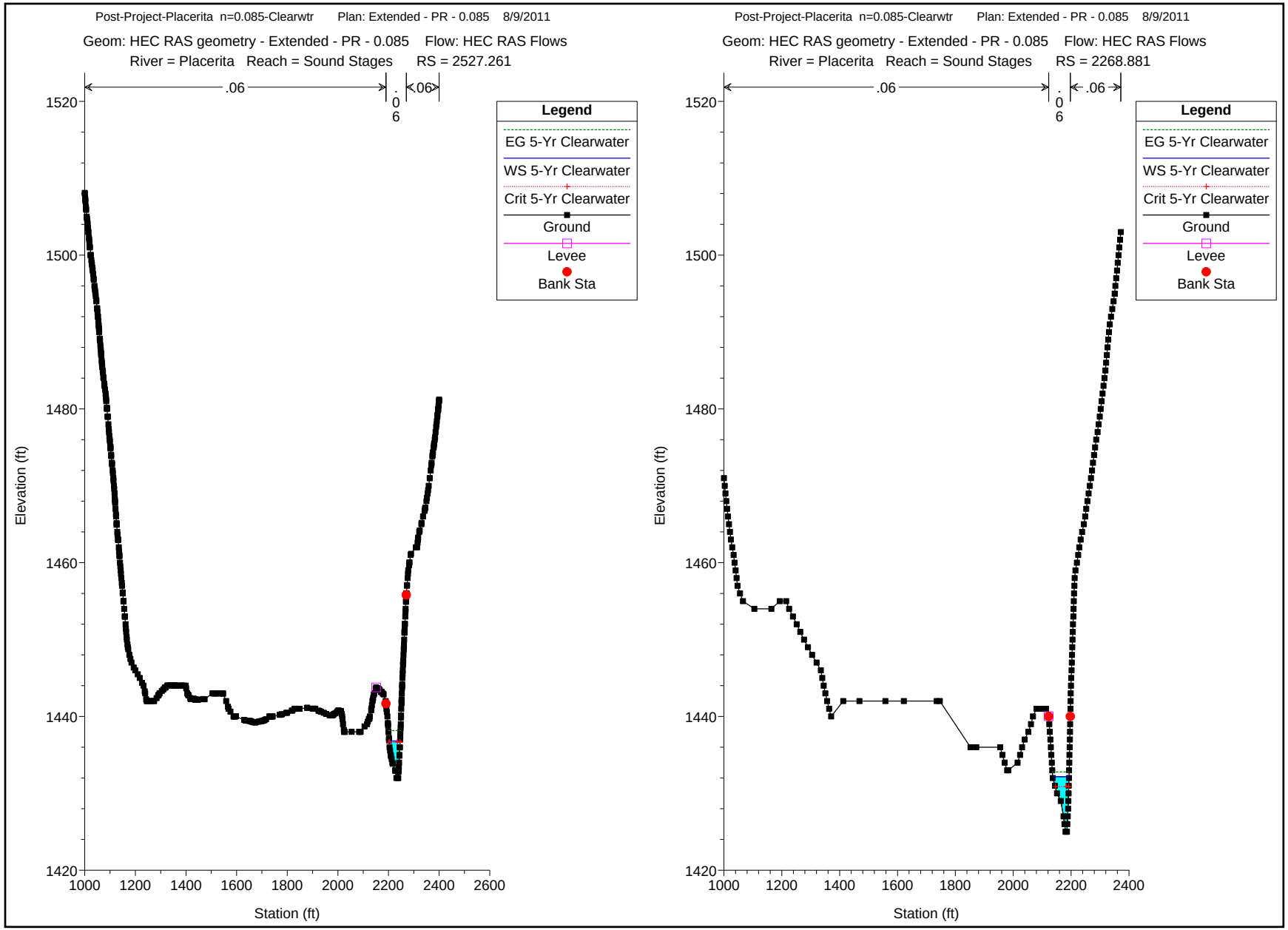

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1600
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
1500
1495
1490
1485
1480
1475
1000
1100
1200
1300
1400
1500
1600
1700
Station (ft)

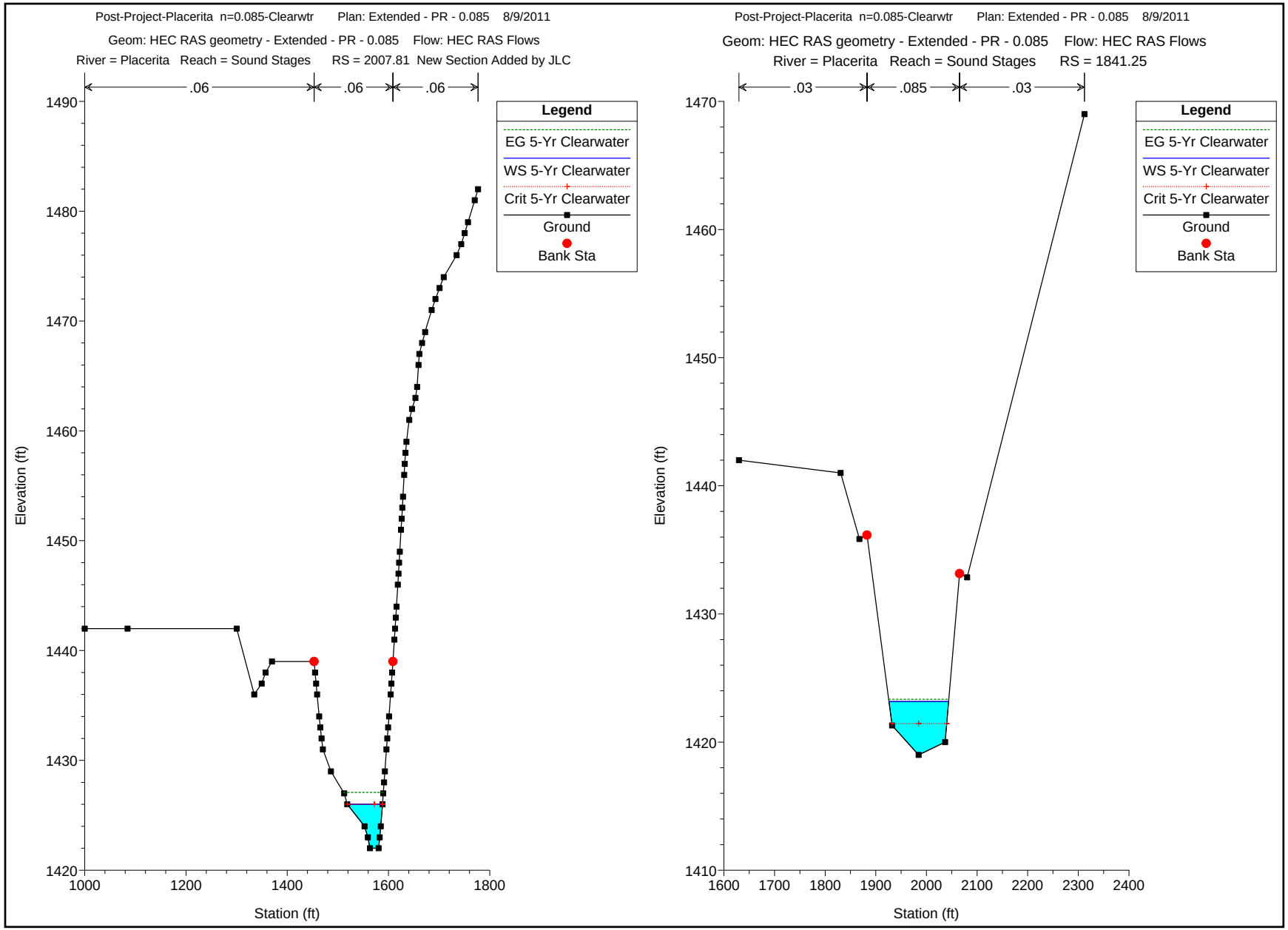

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1500
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1400 D/S of Upper Reach
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

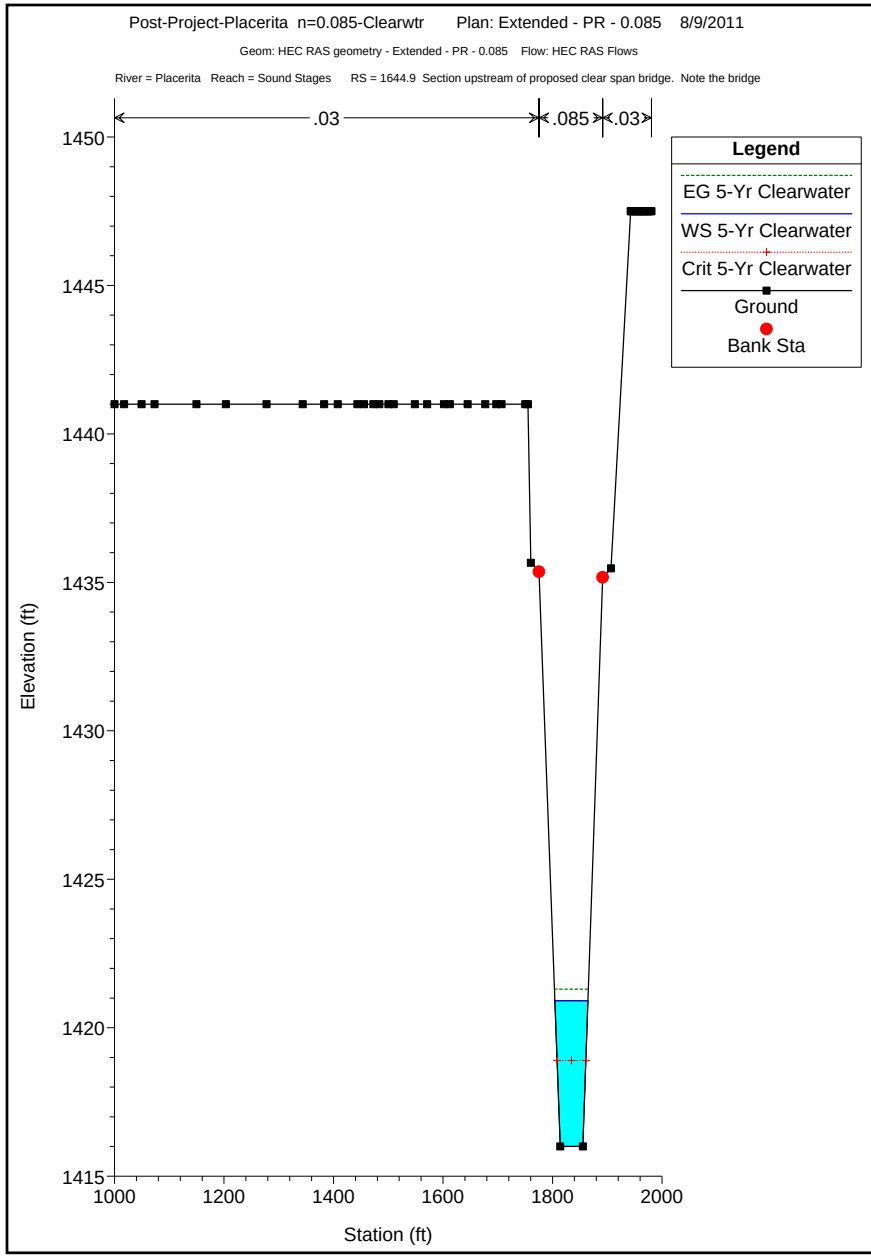

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 510
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 410
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

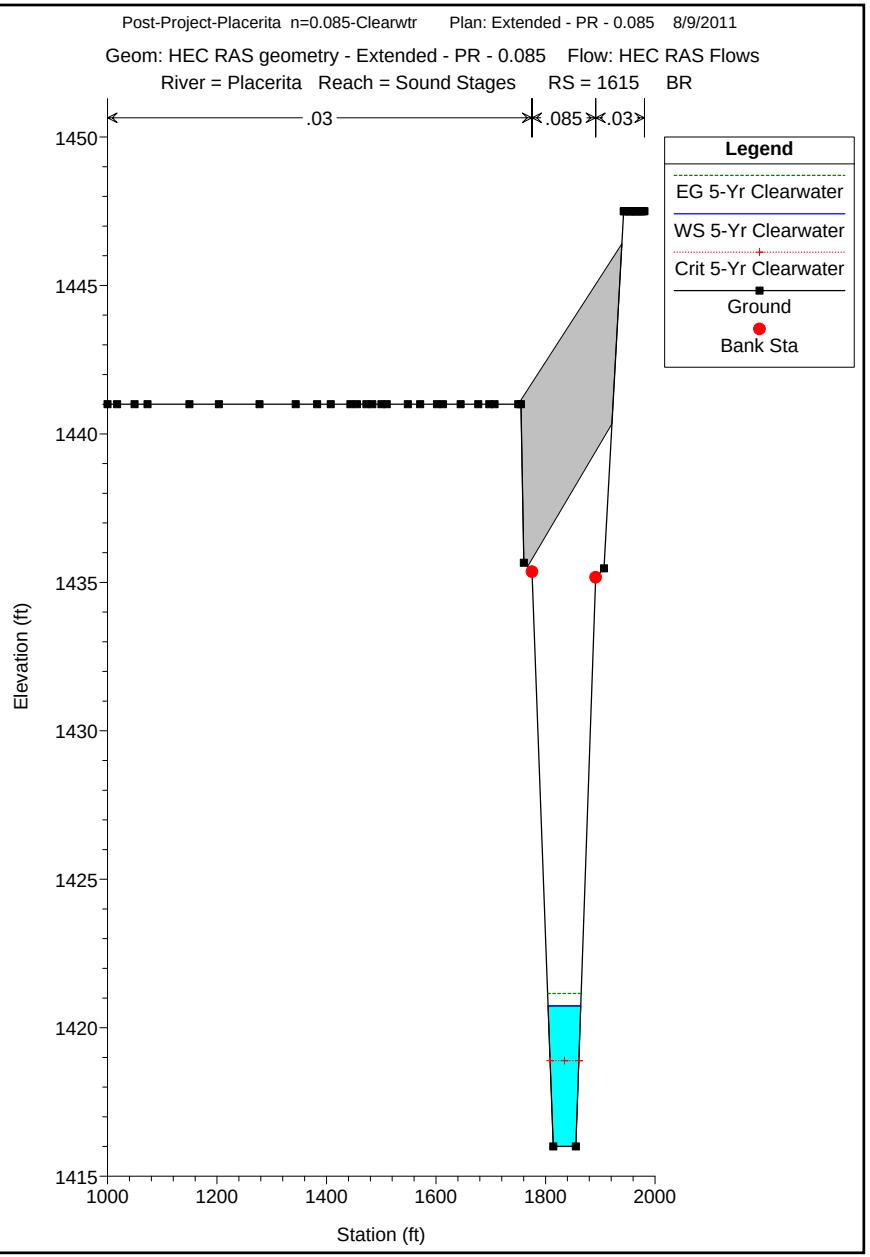

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 310
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1530
1525
1520
1515
1510
1505
1500
1000
1100
1200
1300
1400
1500
1600
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 210
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1515
1510
1505
1500
1495
1490
1485
1000
1100
1200
1300
1400
1500
1600

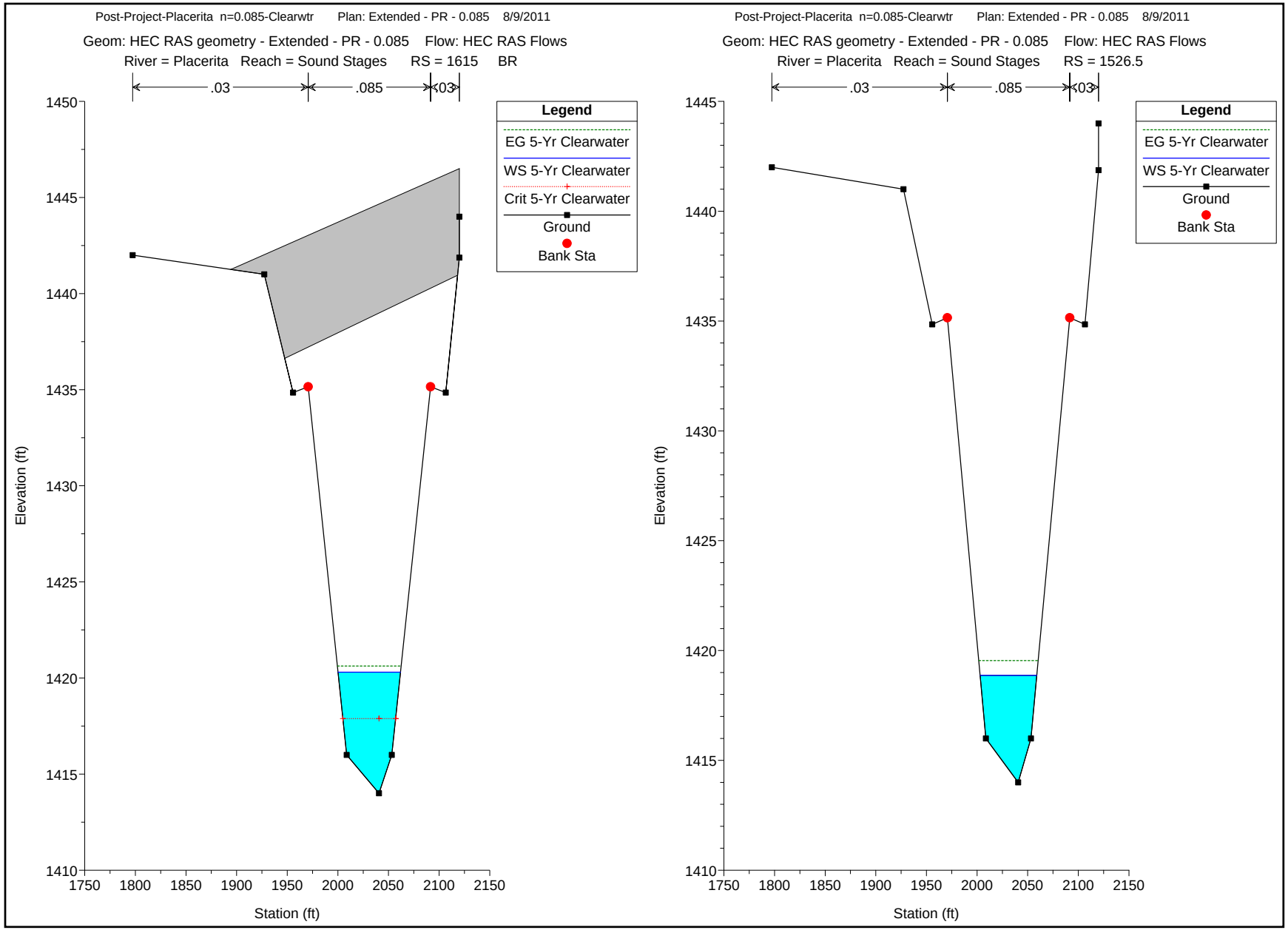

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 110
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
800
900
1000
1100
1200
1300
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 10
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1050
1100
1150
1200
1250

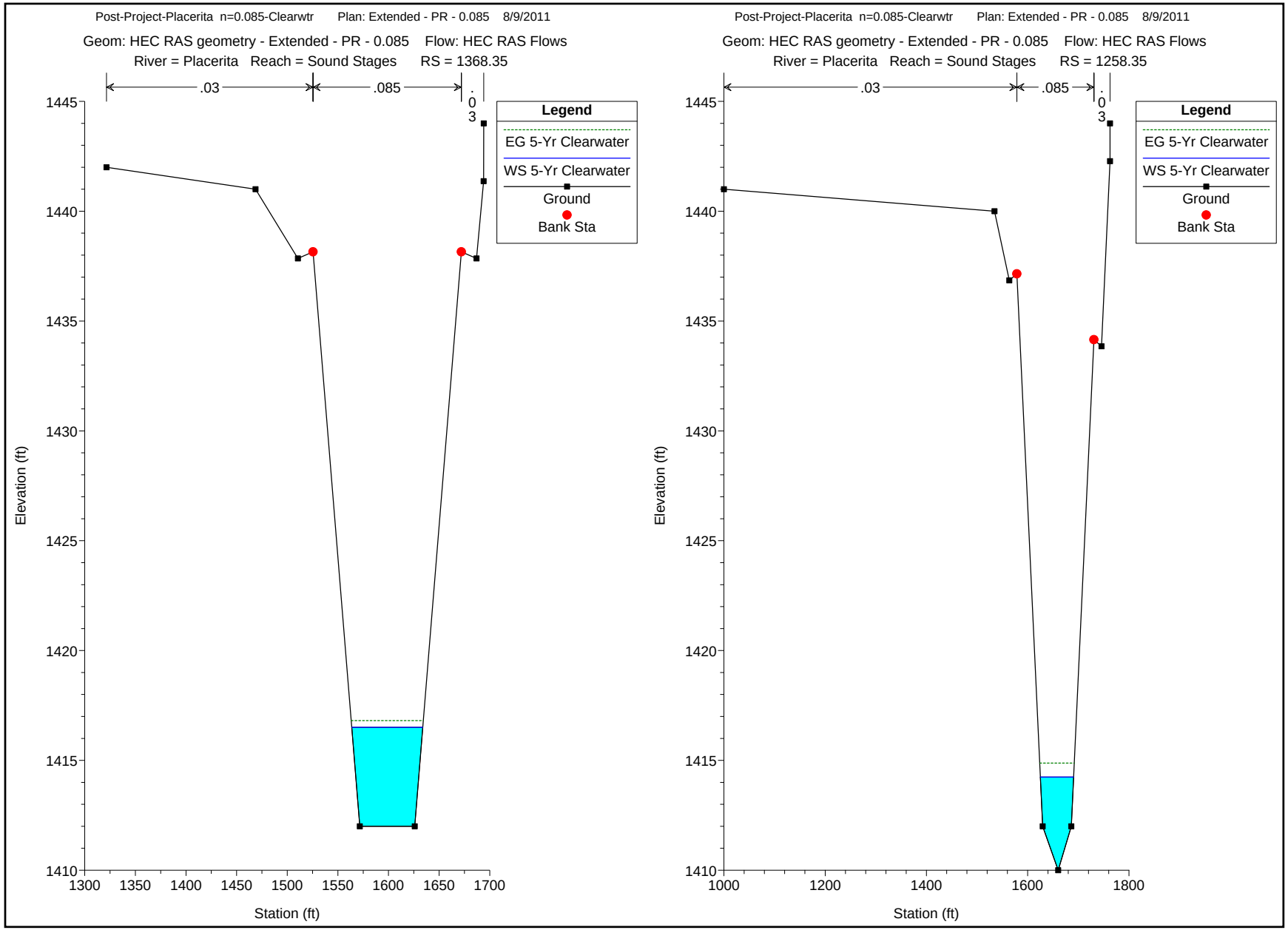

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2527.261
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2268.881
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

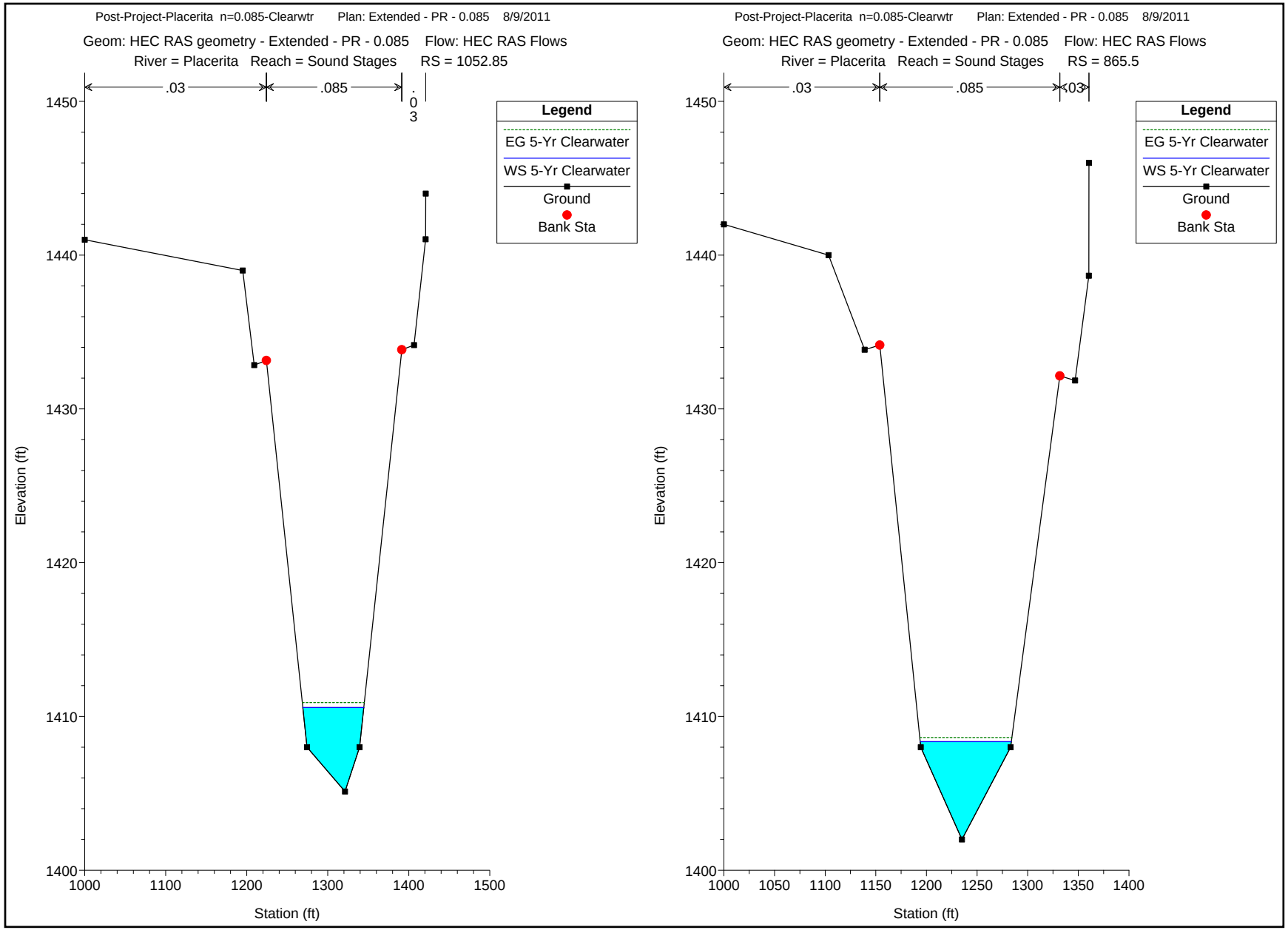

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2007.81 New Section Added by JLC
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1841.25
.03
.085
.03
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)


Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1644.9 Section upstream of proposed clear span bridge. Note the bridge
.03
.085
.03
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1445
1440
1435
1430
1425
1420
1415
1000
1200
1400
1600
1800
2000


Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1615 BR
.03
.085
.03
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1445
1440
1435
1430
1425
1420
1415
1000
1200
1400
1600
1800
2000


Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1615 BR
.03
.085
.03
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1526.5
.03
.085
.03
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)


Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1368.35
.03
.085
.03
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1445
1440
1435
1430
1425
1420
1415
1410
1300
1350
1400
1450
1500
1550
1600
1650
1700
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1258.35
.03
.085
.03
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1445
1440
1435
1430
1425
1420
1415
1410
1000
1200
1400
1600
1800


Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1052.85
.03
.085
.03
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1440
1430
1420
1410
1400
1000
1100
1200
1300
1400
1500
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 865.5
.03
.085
.03
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1440
1430
1420
1410
1400
1000
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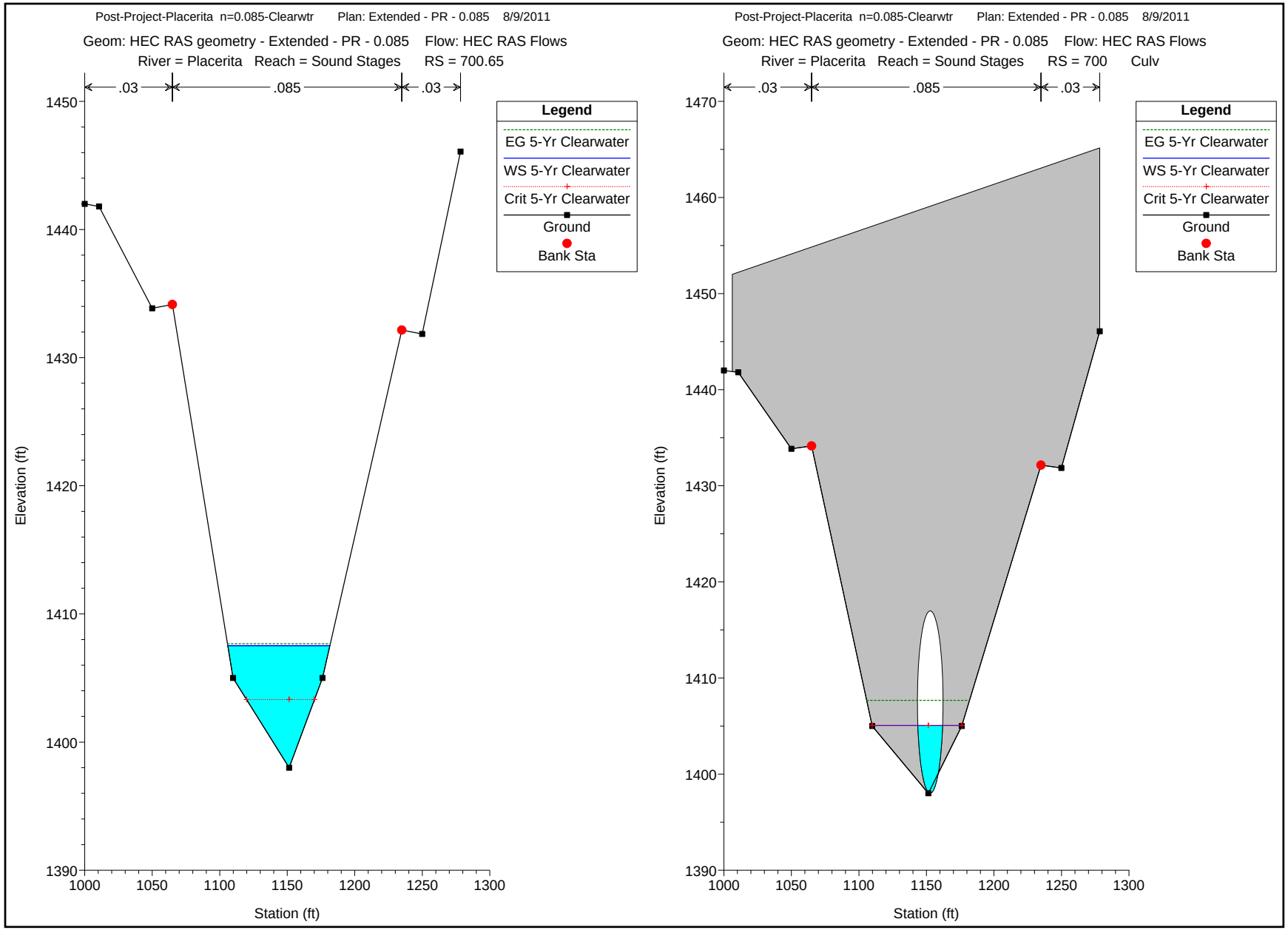
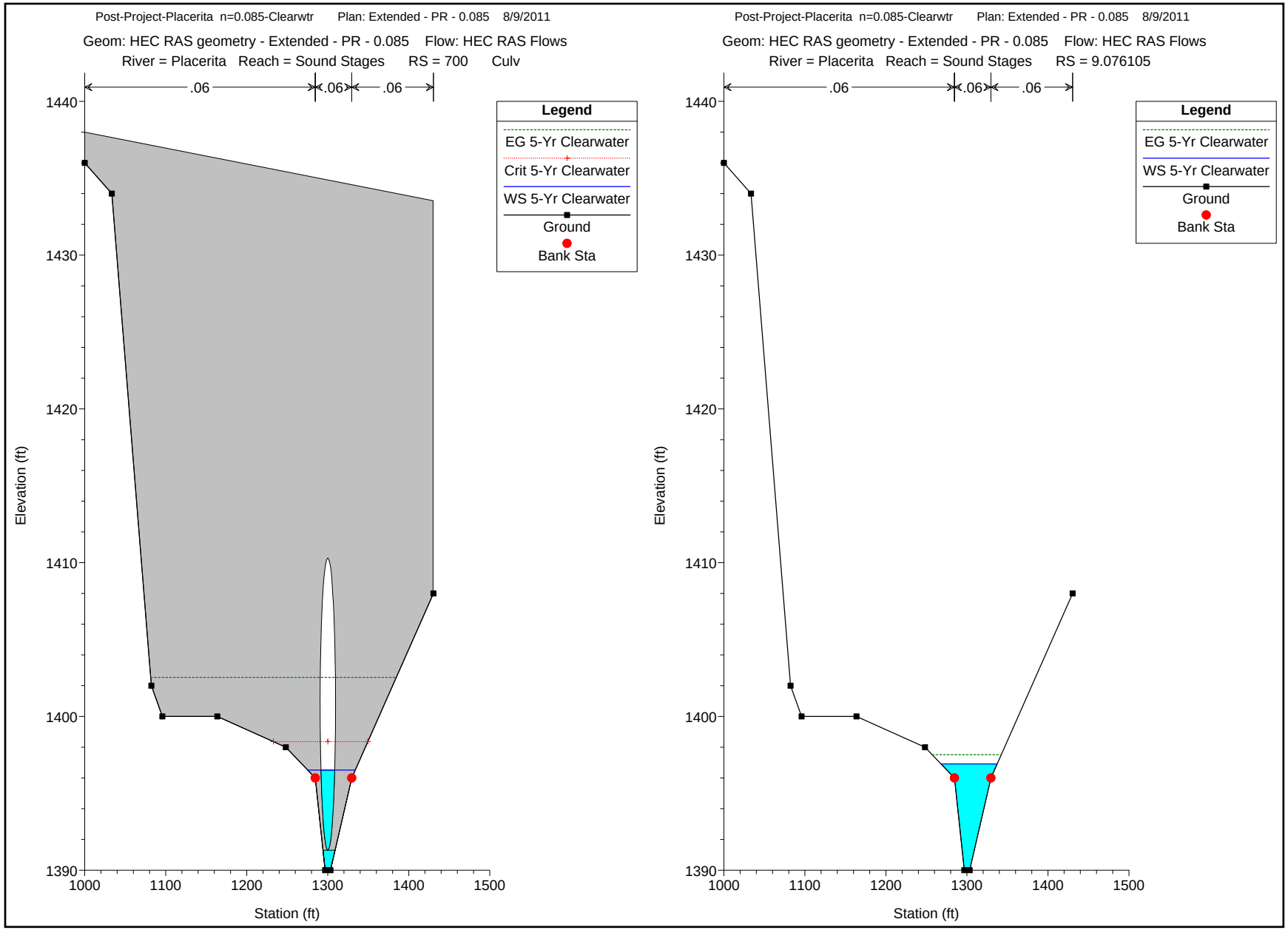
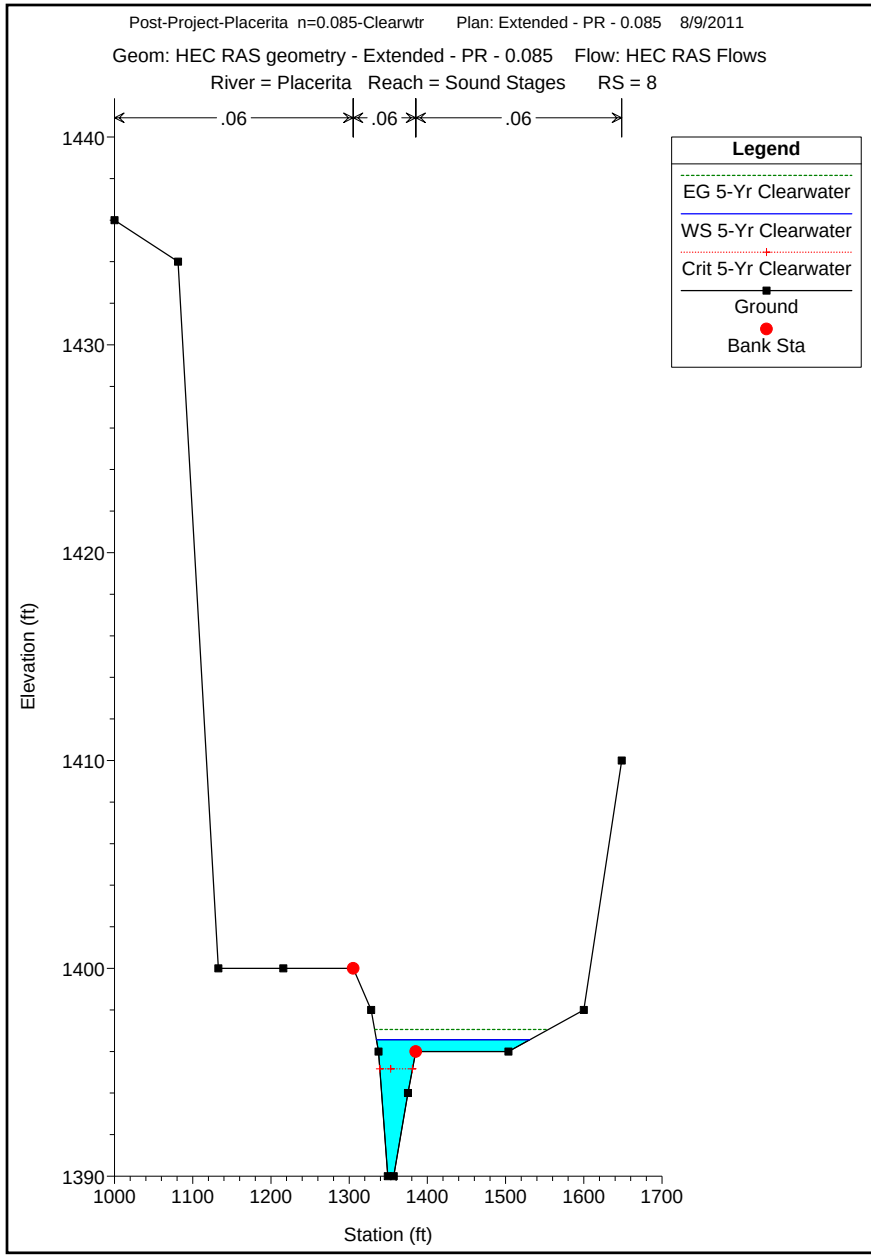
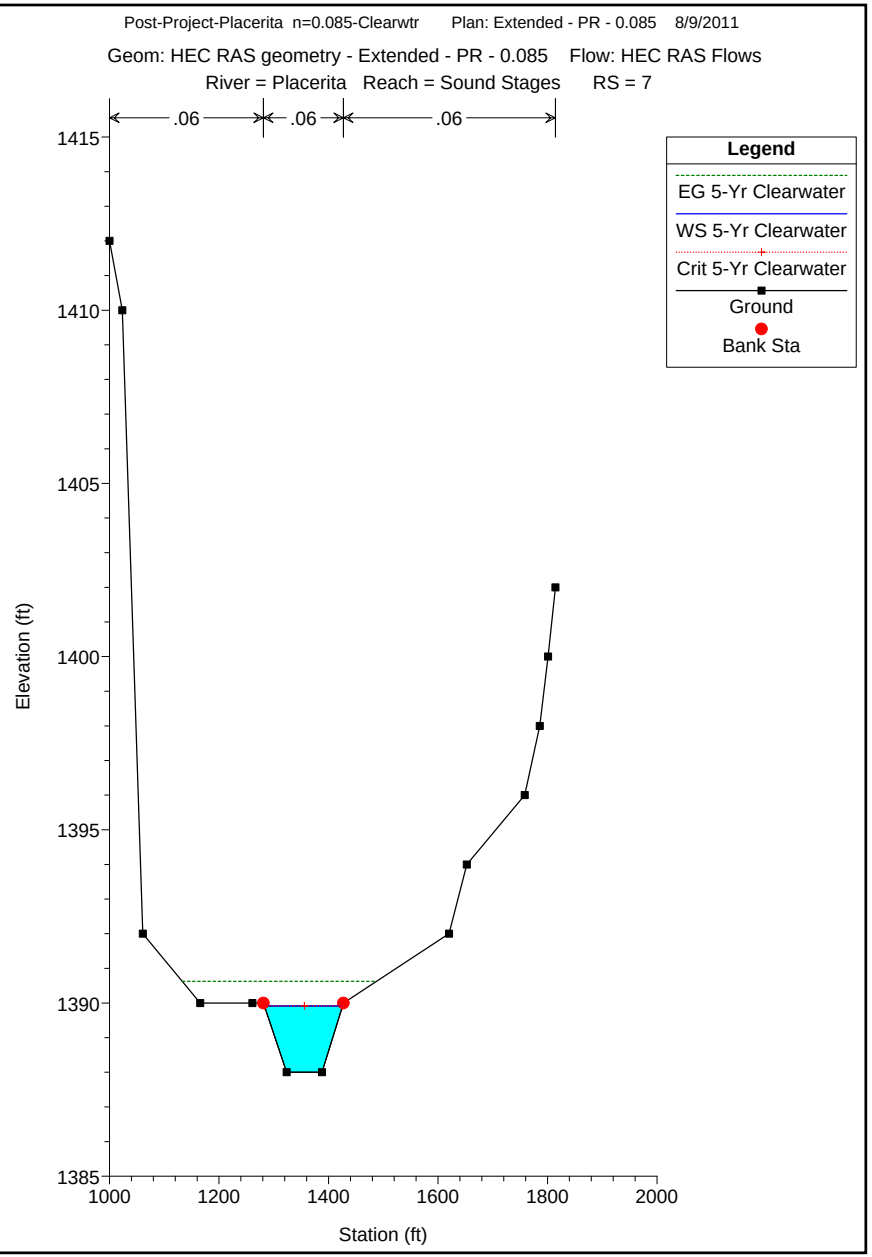
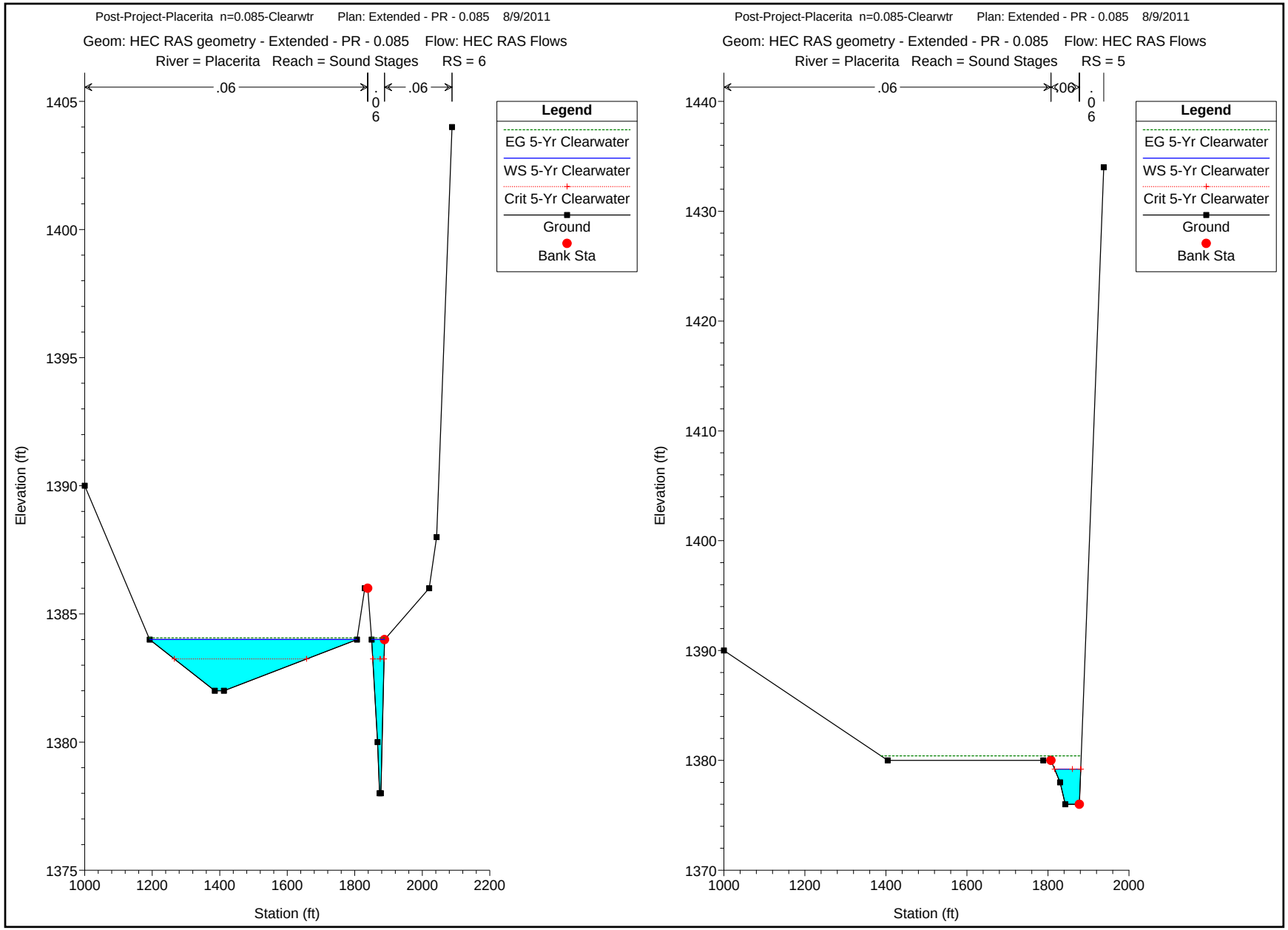
1100
1150
1200
1250
1300
1350
1400

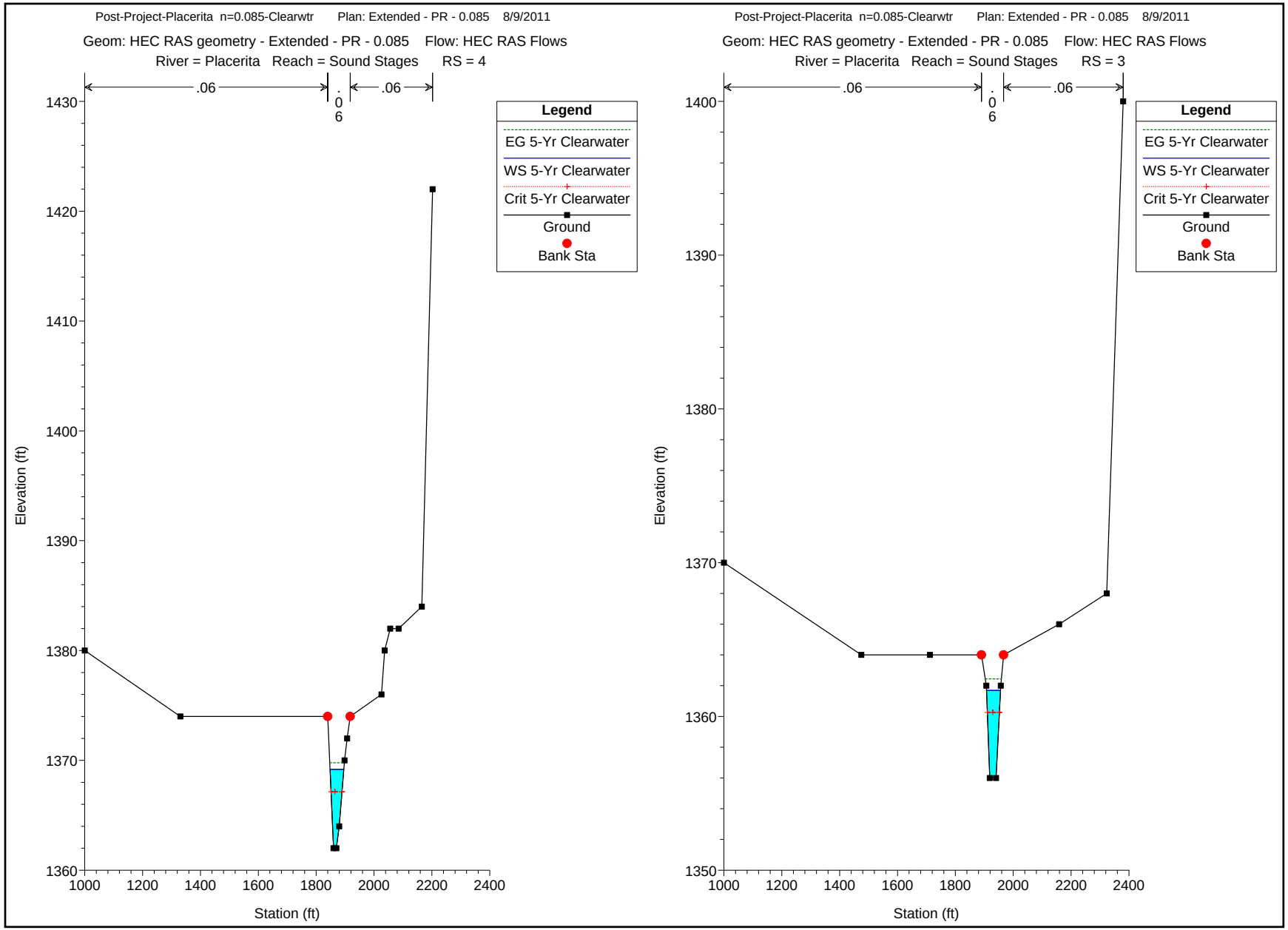

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700.65
.03
.085
.03
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700 Culv
.03
.085
.03
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

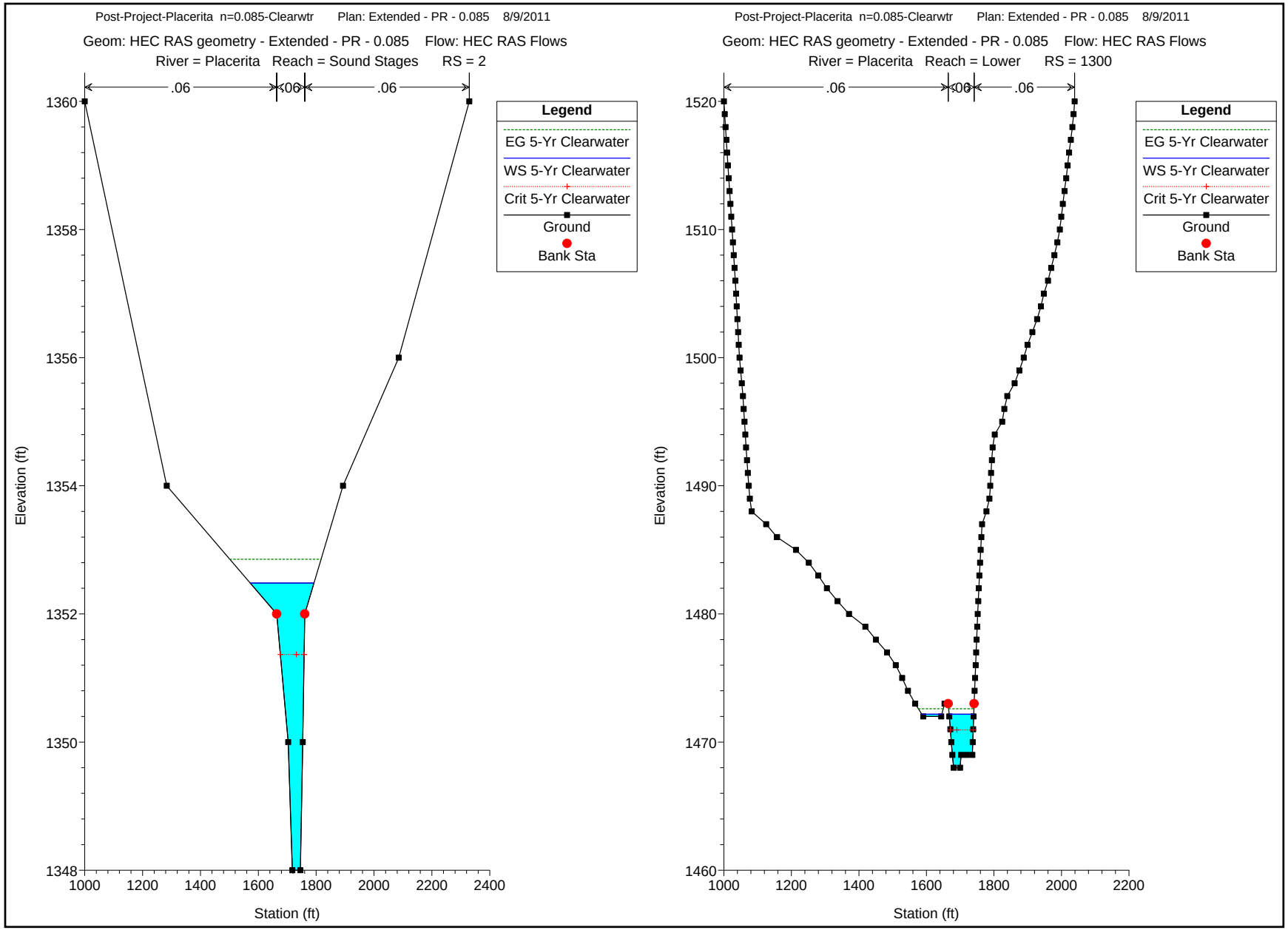

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700 Culv
.06
.06
.06
Legend
EG 5-Yr Clearwater
Crit 5-Yr Clearwater
WS 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 9.076105
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500
Station (ft)

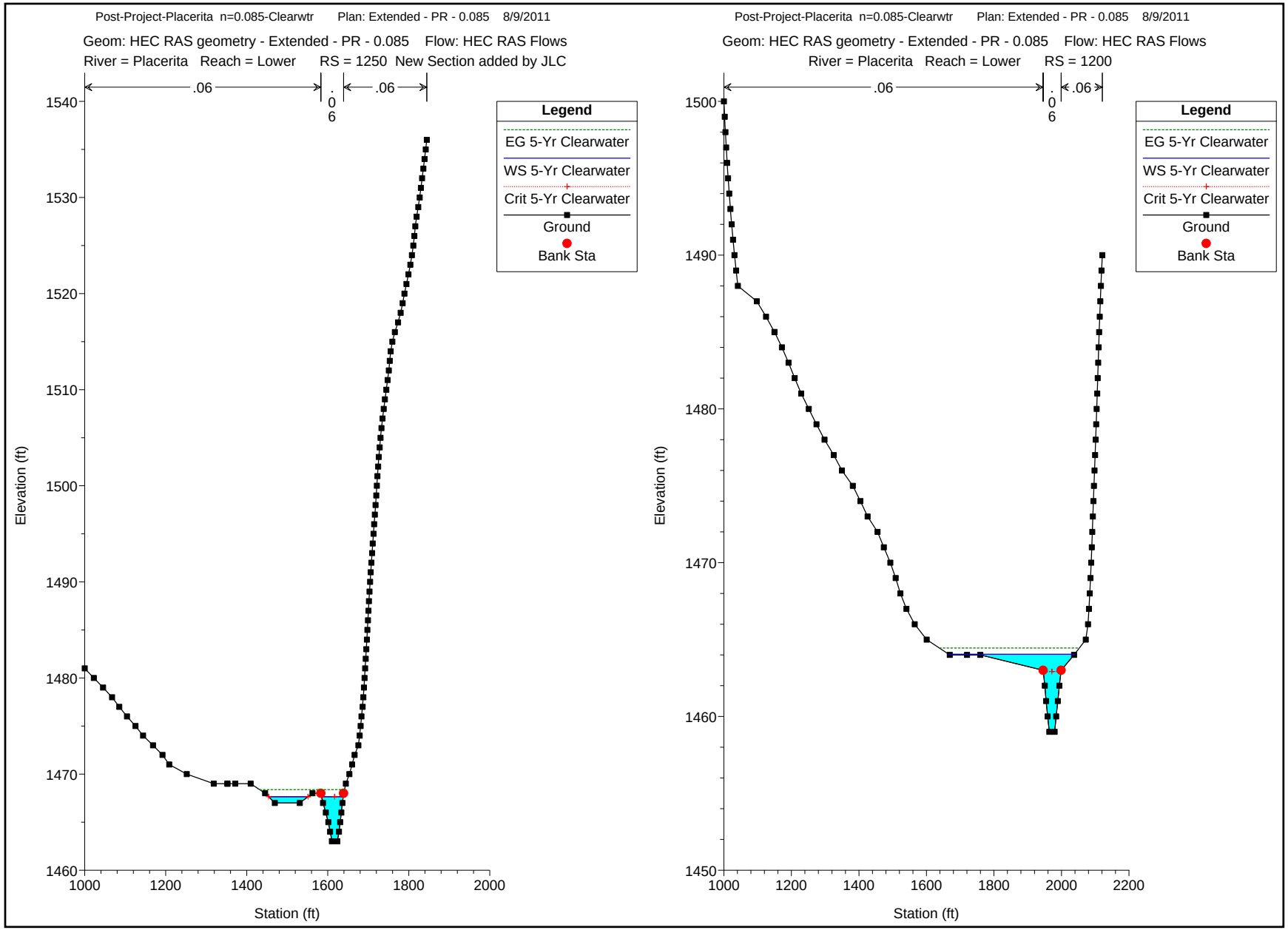

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 8
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500
1600
1700
Station (ft)

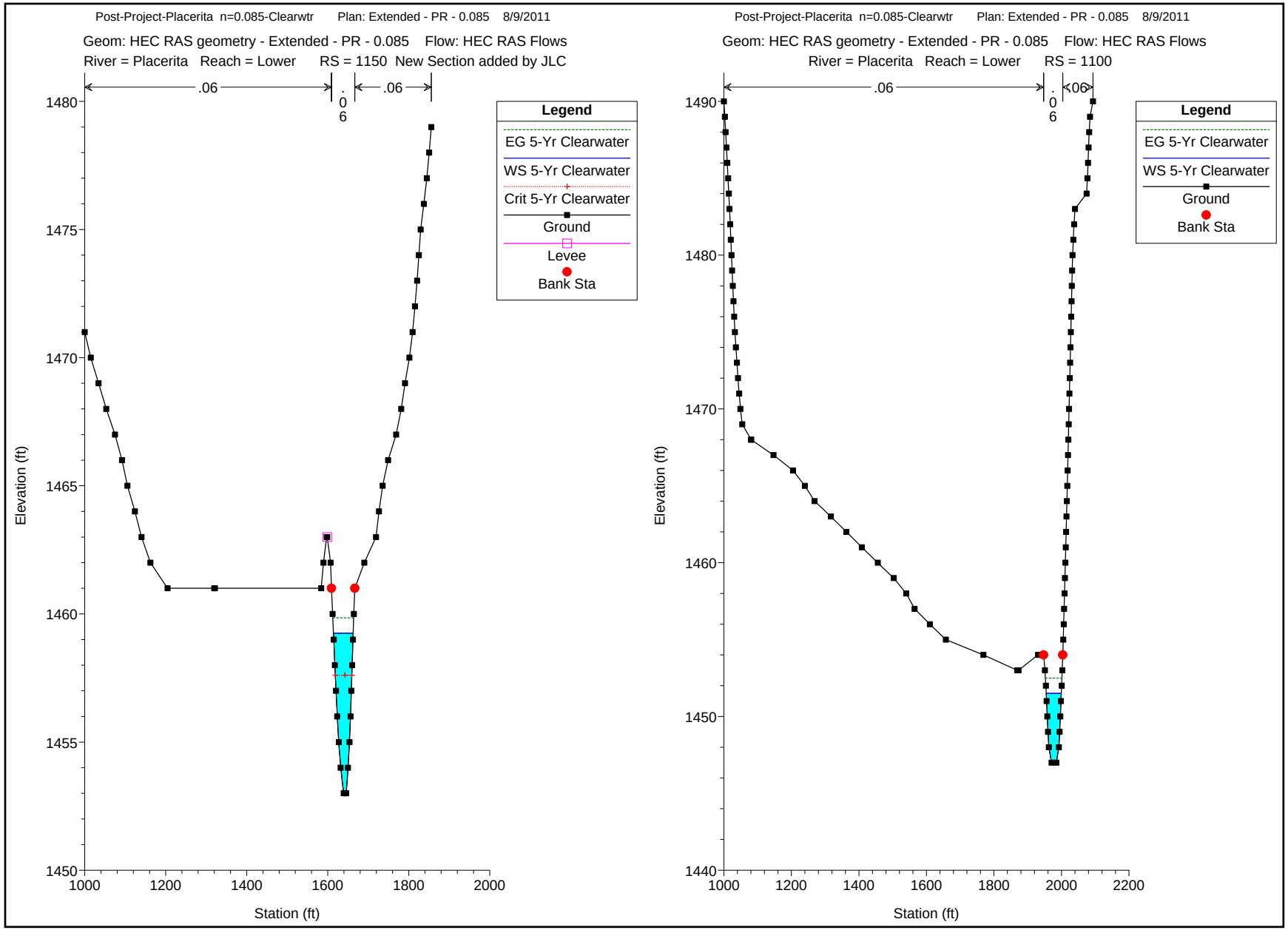

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 7
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1415
1410
1405
1400
1395
1390
1385
1000
1200
1400
1600
1800
2000
Station (ft)

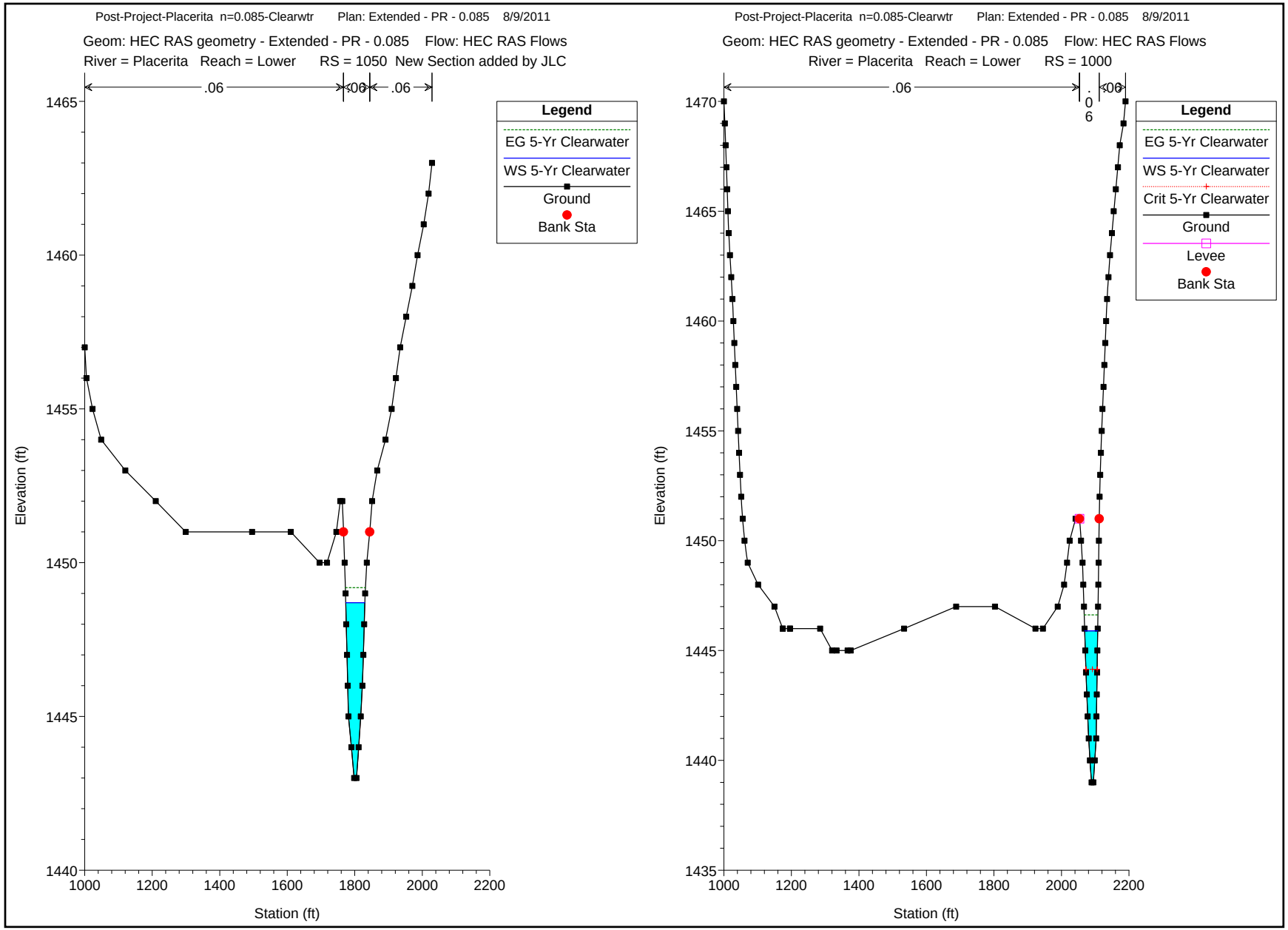

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 6
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 5
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)


Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 4
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 3
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)


Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1300
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)


Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1250 New Section added by JLC
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1200
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

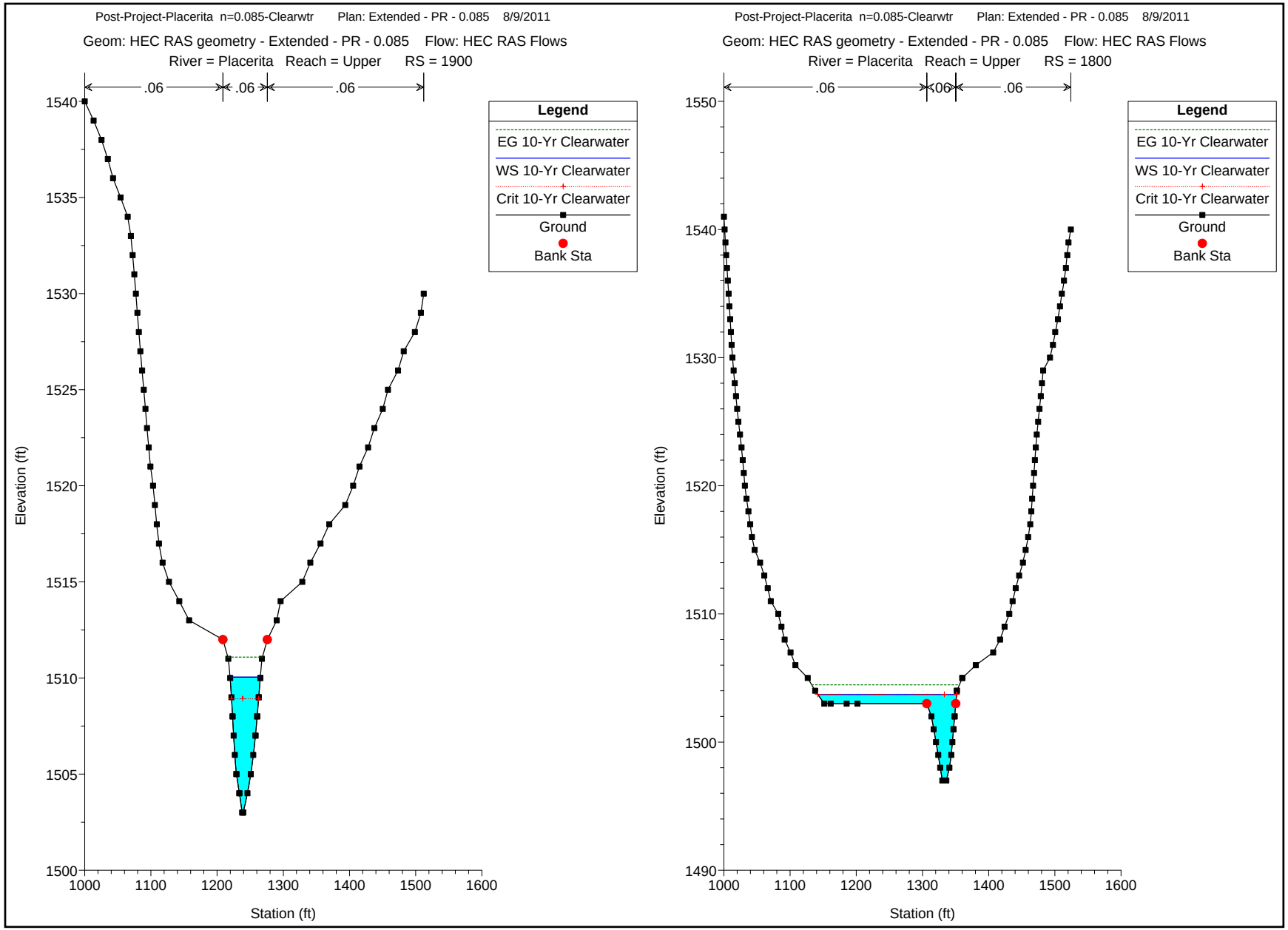

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1150 New Section added by JLC
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1100
.06
.06
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

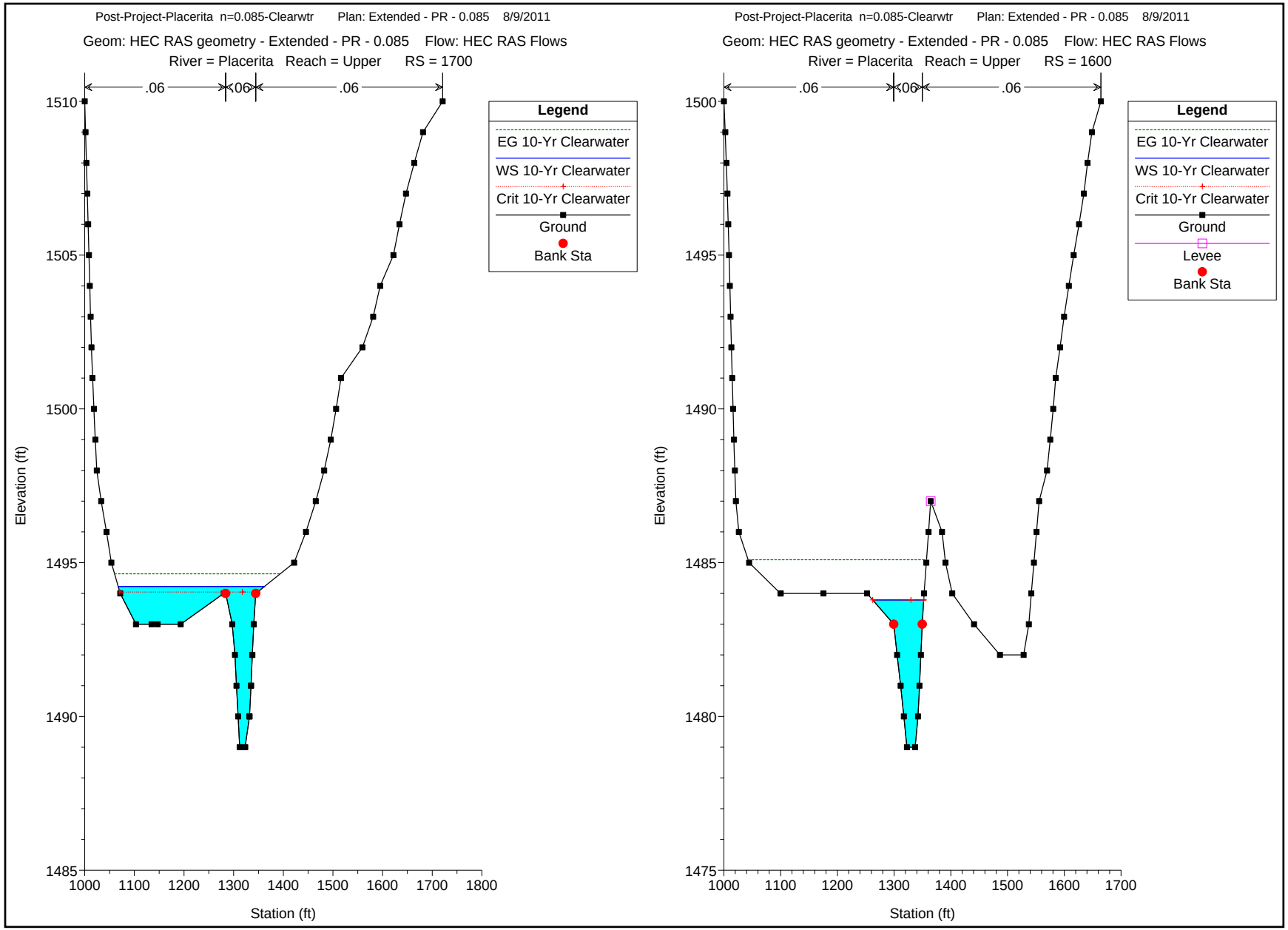

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1050 New Section added by JLC
.06
.00
.06
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1000
.06
.00
Legend
EG 5-Yr Clearwater
WS 5-Yr Clearwater
Crit 5-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

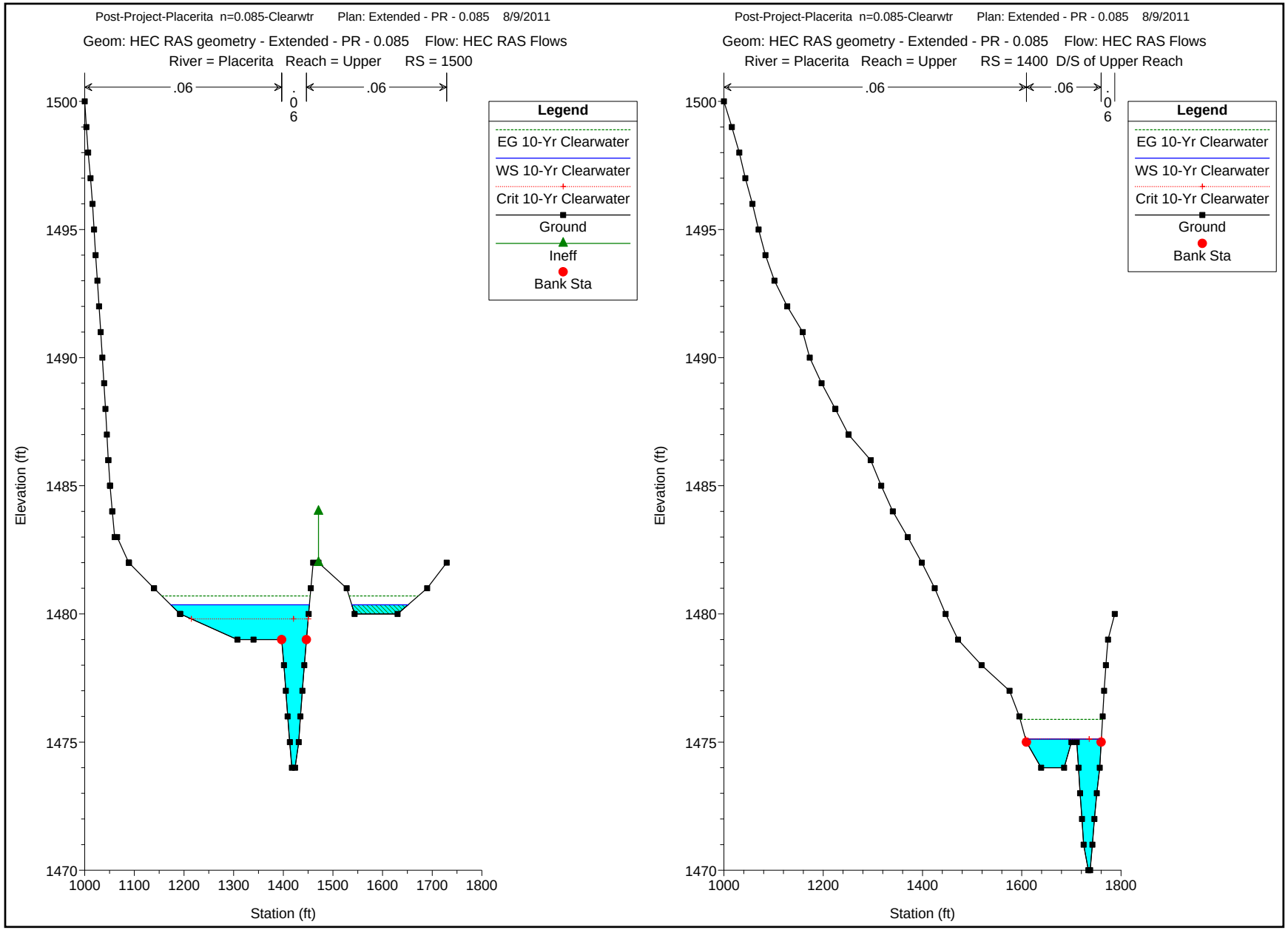
10-Year Storm Event – Post Project Condition HEC-RAS Output

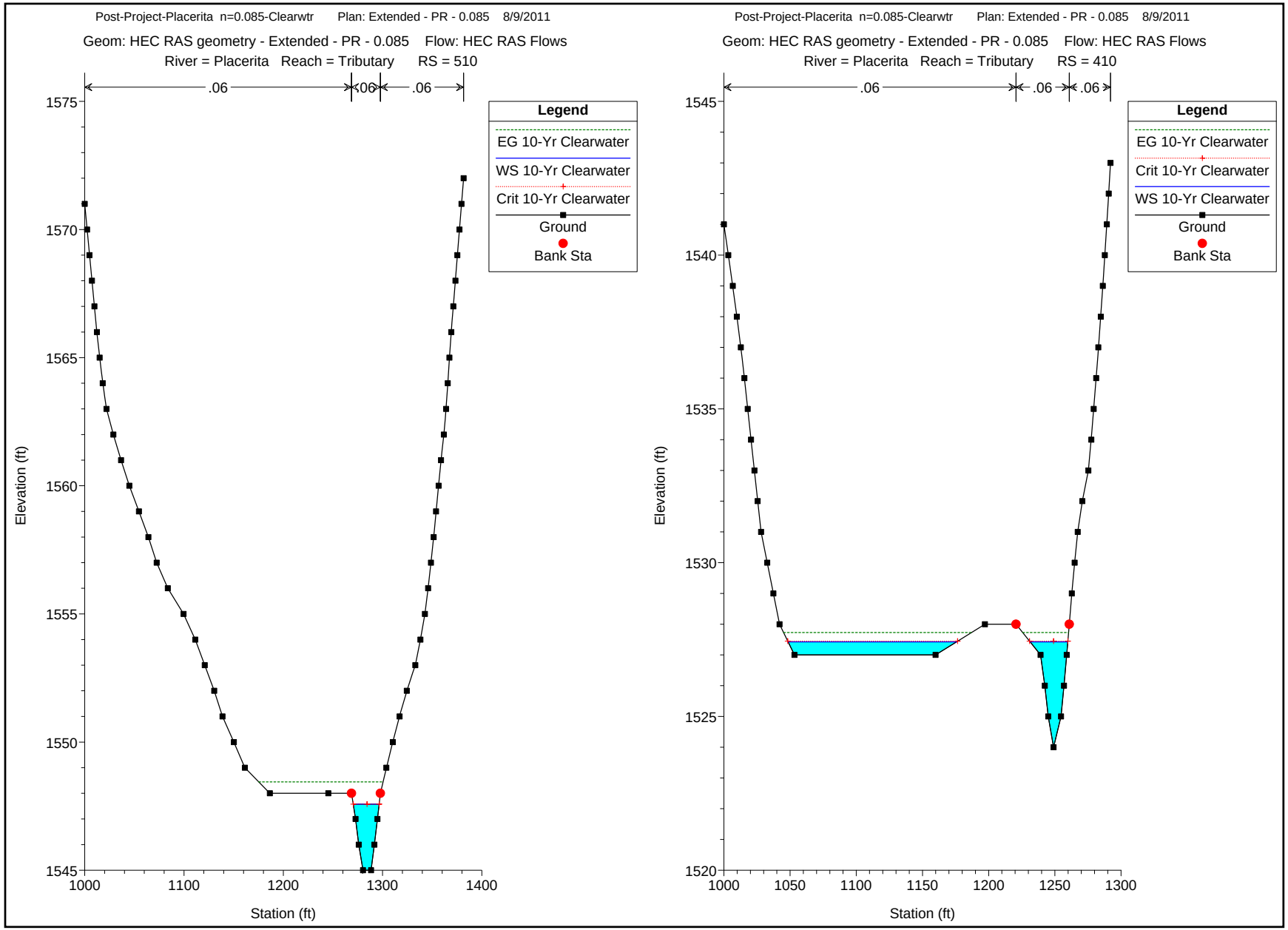
HEC-RAS Plan: Ex_PR_0.085 Profile: 10-Yr Clearwater

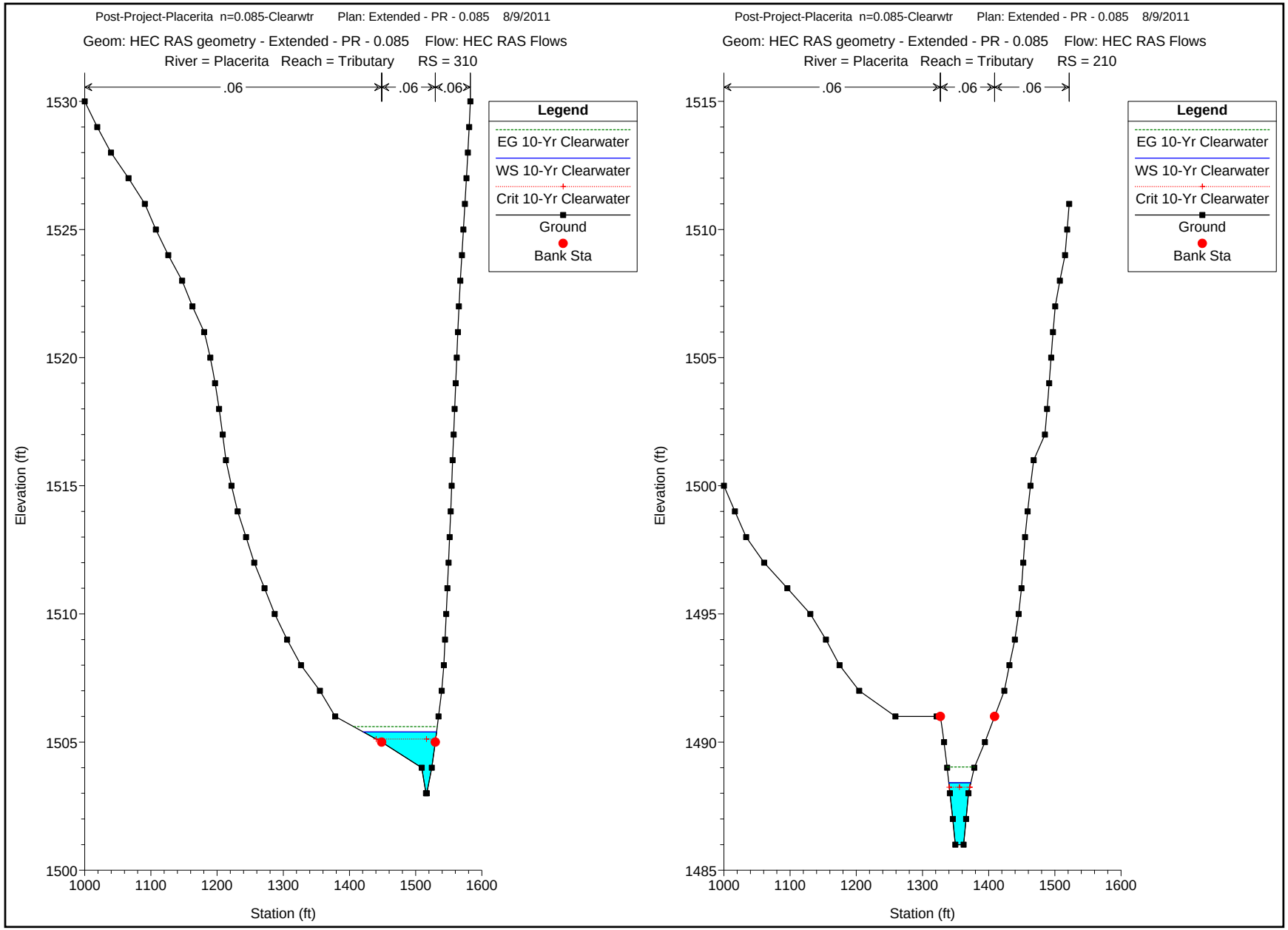
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Upper	1900	10-Yr Clearwater	1630.60	1503.00	1510.04	1508.92	1511.09	0.016605	8.20	198.91	45.72	0.69
Upper	1800	10-Yr Clearwater	1630.60	1497.00	1503.72	1503.72	1504.47	0.015057	7.54	294.95	209.76	0.66
Upper	1700	10-Yr Clearwater	1630.60	1489.00	1494.23	1494.05	1494.64	0.014084	5.99	380.49	294.76	0.61
Upper	1600	10-Yr Clearwater	1630.60	1479.00	1483.79	1483.79	1485.10	0.027855	9.27	187.73	89.86	0.88
Upper	1500	10-Yr Clearwater	1630.60	1474.00	1480.36	1479.81	1480.70	0.007073	5.42	441.44	392.88	0.46
Upper	1400	10-Yr Clearwater	1630.60	1470.00	1475.12	1475.12	1475.89	0.045901	7.04	231.84	152.52	1.00
Tributary	510	10-Yr Clearwater	334.00	1545.00	1547.58	1547.58	1548.45	0.046318	7.48	44.64	26.11	1.01
Tributary	410	10-Yr Clearwater	334.00	1524.00	1527.43	1527.45	1527.73	0.025137	5.15	94.38	155.82	0.73
Tributary	310	10-Yr Clearwater	334.00	1503.00	1505.39	1505.12	1505.60	0.020093	3.71	94.08	110.67	0.63
Tributary	210	10-Yr Clearwater	334.00	1486.00	1488.41	1488.24	1489.03	0.035698	6.30	53.00	33.32	0.88
Tributary	110	10-Yr Clearwater	334.00	1479.00	1482.68	1481.89	1482.97	0.010403	4.64	100.32	137.01	0.51
Tributary	10	10-Yr Clearwater	334.00	1471.00	1474.56	1474.56	1475.70	0.046824	8.57	38.98	17.30	1.01
Lower	1300	10-Yr Clearwater	1895.70	1468.00	1472.90	1471.69	1473.46	0.011038	6.17	347.88	160.09	0.56
Lower	1250	10-Yr Clearwater	1895.70	1463.00	1468.29	1468.29	1469.06	0.020518	7.82	318.61	205.59	0.75
Lower	1200	10-Yr Clearwater	1895.70	1459.00	1464.80	1464.34	1465.05	0.005695	4.95	629.39	450.28	0.42
Lower	1150	10-Yr Clearwater	1895.70	1453.00	1460.60	1458.76	1461.39	0.010776	7.11	266.76	55.47	0.57
Lower	1100	10-Yr Clearwater	1895.70	1447.00	1452.72	1451.95	1453.98	0.020738	9.00	210.66	50.34	0.78
Lower	1050	10-Yr Clearwater	1895.70	1443.00	1450.33		1450.87	0.007798	5.91	332.29	128.77	0.49
Lower	1000	10-Yr Clearwater	1895.70	1439.00	1447.51	1445.42	1448.44	0.011102	7.74	244.89	43.26	0.57
Sound Stages	2527.261	10-Yr Clearwater	1923.30	1432.00	1437.91	1437.71	1439.63	0.031653	10.52	182.80	46.89	0.94
Sound Stages	2268.881	10-Yr Clearwater	1923.30	1425.00	1433.15	1431.96	1434.04	0.014575	7.57	254.15	58.41	0.64
Sound Stages	2007.81	10-Yr Clearwater	1923.30	1422.00	1426.77	1426.77	1428.14	0.038740	9.37	205.29	75.52	1.00
Sound Stages	1841.25	10-Yr Clearwater	1923.30	1419.00	1424.40	1422.00	1424.62	0.006951	3.73	515.75	124.54	0.32
Sound Stages	1644.9	10-Yr Clearwater	1923.30	1416.00	1422.24	1419.81	1422.76	0.013278	5.78	332.90	65.52	0.45
Sound Stages	1615		Bridge									
Sound Stages	1526.5	10-Yr Clearwater	1923.30	1414.00	1420.07		1420.93	0.027486	7.44	258.54	60.72	0.64
Sound Stages	1368.35	10-Yr Clearwater	1923.30	1412.00	1417.66		1418.10	0.011627	5.30	363.20	74.15	0.42
Sound Stages	1258.35	10-Yr Clearwater	1923.30	1410.00	1415.21		1416.06	0.032084	7.41	259.58	69.67	0.68
Sound Stages	1052.85	10-Yr Clearwater	1923.30	1405.12	1411.93		1412.33	0.010998	5.06	380.16	80.75	0.41
Sound Stages	865.5	10-Yr Clearwater	1923.30	1402.00	1410.73		1410.95	0.004952	3.68	522.00	98.45	0.28
Sound Stages	700.65	10-Yr Clearwater	1923.30	1398.00	1410.25	1404.34	1410.39	0.002271	3.05	630.34	85.67	0.20
Sound Stages	700		Culvert									
Sound Stages	9.076105	10-Yr Clearwater	1923.30	1390.00	1397.34	1396.49	1398.47	0.016166	8.67	238.91	80.48	0.70
Sound Stages	8	10-Yr Clearwater	1923.30	1390.00	1396.96	1396.86	1397.67	0.014582	7.40	347.53	216.97	0.65
Sound Stages	7	10-Yr Clearwater	2071.00	1388.00	1390.54	1390.54	1391.13	0.027581	6.48	372.19	341.30	0.81
Sound Stages	6	10-Yr Clearwater	2071.00	1378.00	1384.23	1383.56	1384.33	0.004922	3.70	916.98	679.05	0.36
Sound Stages	5	10-Yr Clearwater	2071.00	1376.00	1380.60	1380.60	1381.09	0.012877	6.40	499.51	502.01	0.61
Sound Stages	4	10-Yr Clearwater	2071.00	1362.00	1370.95	1368.39	1371.66	0.008548	6.73	307.77	57.33	0.51
Sound Stages	3	10-Yr Clearwater	2125.40	1356.00	1363.04	1361.45	1363.98	0.015019	7.79	272.83	63.65	0.66
Sound Stages	2	10-Yr Clearwater	2125.40	1348.00	1353.09	1352.28	1353.53	0.010202	5.64	484.27	376.85	0.54

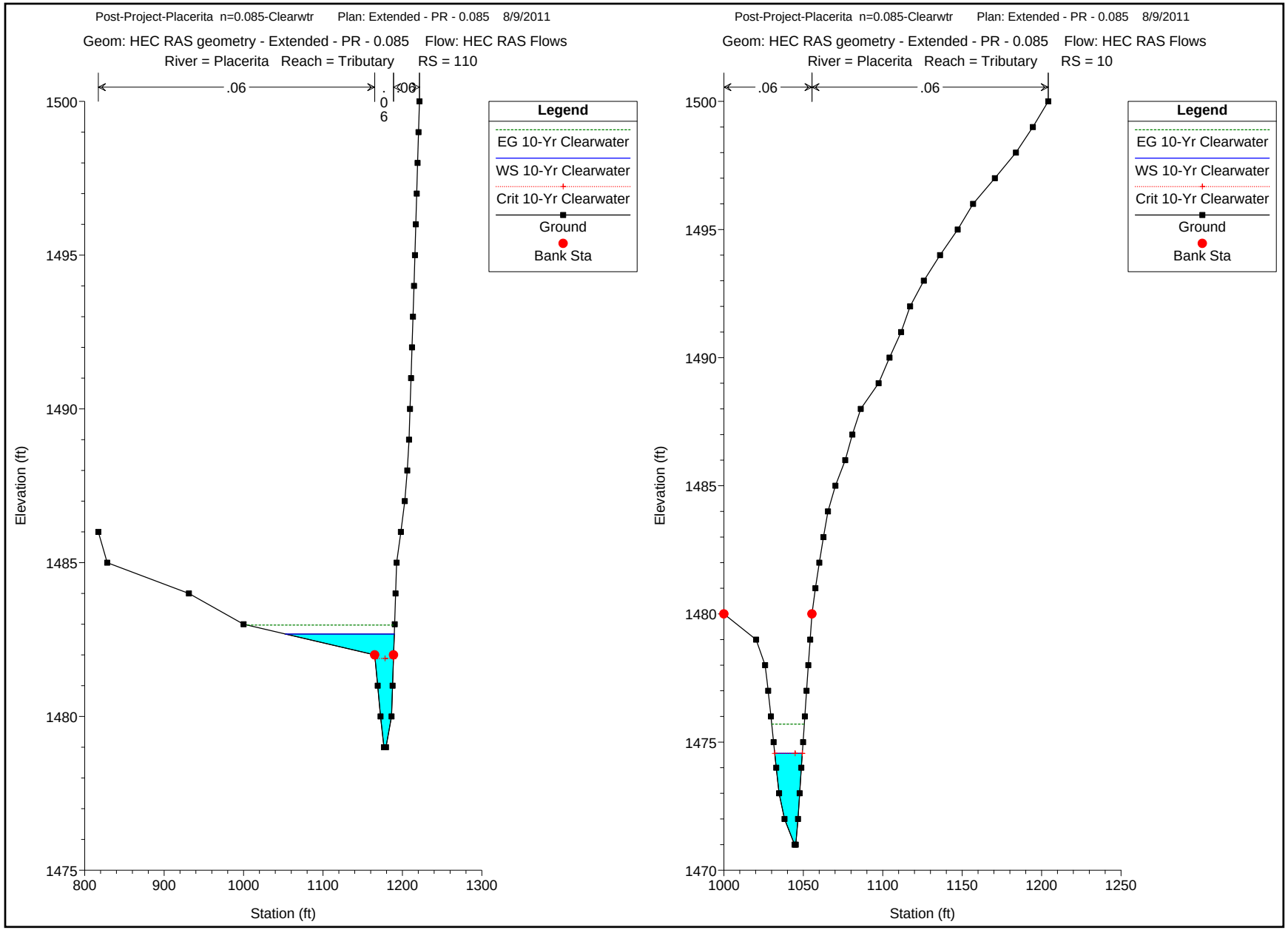

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1900
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1800
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

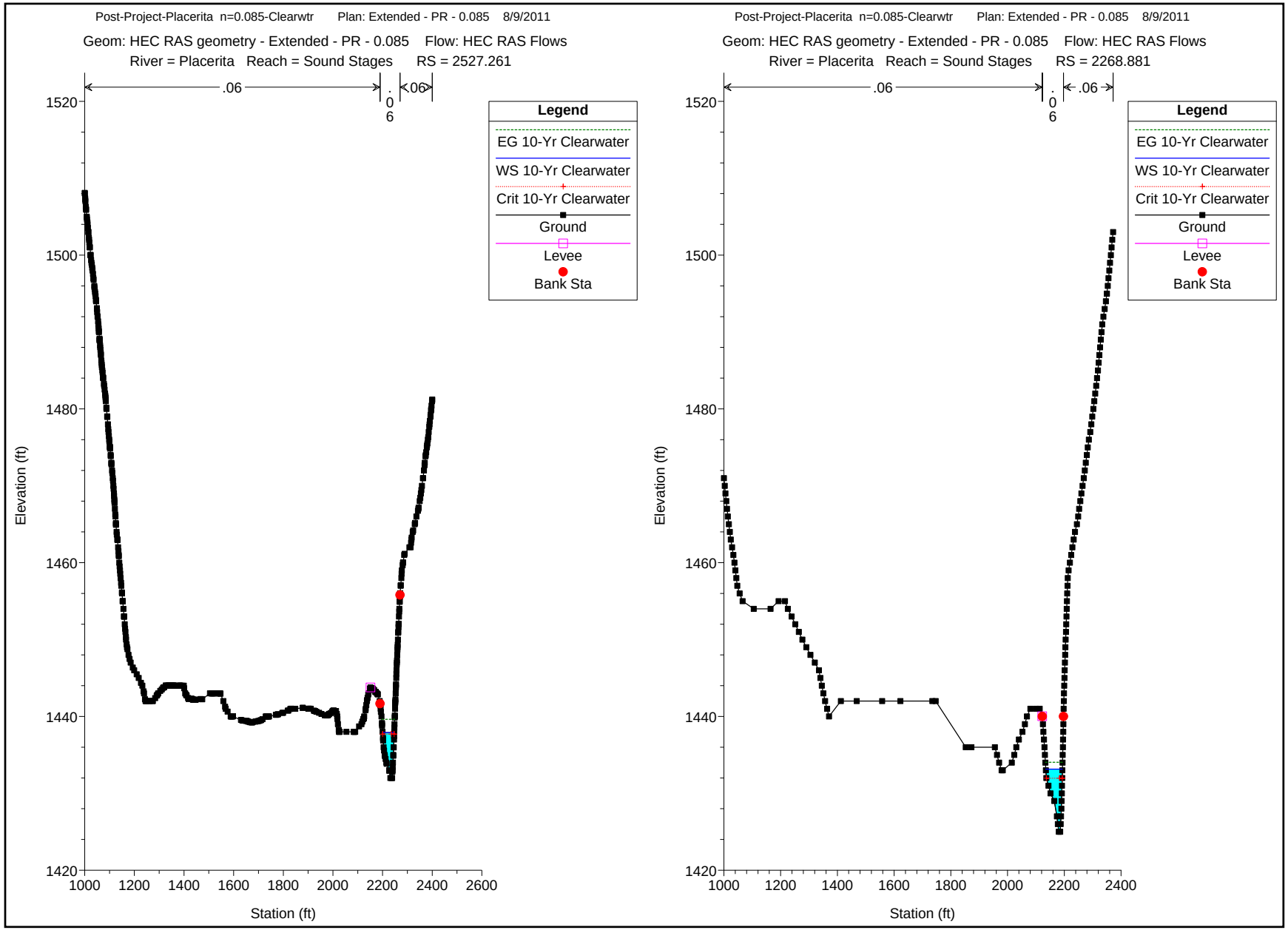

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1700
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1600
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

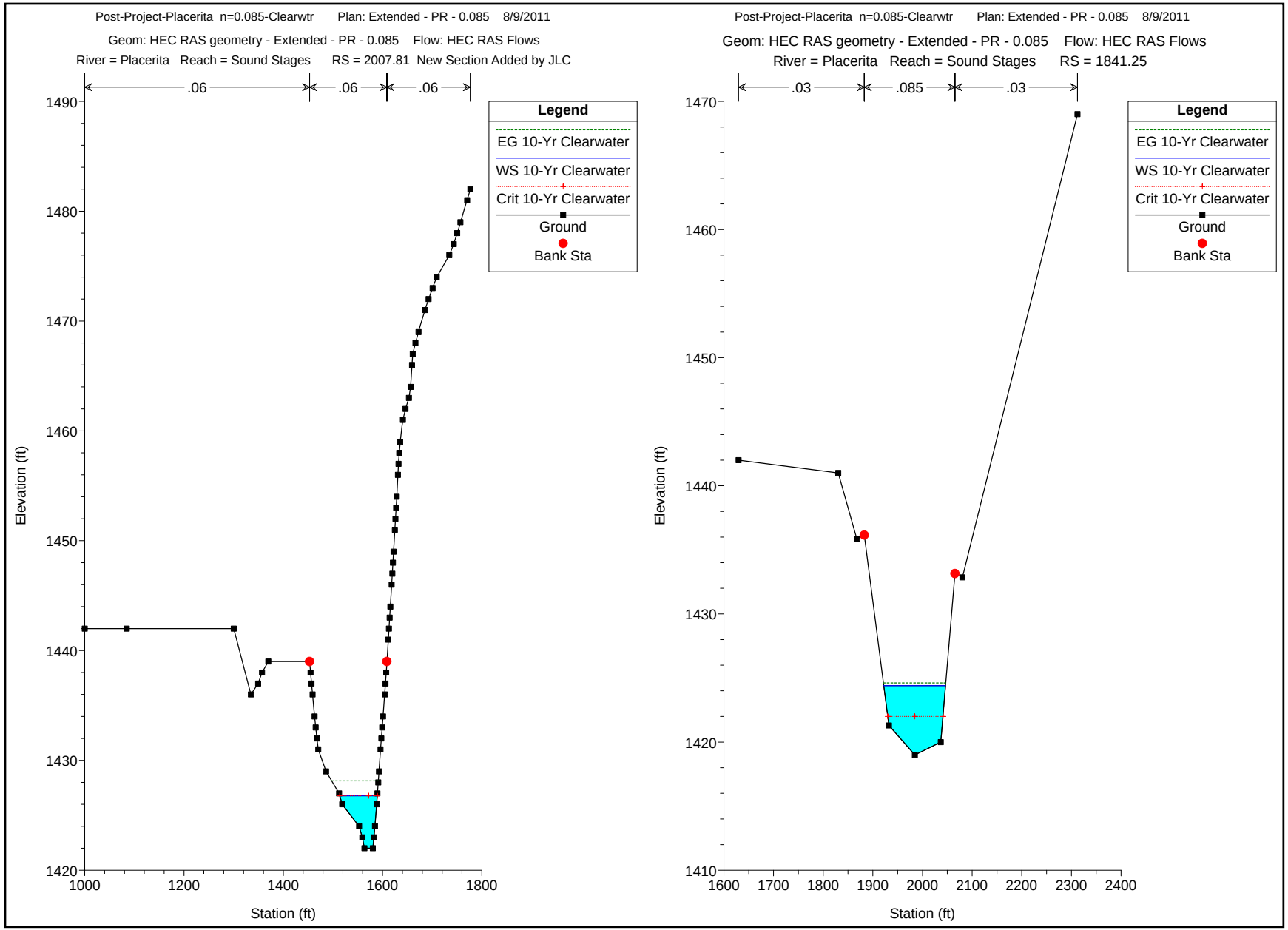

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1500
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1400 D/S of Upper Reach
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

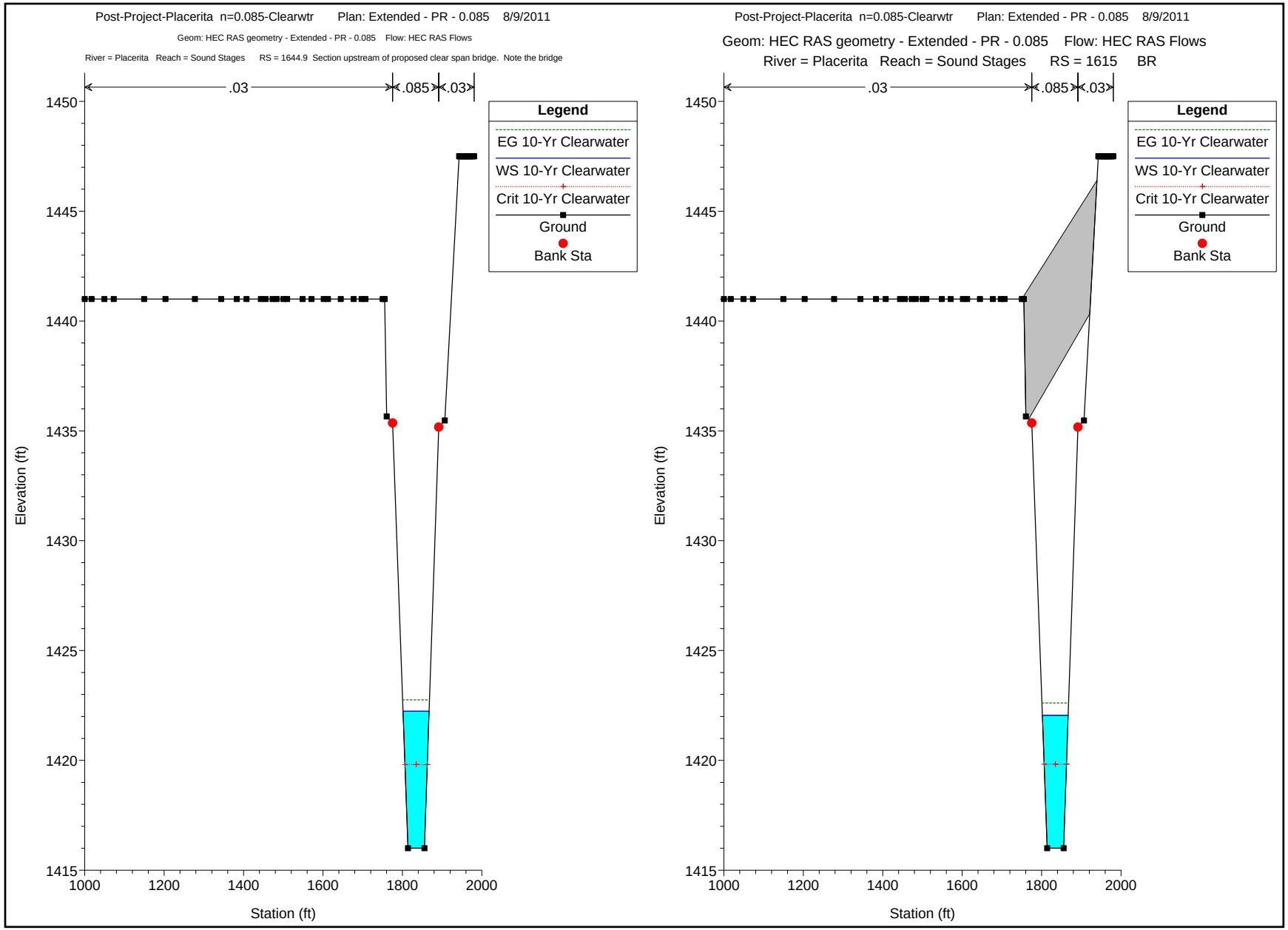

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 510
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 410
.06
.06
.06
Legend
EG 10-Yr Clearwater
Crit 10-Yr Clearwater
WS 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

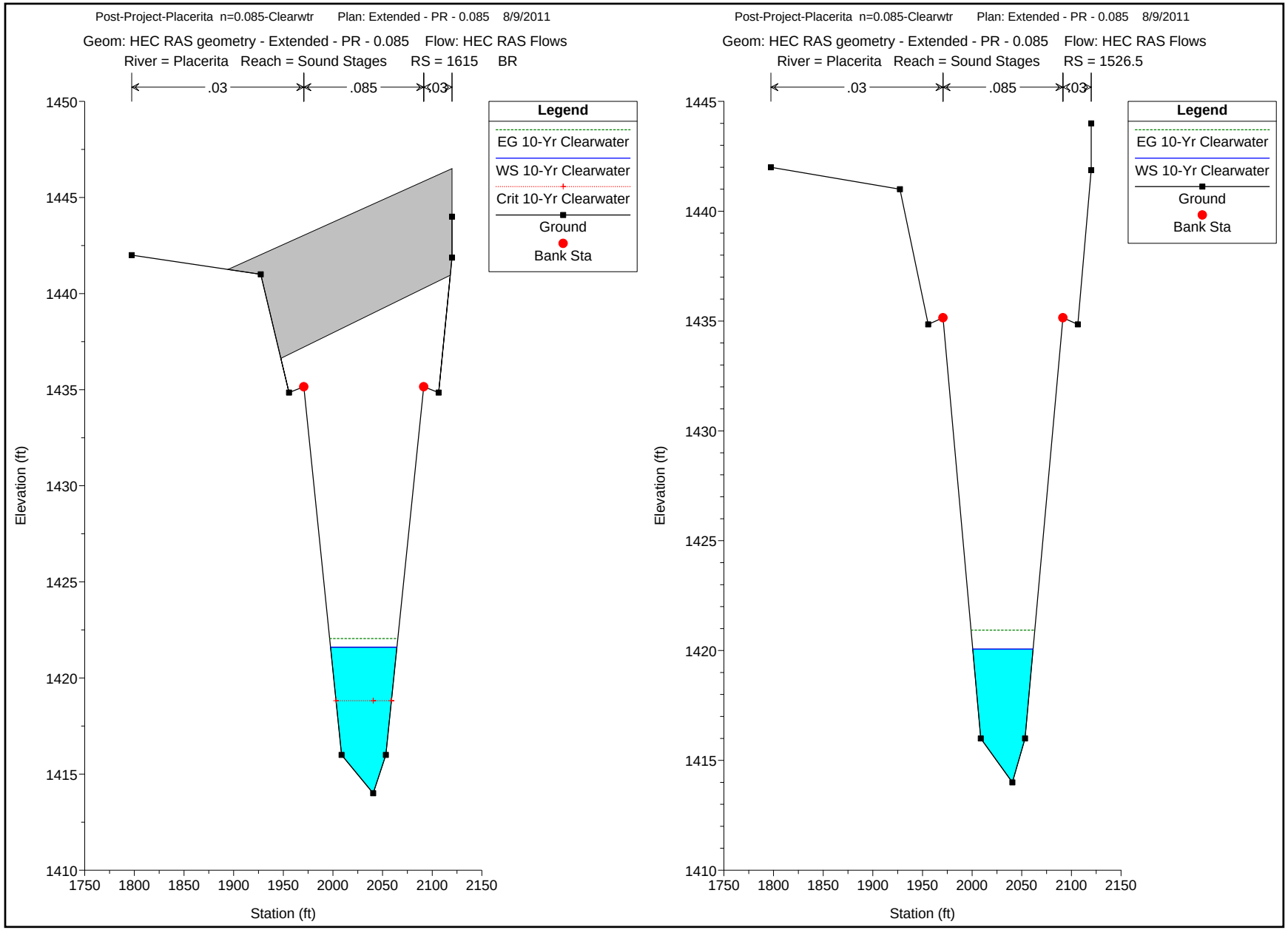

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 310
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 210
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

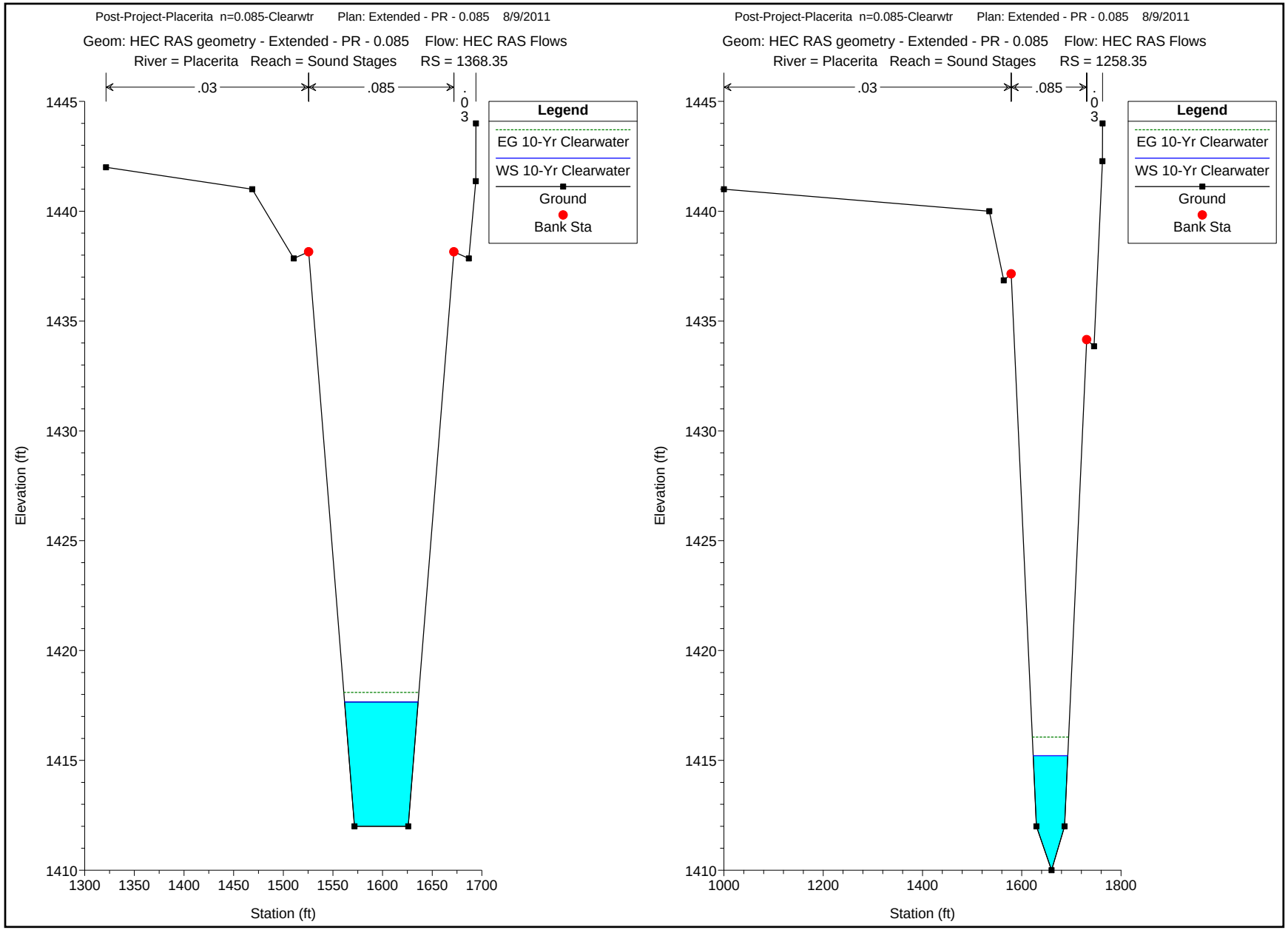

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 110
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
800
900
1000
1100
1200
1300
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 10
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1050
1100
1150
1200
1250

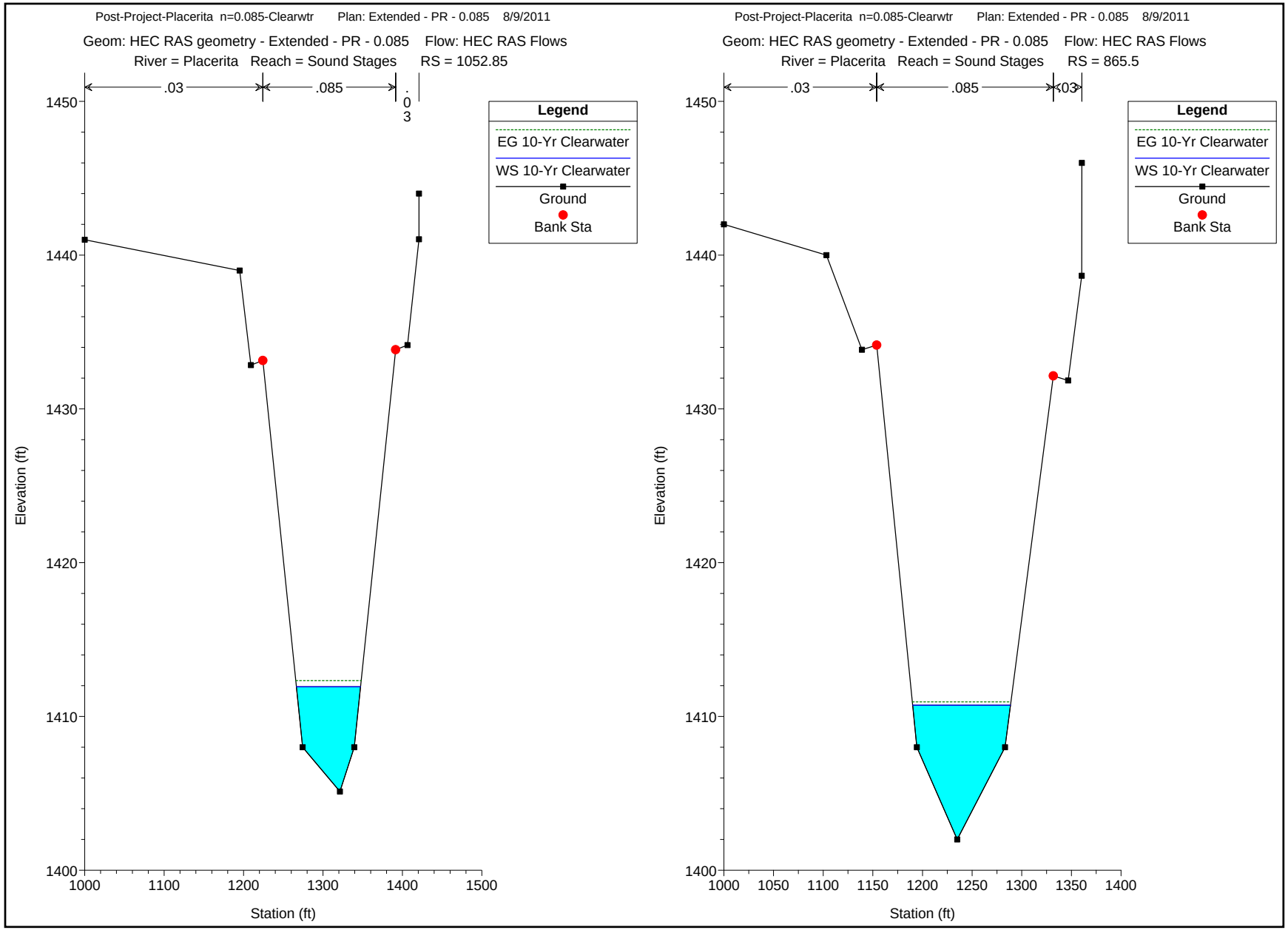

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2527.261
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2268.881
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

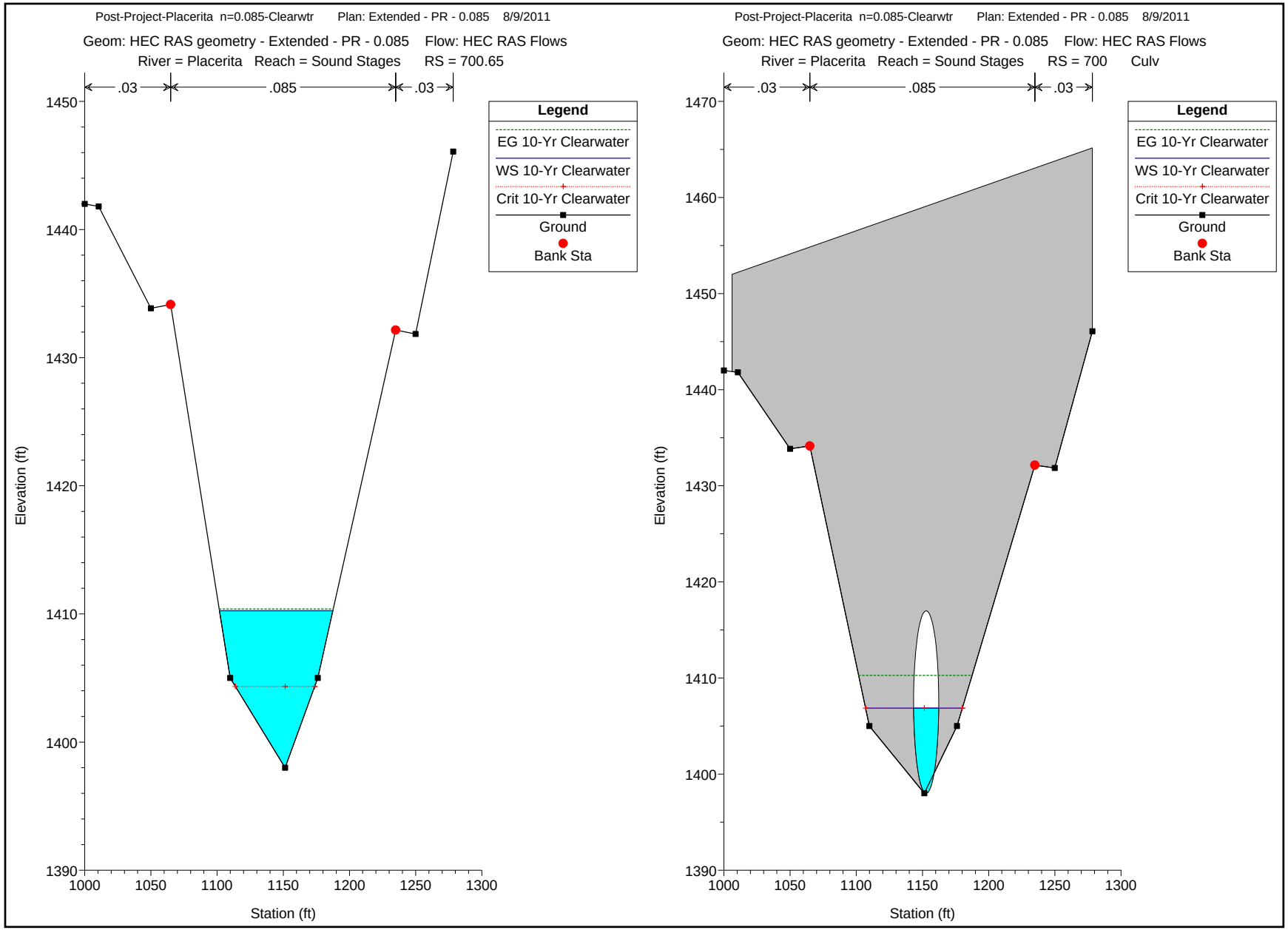

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2007.81 New Section Added by JLC
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1841.25
.03
.085
.03
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

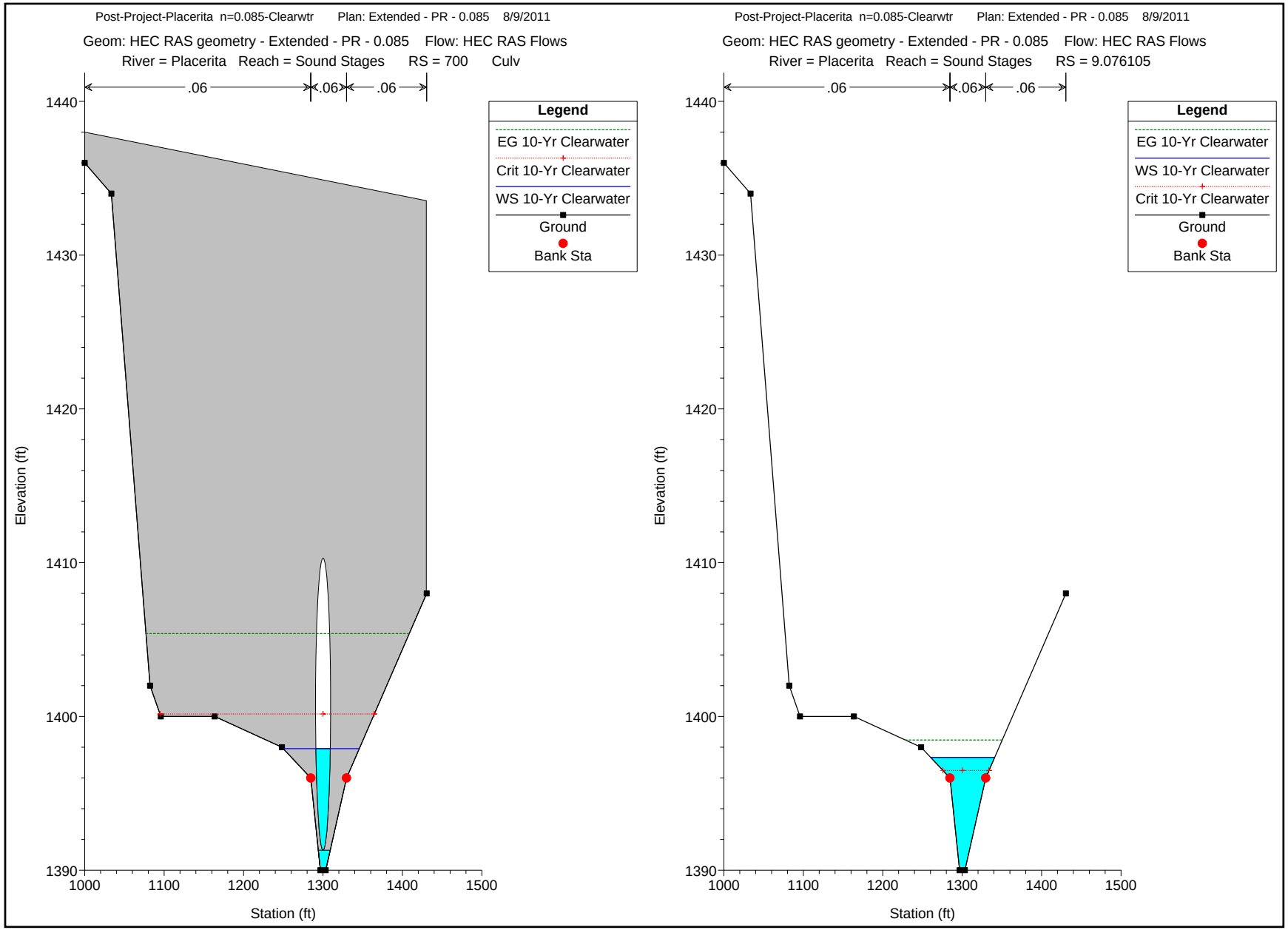

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1644.9 Section upstream of proposed clear span bridge. Note the bridge
.03
.085
.03
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1615 BR
.03
.085
.03
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

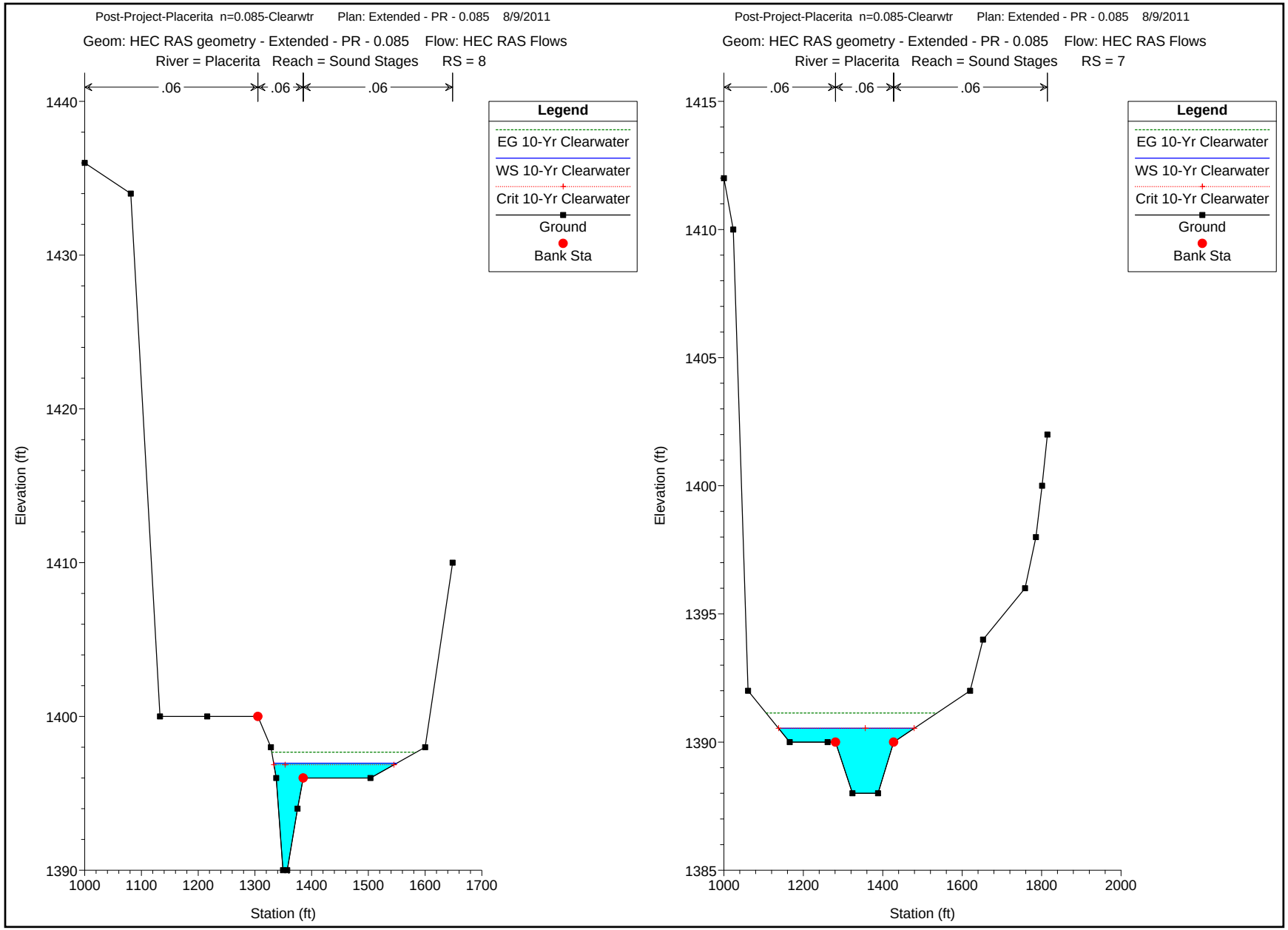

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1615 BR
.03
.085
.03
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1526.5
.03
.085
.03
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

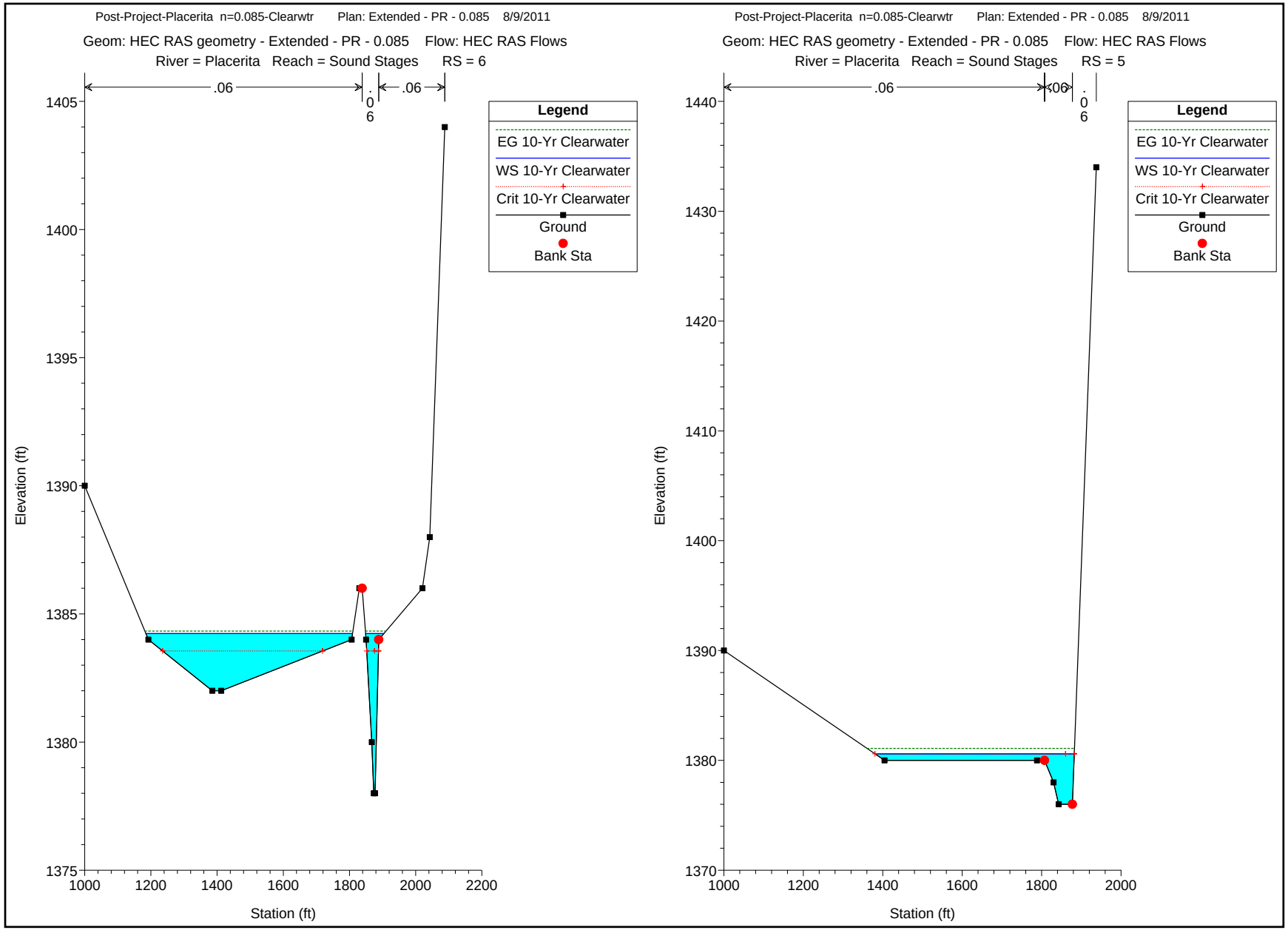

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1368.35
.03
.085
.03
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1445
1440
1435
1430
1425
1420
1415
1410
1300
1350
1400
1450
1500
1550
1600
1650
1700
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1258.35
.03
.085
.03
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1445
1440
1435
1430
1425
1420
1415
1410
1000
1200
1400
1600
1800

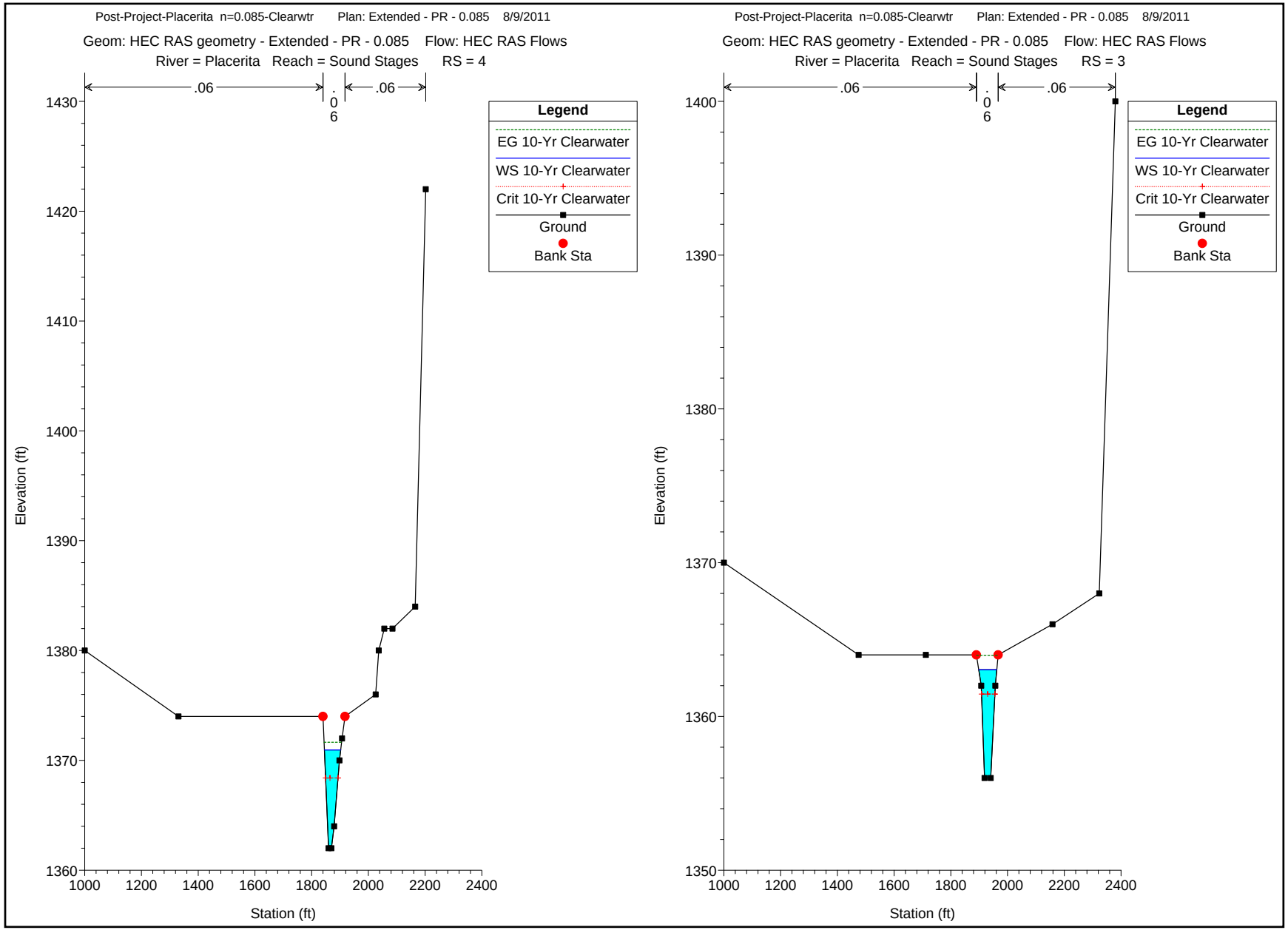

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1052.85
.03
.085
.03
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1440
1430
1420
1410
1400
1000
1100
1200
1300
1400
1500
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 865.5
.03
.085
.03
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1440
1430
1420
1410
1400
1000
1050
1100
1150
1200
1250
1300
1350
1400

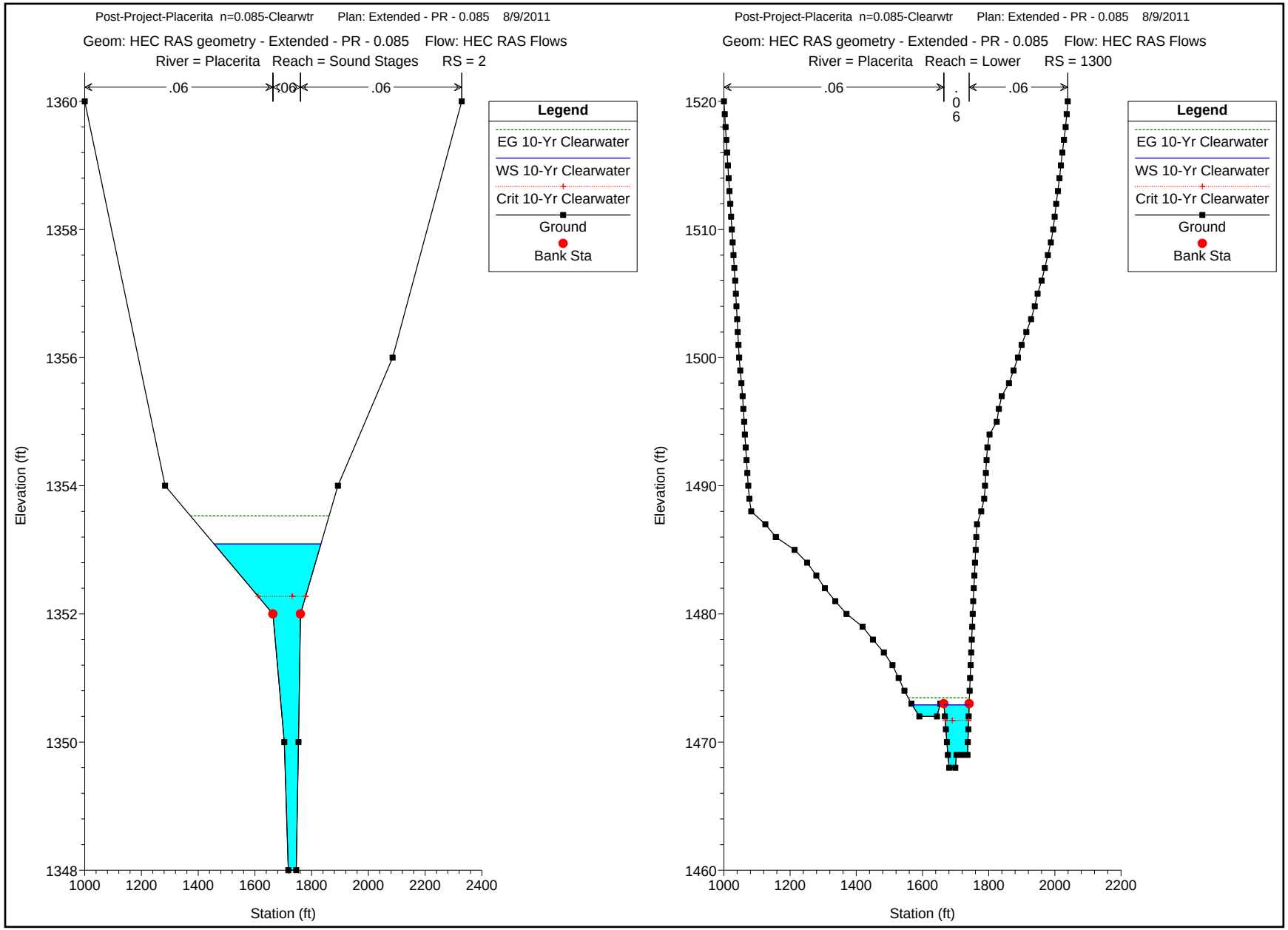

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700.65
.03
.085
.03
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700 Culv
.03
.085
.03
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

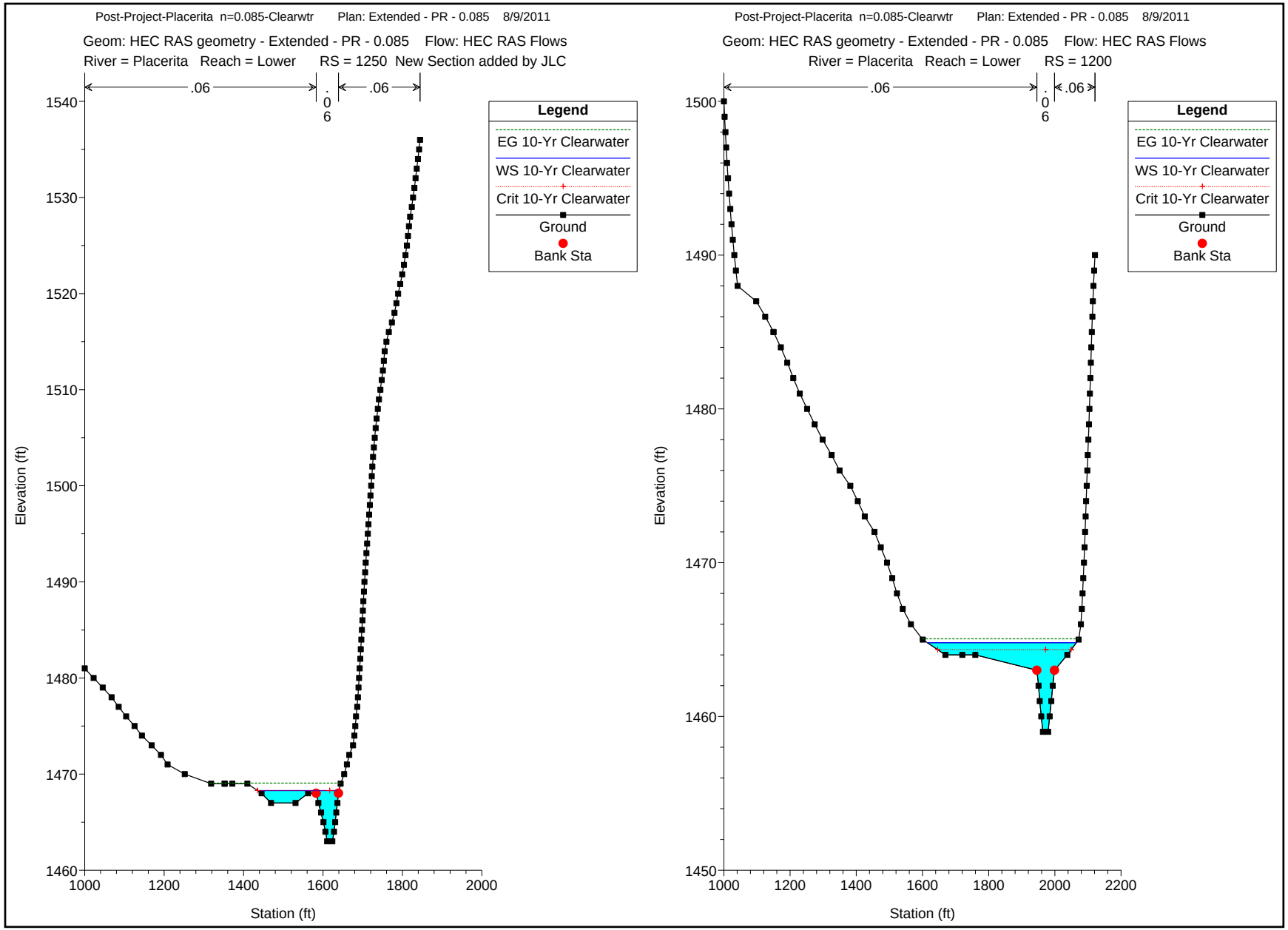

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700 Culv
.06
.06
.06
Legend
EG 10-Yr Clearwater
Crit 10-Yr Clearwater
WS 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 9.076105
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500
Station (ft)

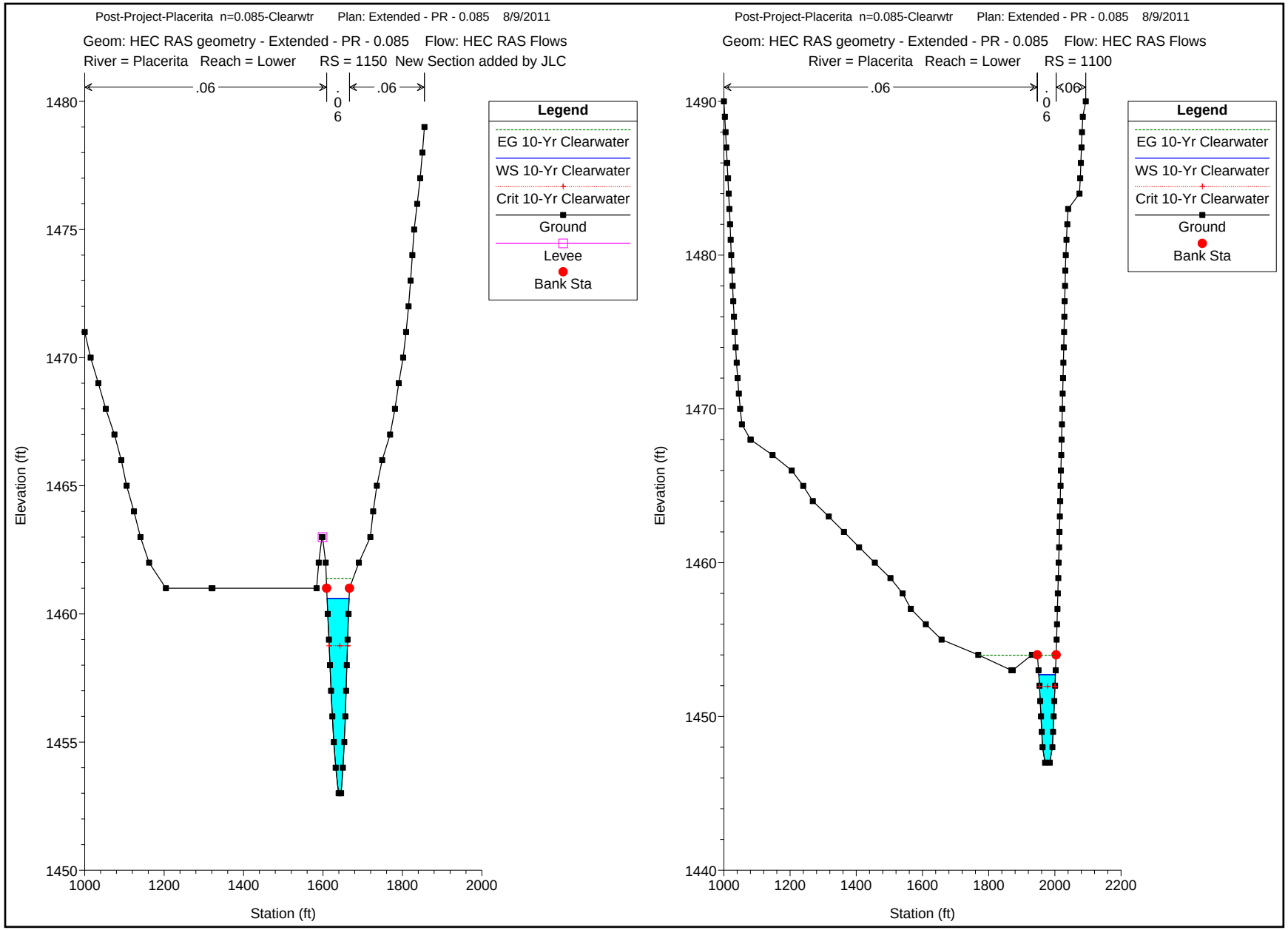

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 8
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 7
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

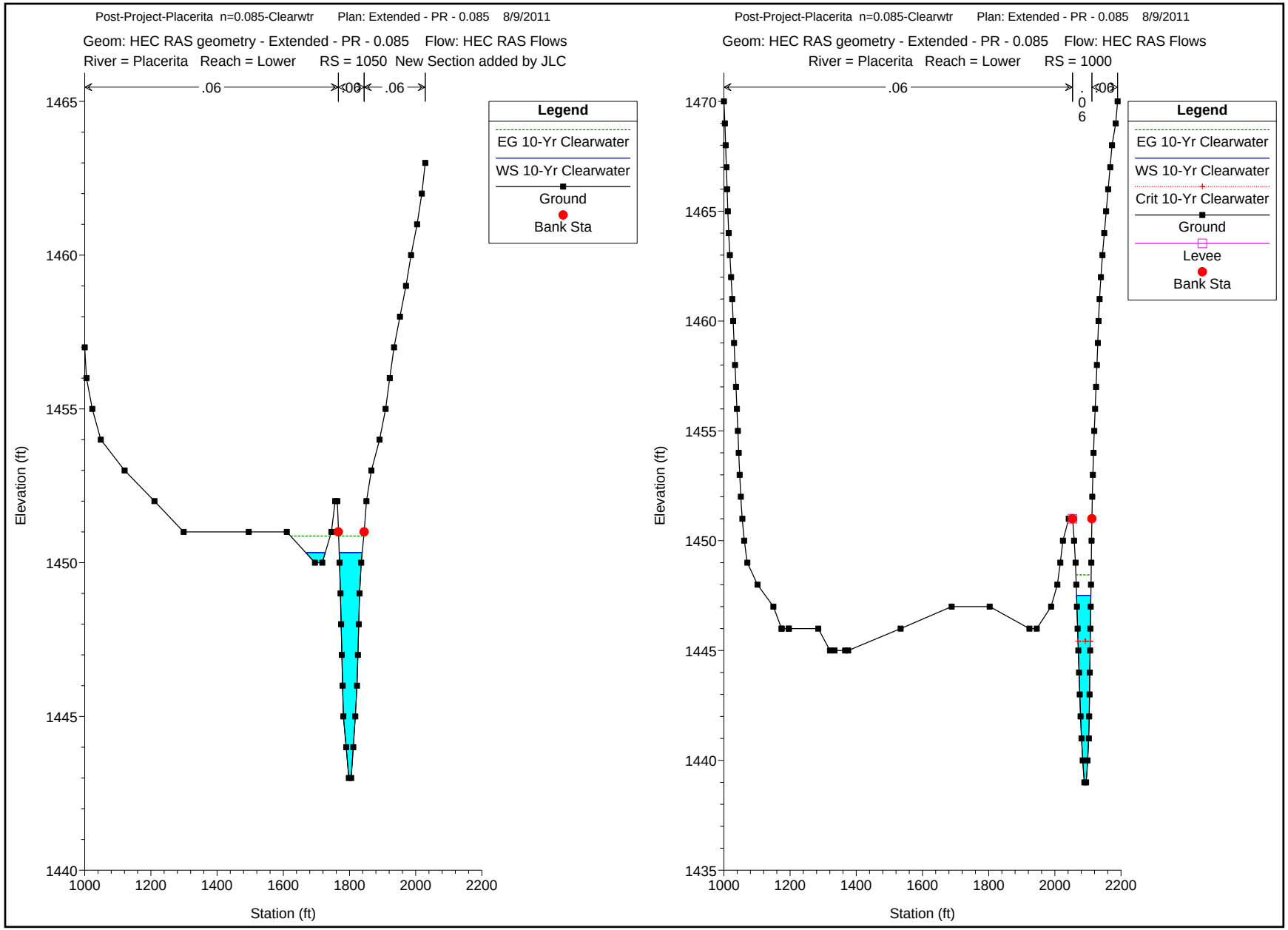

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 6
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 5
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)


Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 4
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 3
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)


Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1300
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)


Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1250 New Section added by JLC
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1200
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

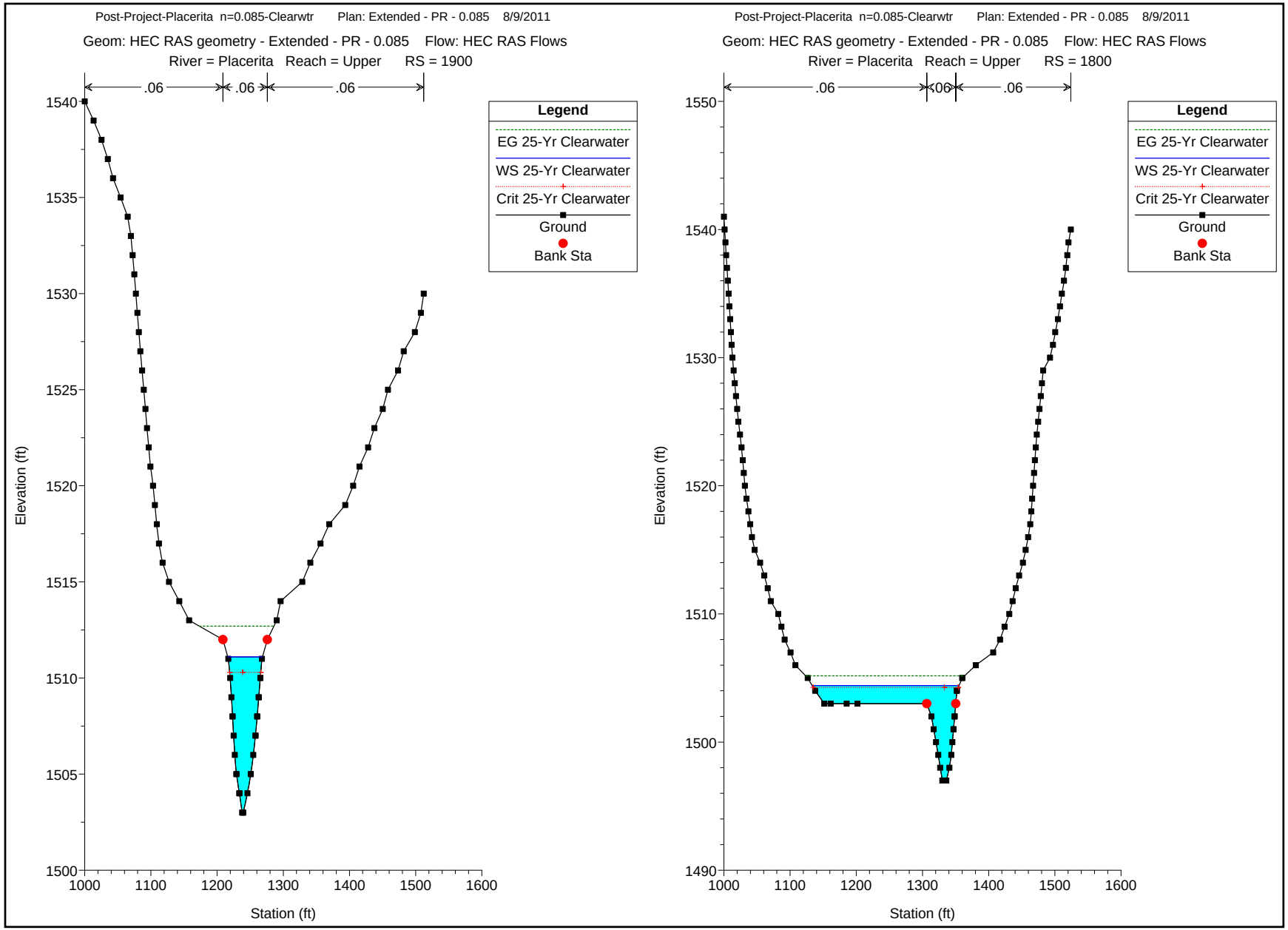

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1150 New Section added by JLC
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1100
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

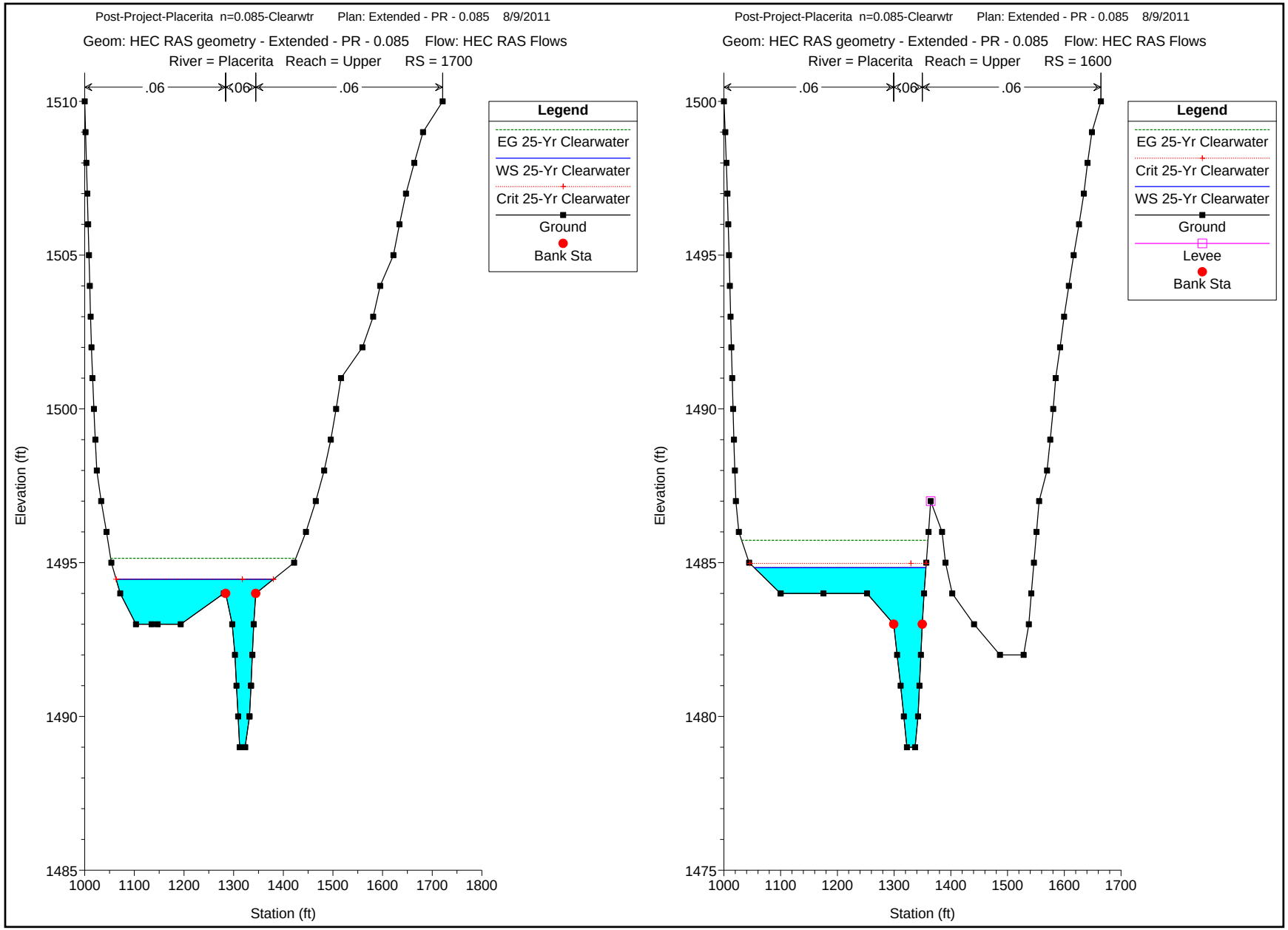

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1050 New Section added by JLC
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1465
1460
1455
1450
1445
1440
1000
1200
1400
1600
1800
2000
2200
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1000
.06
.06
.06
Legend
EG 10-Yr Clearwater
WS 10-Yr Clearwater
Crit 10-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
1470
1465
1460
1455
1450
1445
1440
1435
1000
1200
1400
1600
1800
2000
2200

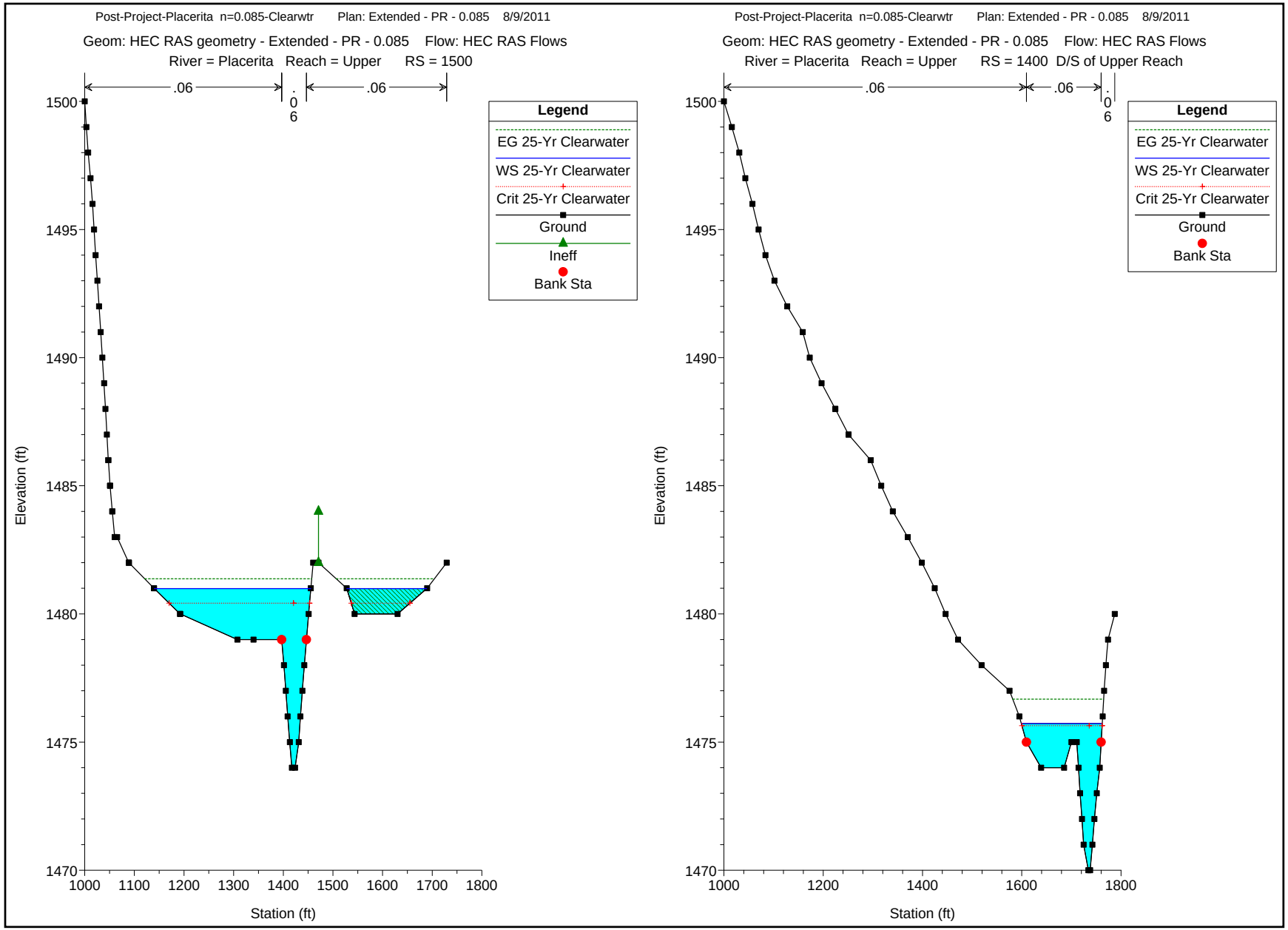
25-Year Storm Event – Post Project Condition HEC-RAS Output

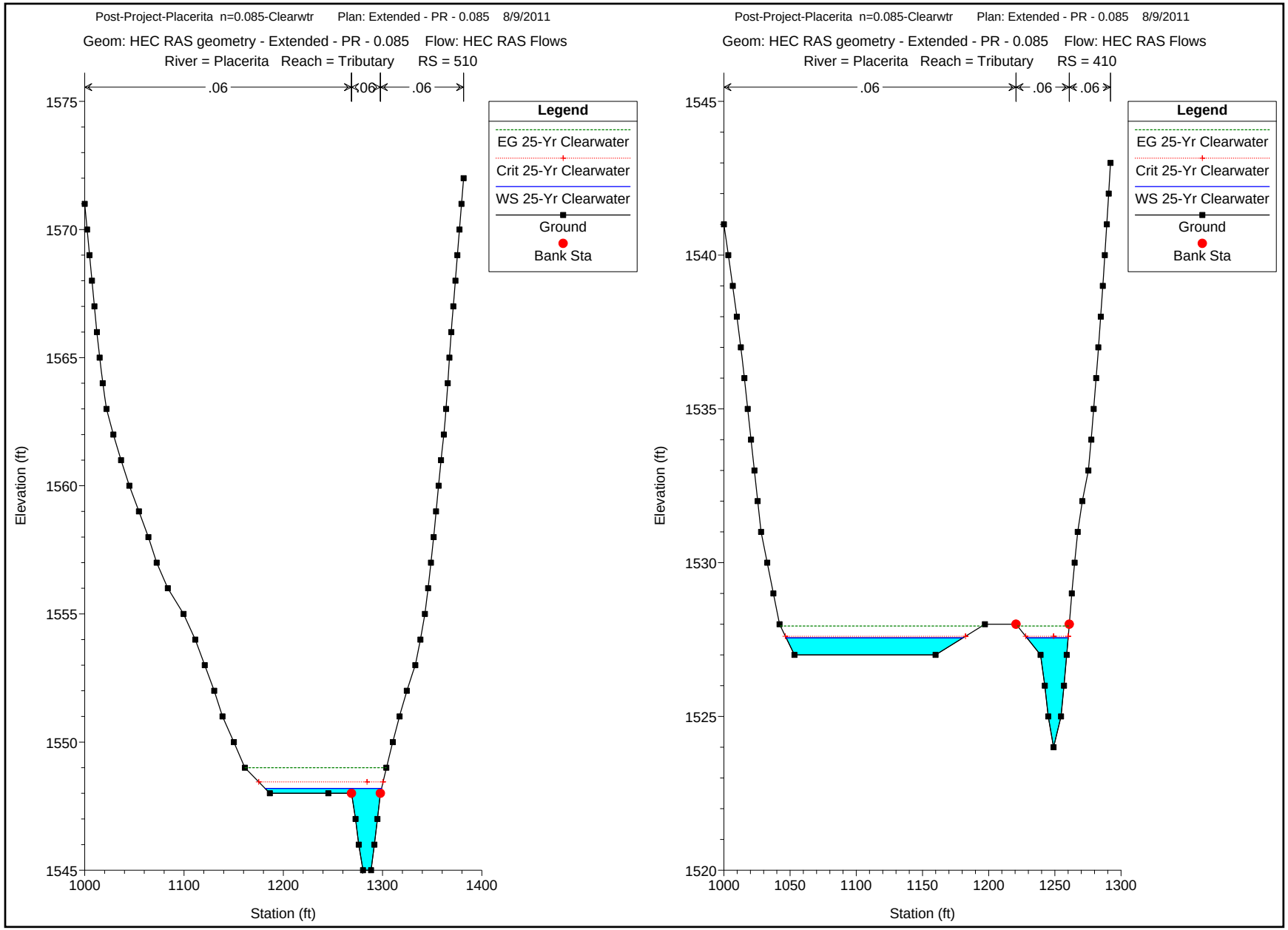
HEC-RAS Plan: Ex_PR_0.085 Profile: 25-Yr Clearwater

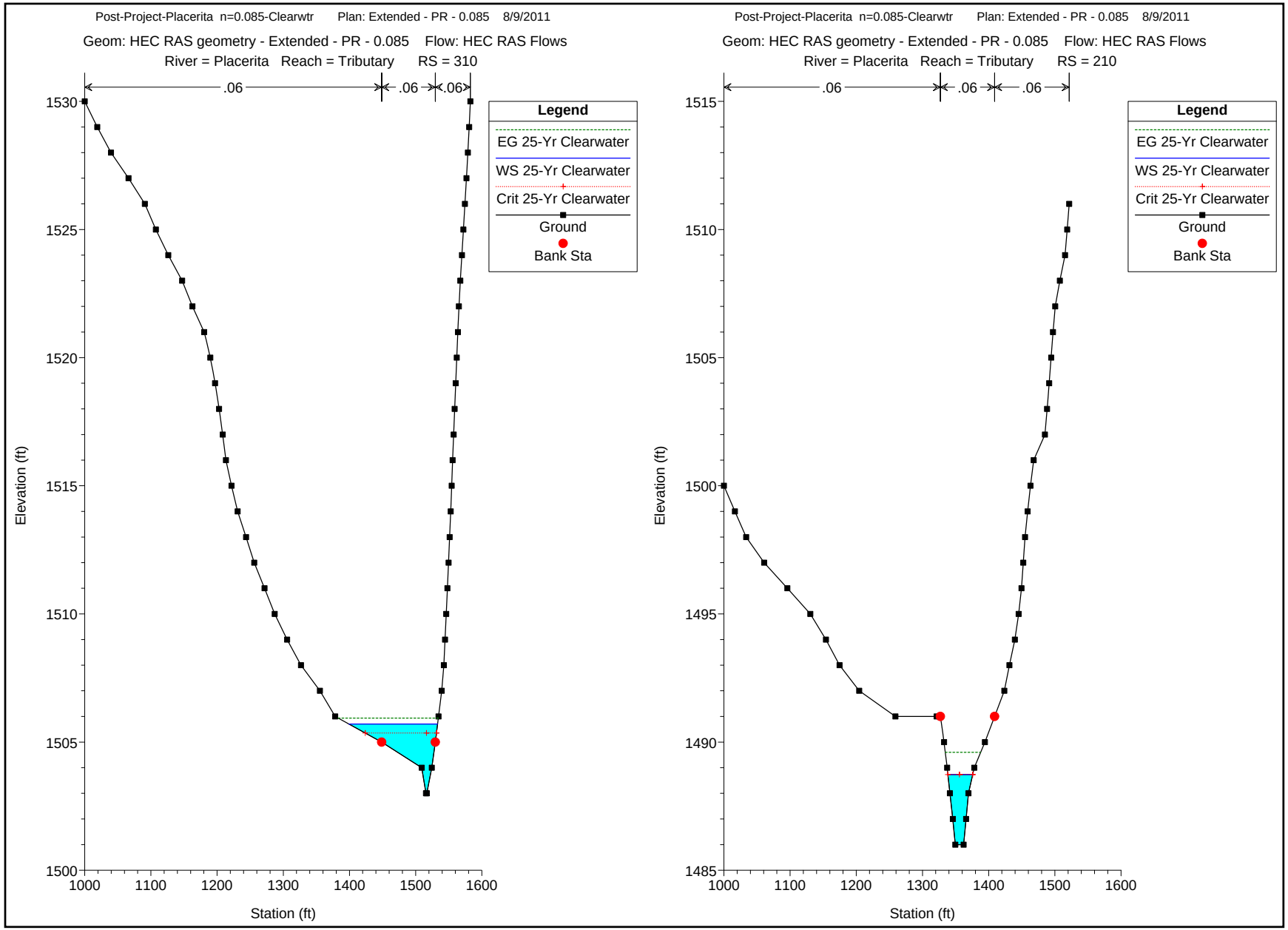
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Upper	1900	25-Yr Clearwater	2543.10	1503.00	1511.10	1510.29	1512.70	0.022576	10.17	249.96	52.33	0.82
Upper	1800	25-Yr Clearwater	2543.10	1497.00	1504.41	1504.27	1505.16	0.014131	8.11	445.22	222.16	0.65
Upper	1700	25-Yr Clearwater	2543.10	1489.00	1494.46	1494.46	1495.14	0.022215	7.91	451.26	316.78	0.78
Upper	1600	25-Yr Clearwater	2543.10	1479.00	1484.84	1484.98	1485.73	0.016603	8.55	440.71	302.65	0.71
Upper	1500	25-Yr Clearwater	2543.10	1474.00	1480.99	1480.42	1481.37	0.007456	6.09	628.52	476.36	0.48
Upper	1400	25-Yr Clearwater	2543.10	1470.00	1475.72	1475.64	1476.68	0.036800	7.85	326.97	163.00	0.95
Tributary	510	25-Yr Clearwater	481.40	1545.00	1548.19	1548.44	1549.00	0.033855	7.39	78.12	117.30	0.89
Tributary	410	25-Yr Clearwater	481.40	1524.00	1527.56	1527.61	1527.94	0.034047	5.98	115.14	164.74	0.85
Tributary	310	25-Yr Clearwater	481.40	1503.00	1505.70	1505.35	1505.94	0.016605	3.98	132.05	133.95	0.59
Tributary	210	25-Yr Clearwater	481.40	1486.00	1488.73	1488.73	1489.60	0.045555	7.49	64.24	37.41	1.01
Tributary	110	25-Yr Clearwater	481.40	1479.00	1483.05	1482.79	1483.31	0.009344	4.80	161.37	193.44	0.49
Tributary	10	25-Yr Clearwater	481.40	1471.00	1475.26	1475.26	1476.60	0.044328	9.31	51.73	19.25	1.00
Lower	1300	25-Yr Clearwater	2936.70	1468.00	1473.74	1472.95	1474.41	0.011180	7.07	498.34	191.23	0.58
Lower	1250	25-Yr Clearwater	2936.70	1463.00	1468.83	1468.83	1469.79	0.022682	9.08	435.39	227.77	0.81
Lower	1200	25-Yr Clearwater	2936.70	1459.00	1465.73	1464.76	1465.90	0.003433	4.37	1080.52	502.30	0.33
Lower	1150	25-Yr Clearwater	2936.70	1453.00	1461.52	1460.17	1462.83	0.014907	9.19	322.52	70.95	0.69
Lower	1100	25-Yr Clearwater	2936.70	1447.00	1454.34	1454.34	1455.38	0.014251	8.66	449.61	273.94	0.67
Lower	1050	25-Yr Clearwater	2936.70	1443.00	1452.03	1449.28	1452.27	0.003388	4.54	1047.17	644.12	0.33
Lower	1000	25-Yr Clearwater	2936.70	1439.00	1449.57	1447.03	1450.73	0.011102	8.63	340.40	50.62	0.59
Sound Stages	2527.261	25-Yr Clearwater	2981.80	1432.00	1439.34	1439.12	1441.49	0.029518	11.76	253.48	51.63	0.94
Sound Stages	2268.881	25-Yr Clearwater	2981.80	1425.00	1434.35	1433.12	1435.65	0.016514	9.15	325.92	61.18	0.70
Sound Stages	2007.81	25-Yr Clearwater	2981.80	1422.00	1427.82	1427.82	1429.45	0.036438	10.25	291.03	89.33	1.00
Sound Stages	1841.25	25-Yr Clearwater	2981.80	1419.00	1426.04	1422.73	1426.30	0.005851	4.10	727.71	133.58	0.31
Sound Stages	1644.9	25-Yr Clearwater	2981.80	1416.00	1423.89	1421.00	1424.58	0.013715	6.68	446.47	71.96	0.47
Sound Stages	1615		Bridge									
Sound Stages	1526.5	25-Yr Clearwater	2981.80	1414.00	1421.57		1422.67	0.026493	8.42	354.10	66.70	0.64
Sound Stages	1368.35	25-Yr Clearwater	2981.80	1412.00	1419.11		1419.72	0.012642	6.28	474.54	79.27	0.45
Sound Stages	1258.35	25-Yr Clearwater	2981.80	1410.00	1416.64		1417.69	0.028226	8.21	363.27	75.43	0.66
Sound Stages	1052.85	25-Yr Clearwater	2981.80	1405.12	1414.86		1415.20	0.005862	4.71	633.38	92.46	0.32
Sound Stages	865.5	25-Yr Clearwater	2981.80	1402.00	1414.32		1414.49	0.002341	3.32	897.80	111.22	0.21
Sound Stages	700.65	25-Yr Clearwater	2981.80	1398.00	1414.03	1405.49	1414.17	0.001556	3.04	980.50	99.68	0.17
Sound Stages	700		Culvert									
Sound Stages	9.076105	25-Yr Clearwater	2981.80	1390.00	1397.98	1397.98	1399.88	0.023591	11.40	296.46	97.64	0.86
Sound Stages	8	25-Yr Clearwater	2981.80	1390.00	1397.04	1397.49	1398.59	0.031809	11.02	364.56	221.08	0.96
Sound Stages	7	25-Yr Clearwater	3210.80	1388.00	1390.99	1390.99	1391.69	0.026383	7.28	543.72	409.33	0.82
Sound Stages	6	25-Yr Clearwater	3210.80	1378.00	1384.73	1383.87	1384.85	0.004548	3.74	1271.49	736.93	0.35
Sound Stages	5	25-Yr Clearwater	3210.80	1376.00	1380.96	1380.96	1381.54	0.015316	7.46	682.92	516.94	0.67
Sound Stages	4	25-Yr Clearwater	3210.80	1362.00	1372.87	1369.97	1373.74	0.008794	7.48	429.20	69.75	0.53
Sound Stages	3	25-Yr Clearwater	3295.10	1356.00	1364.22	1363.14	1365.41	0.017455	8.91	453.53	530.81	0.73
Sound Stages	2	25-Yr Clearwater	3295.10	1348.00	1353.70	1353.34	1354.18	0.010219	6.30	761.52	532.91	0.55

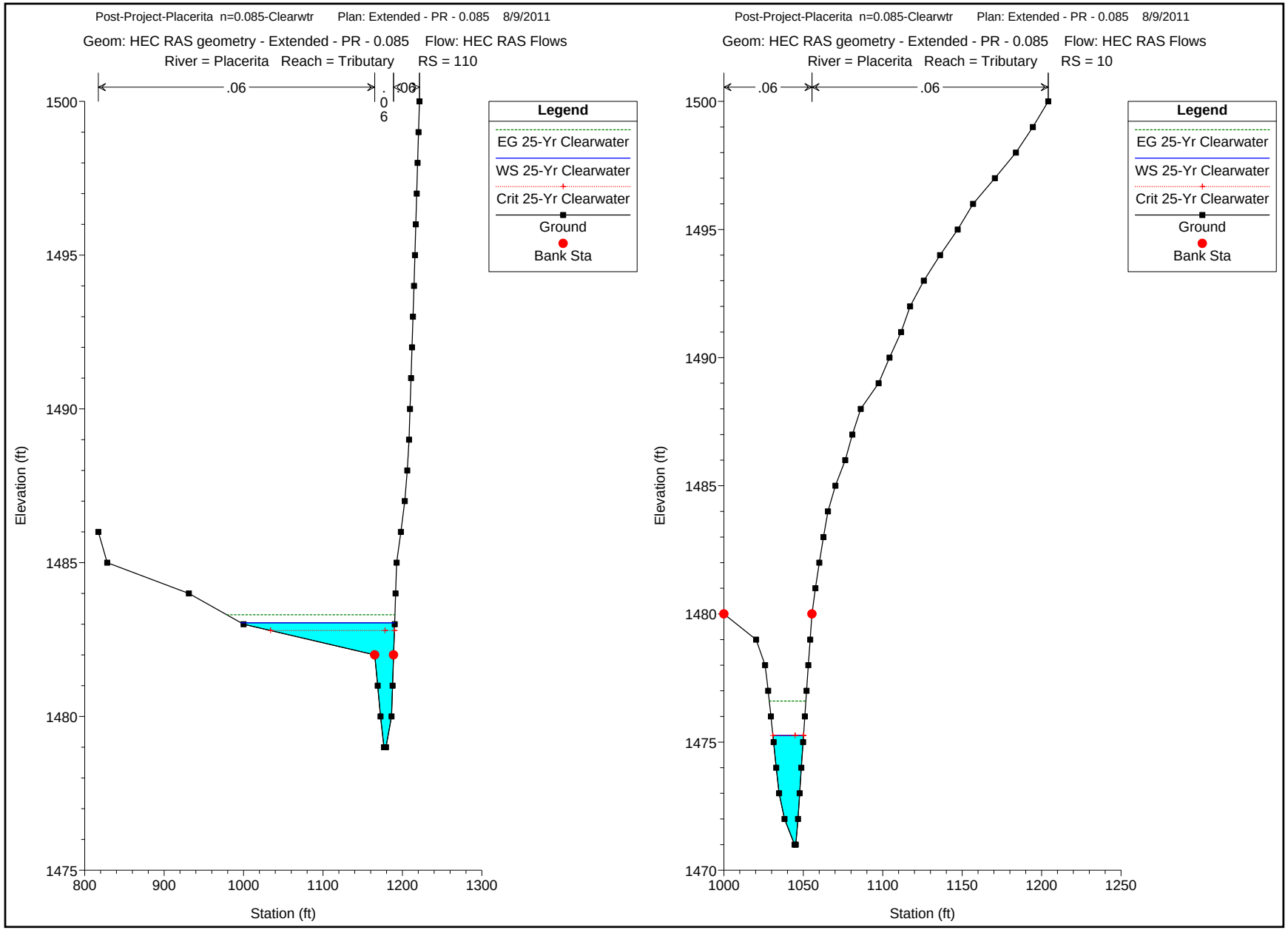

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1900
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1800
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

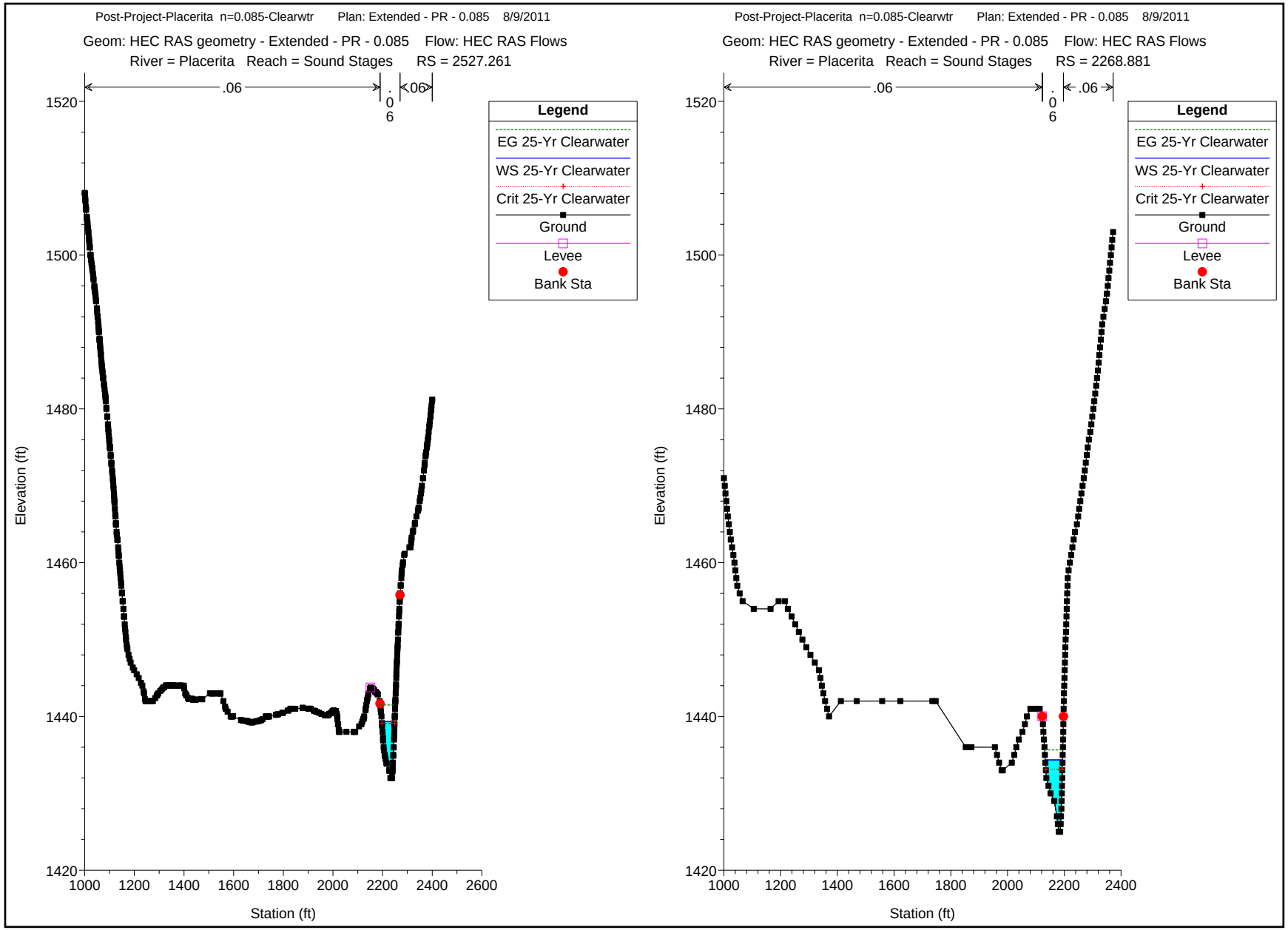

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1700
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1510
1505
1500
1495
1490
1485
1000
1100
1200
1300
1400
1500
1600
1700
1800
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1600
.06
.06
.06
Legend
EG 25-Yr Clearwater
Crit 25-Yr Clearwater
WS 25-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1000
1100
1200
1300
1400
1500
1600
1700

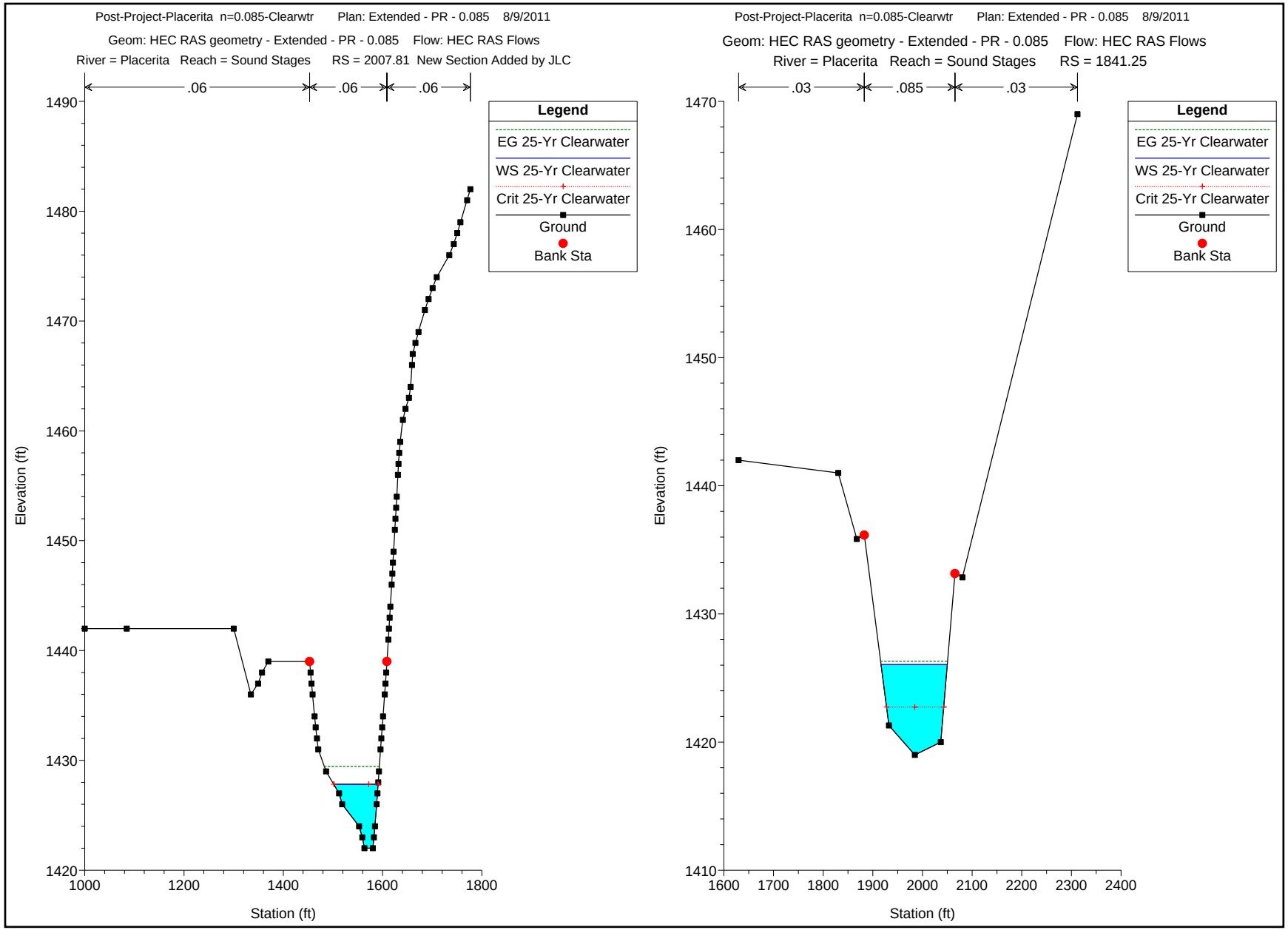

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1500
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1400 D/S of Upper Reach
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

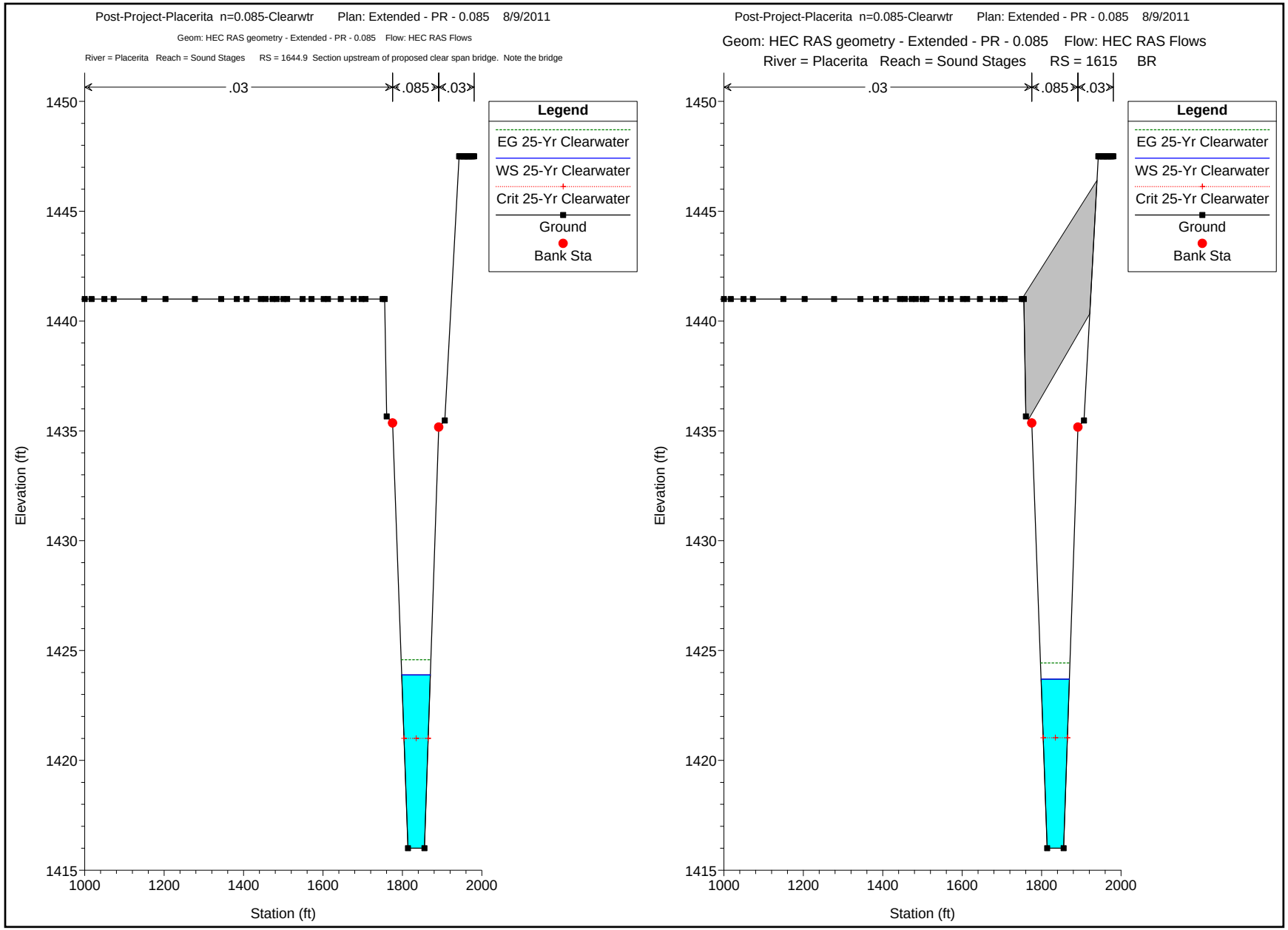

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 510
.06
.06
.06
Legend
EG 25-Yr Clearwater
Crit 25-Yr Clearwater
WS 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1575
1570
1565
1560
1555
1550
1545
1000
1100
1200
1300
1400
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 410
.06
.06
.06
Legend
EG 25-Yr Clearwater
Crit 25-Yr Clearwater
WS 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1545
1540
1535
1530
1525
1520
1000
1050
1100
1150
1200
1250
1300

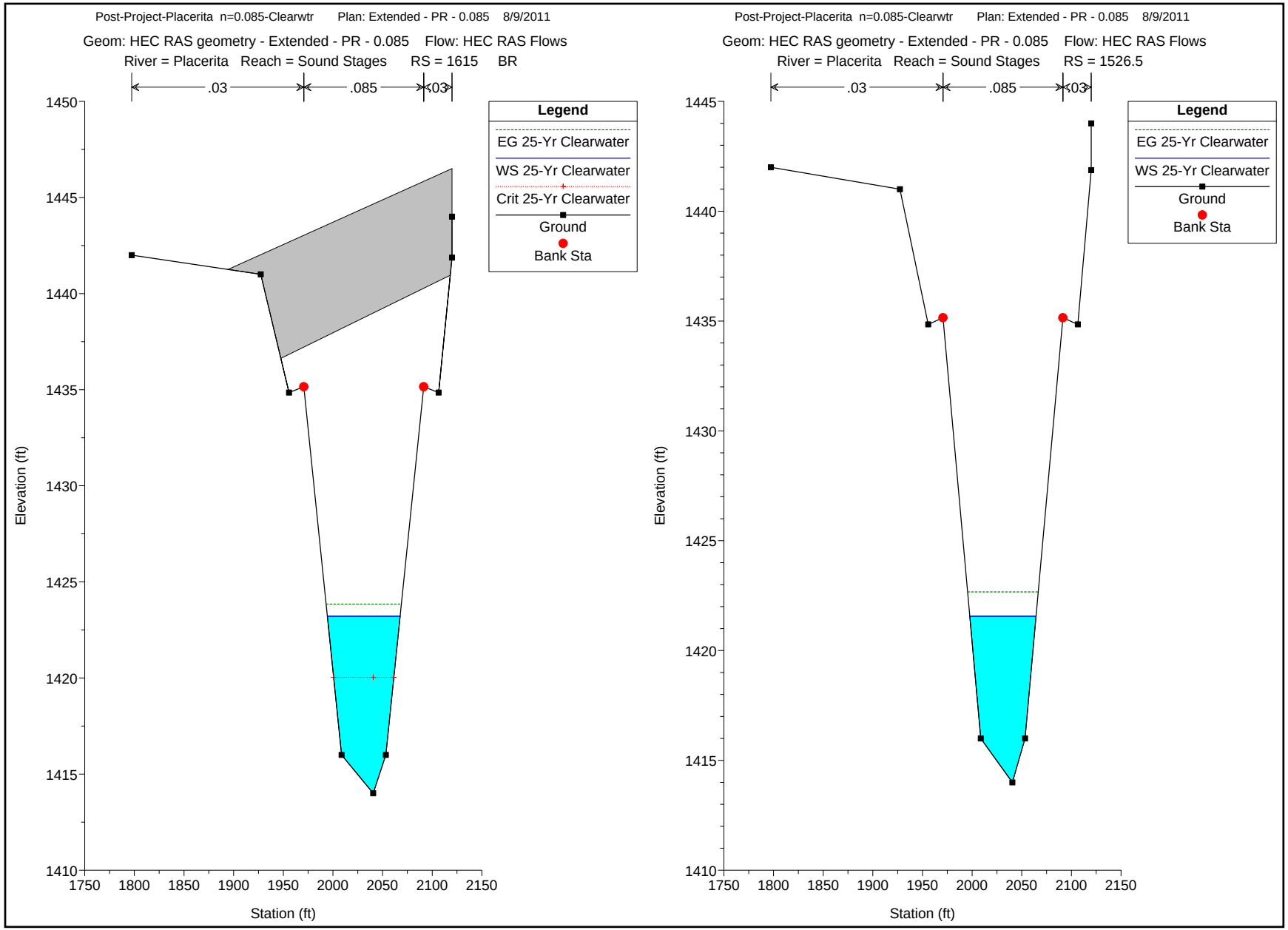

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 310
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 210
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

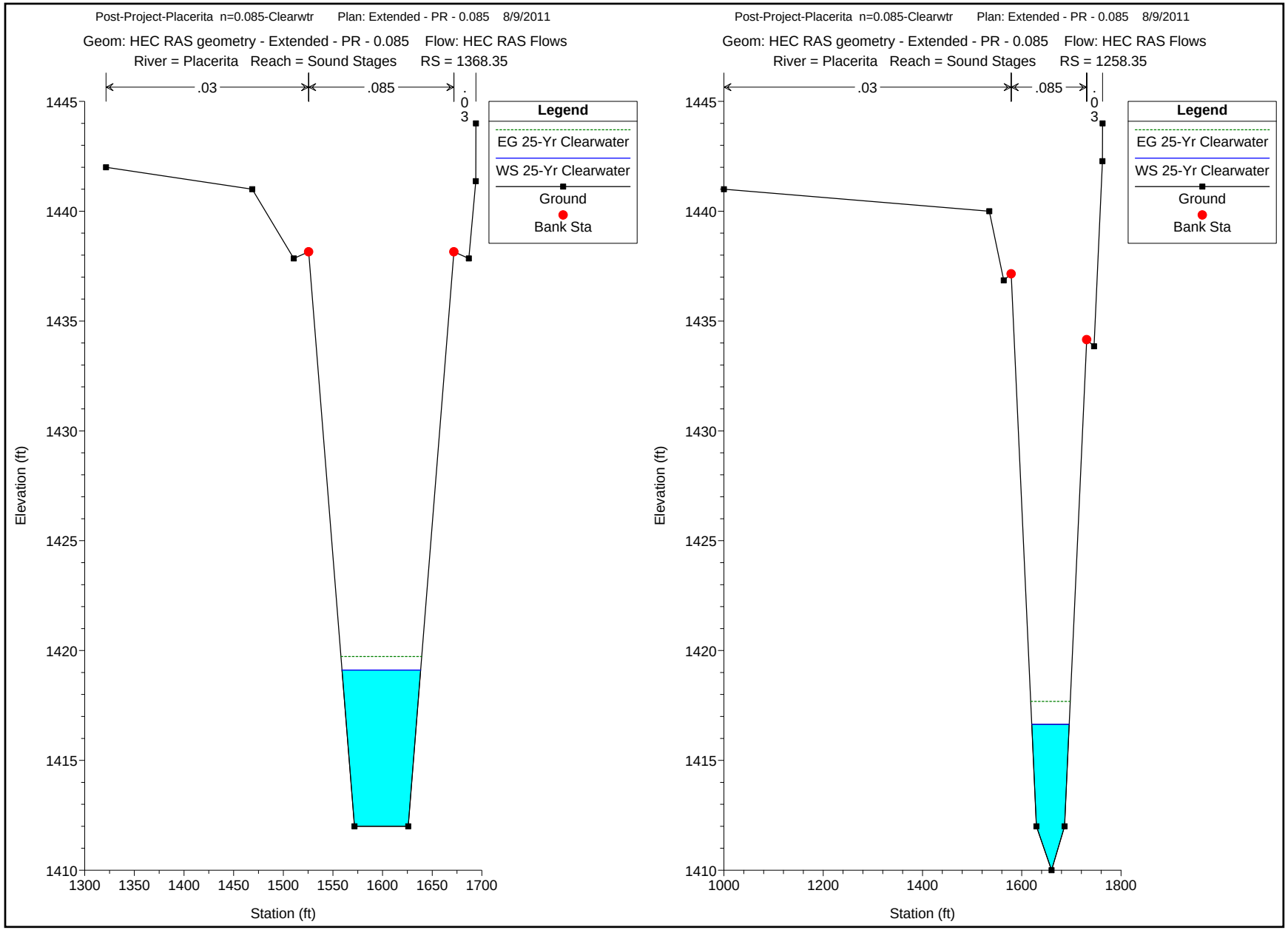

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 110
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
800
900
1000
1100
1200
1300
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 10
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1050
1100
1150
1200
1250

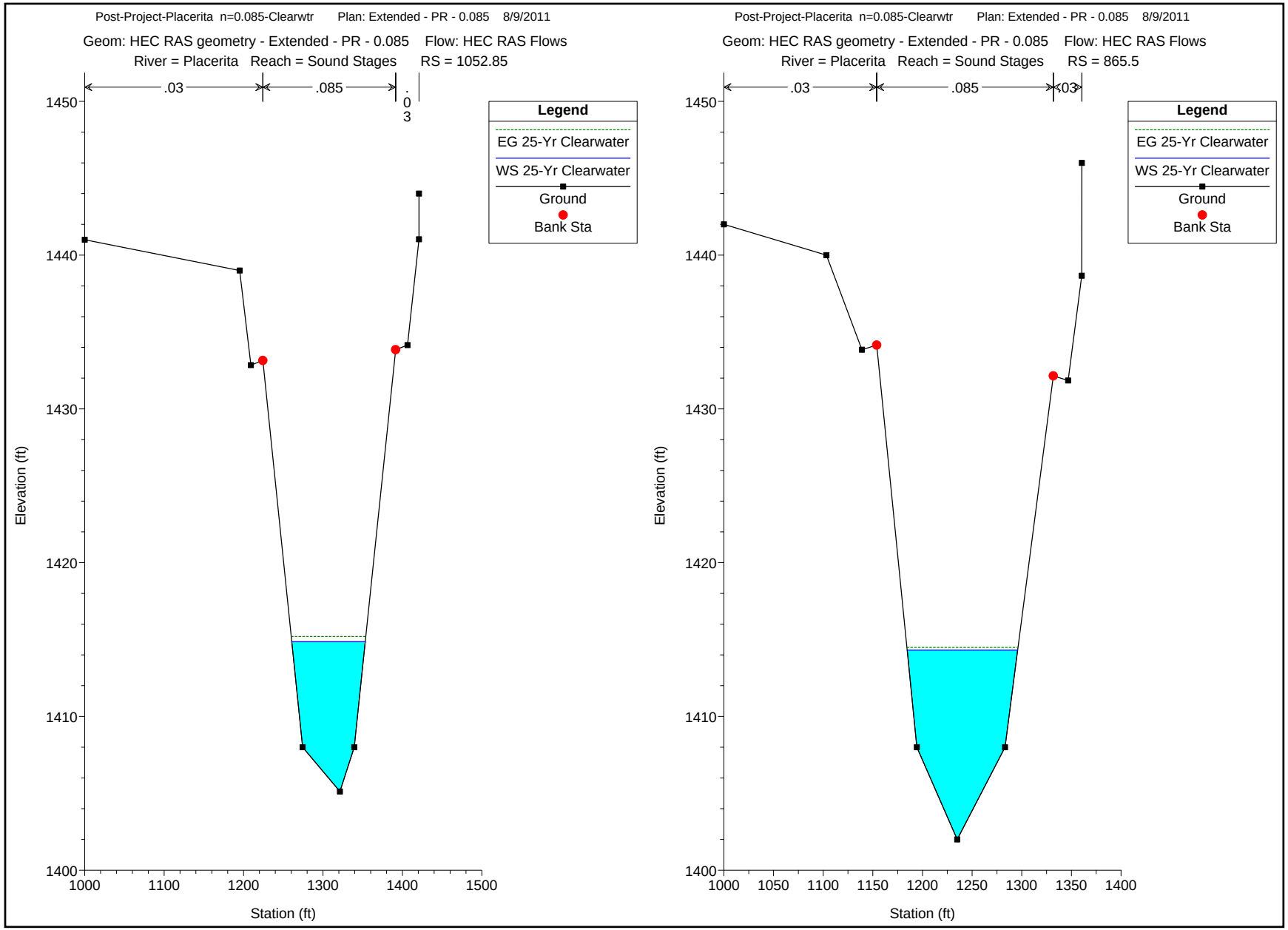

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2527.261
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2268.881
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

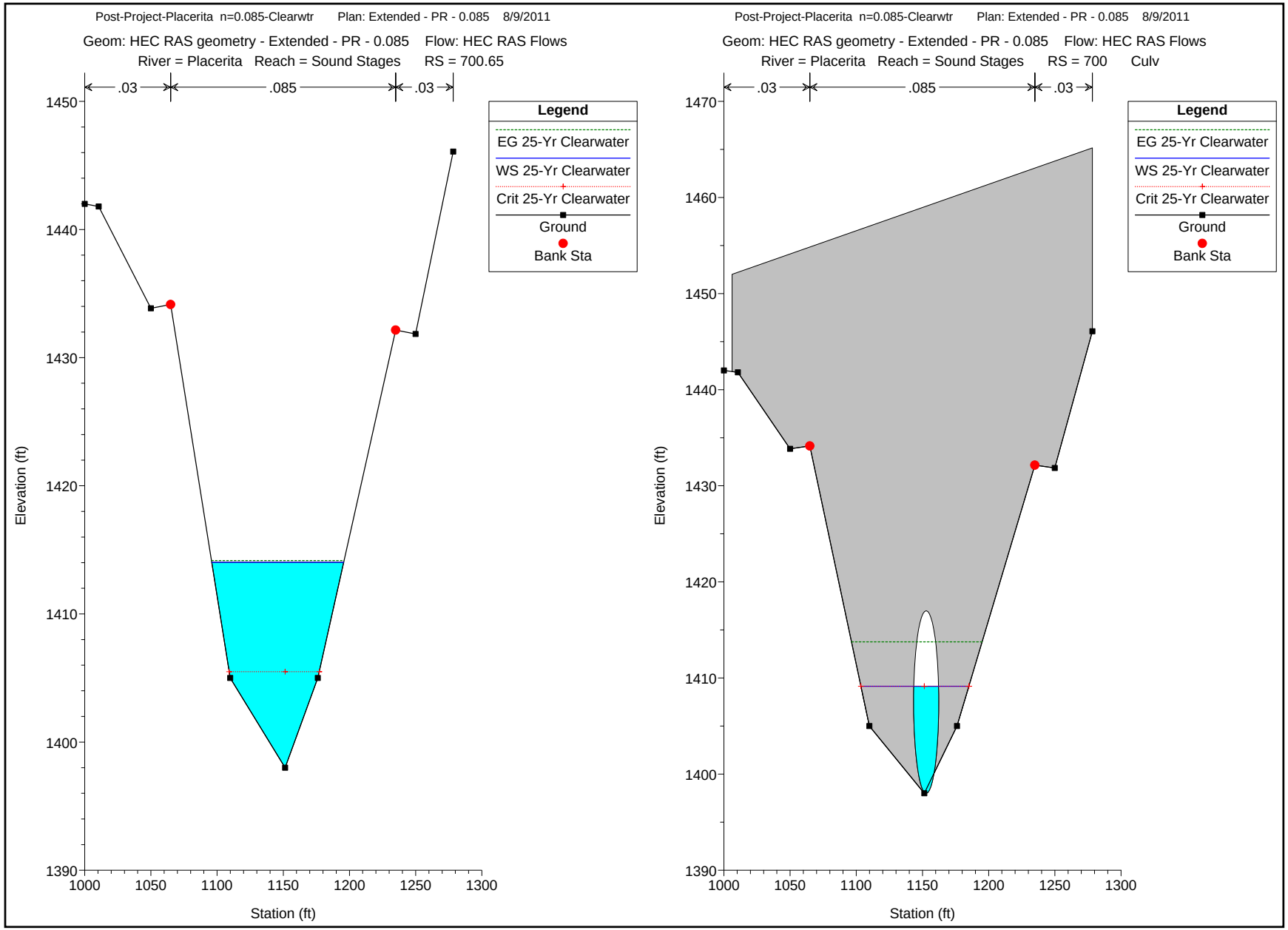

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2007.81 New Section Added by JLC
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1490
1480
1470
1460
1450
1440
1430
1420
1000
1200
1400
1600
1800
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1841.25
.03
.085
.03
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1470
1460
1450
1440
1430
1420
1410
1600
1700
1800
1900
2000
2100
2200
2300
2400

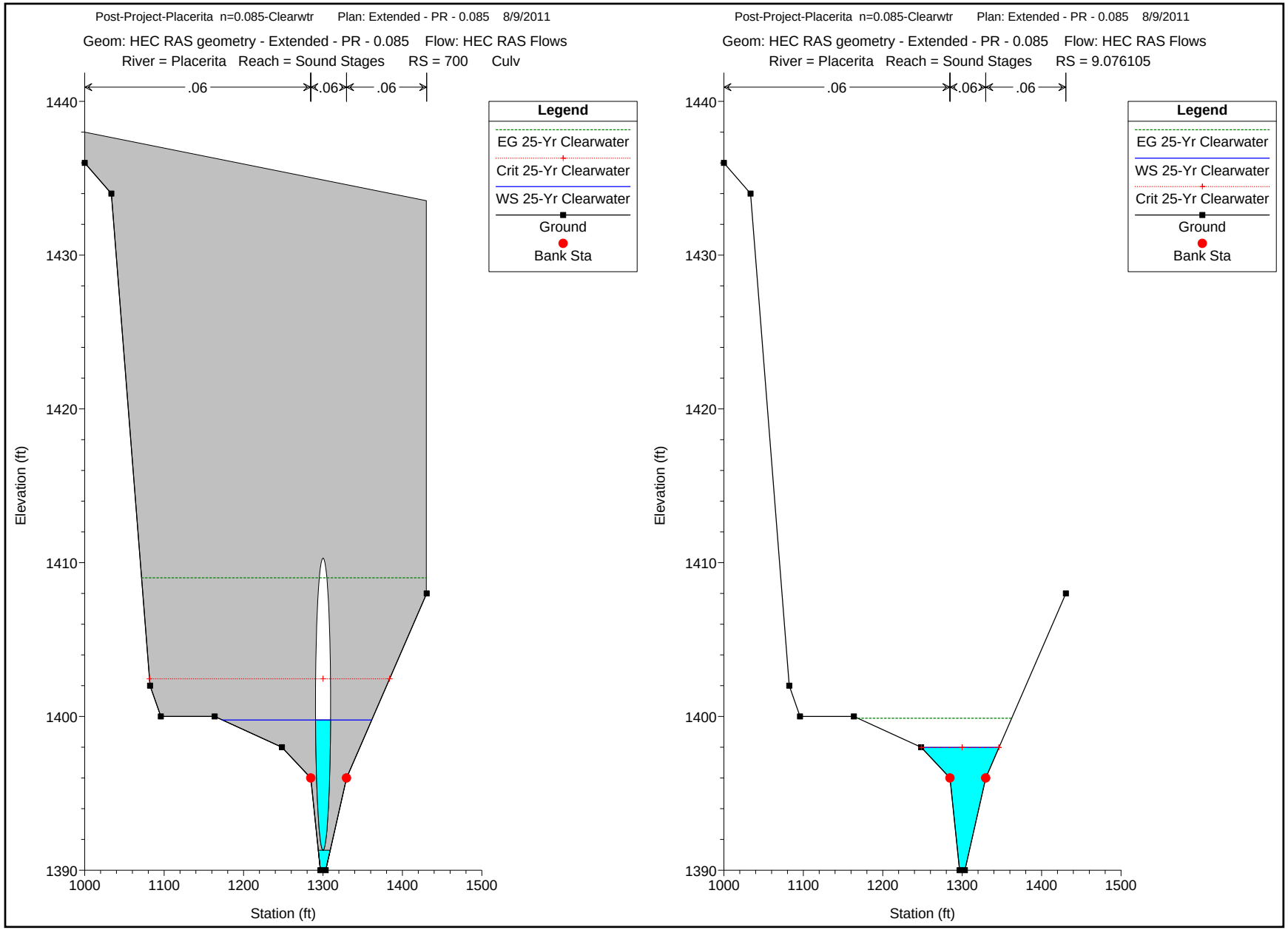

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1644.9 Section upstream of proposed clear span bridge. Note the bridge
.03
.085
.03
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1615 BR
.03
.085
.03
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

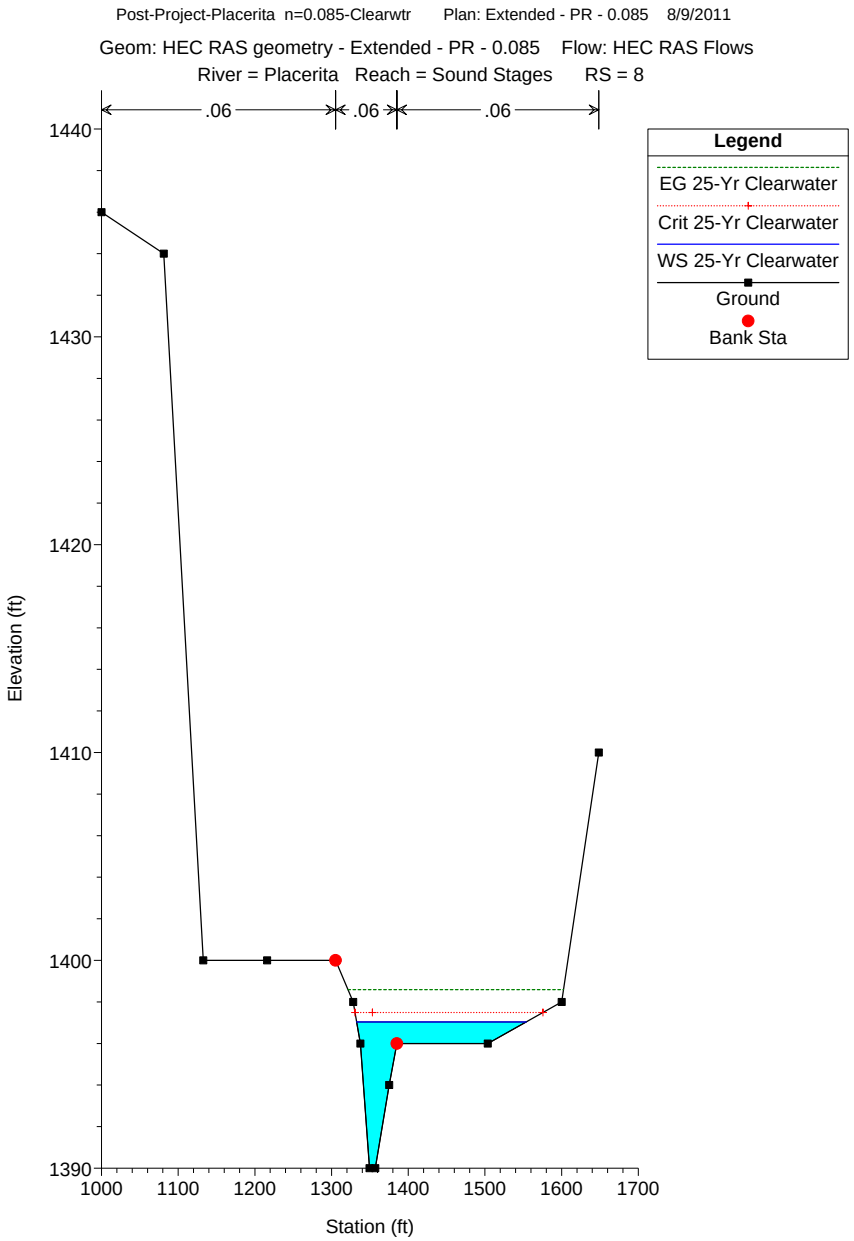

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1615 BR
.03
.085
.03
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1526.5
.03
.085
.03
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

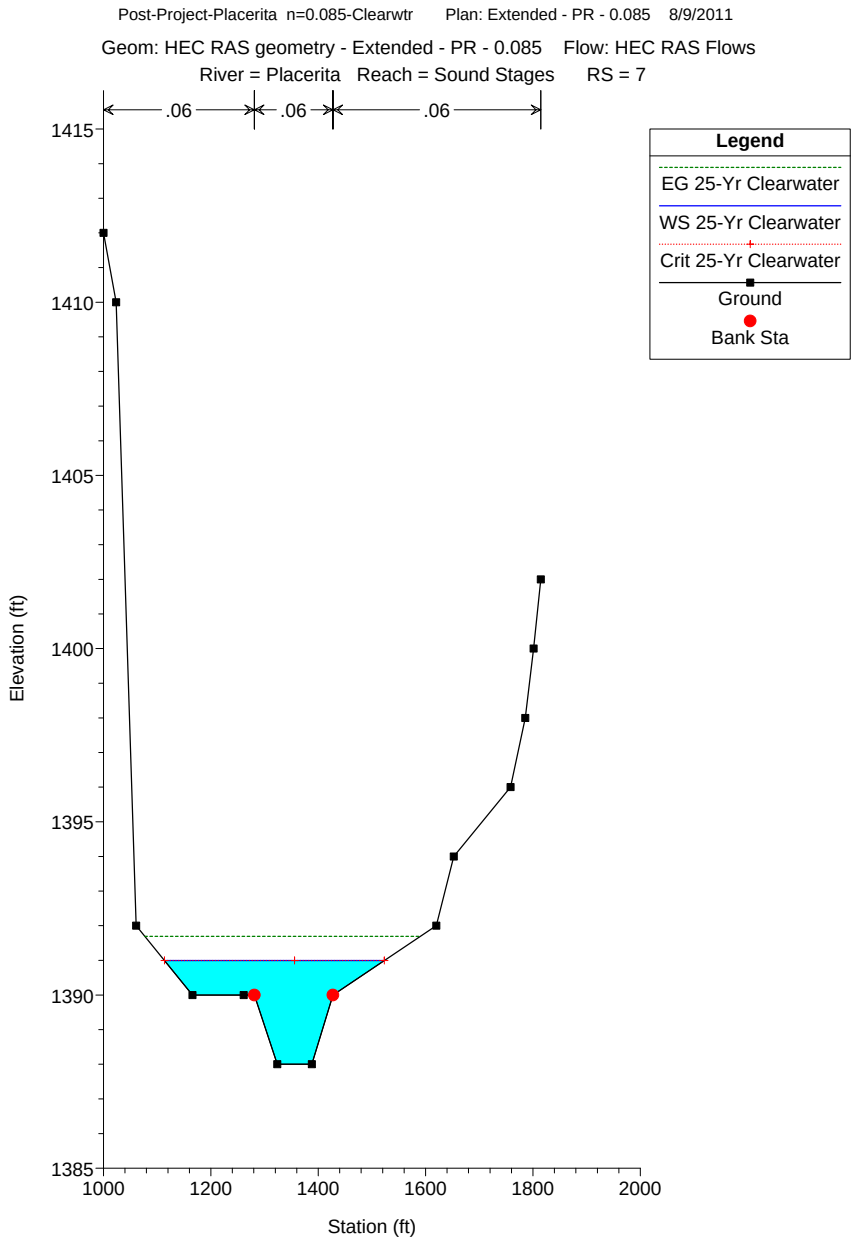

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1368.35
.03
.085
.03
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1445
1440
1435
1430
1425
1420
1415
1410
1300
1350
1400
1450
1500
1550
1600
1650
1700
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1258.35
.03
.085
.03
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1445
1440
1435
1430
1425
1420
1415
1410
1000
1200
1400
1600
1800

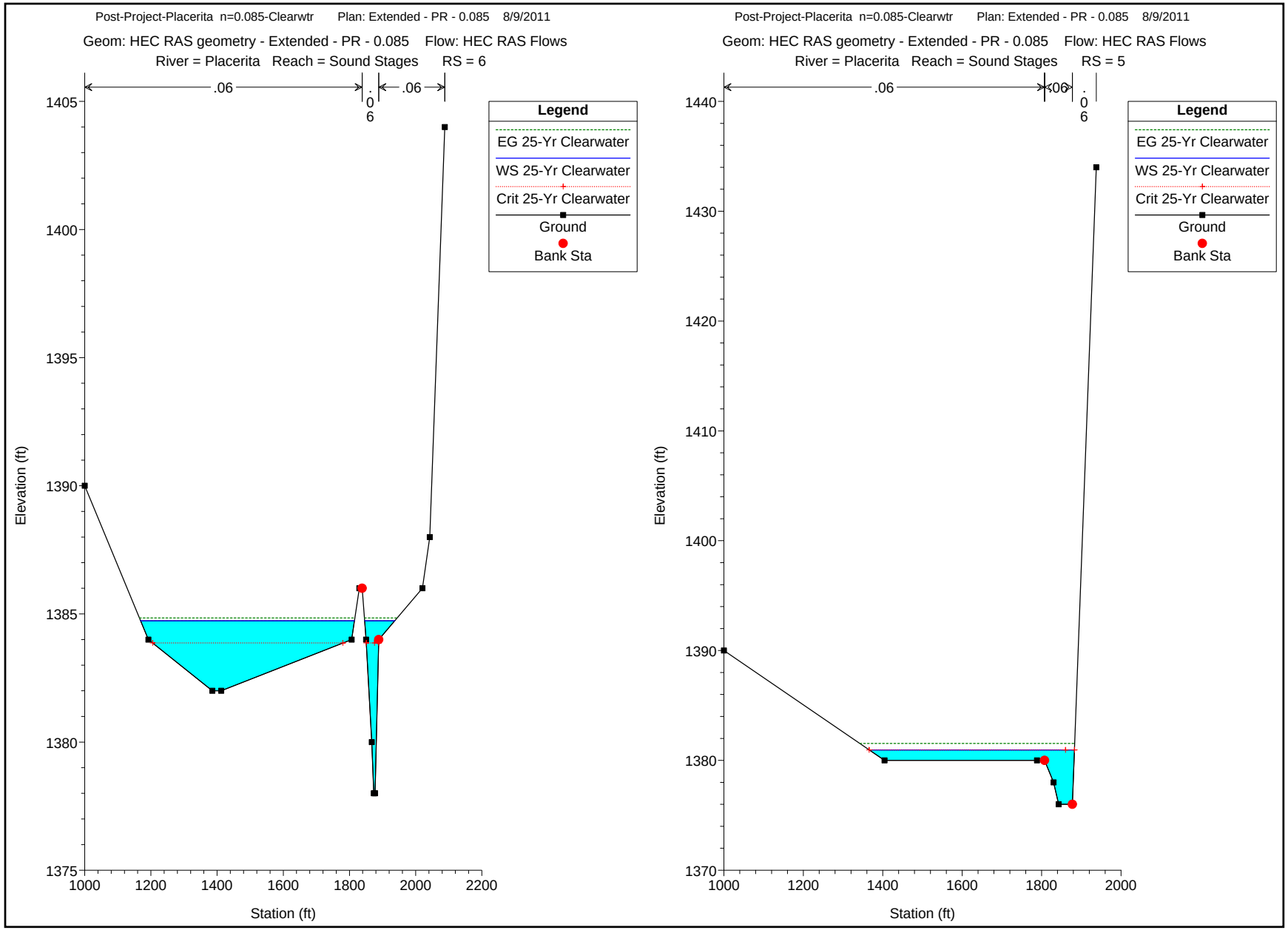

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1052.85
.03
.085
.03
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1440
1430
1420
1410
1400
1000
1100
1200
1300
1400
1500
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 865.5
.03
.085
.03
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1440
1430
1420
1410
1400
1000
1050
1100
1150
1200
1250
1300
1350
1400

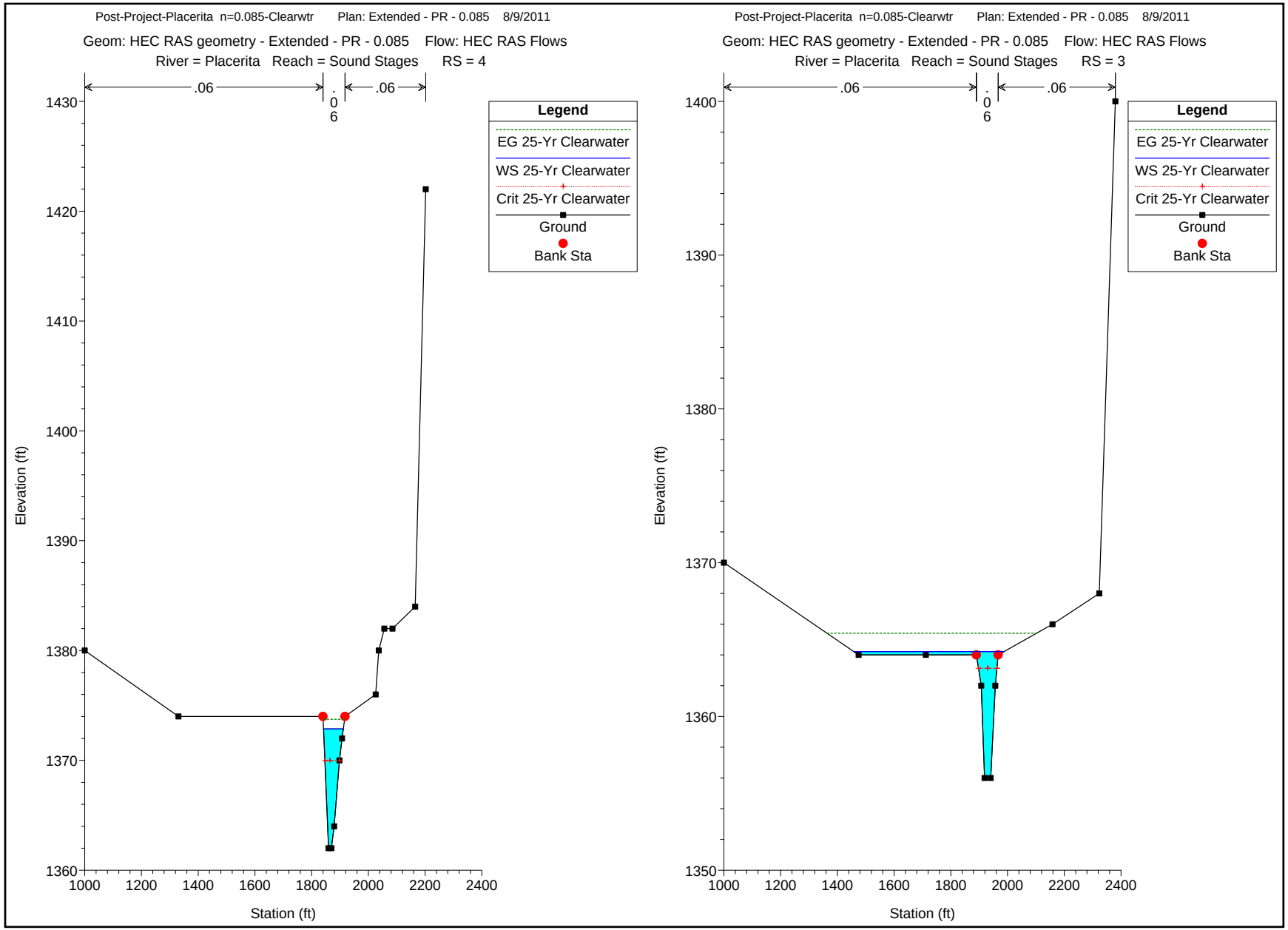

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700.65
.03
.085
.03
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700 Culv
.03
.085
.03
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

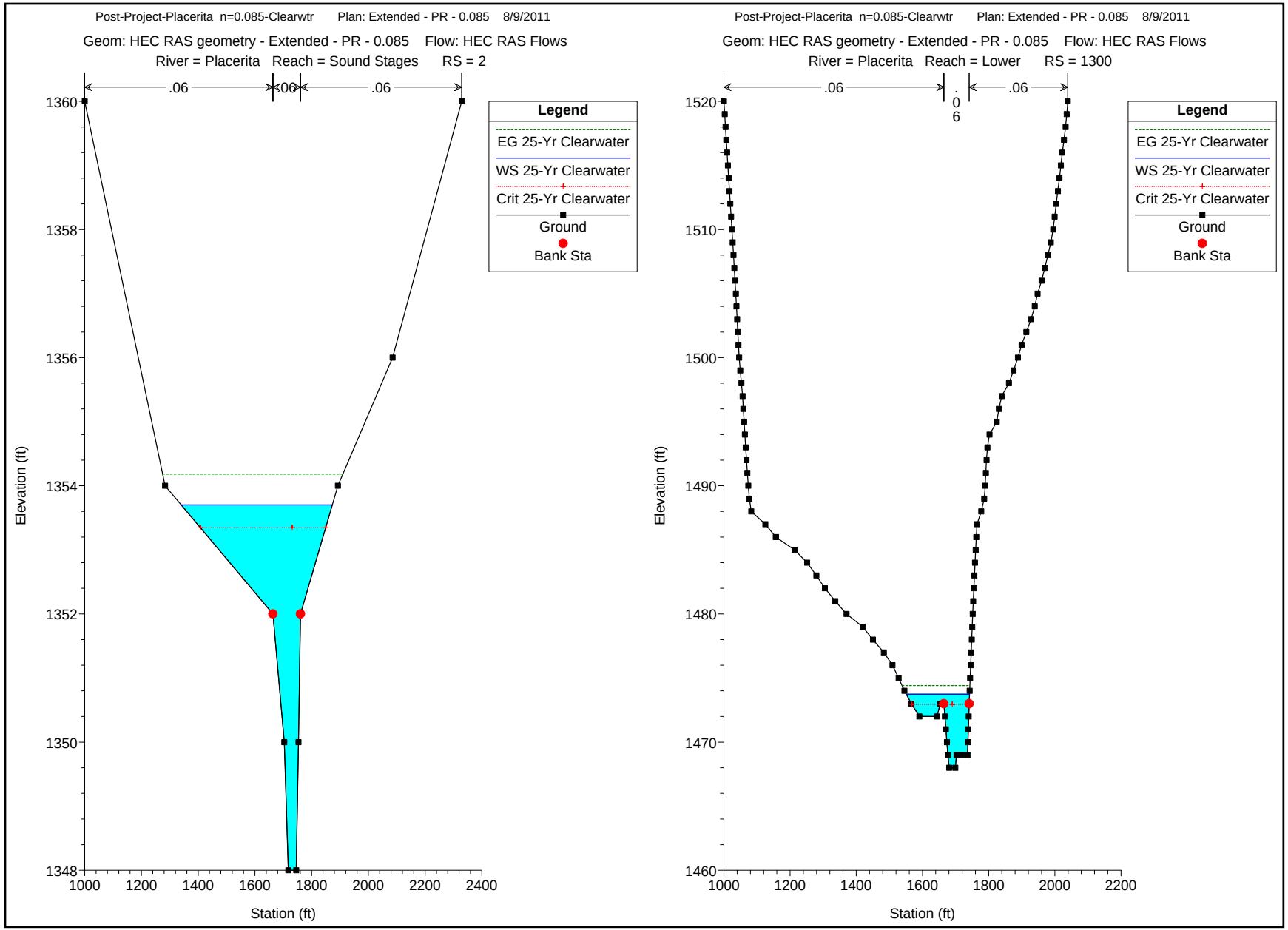

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700 Culv
.06
.06
.06
Legend
EG 25-Yr Clearwater
Crit 25-Yr Clearwater
WS 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 9.076105
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500
Station (ft)

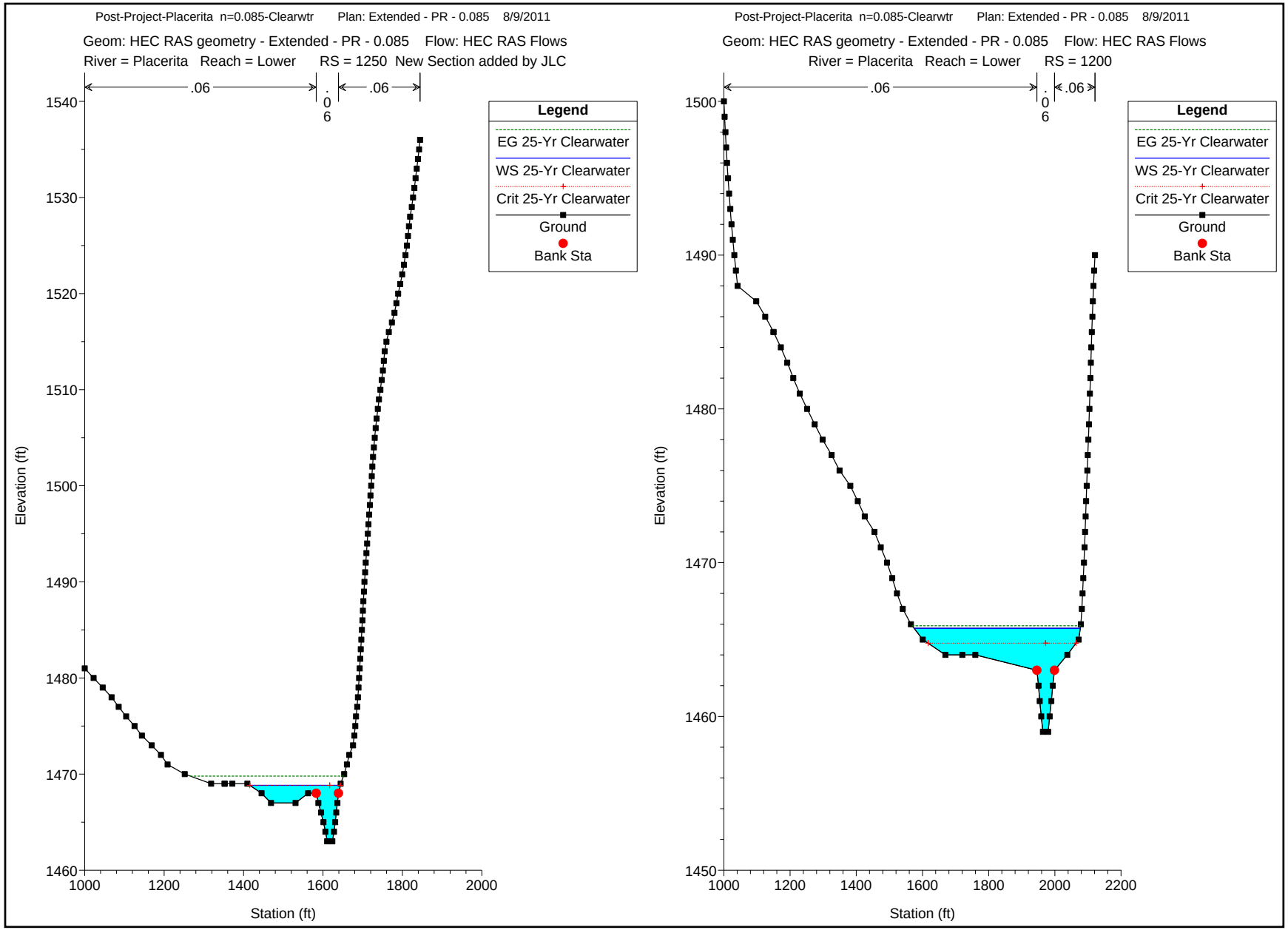

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 8
.06
.06
.06
Legend
EG 25-Yr Clearwater
Crit 25-Yr Clearwater
WS 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500
1600
1700
Station (ft)

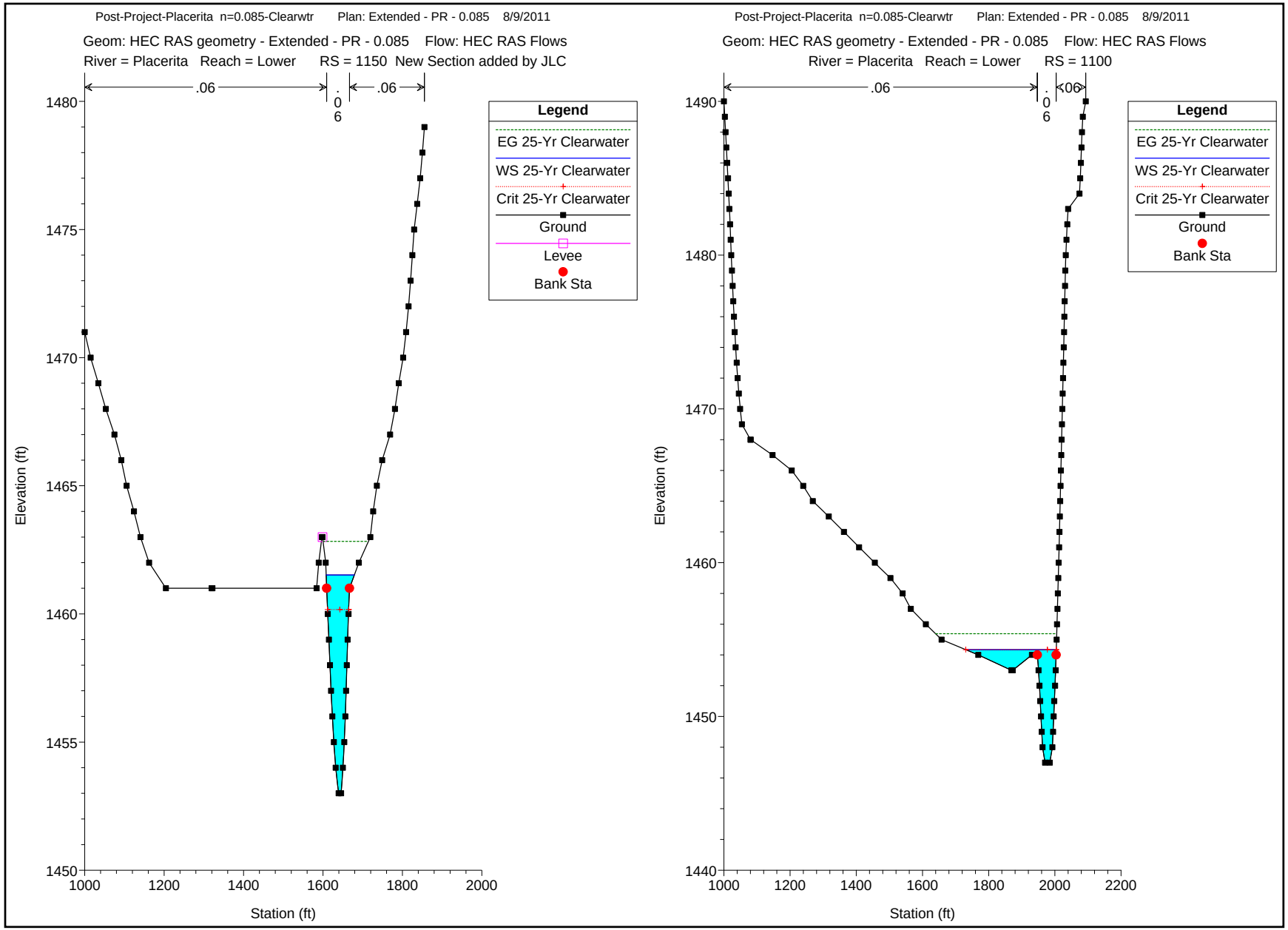

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 7
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1415
1410
1405
1400
1395
1390
1385
1000
1200
1400
1600
1800
2000
Station (ft)

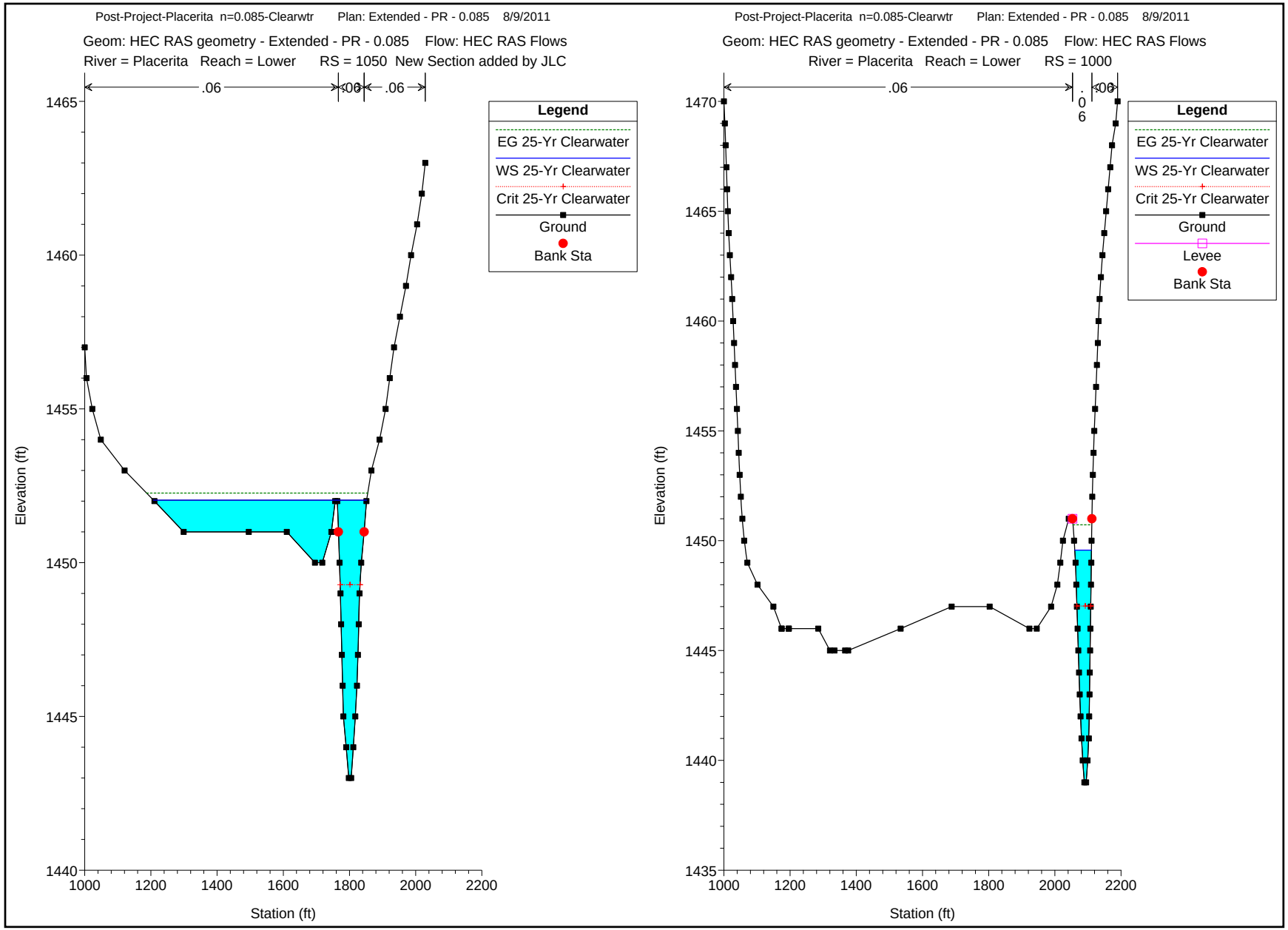

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 6
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 5
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)


Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 4
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 3
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)


Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1300
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)


Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1250 New Section added by JLC
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1200
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

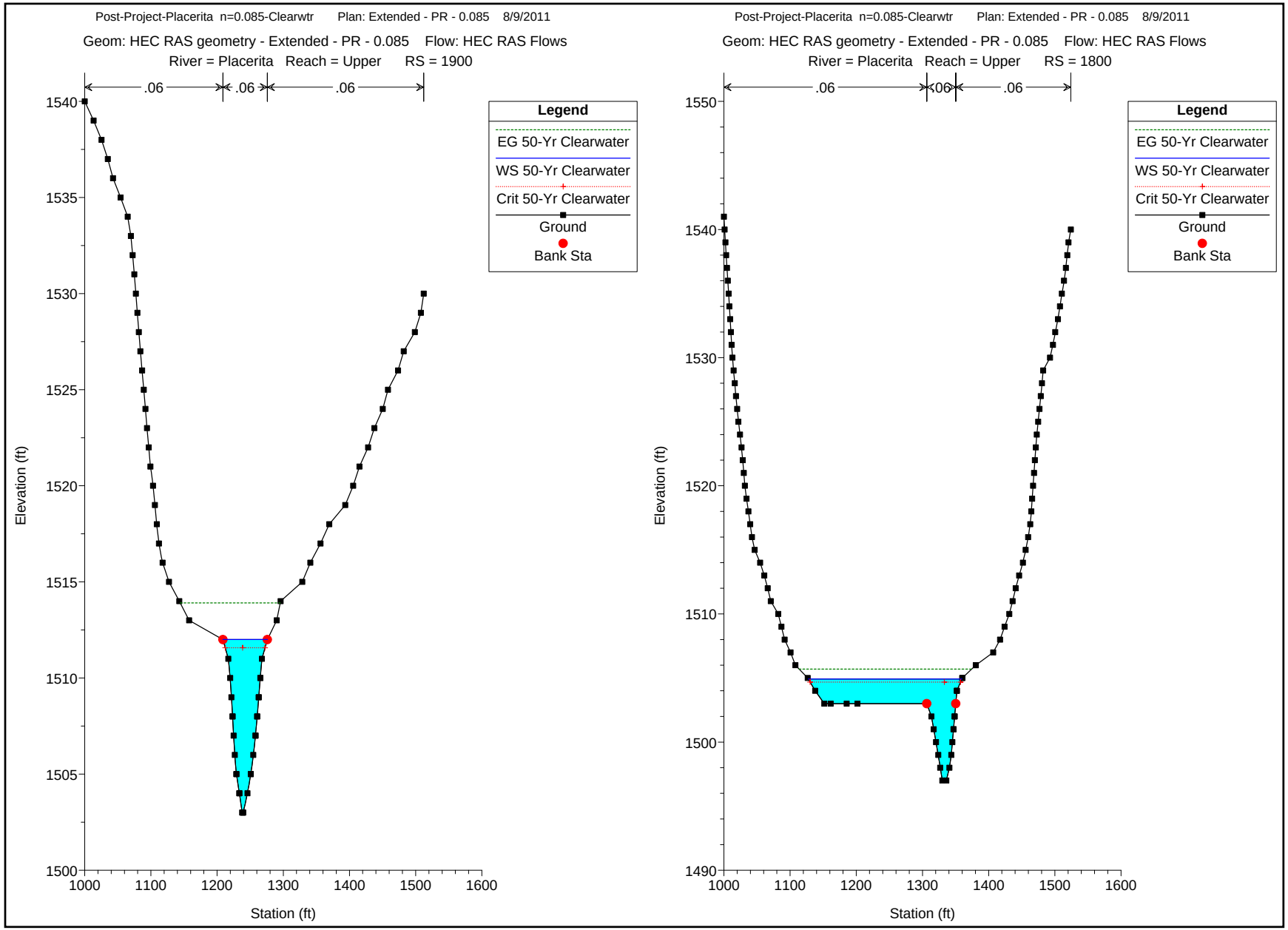

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1150 New Section added by JLC
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1100
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

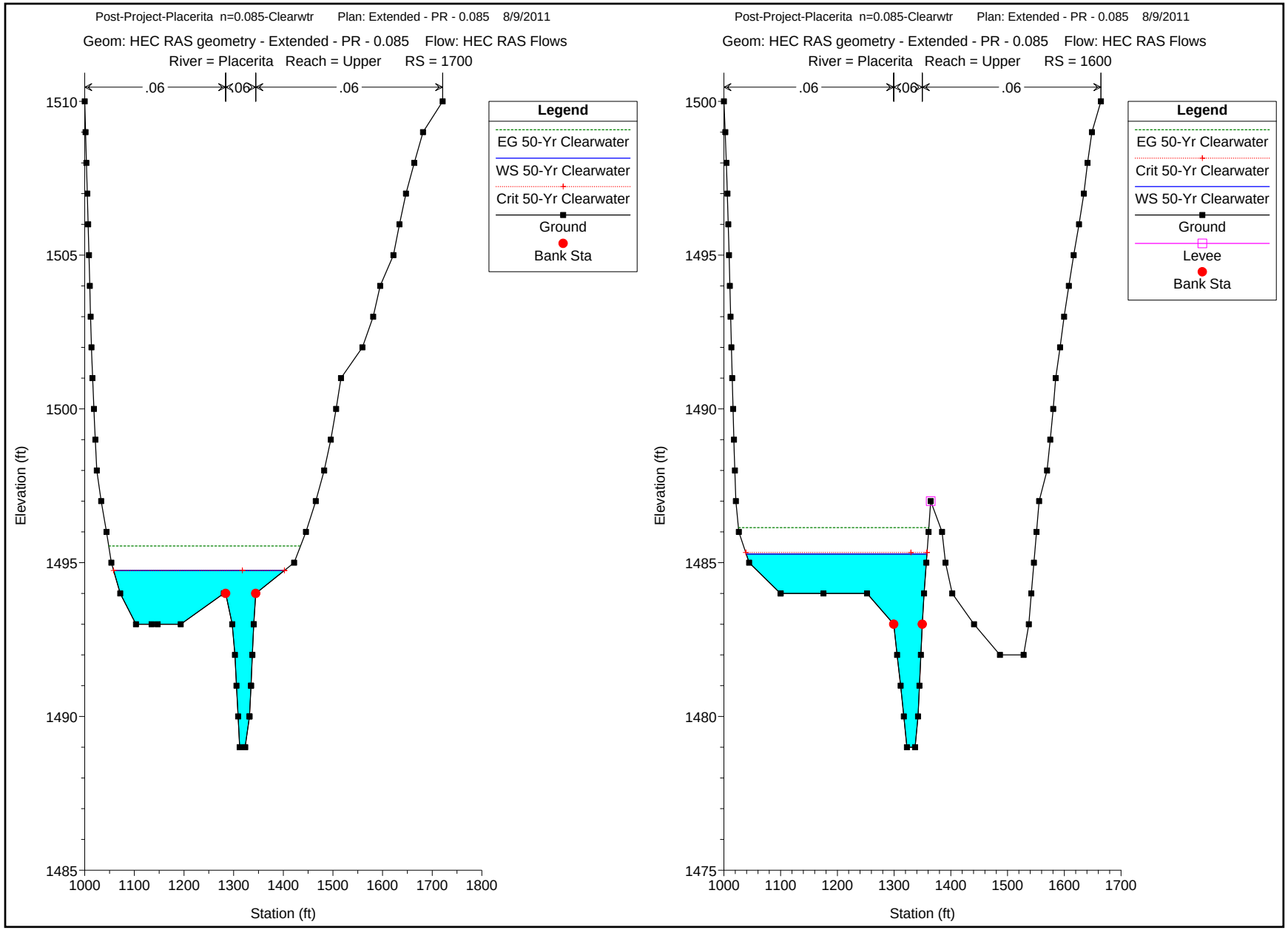

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1050 New Section added by JLC
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1000
.06
.06
.06
Legend
EG 25-Yr Clearwater
WS 25-Yr Clearwater
Crit 25-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

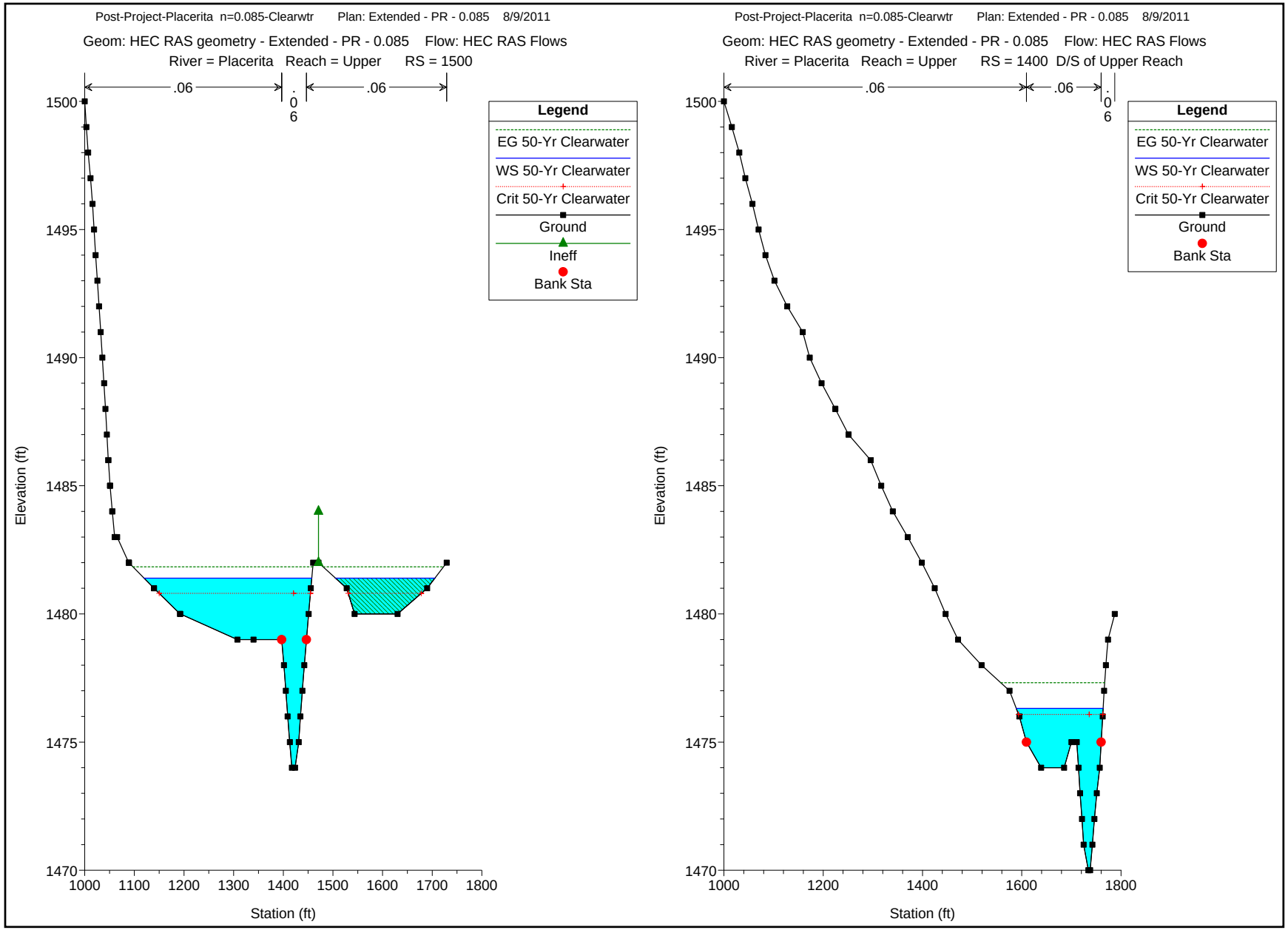
50-Year Storm Event – Post Project Condition HEC-RAS Output

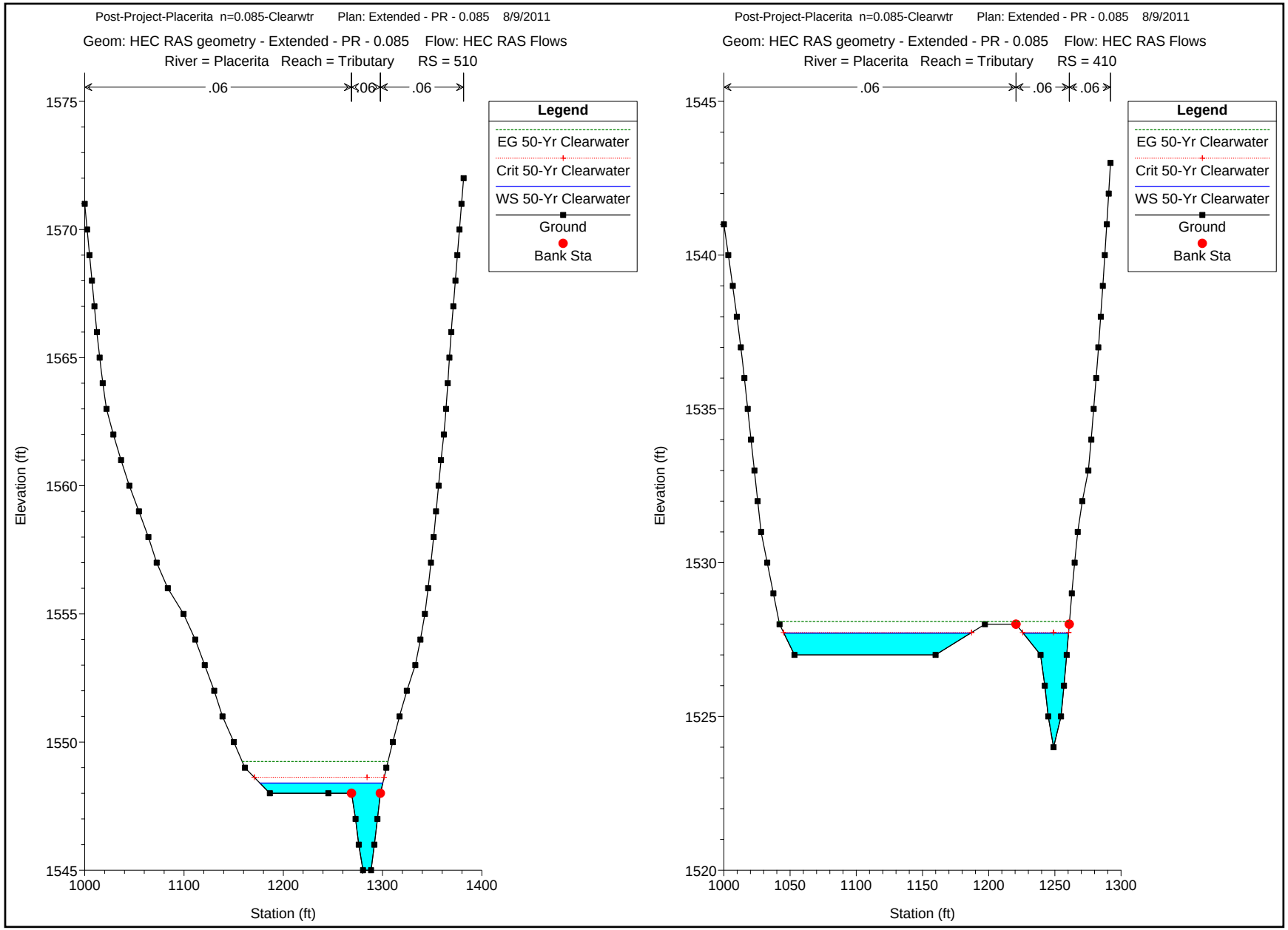
HEC-RAS Plan: Ex_PR_0.085 Profile: 50-Yr Clearwater

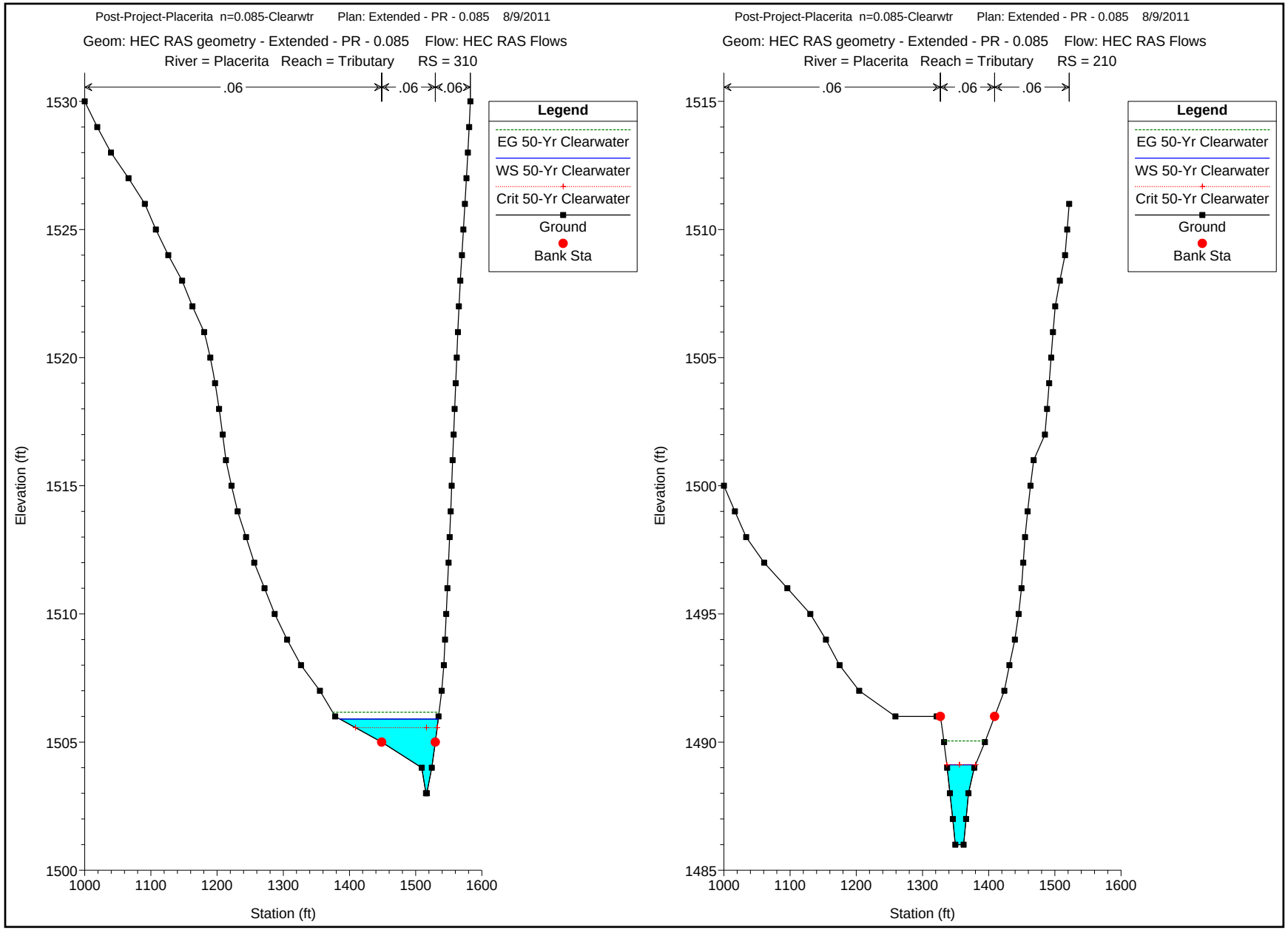
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Upper	1900	50-Yr Clearwater	3369.20	1503.00	1512.00	1511.57	1513.91	0.028291	11.07	304.29	67.40	0.92
Upper	1800	50-Yr Clearwater	3369.20	1497.00	1504.92	1504.68	1505.70	0.013679	8.53	559.60	231.94	0.65
Upper	1700	50-Yr Clearwater	3369.20	1489.00	1494.75	1494.75	1495.54	0.023908	8.69	545.83	344.02	0.82
Upper	1600	50-Yr Clearwater	3369.20	1479.00	1485.28	1485.33	1486.14	0.015620	8.84	579.40	318.46	0.70
Upper	1500	50-Yr Clearwater	3369.20	1474.00	1481.40	1480.80	1481.84	0.008080	6.69	762.28	538.15	0.51
Upper	1400	50-Yr Clearwater	3369.20	1470.00	1476.32	1476.08	1477.31	0.027993	8.07	427.36	175.07	0.86
Tributary	510	50-Yr Clearwater	616.70	1545.00	1548.40	1548.62	1549.24	0.033813	7.86	103.07	123.71	0.91
Tributary	410	50-Yr Clearwater	616.70	1524.00	1527.71	1527.73	1528.09	0.034358	6.03	141.38	175.37	0.85
Tributary	310	50-Yr Clearwater	616.70	1503.00	1505.90	1505.56	1506.17	0.016541	4.34	159.50	148.53	0.61
Tributary	210	50-Yr Clearwater	616.70	1486.00	1489.11	1489.11	1490.05	0.044311	7.75	79.61	43.25	1.01
Tributary	110	50-Yr Clearwater	616.70	1479.00	1483.30	1483.06	1483.53	0.008416	4.81	212.43	211.13	0.47
Tributary	10	50-Yr Clearwater	616.70	1471.00	1475.80	1475.80	1477.31	0.043037	9.85	62.62	20.80	1.00
Lower	1300	50-Yr Clearwater	3890.30	1468.00	1474.11	1473.61	1475.01	0.013807	8.28	570.85	199.19	0.66
Lower	1250	50-Yr Clearwater	3890.30	1463.00	1469.54	1469.54	1470.37	0.017490	8.92	662.61	366.85	0.73
Lower	1200	50-Yr Clearwater	3890.30	1459.00	1466.49	1465.11	1466.63	0.002502	4.08	1472.53	527.06	0.29
Lower	1150	50-Yr Clearwater	3890.30	1453.00	1462.13	1461.22	1463.95	0.018210	10.89	370.52	88.16	0.77
Lower	1100	50-Yr Clearwater	3890.30	1447.00	1454.96	1454.96	1455.94	0.013072	8.93	640.45	343.38	0.65
Lower	1050	50-Yr Clearwater	3890.30	1443.00	1452.87	1451.58	1453.02	0.002193	4.00	1621.12	731.88	0.27
Lower	1000	50-Yr Clearwater	3890.30	1439.00	1448.27	1448.27	1451.30	0.032834	13.98	278.26	45.42	1.00
Sound Stages	2527.261	50-Yr Clearwater	3950.40	1432.00	1440.50	1440.20	1442.93	0.028148	12.52	315.60	56.20	0.93
Sound Stages	2268.881	50-Yr Clearwater	3950.40	1425.00	1435.22	1434.07	1436.90	0.018362	10.40	379.83	63.22	0.75
Sound Stages	2007.81	50-Yr Clearwater	3950.40	1422.00	1428.61	1428.61	1430.42	0.035178	10.81	365.43	100.79	1.00
Sound Stages	1841.25	50-Yr Clearwater	3950.40	1419.00	1427.34	1423.32	1427.63	0.005334	4.36	905.31	140.72	0.30
Sound Stages	1644.9	50-Yr Clearwater	3950.40	1416.00	1425.15	1421.96	1425.98	0.013994	7.31	540.37	76.87	0.49
Sound Stages	1615		Bridge									
Sound Stages	1526.5	50-Yr Clearwater	3950.40	1414.00	1422.75		1424.02	0.025714	9.07	435.48	71.39	0.65
Sound Stages	1368.35	50-Yr Clearwater	3950.40	1412.00	1420.45		1421.16	0.012108	6.77	583.68	83.98	0.45
Sound Stages	1258.35	50-Yr Clearwater	3950.40	1410.00	1418.76		1419.61	0.016189	7.42	532.17	83.97	0.52
Sound Stages	1052.85	50-Yr Clearwater	3950.40	1405.12	1417.83		1418.12	0.003446	4.26	926.34	104.39	0.25
Sound Stages	865.5	50-Yr Clearwater	3950.40	1402.00	1417.52		1417.67	0.001484	3.11	1272.10	122.62	0.17
Sound Stages	700.65	50-Yr Clearwater	3950.40	1398.00	1417.31	1406.36	1417.45	0.001171	2.97	1328.03	111.86	0.15
Sound Stages	700		Culvert									
Sound Stages	9.076105	50-Yr Clearwater	3950.40	1390.00	1399.21	1399.21	1400.88	0.017110	11.13	454.60	159.65	0.76
Sound Stages	8	50-Yr Clearwater	3950.40	1390.00	1397.12	1397.99	1399.59	0.050565	14.01	382.43	225.31	1.21
Sound Stages	7	50-Yr Clearwater	4122.10	1388.00	1391.30	1391.30	1392.05	0.025440	7.73	674.46	454.39	0.82
Sound Stages	6	50-Yr Clearwater	4122.10	1378.00	1384.93	1384.11	1385.07	0.005449	4.18	1418.19	759.58	0.39
Sound Stages	5	50-Yr Clearwater	4122.10	1376.00	1381.49	1381.18	1381.91	0.010387	6.70	963.33	538.97	0.57
Sound Stages	4	50-Yr Clearwater	4122.10	1362.00	1372.83		1374.28	0.014732	9.67	426.45	69.48	0.69
Sound Stages	3	50-Yr Clearwater	4167.40	1356.00	1364.94	1364.94	1365.63	0.010403	7.57	881.05	656.79	0.58
Sound Stages	2	50-Yr Clearwater	4167.40	1348.00	1354.04	1353.68	1354.53	0.010209	6.64	955.13	614.75	0.56

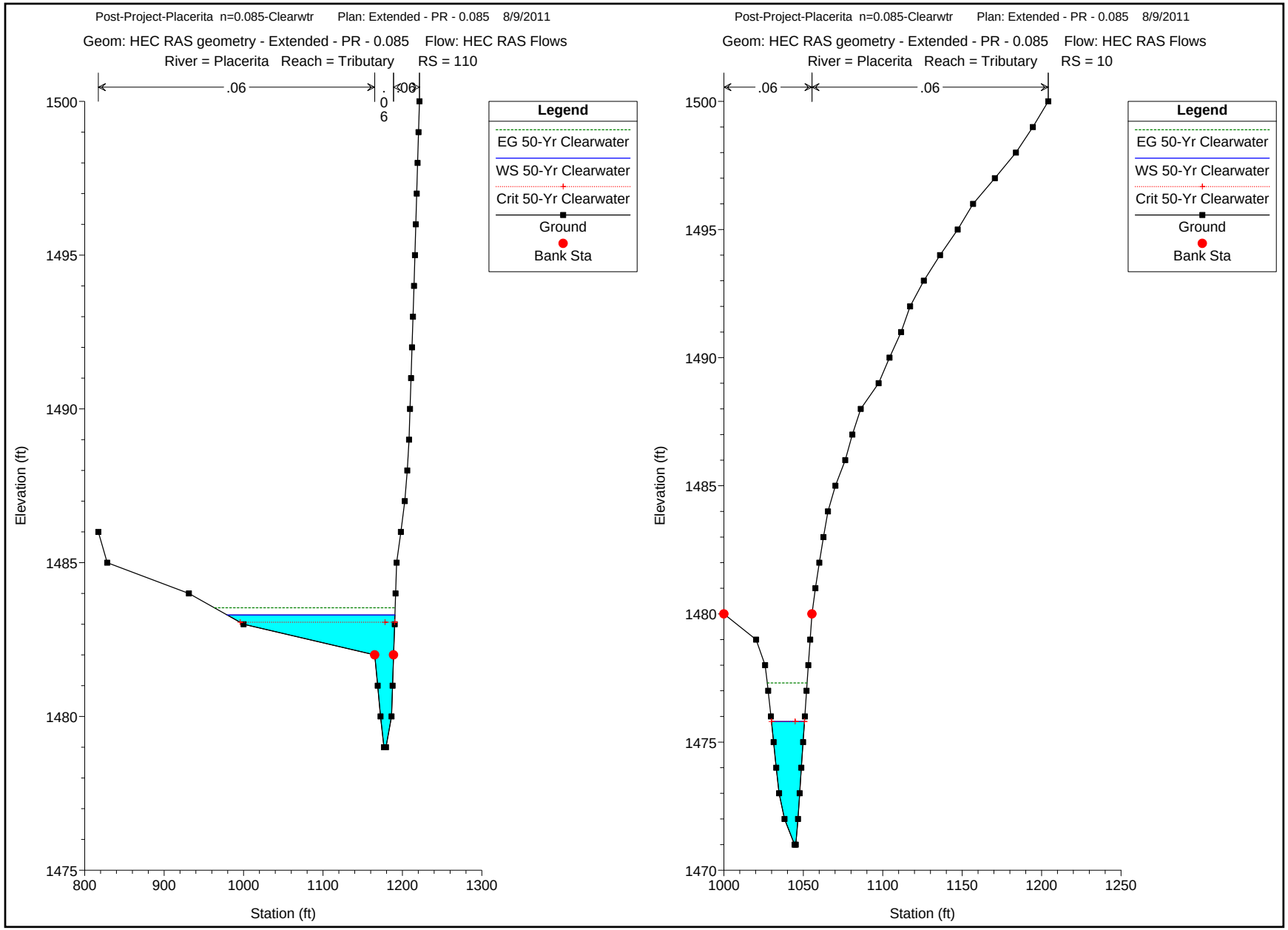

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1900
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1800
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

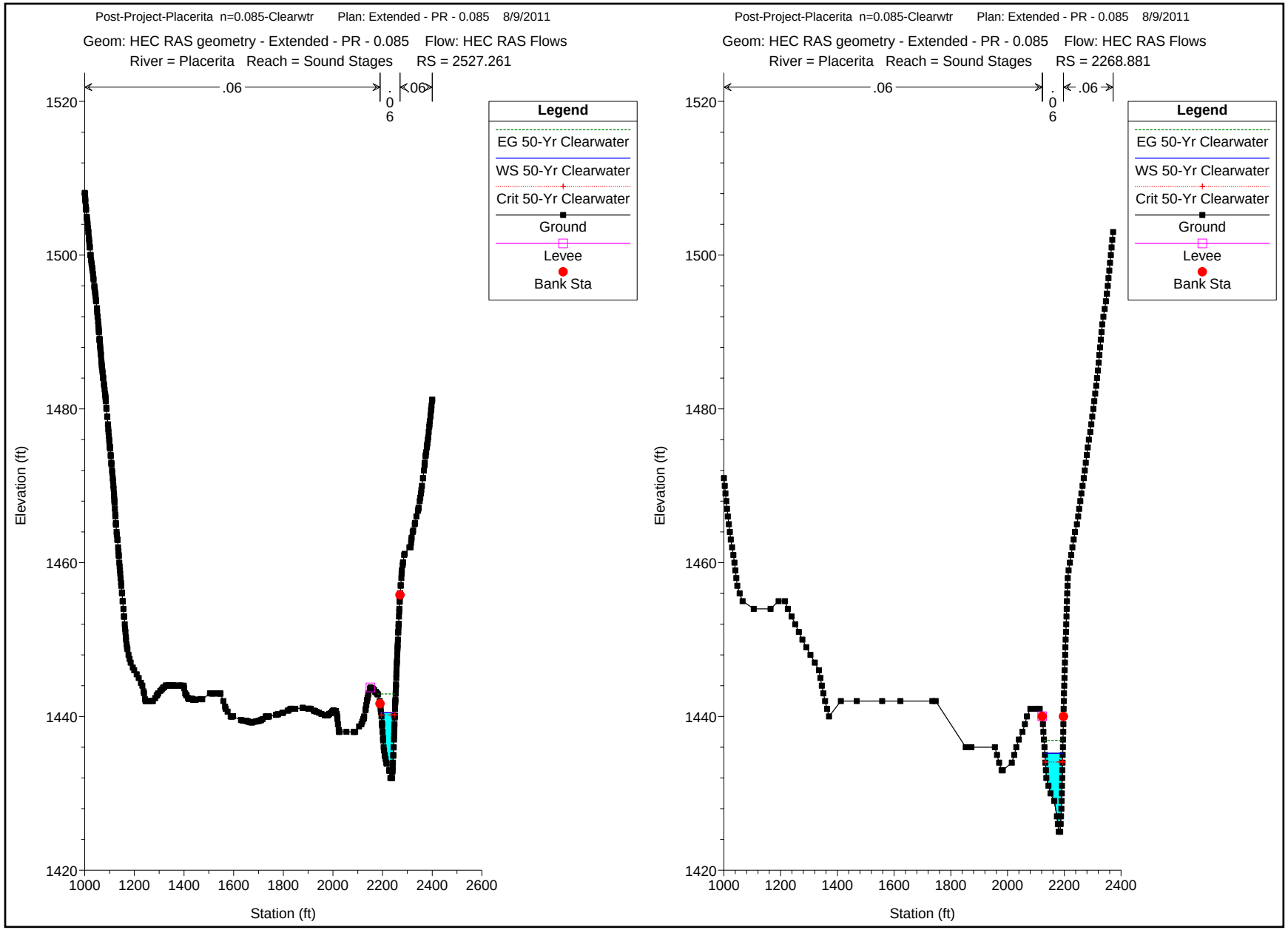

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1700
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1600
.06
.06
.06
Legend
EG 50-Yr Clearwater
Crit 50-Yr Clearwater
WS 50-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

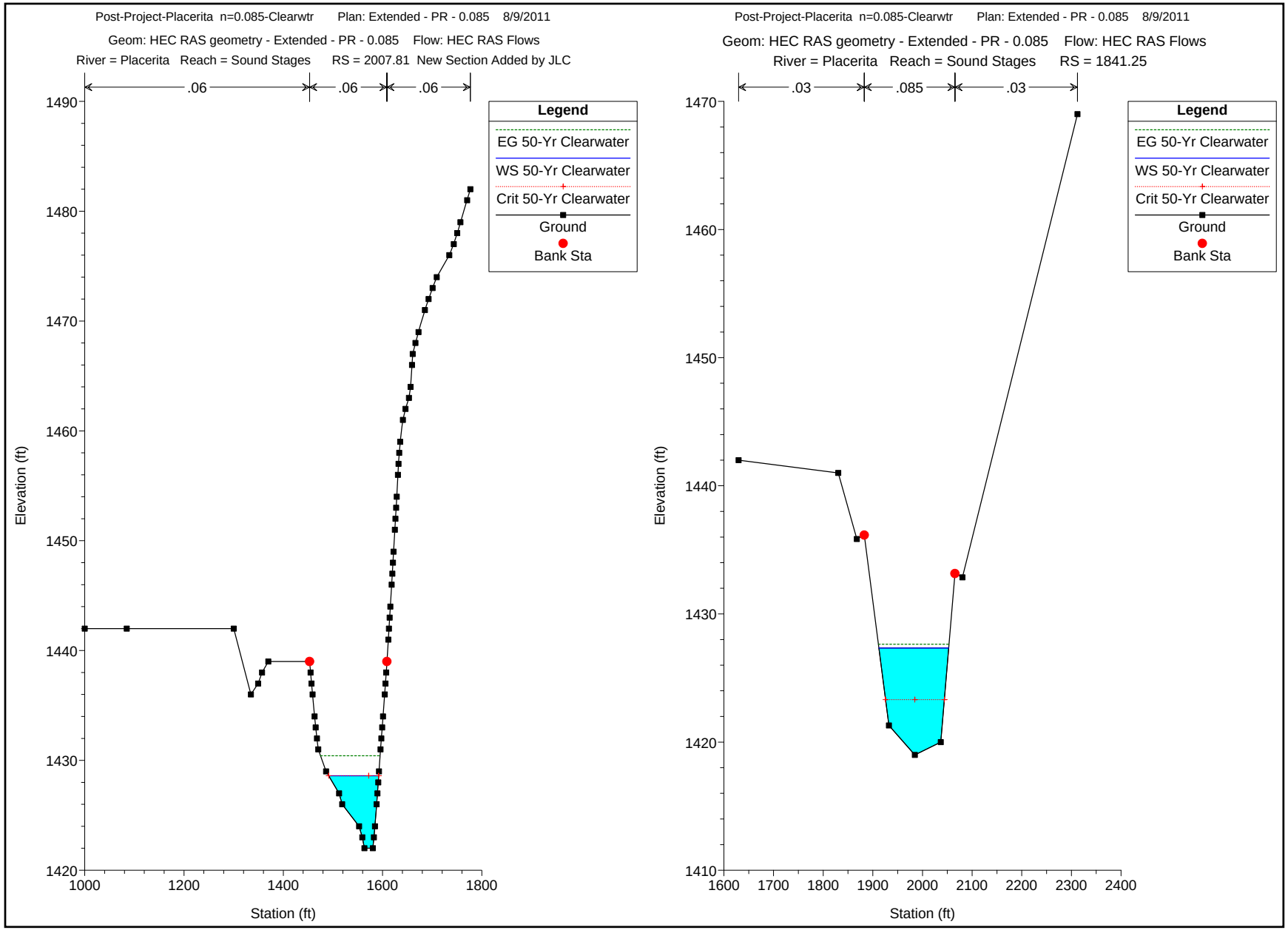

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1500
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1400 D/S of Upper Reach
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

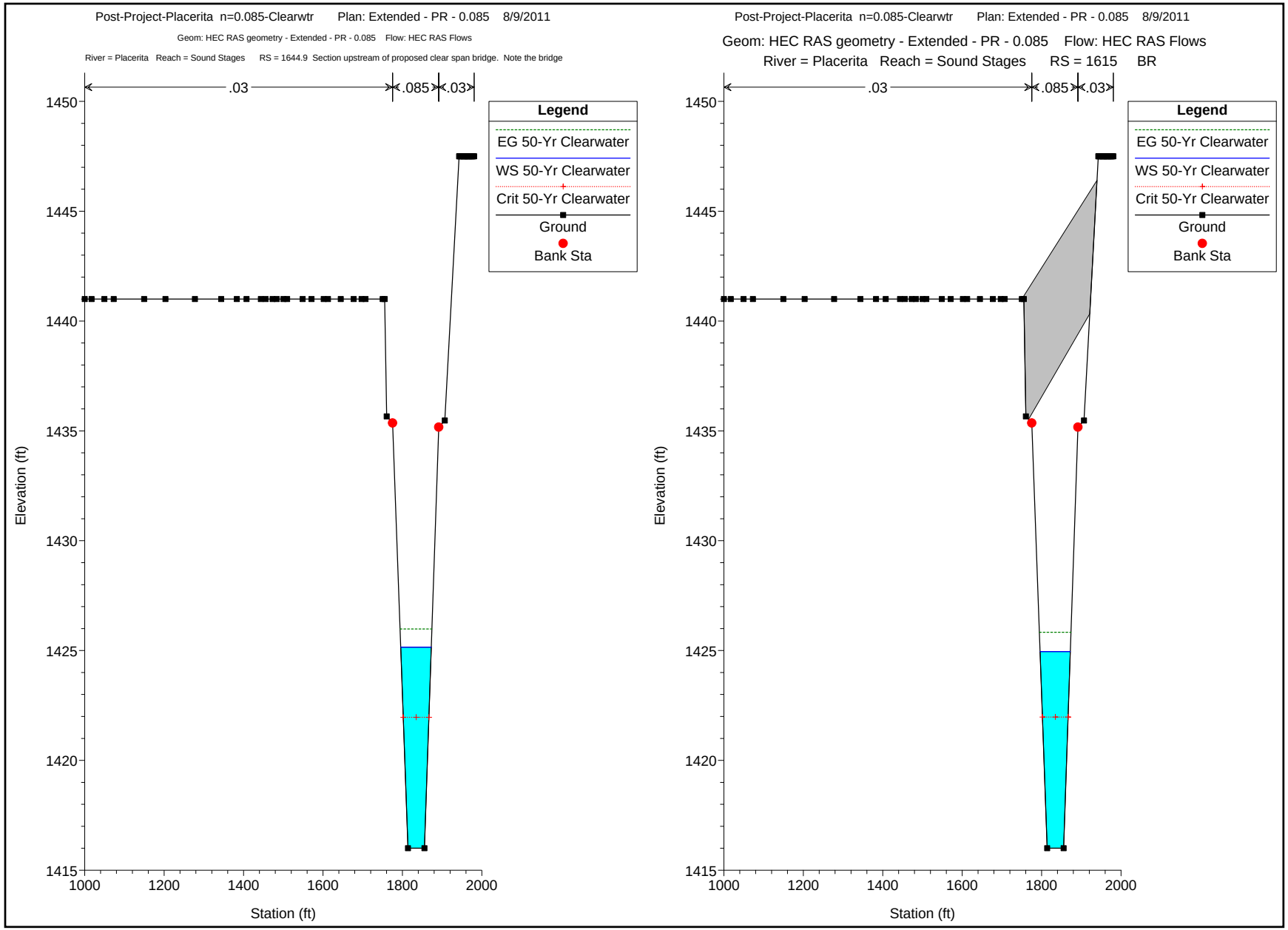

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 510
.06
.06
.06
Legend
EG 50-Yr Clearwater
Crit 50-Yr Clearwater
WS 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1575
1570
1565
1560
1555
1550
1545
1000
1100
1200
1300
1400
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 410
.06
.06
.06
Legend
EG 50-Yr Clearwater
Crit 50-Yr Clearwater
WS 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1545
1540
1535
1530
1525
1520
1000
1050
1100
1150
1200
1250
1300
Station (ft)

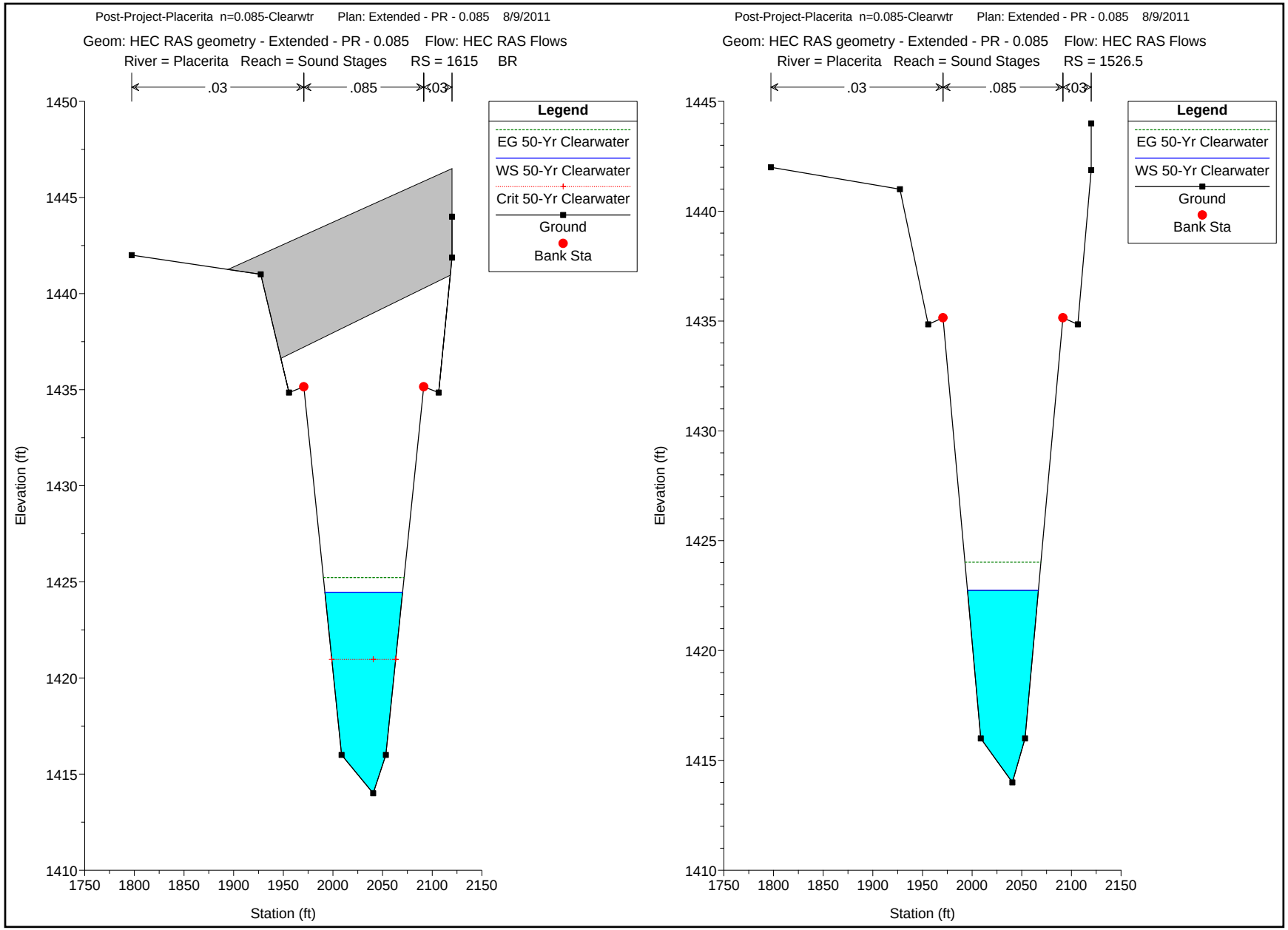

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 310
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 210
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

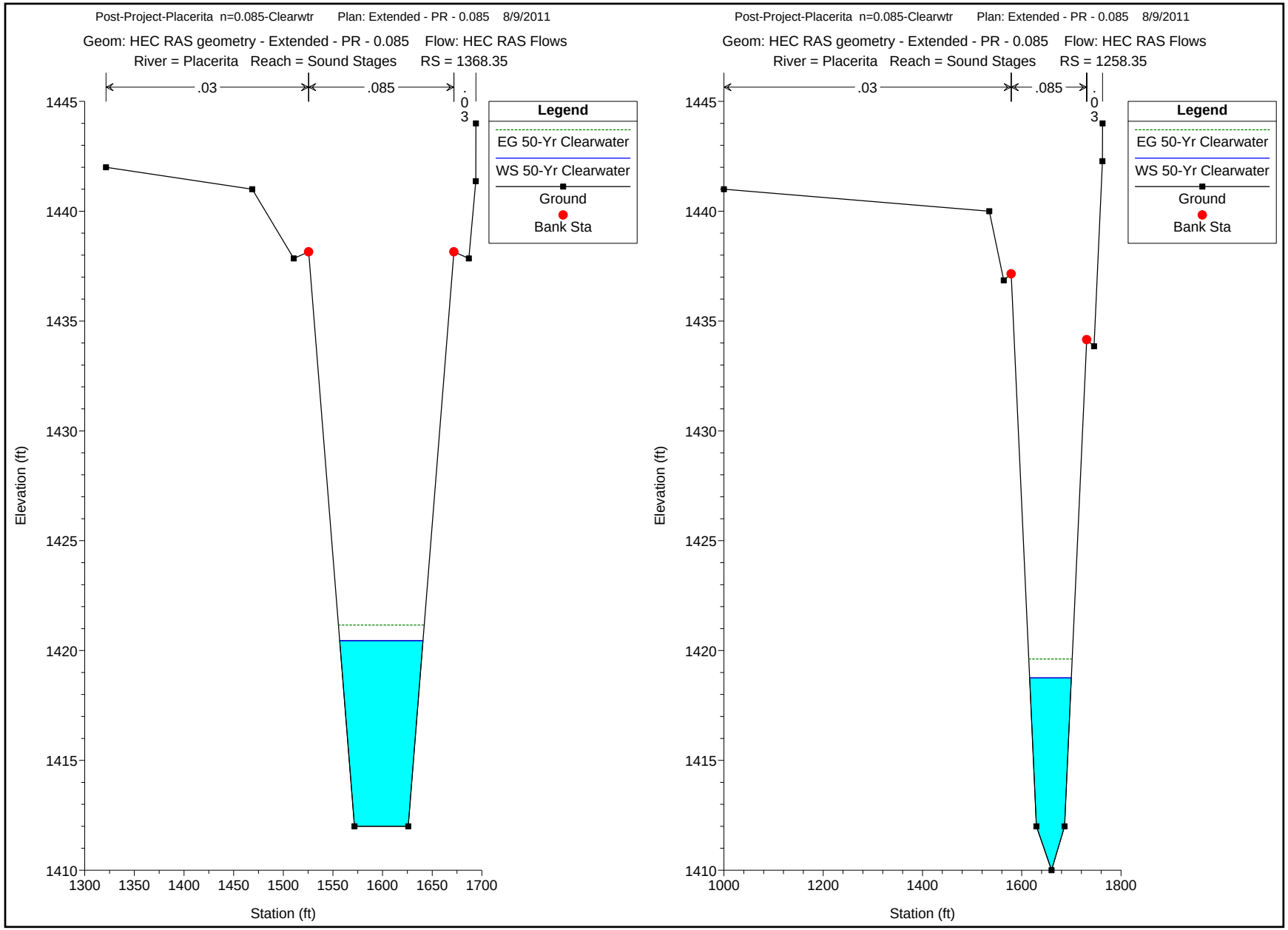

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 110
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
800
900
1000
1100
1200
1300
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 10
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1050
1100
1150
1200
1250

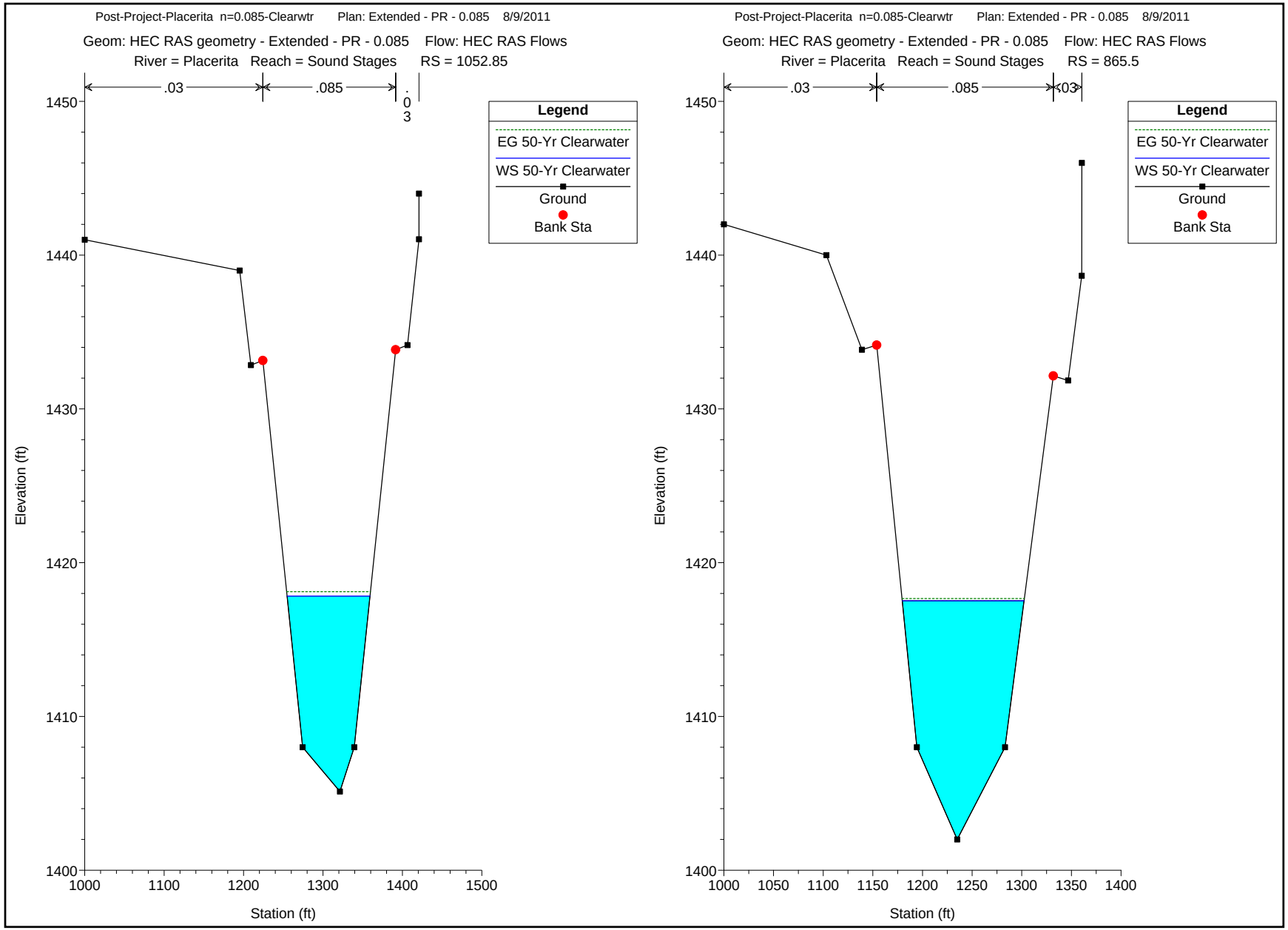

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2527.261
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2268.881
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

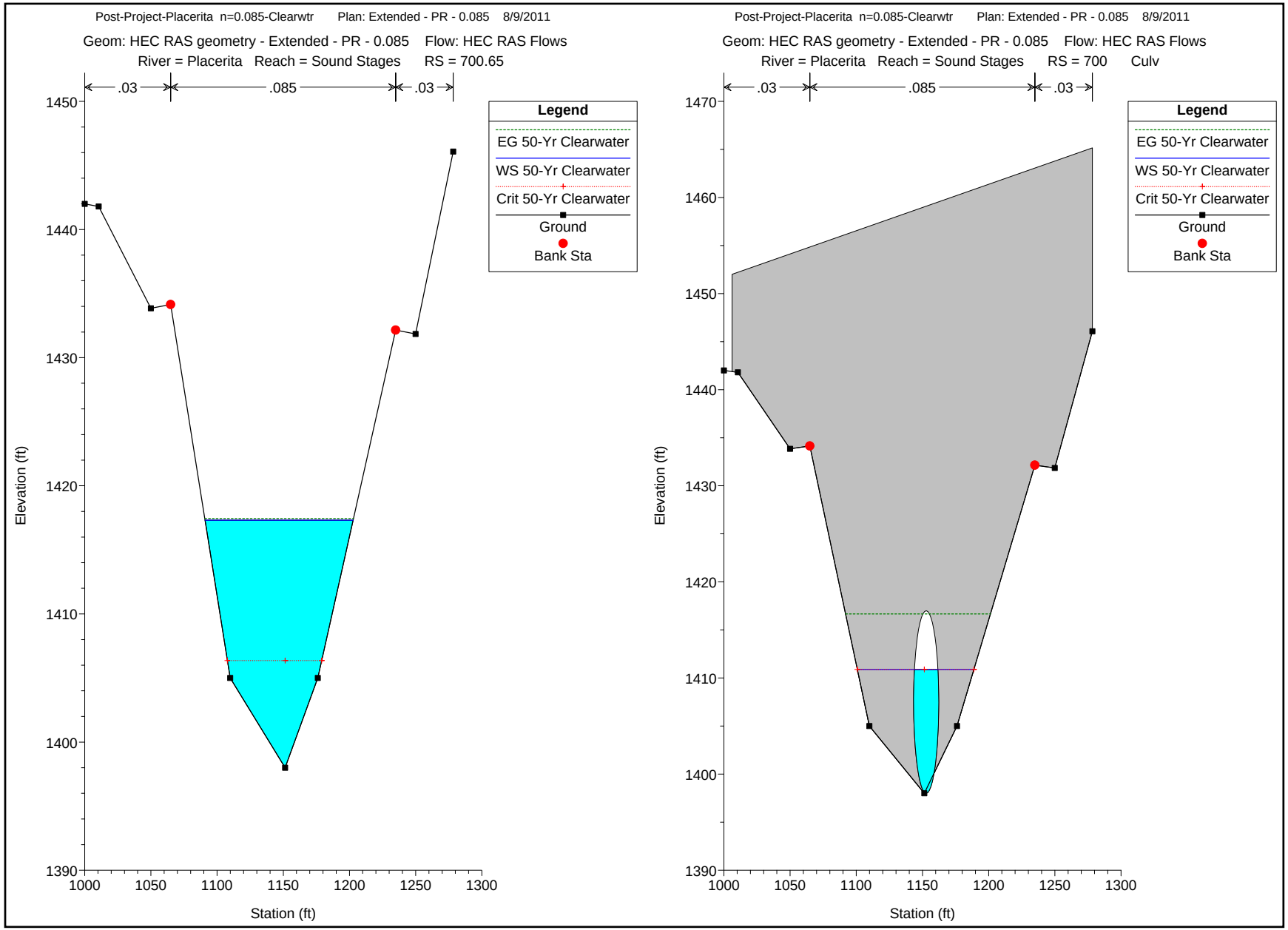

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2007.81 New Section Added by JLC
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1841.25
.03
.085
.03
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

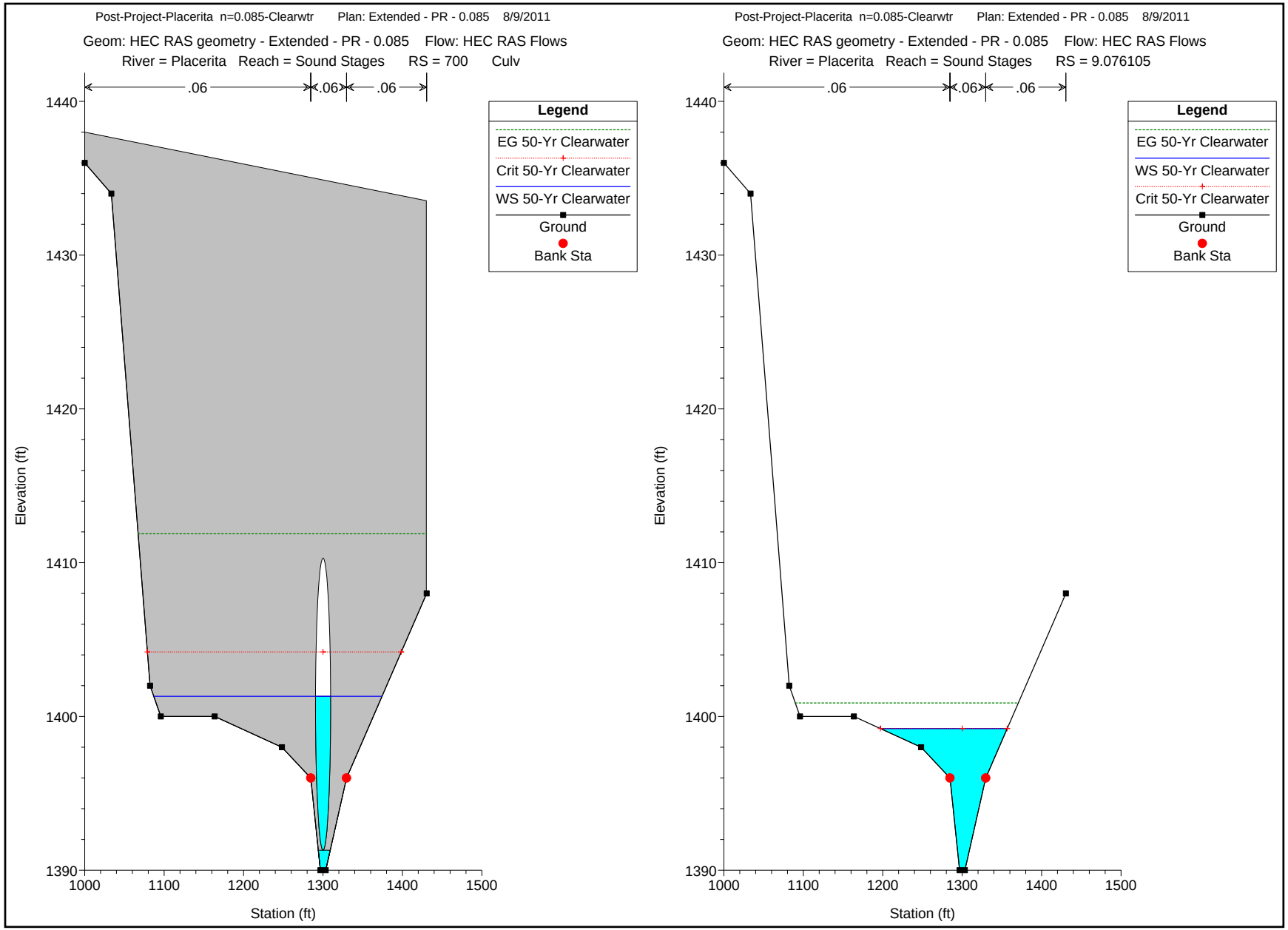

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1644.9 Section upstream of proposed clear span bridge. Note the bridge
.03
.085
.03
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1615 BR
.03
.085
.03
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

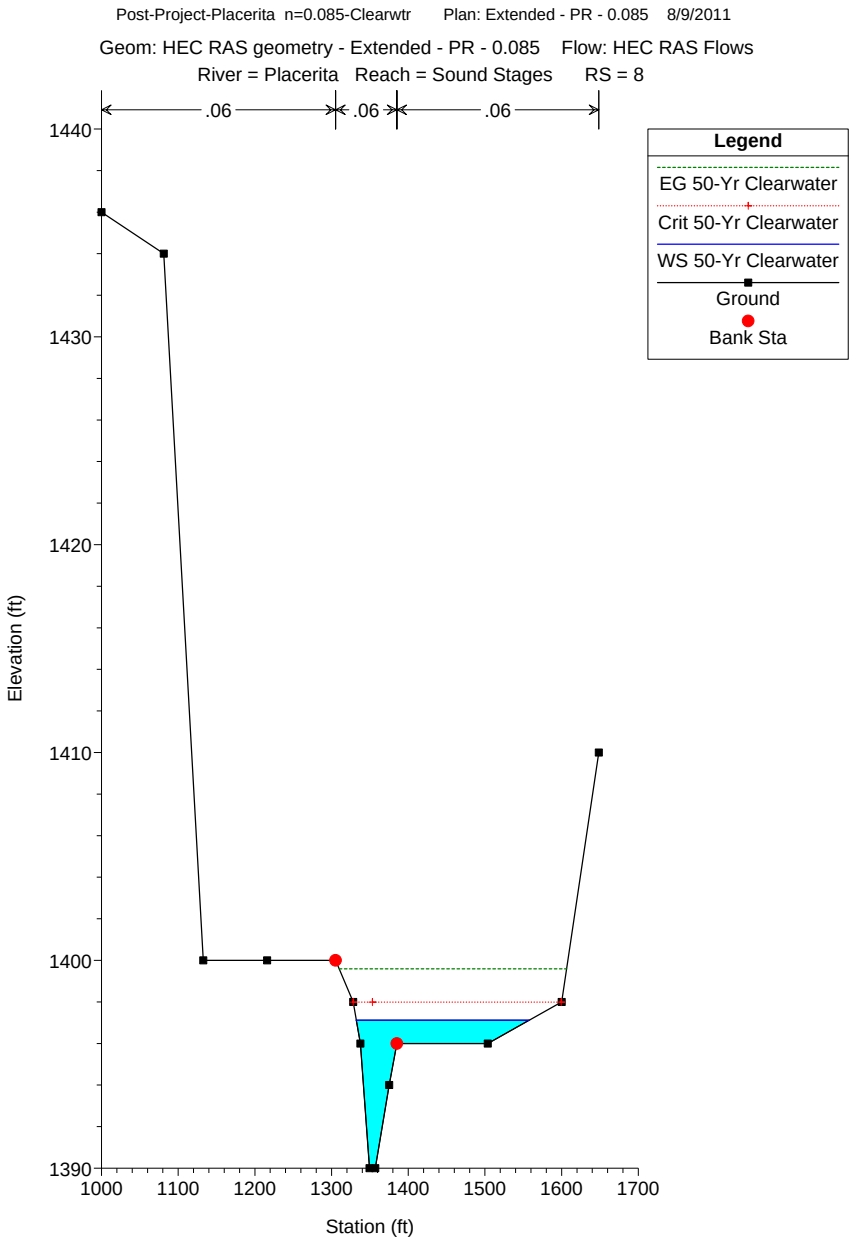

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1615 BR
.03
.085
.03
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1526.5
.03
.085
.03
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

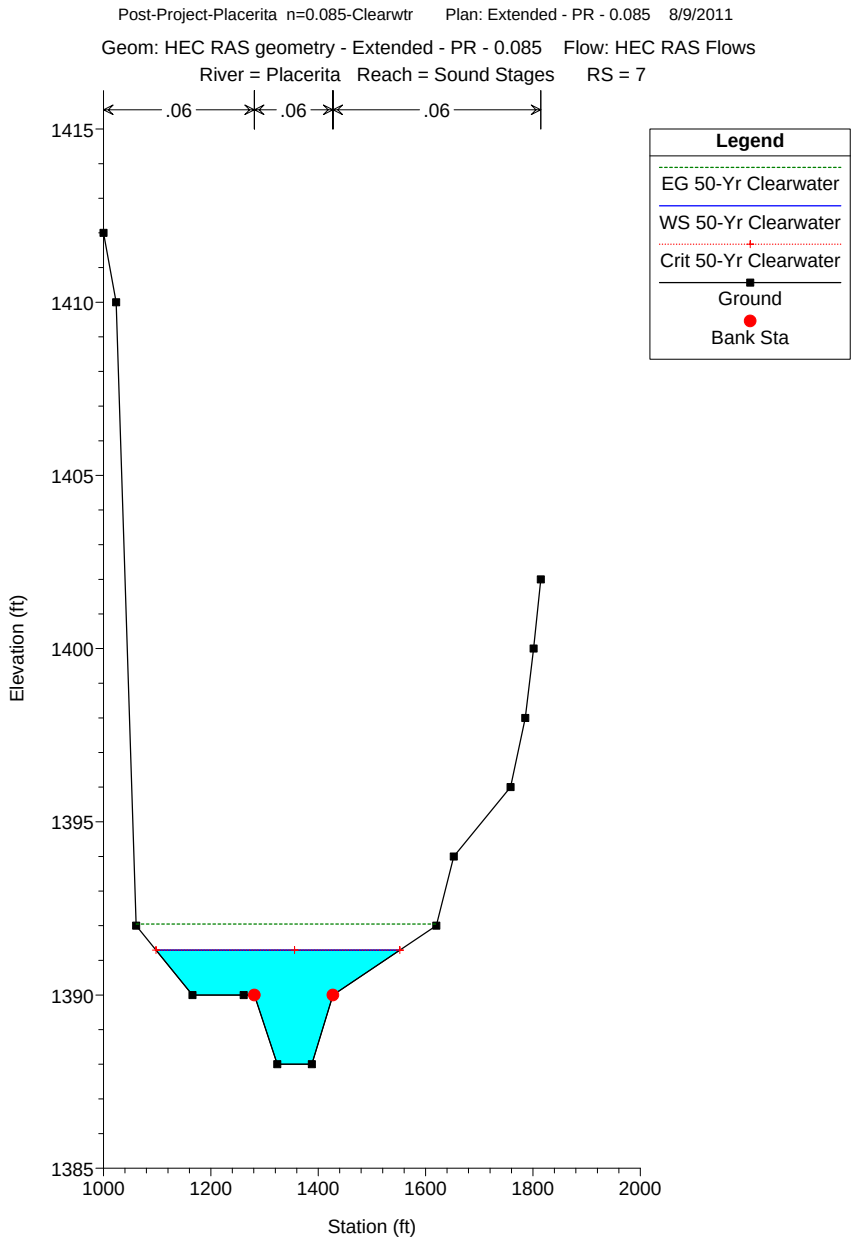

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1368.35
.03
.085
.03
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1445
1440
1435
1430
1425
1420
1415
1410
1300
1350
1400
1450
1500
1550
1600
1650
1700
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1258.35
.03
.085
.03
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1445
1440
1435
1430
1425
1420
1415
1410
1000
1200
1400
1600
1800

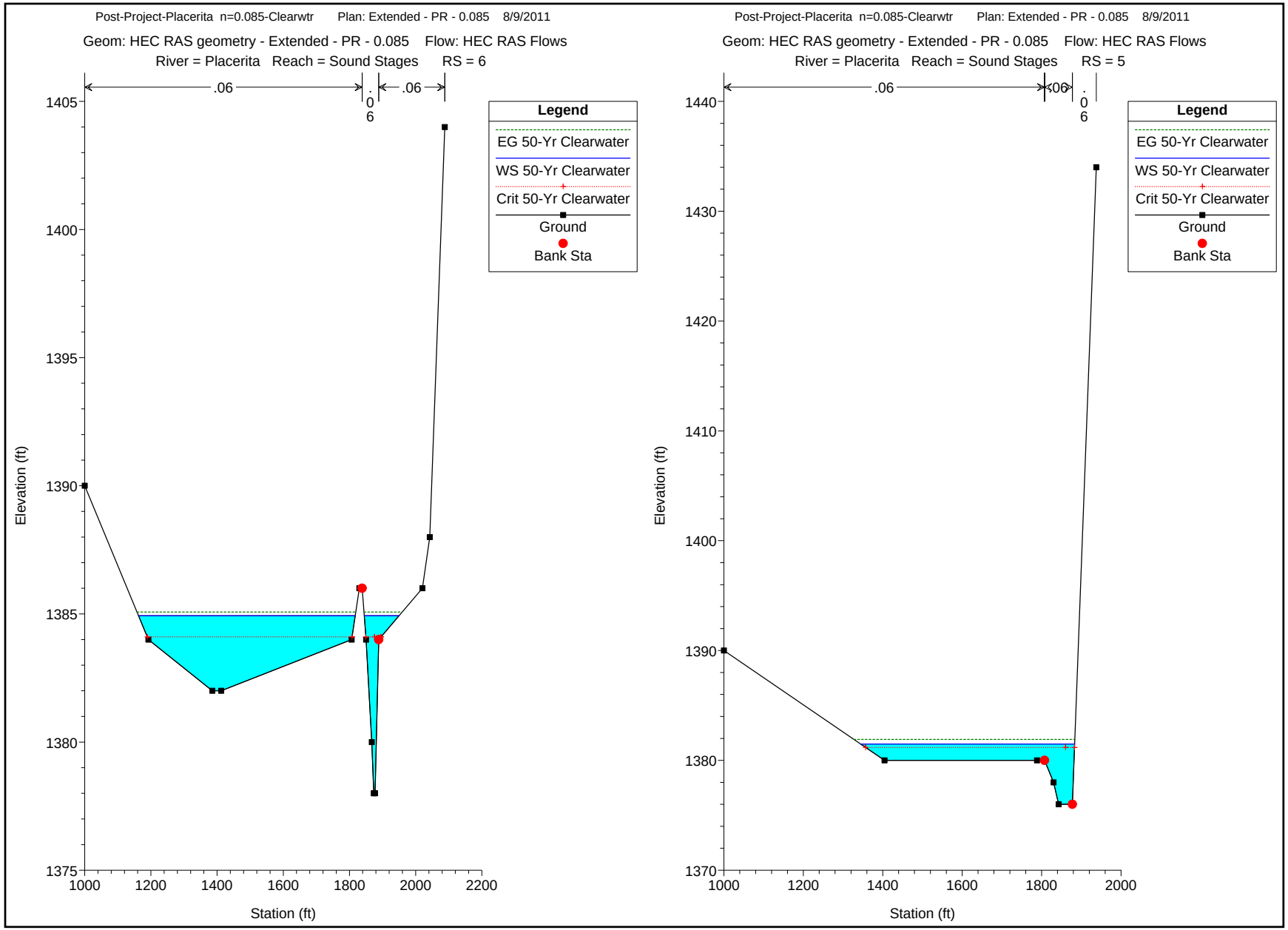

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1052.85
.03
.085
.03
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1440
1430
1420
1410
1400
1000
1100
1200
1300
1400
1500
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 865.5
.03
.085
.03
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1440
1430
1420
1410
1400
1000
1050
1100
1150
1200
1250
1300
1350
1400

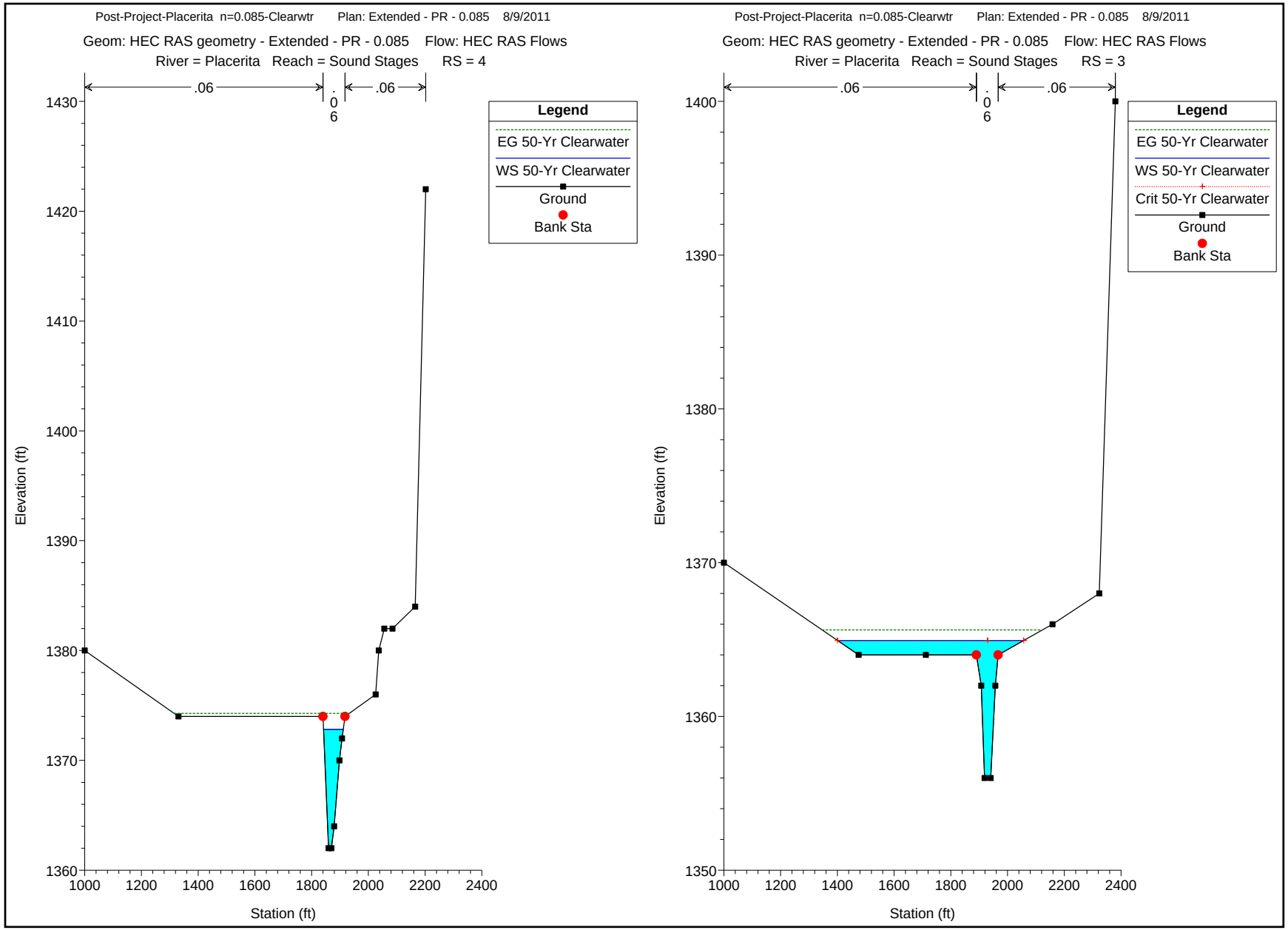

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700.65
.03
.085
.03
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700 Culv
.03
.085
.03
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

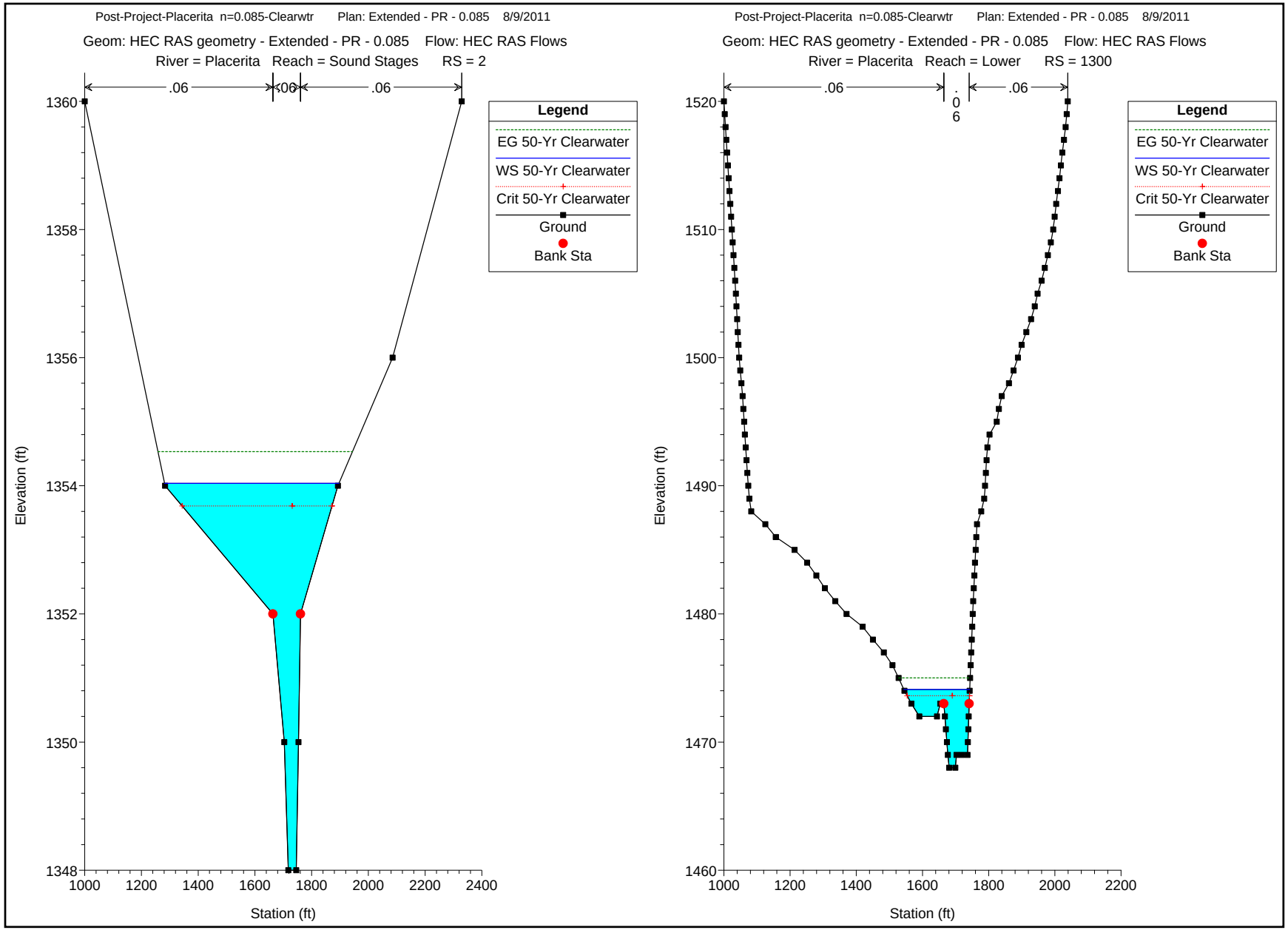

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700 Culv
.06
.06
.06
Legend
EG 50-Yr Clearwater
Crit 50-Yr Clearwater
WS 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 9.076105
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500
Station (ft)

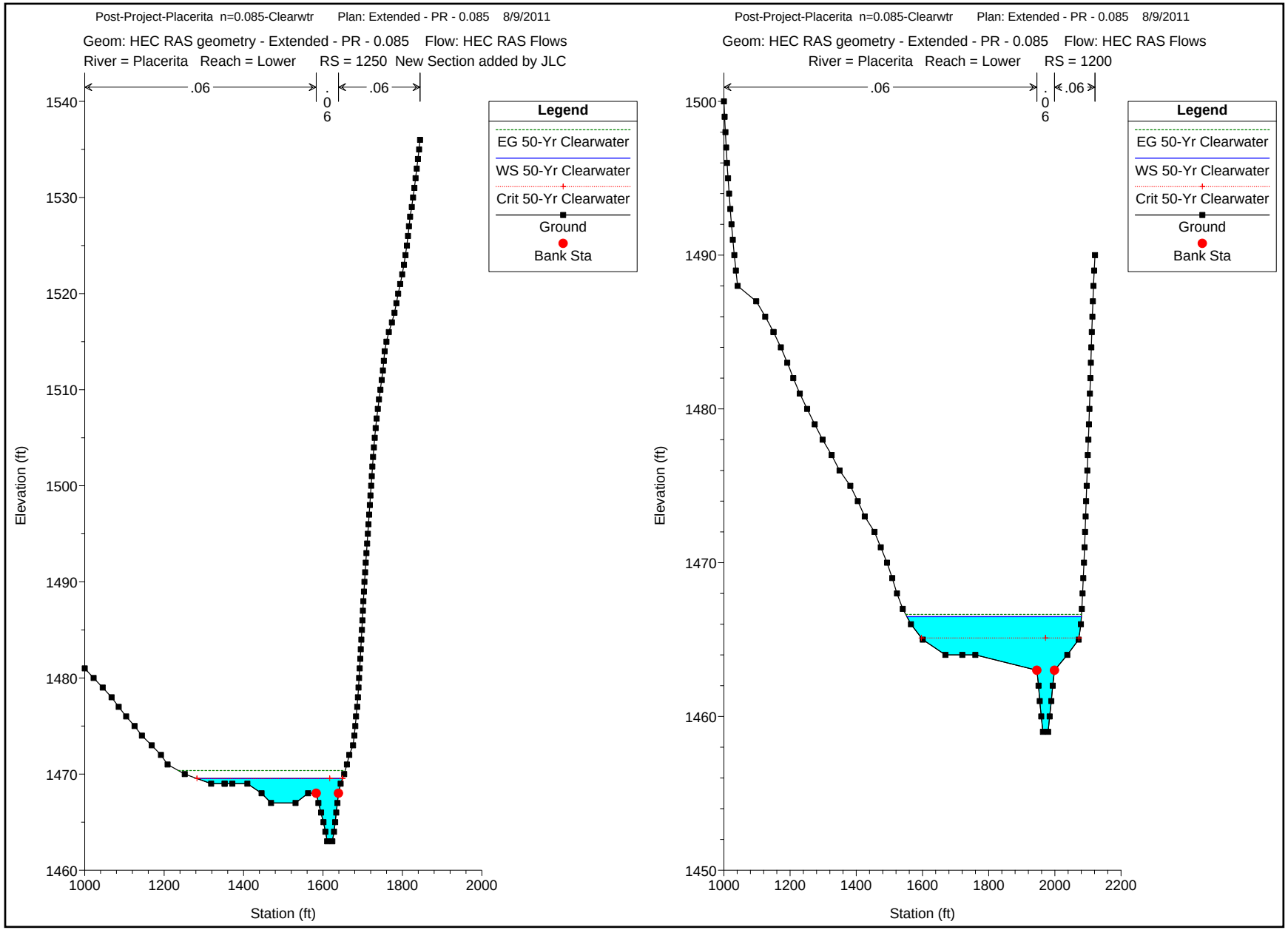

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 8
.06
.06
.06
Legend
EG 50-Yr Clearwater
Crit 50-Yr Clearwater
WS 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500
1600
1700
Station (ft)

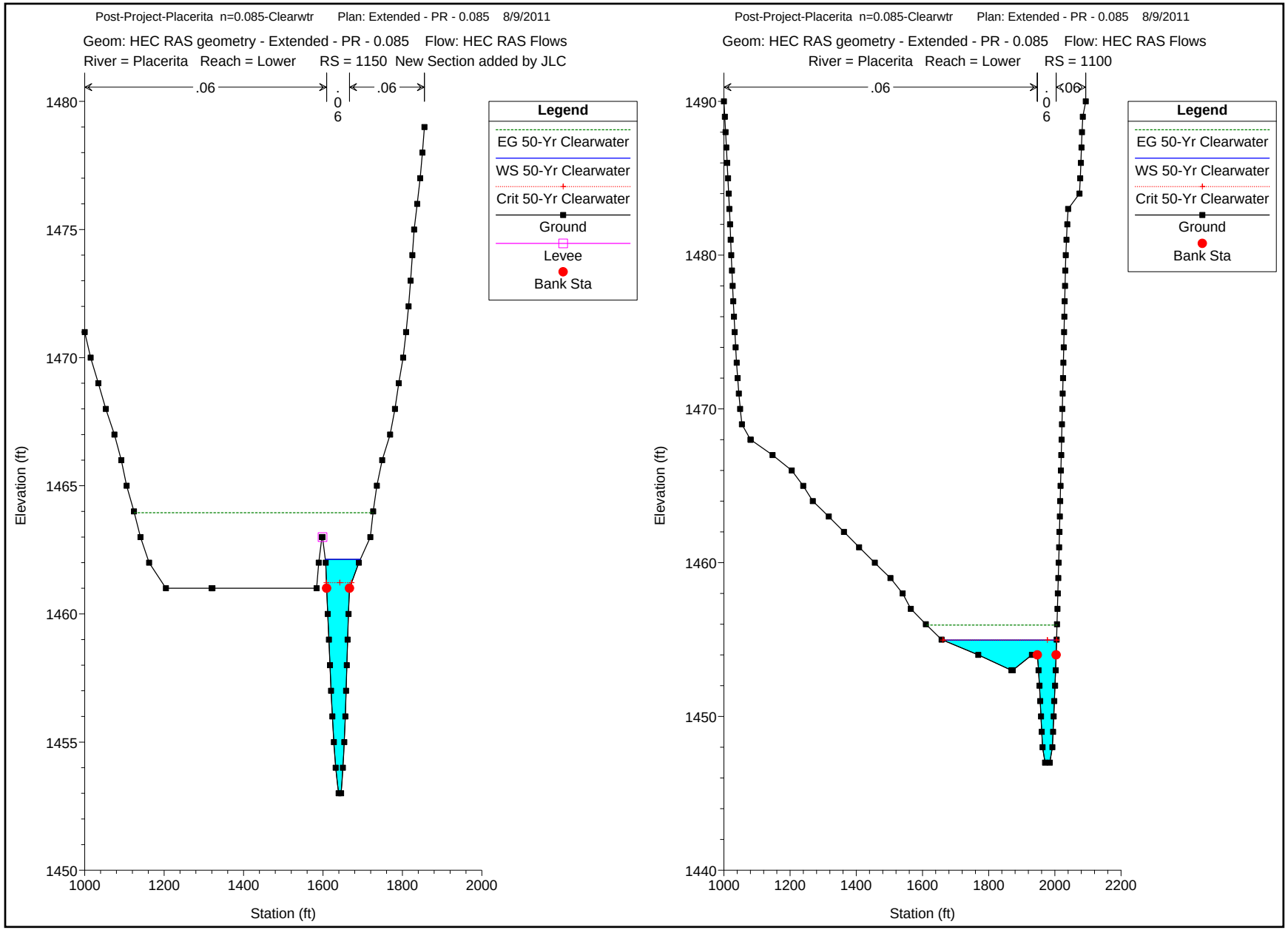

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 7
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
1415
1410
1405
1400
1395
1390
1385
1000
1200
1400
1600
1800
2000
Station (ft)

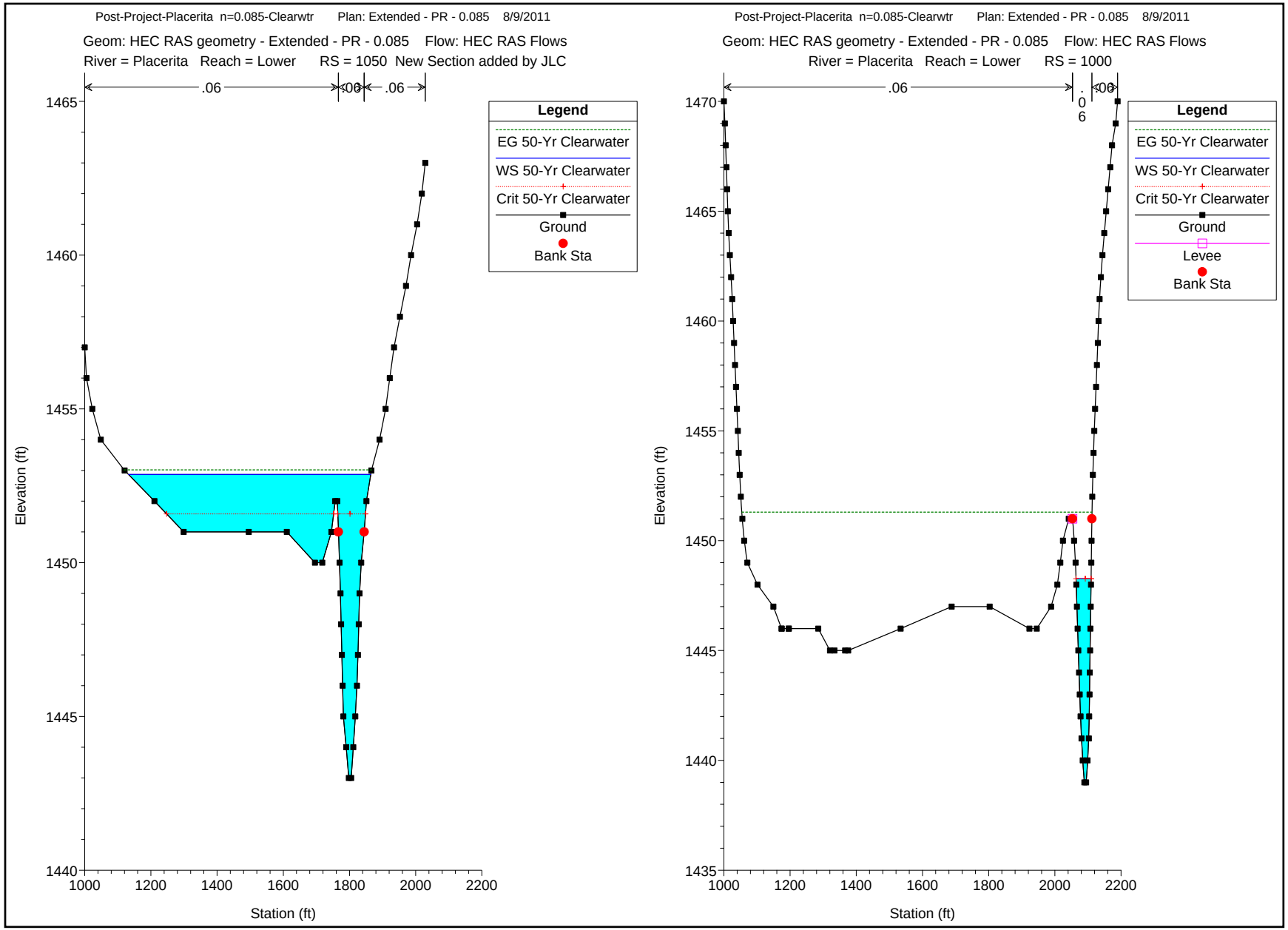

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 6
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 5
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)


Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 4
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 3
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)


Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1300
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)


Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1250 New Section added by JLC
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1200
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

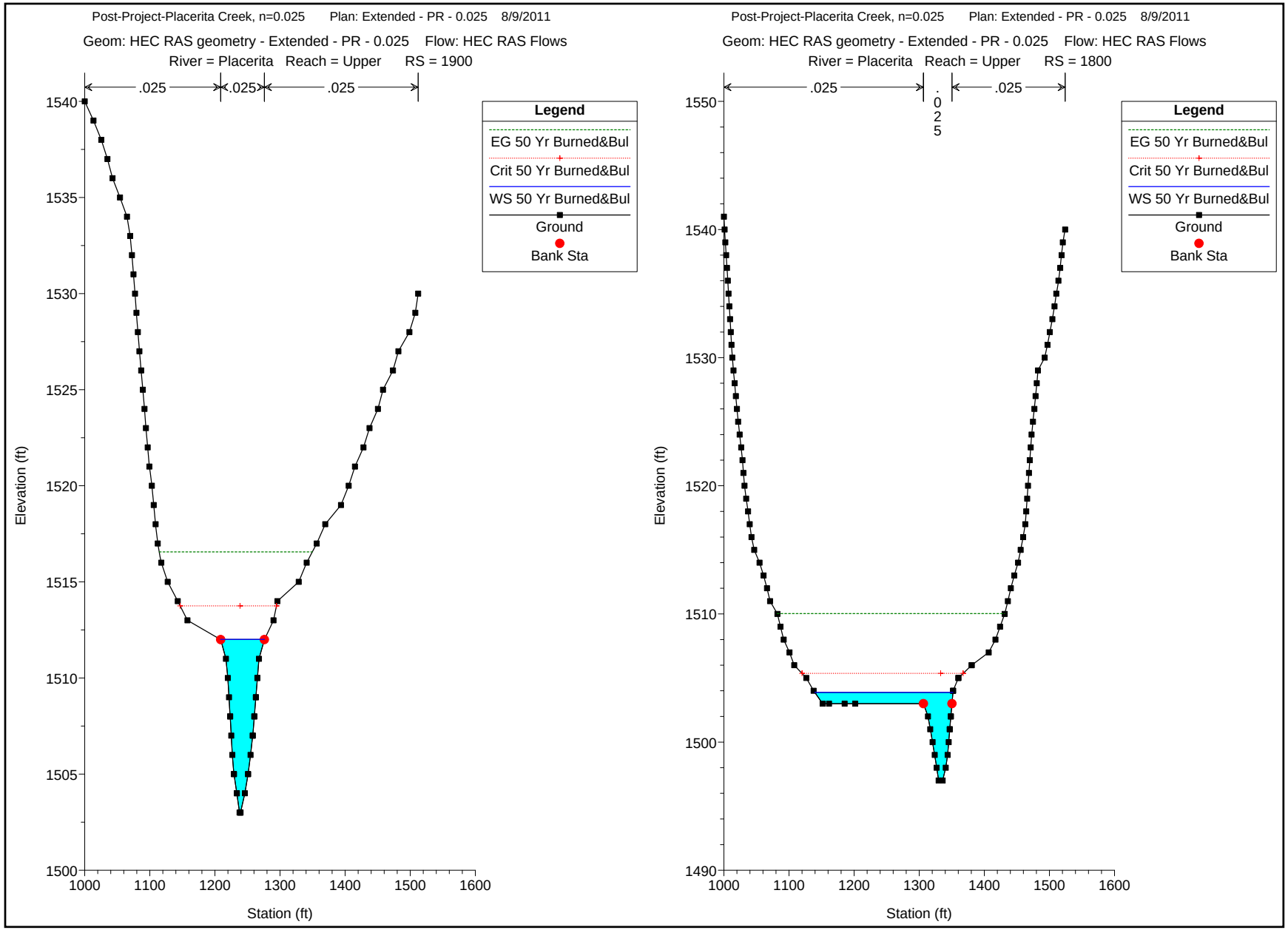

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1150 New Section added by JLC
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1100
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)

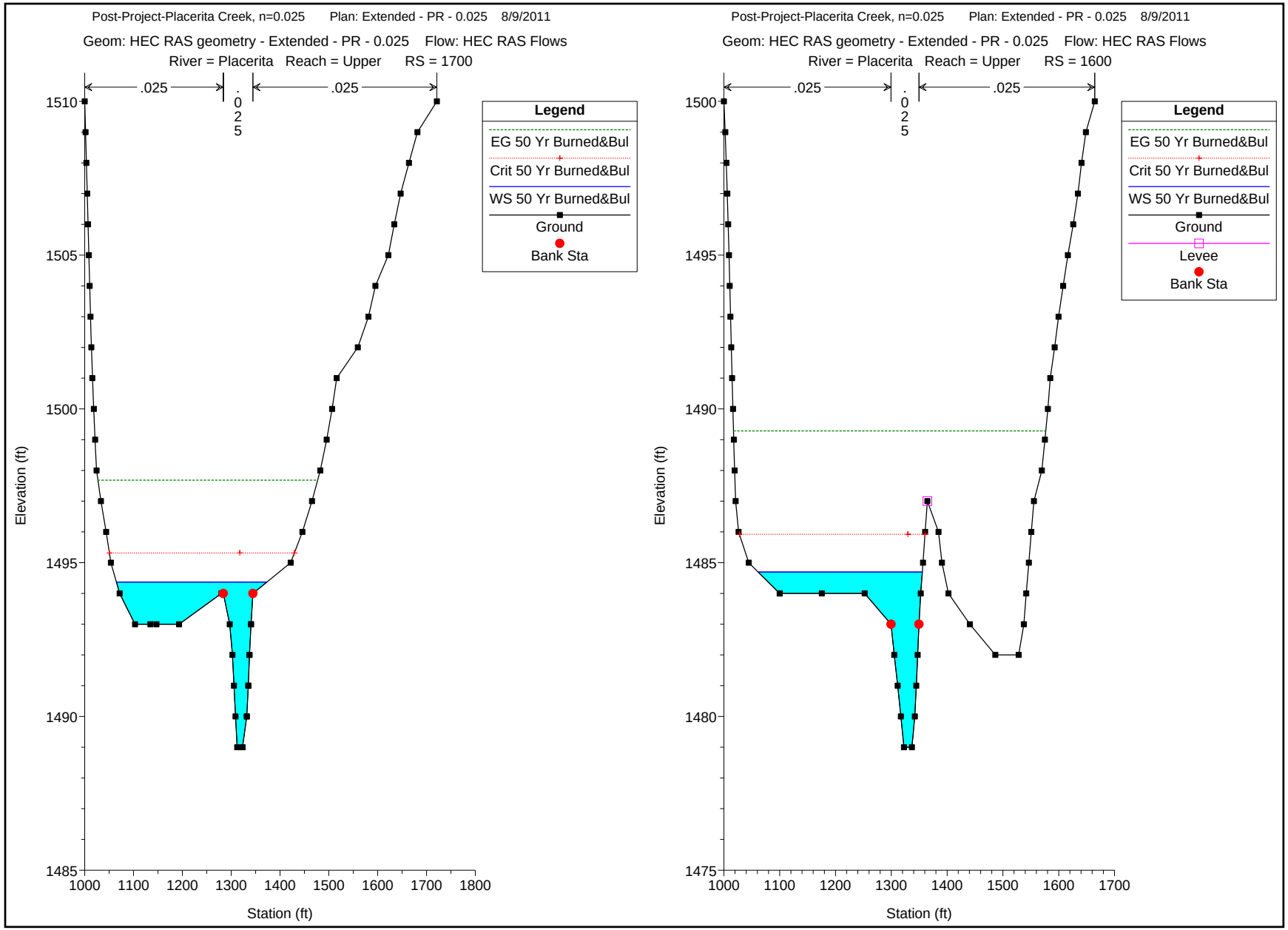

Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1050 New Section added by JLC
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Bank Sta
Elevation (ft)
Station (ft)
1440
1445
1450
1455
1460
1465
1000
1200
1400
1600
1800
2000
2200
Post-Project-Placerita n=0.085-Clearwtr Plan: Extended - PR - 0.085 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.085 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1000
.06
.06
.06
Legend
EG 50-Yr Clearwater
WS 50-Yr Clearwater
Crit 50-Yr Clearwater
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
1435
1440
1445
1450
1455
1460
1465
1470
1000
1200
1400
1600
1800
2000
2200

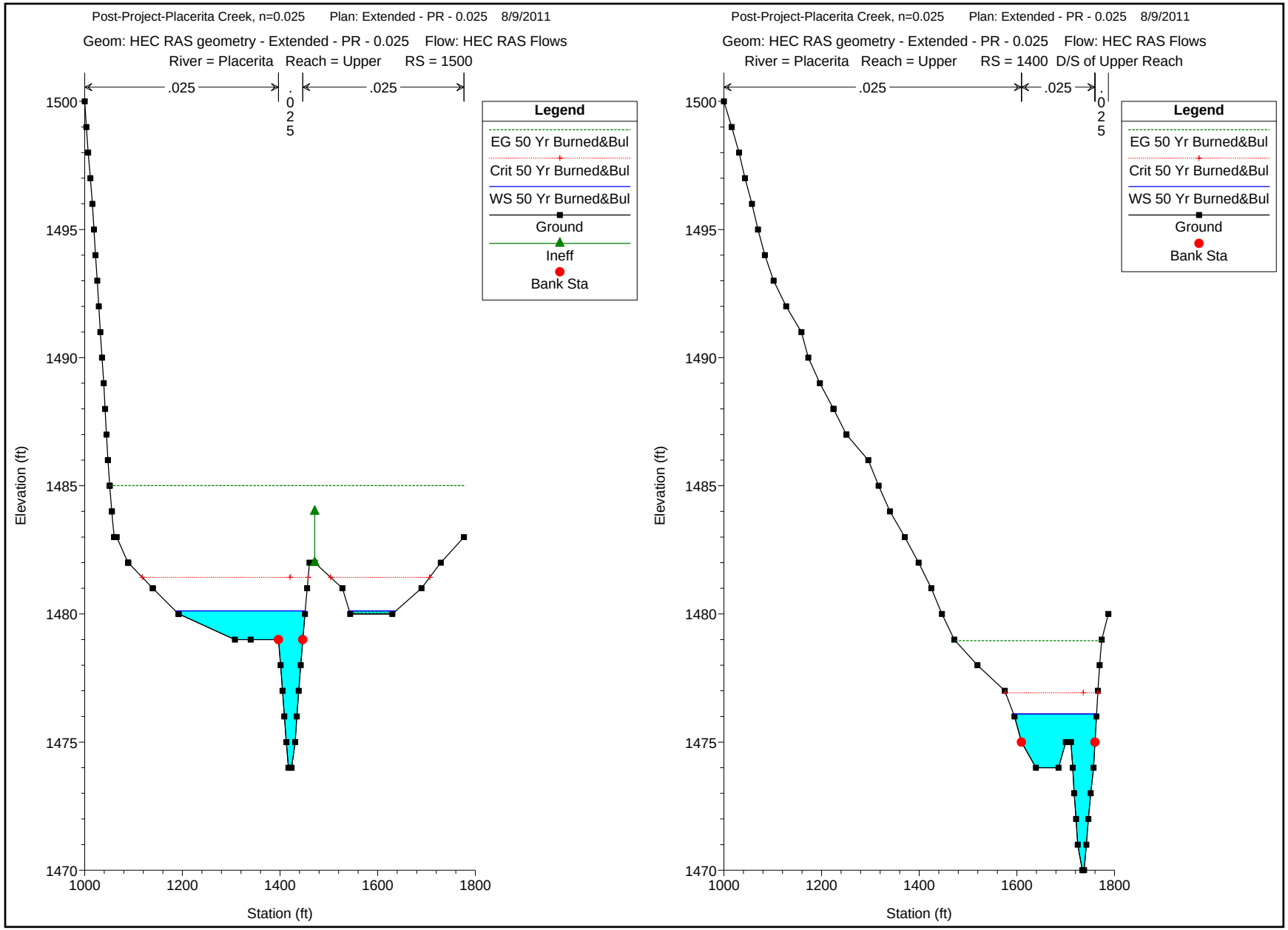
50-YEAR STORM EVENT BURNED AND BULK – POST PROJECT CONDITION HEC-RAS OUTPUT

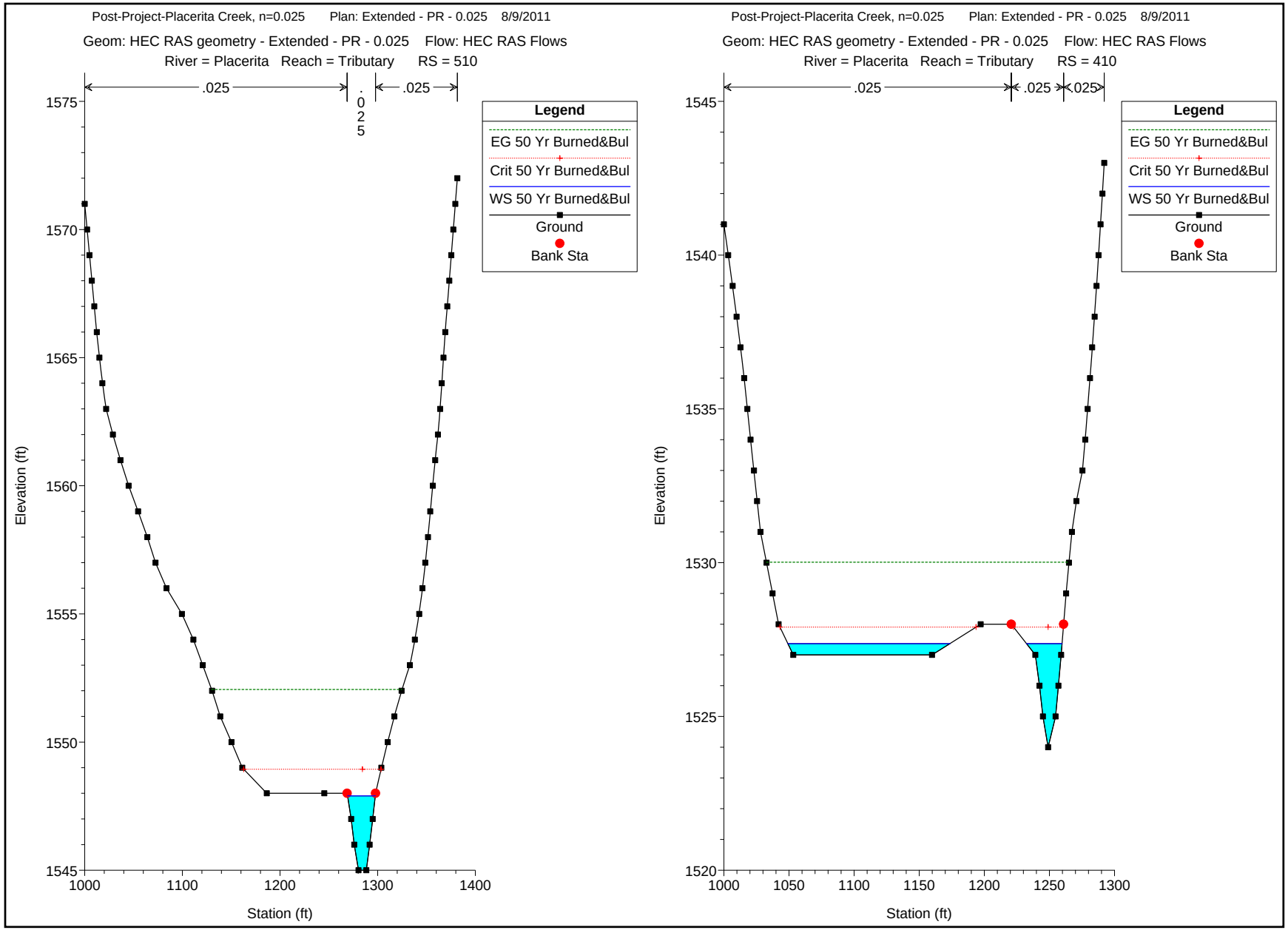
HEC-RAS Plan: Ex_PR_0.025 Profile: 50 Yr Burned&Bul

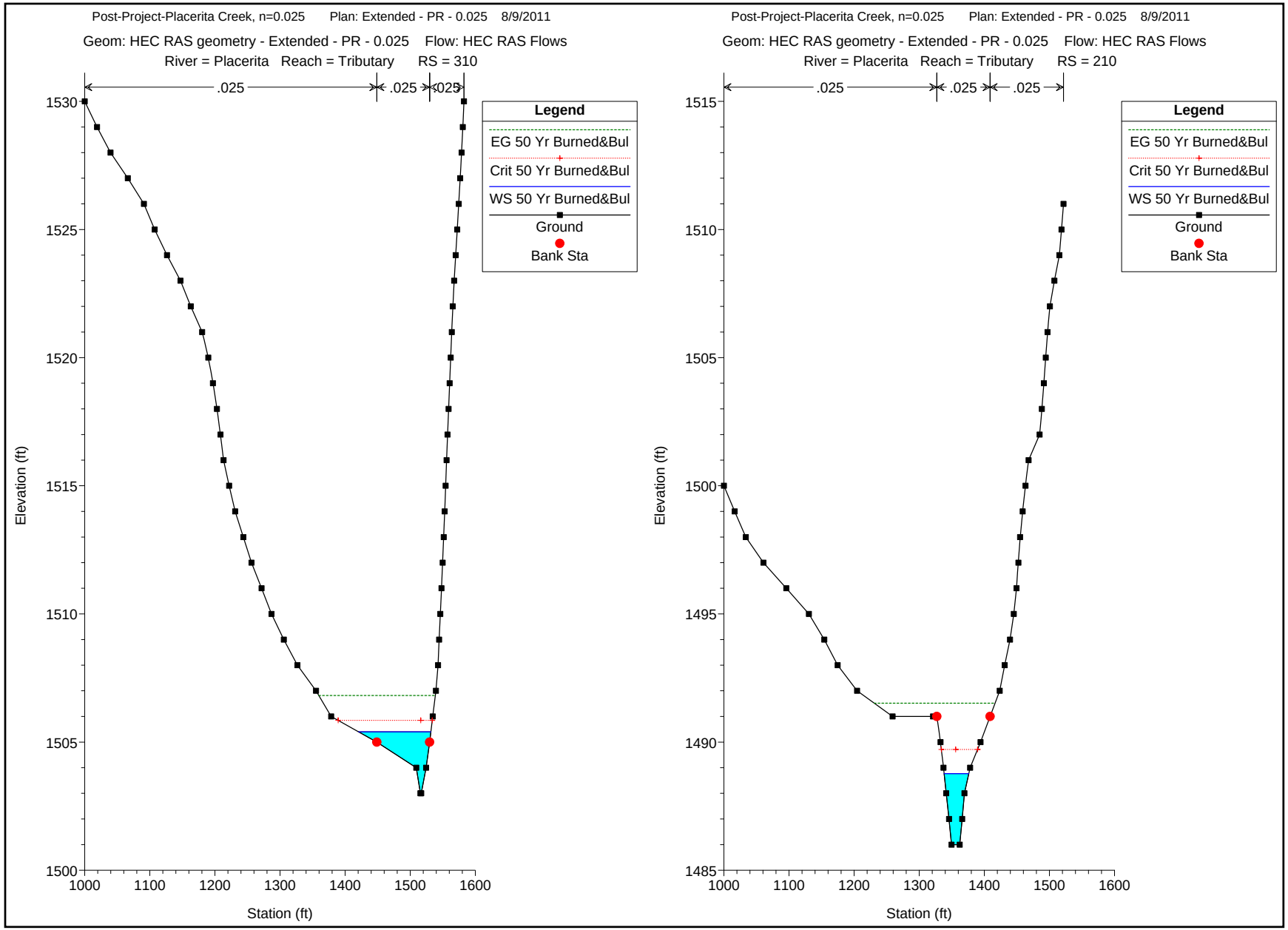
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Upper	1900	50 Yr Burned&Bul	5214.80	1503.00	1512.01	1513.75	1516.56	0.011712	17.11	304.72	67.81	1.42
Upper	1800	50 Yr Burned&Bul	5214.80	1497.00	1503.88	1505.36	1510.03	0.021211	22.03	328.77	212.23	1.88
Upper	1700	50 Yr Burned&Bul	5214.80	1489.00	1494.37	1495.32	1497.68	0.019117	17.28	423.07	308.20	1.73
Upper	1600	50 Yr Burned&Bul	5214.80	1479.00	1484.70	1485.92	1489.29	0.014923	19.05	398.02	294.17	1.61
Upper	1500	50 Yr Burned&Bul	5214.80	1474.00	1480.12	1481.43	1485.01	0.017836	19.87	376.26	361.15	1.74
Upper	1400	50 Yr Burned&Bul	5214.80	1470.00	1476.10	1476.92	1478.96	0.015519	13.63	389.37	170.04	1.51
Tributary	510	50 Yr Burned&Bul	874.10	1545.00	1547.90	1548.94	1552.05	0.033807	16.35	53.46	28.39	2.10
Tributary	410	50 Yr Burned&Bul	874.10	1524.00	1527.37	1527.91	1530.01	0.036322	14.90	85.41	151.79	2.10
Tributary	310	50 Yr Burned&Bul	874.10	1503.00	1505.40	1505.85	1506.82	0.023560	9.66	94.55	110.99	1.63
Tributary	210	50 Yr Burned&Bul	874.10	1486.00	1488.77	1489.71	1491.52	0.024603	13.30	65.72	37.91	1.78
Tributary	110	50 Yr Burned&Bul	874.10	1479.00	1482.59	1483.30	1484.98	0.015024	13.08	88.77	122.17	1.45
Tributary	10	50 Yr Burned&Bul	874.10	1471.00	1475.68	1476.66	1478.96	0.016772	14.53	60.14	20.46	1.49
Sound Stages	2527.261	50 Yr Burned&Bul	6211.80	1432.00	1440.58	1442.27	1446.42	0.011618	19.40	320.23	56.58	1.44
Sound Stages	2268.881	50 Yr Burned&Bul	6211.80	1425.00	1433.30	1435.96	1441.98	0.023879	23.65	262.65	58.75	1.97
Sound Stages	2007.81	50 Yr Burned&Bul	6211.80	1422.00	1427.84	1430.00	1434.84	0.027104	21.24	292.46	89.57	2.07
Sound Stages	1841.25	50 Yr Burned&Bul	6211.80	1419.00	1422.52	1424.53	1429.58	0.037248	21.32	291.34	114.18	2.35
Sound Stages	1644.9	50 Yr Burned&Bul	6211.80	1416.00	1425.33	1423.79	1427.28	0.002788	11.21	554.15	77.57	0.74
Sound Stages	1615		Bridge									
Sound Stages	1526.5	50 Yr Burned&Bul	6211.80	1414.00	1425.39		1426.86	0.001869	9.73	638.30	81.93	0.61
Sound Stages	1368.35	50 Yr Burned&Bul	6211.80	1412.00	1425.95		1426.45	0.000424	5.65	1098.99	103.37	0.31
Sound Stages	1258.35	50 Yr Burned&Bul	6211.80	1410.00	1425.99		1426.37	0.000311	4.99	1244.42	113.10	0.27
Sound Stages	1052.85	50 Yr Burned&Bul	6211.80	1405.12	1426.11		1426.27	0.000095	3.22	1927.85	137.55	0.15
Sound Stages	865.5	50 Yr Burned&Bul	6211.80	1402.00	1426.14		1426.24	0.000049	2.52	2461.76	153.32	0.11
Sound Stages	700.65	50 Yr Burned&Bul	6211.80	1398.00	1426.14	1408.06	1426.23	0.000046	2.53	2459.22	144.57	0.11
Sound Stages	700		Culvert									
Sound Stages	9.076105	50 Yr Burned&Bul	6211.80	1390.00	1400.91	1400.91	1402.28	0.002161	11.04	845.61	281.28	0.67
Sound Stages	8	50 Yr Burned&Bul	6211.80	1390.00	1397.40	1398.63	1401.78	0.015430	19.11	448.13	240.22	1.62
Sound Stages	7	50 Yr Burned&Bul	6259.10	1388.00	1390.71	1391.82	1394.79	0.030072	17.19	434.98	367.67	2.06
Sound Stages	6	50 Yr Burned&Bul	6259.10	1378.00	1384.05	1384.42	1385.34	0.011890	13.51	793.54	657.70	1.33
Sound Stages	5	50 Yr Burned&Bul	6259.10	1376.00	1381.49	1381.62	1382.46	0.004104	10.12	967.94	539.33	0.86
Sound Stages	4	50 Yr Burned&Bul	6259.10	1362.00	1370.81	1373.01	1377.59	0.014527	20.89	299.59	56.46	1.60
Sound Stages	3	50 Yr Burned&Bul	5943.50	1356.00	1364.16	1365.35	1368.31	0.010583	16.51	421.97	520.30	1.36
Sound Stages	2	50 Yr Burned&Bul	5943.50	1348.00	1352.94	1354.24	1357.10	0.017325	17.10	428.92	337.15	1.67
Lower	1300	50 Yr Burned&Bul	5993.30	1468.00	1473.34	1474.58	1477.21	0.012080	16.61	424.68	182.37	1.43
Lower	1250	50 Yr Burned&Bul	5993.30	1463.00	1468.80	1470.15	1472.94	0.017037	18.80	428.93	226.60	1.69
Lower	1200	50 Yr Burned&Bul	5993.30	1459.00	1464.54	1465.52	1468.43	0.015188	18.64	518.22	424.10	1.62
Lower	1150	50 Yr Burned&Bul	5993.30	1453.00	1463.01	1463.01	1463.56	0.001327	7.71	1311.13	579.07	0.51
Lower	1100	50 Yr Burned&Bul	5993.30	1447.00	1453.69	1455.72	1461.20	0.018795	22.28	301.50	167.53	1.80
Lower	1050	50 Yr Burned&Bul	5993.30	1443.00	1454.56	1452.18	1454.64	0.000181	3.21	2991.92	866.87	0.20
Lower	1000	50 Yr Burned&Bul	5993.30	1439.00	1450.67	1450.67	1454.17	0.005481	15.02	399.12	56.69	1.00

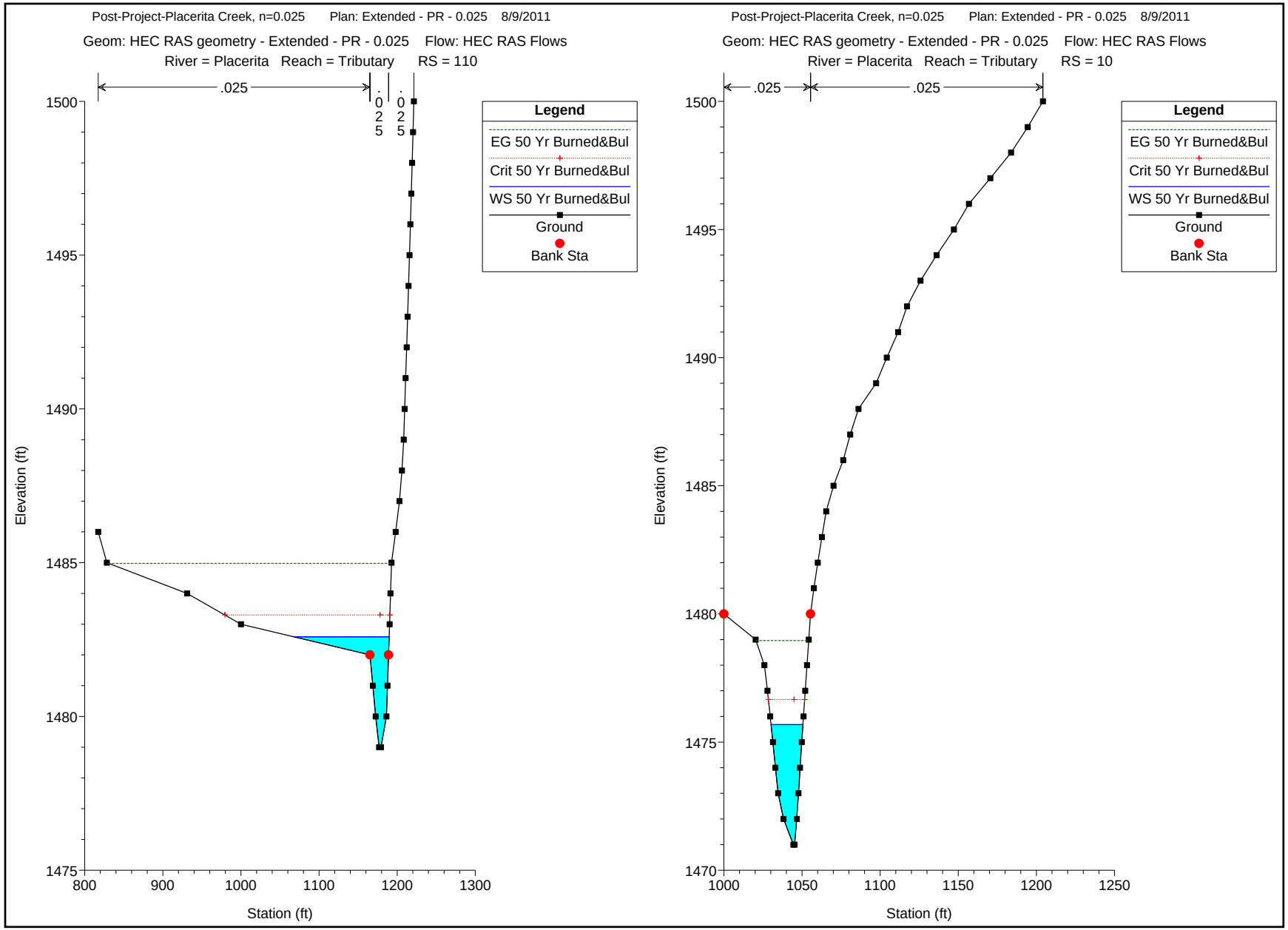

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1900
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1800
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)

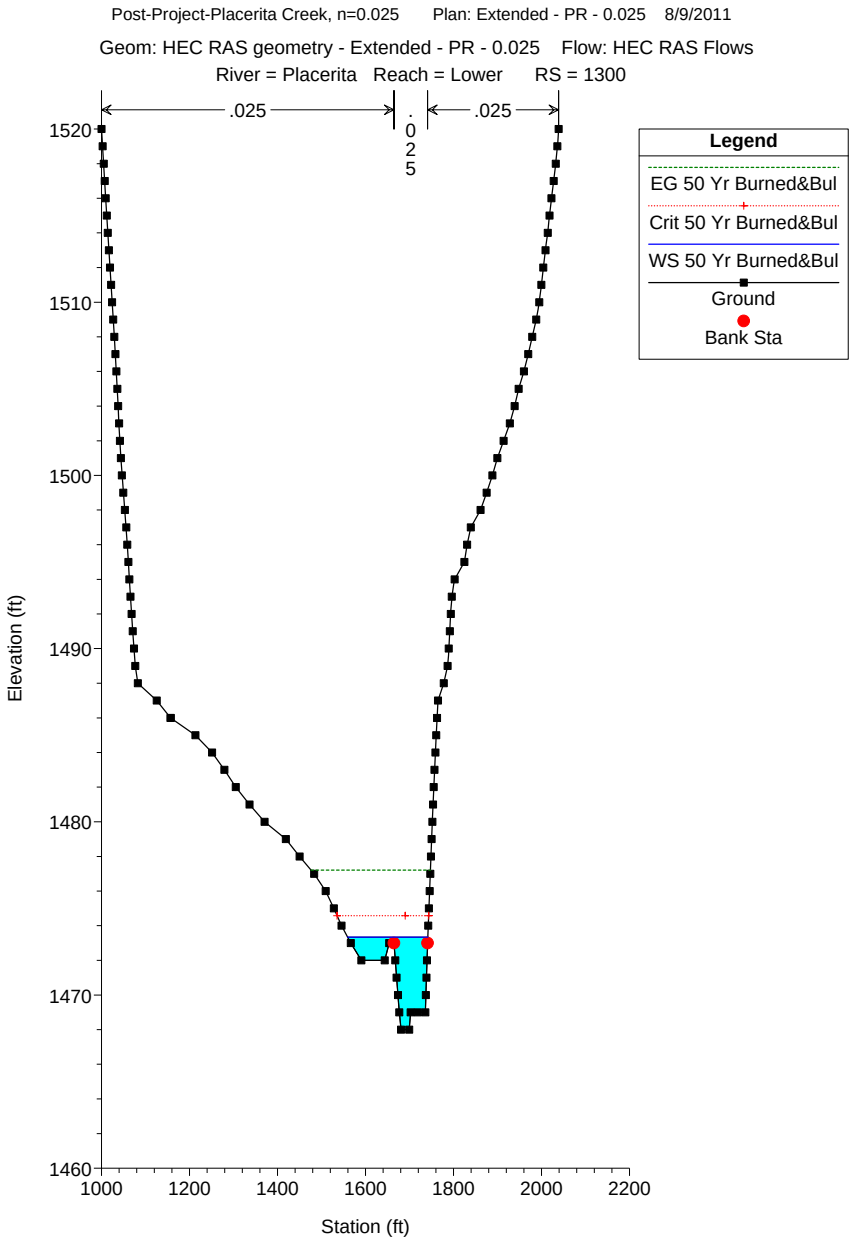

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1700
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1600
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

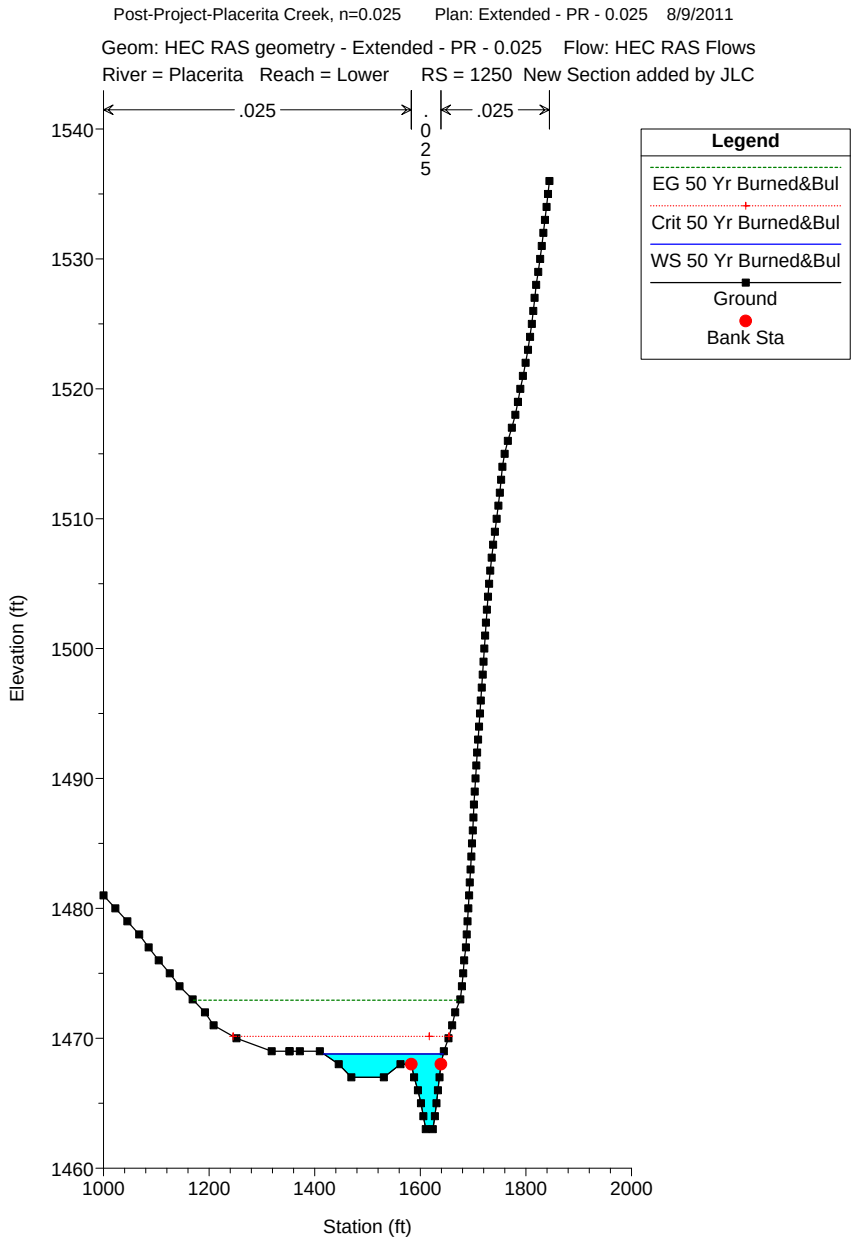

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1500
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1200
1400
1600
1800
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1400 D/S of Upper Reach
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1200
1400
1600
1800

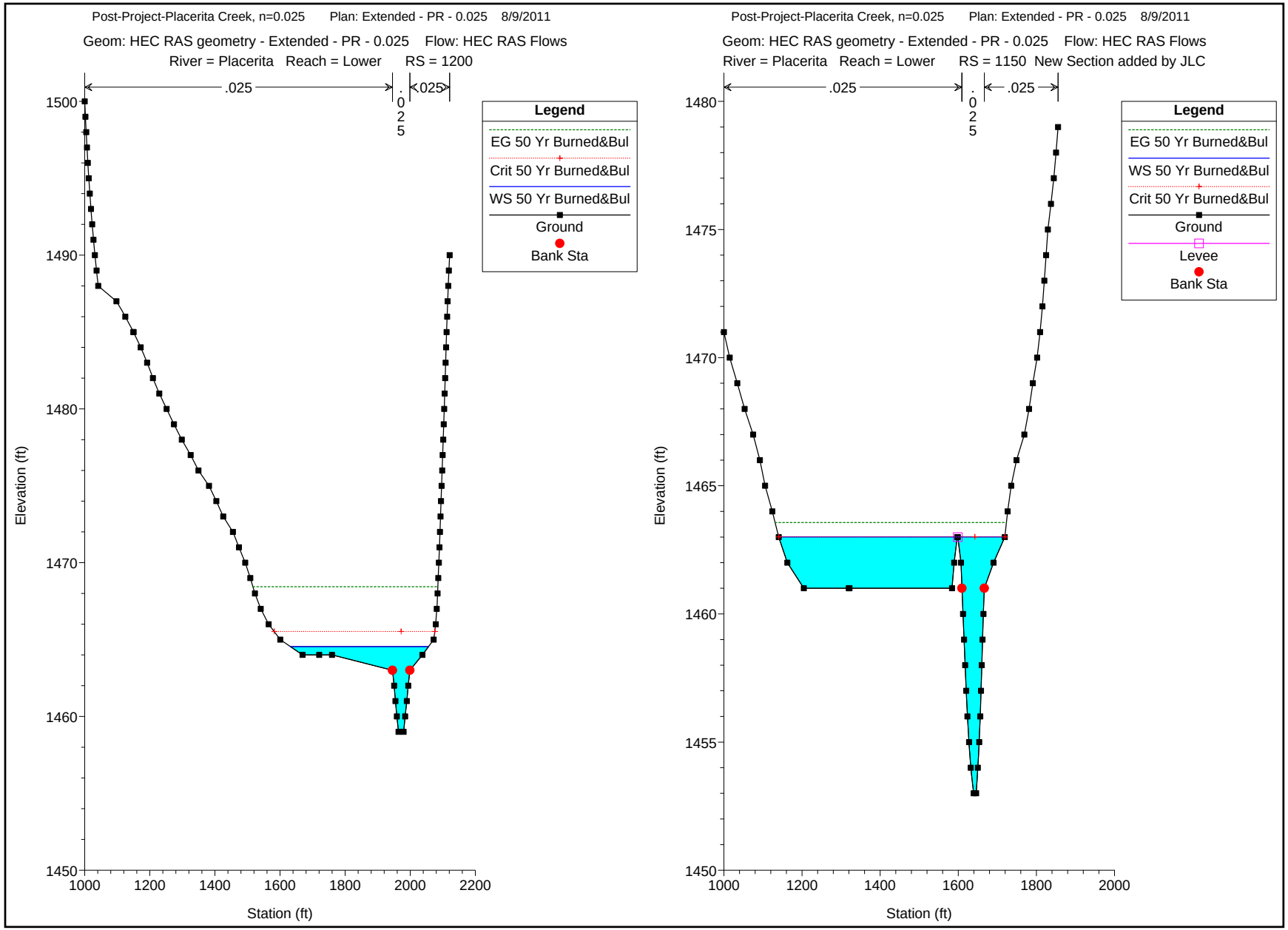

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 510
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1575
1570
1565
1560
1555
1550
1545
1000
1100
1200
1300
1400
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 410
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1545
1540
1535
1530
1525
1520
1000
1050
1100
1150
1200
1250
1300

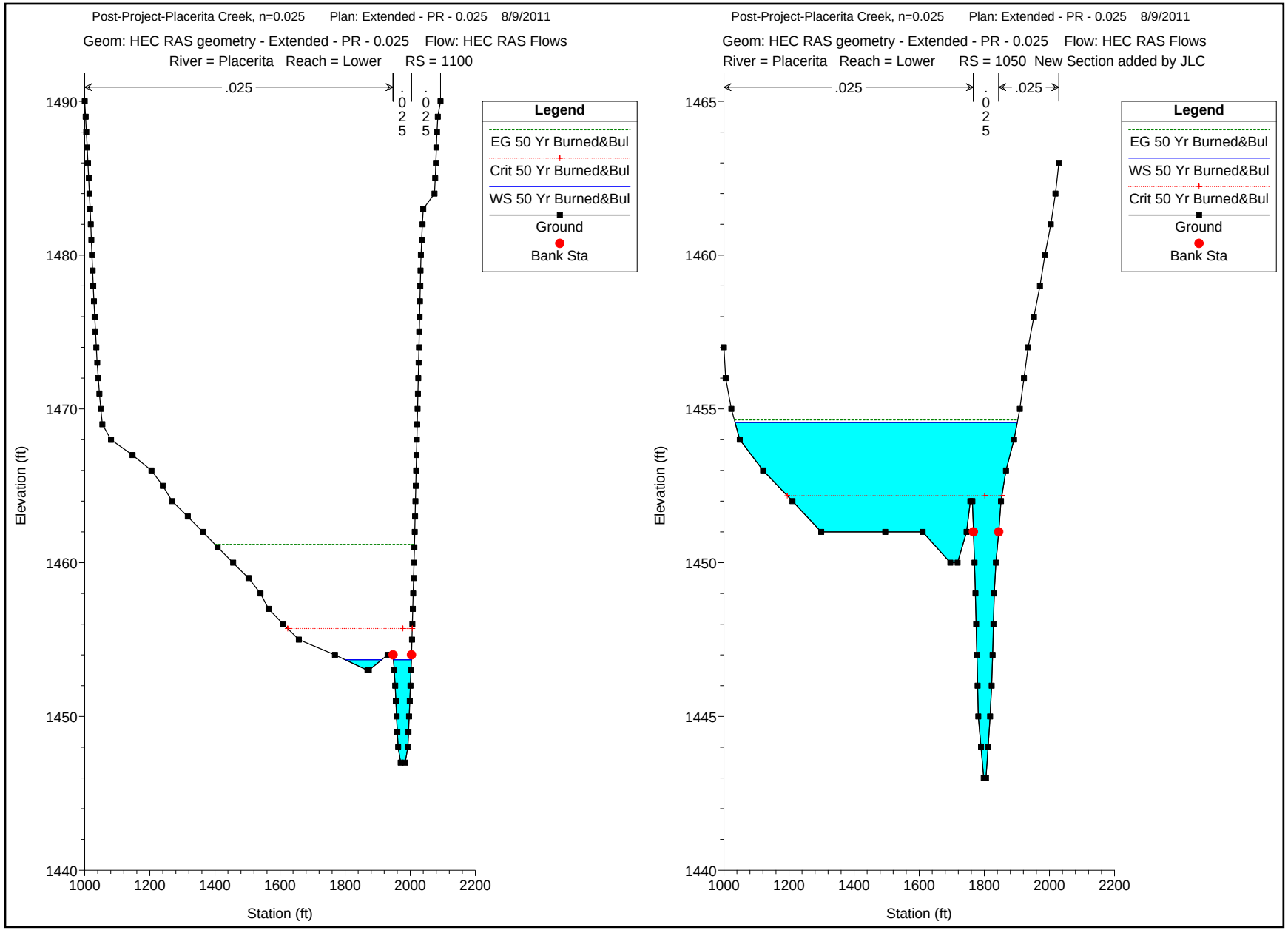

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 310
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1530
1525
1520
1515
1510
1505
1500
1000
1100
1200
1300
1400
1500
1600
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 210
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1515
1510
1505
1500
1495
1490
1485
1000
1100
1200
1300
1400
1500
1600

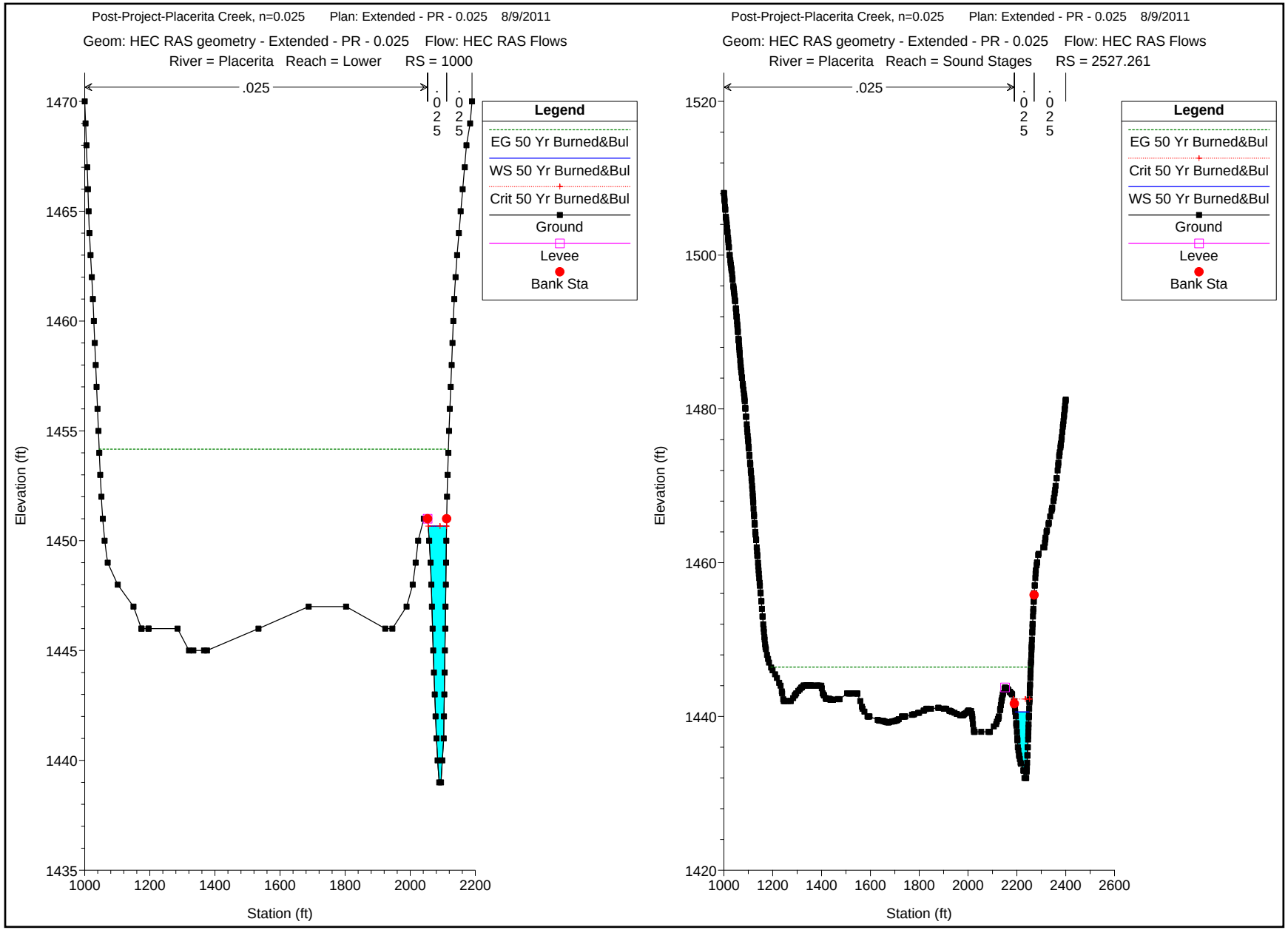

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 110
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 10
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)

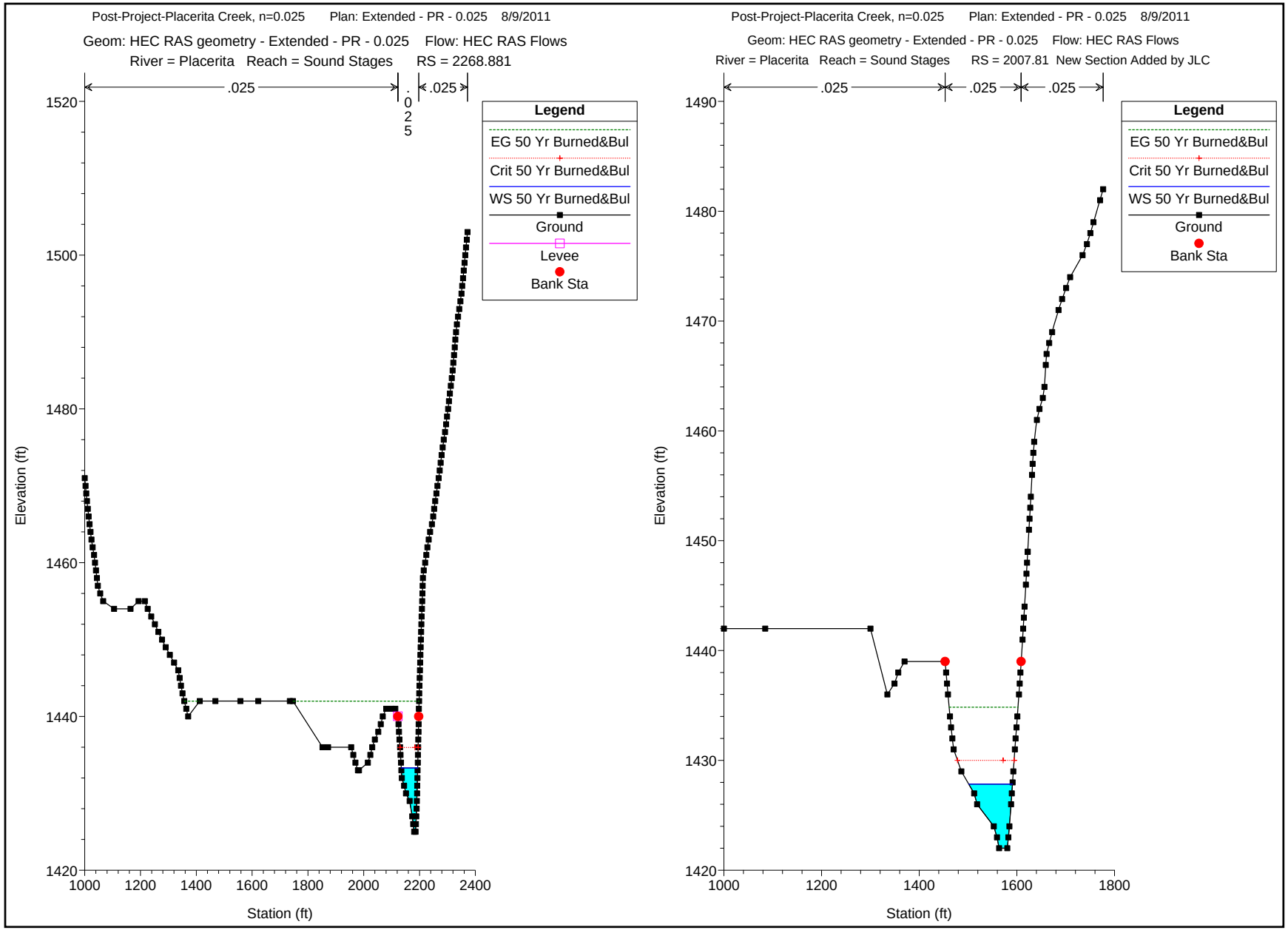

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1300
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1520
1510
1500
1490
1480
1470
1460
1000
1200
1400
1600
1800
2000
2200

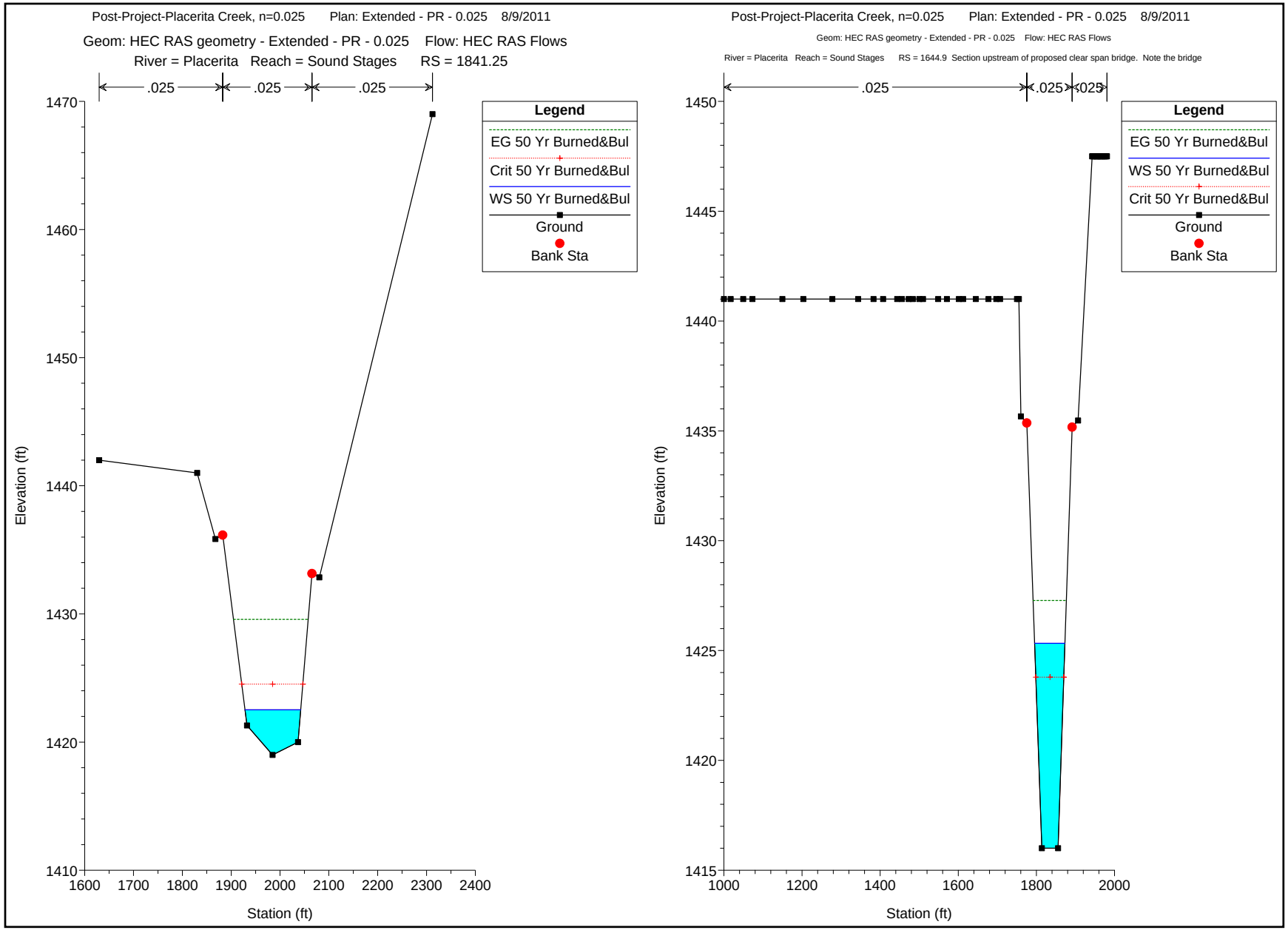

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1250 New Section added by JLC
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1540
1530
1520
1510
1500
1490
1480
1470
1460
1000
1200
1400
1600
1800
2000

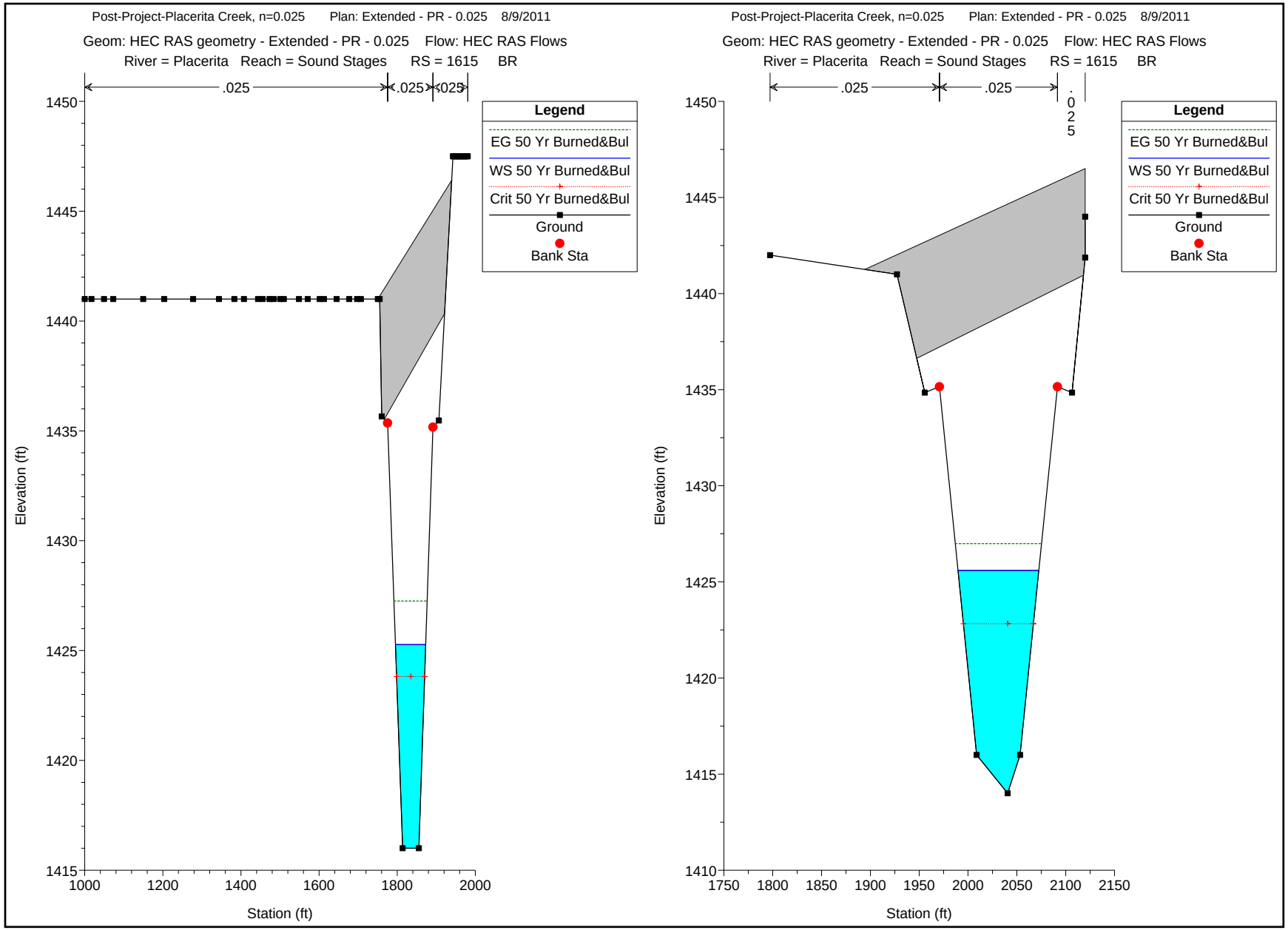

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1200
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1150 New Section added by JLC
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

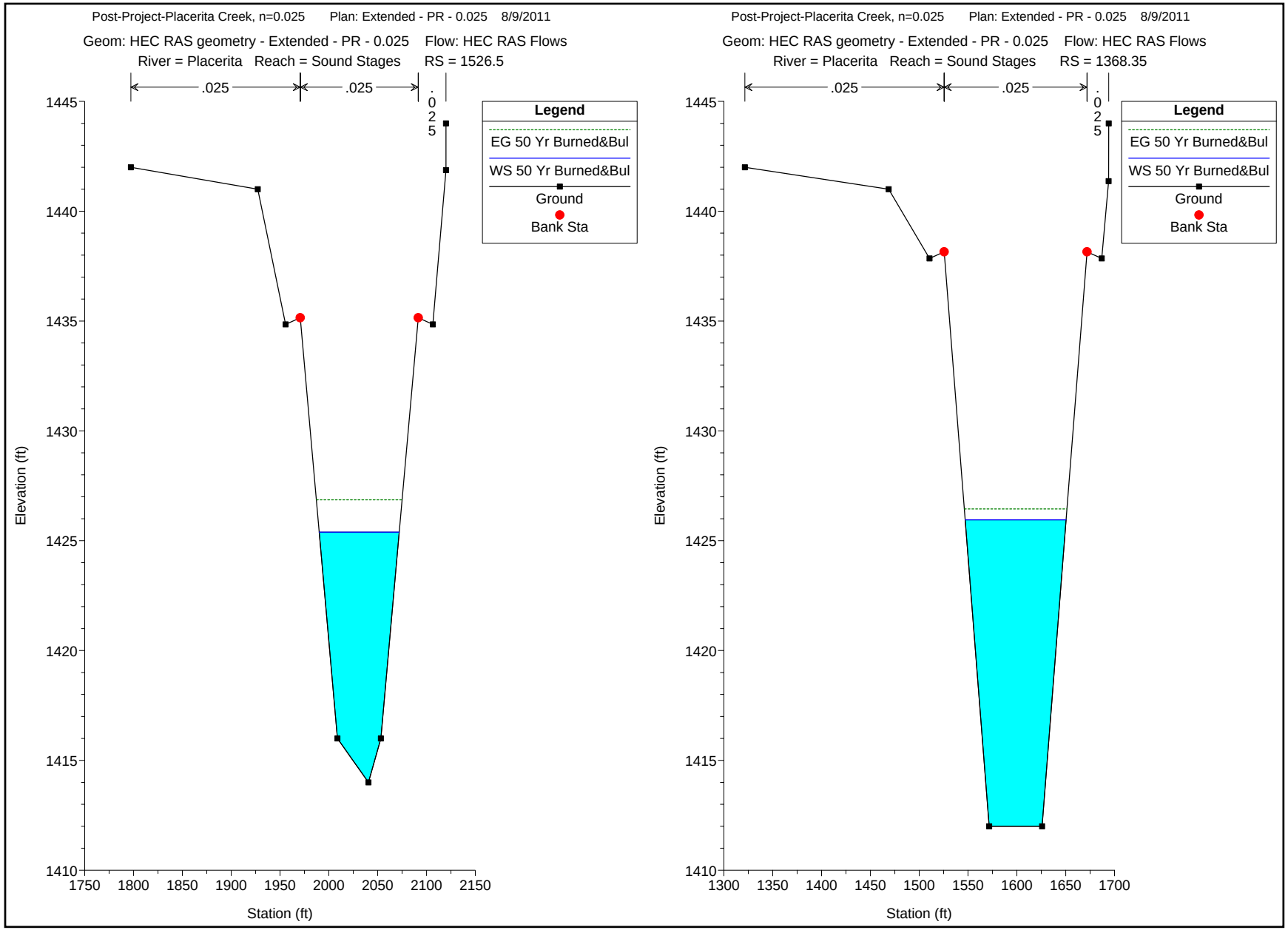

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1100
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1490
1480
1470
1460
1450
1440
1000
1200
1400
1600
1800
2000
2200
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1050 New Section added by JLC
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1465
1460
1455
1450
1445
1440
1000
1200
1400
1600
1800
2000
2200


Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1000
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2527.261
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)


Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2268.881
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2007.81 New Section Added by JLC
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)


Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1841.25
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1410
1420
1430
1440
1450
1460
1470
1600
1700
1800
1900
2000
2100
2200
2300
2400
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1644.9 Section upstream of proposed clear span bridge. Note the bridge
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1415
1420
1425
1430
1435
1440
1445
1450
1000
1200
1400
1600
1800
2000


Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1615 BR
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1445
1440
1435
1430
1425
1420
1415
1000
1200
1400
1600
1800
2000
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1615 BR
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1445
1440
1435
1430
1425
1420
1415
1410
1750
1800
1850
1900
1950
2000
2050
2100
2150


Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1526.5
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1445
1440
1435
1430
1425
1420
1415
1410
1750
1800
1850
1900
1950
2000
2050
2100
2150
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1368.35
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1445
1440
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1430
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1420
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1410
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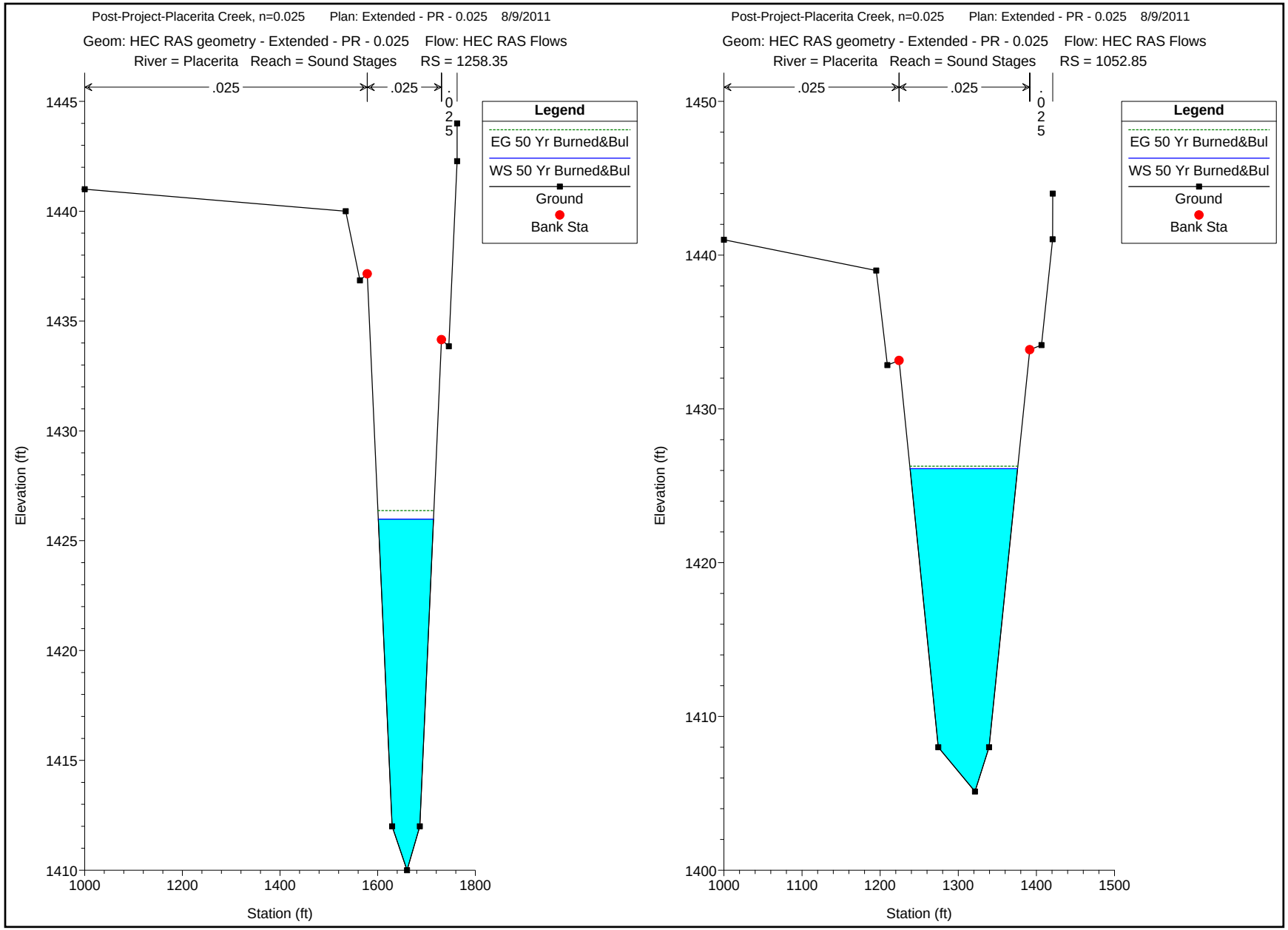
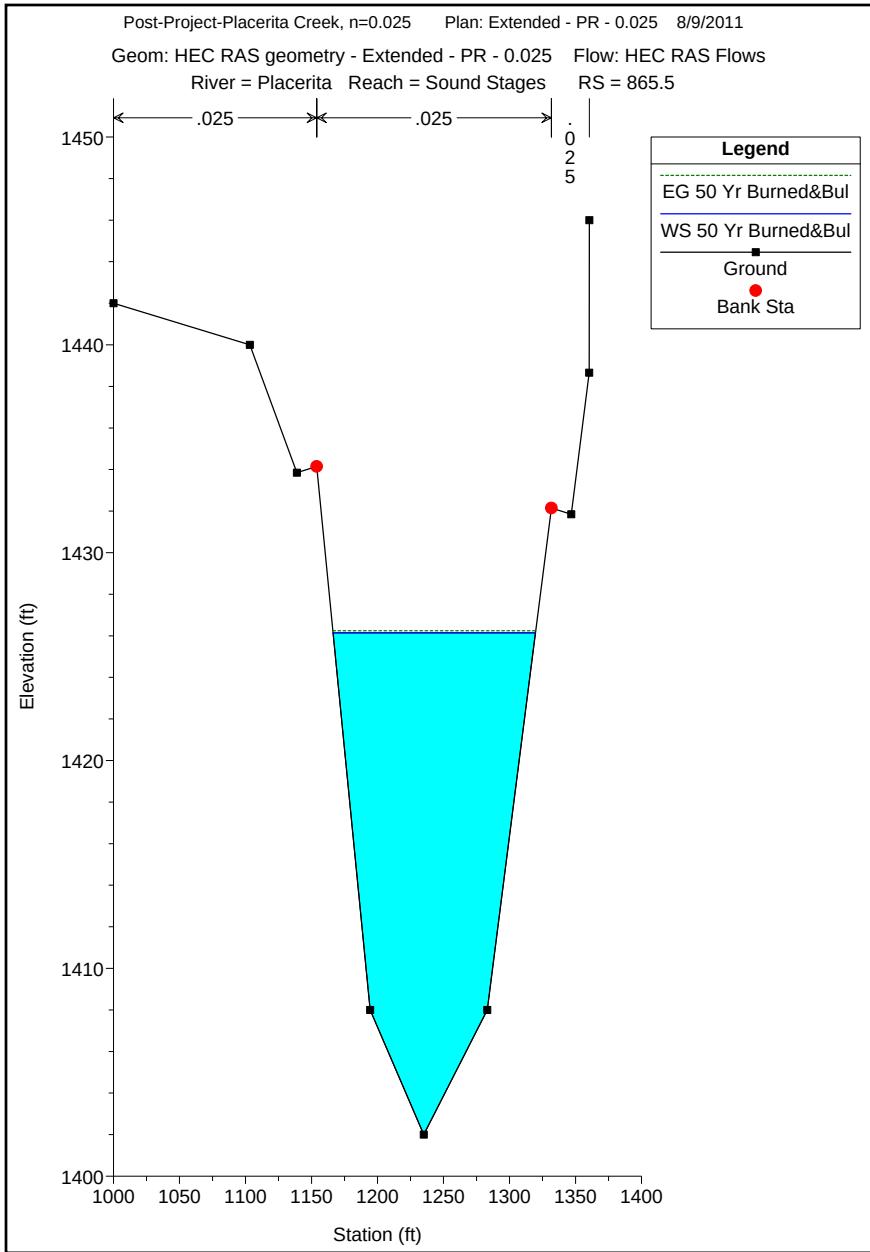
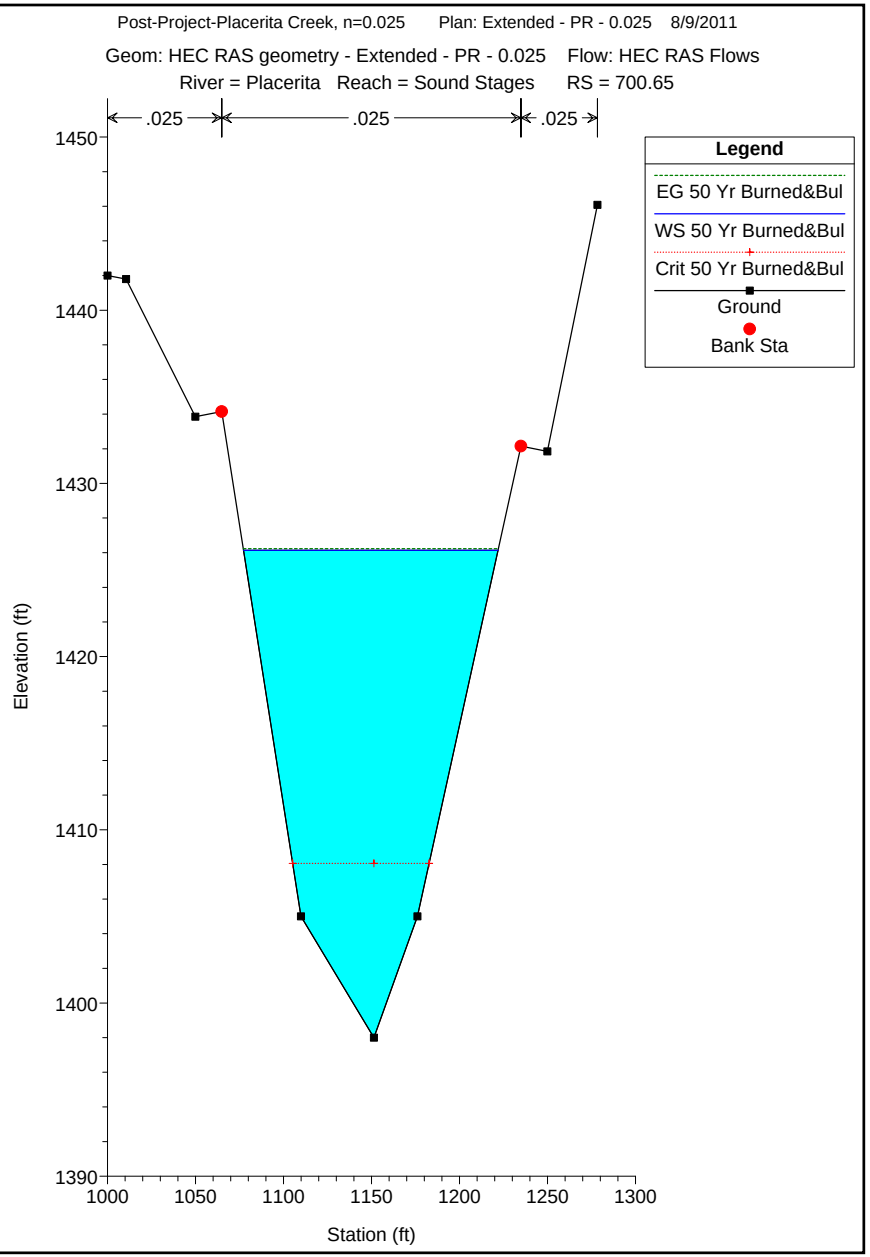
1400
1450
1500
1550
1600
1650
1700


Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1258.35
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1445
1440
1435
1430
1425
1420
1415
1410
1000
1200
1400
1600
1800
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1052.85
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1440
1430
1420
1410
1400
1000
1100
1200
1300
1400
1500


Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 865.5
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1440
1430
1420
1410
1400
1000
1050
1100
1150
1200
1250
1300
1350
1400


Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700.65
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
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1440
1430
1420
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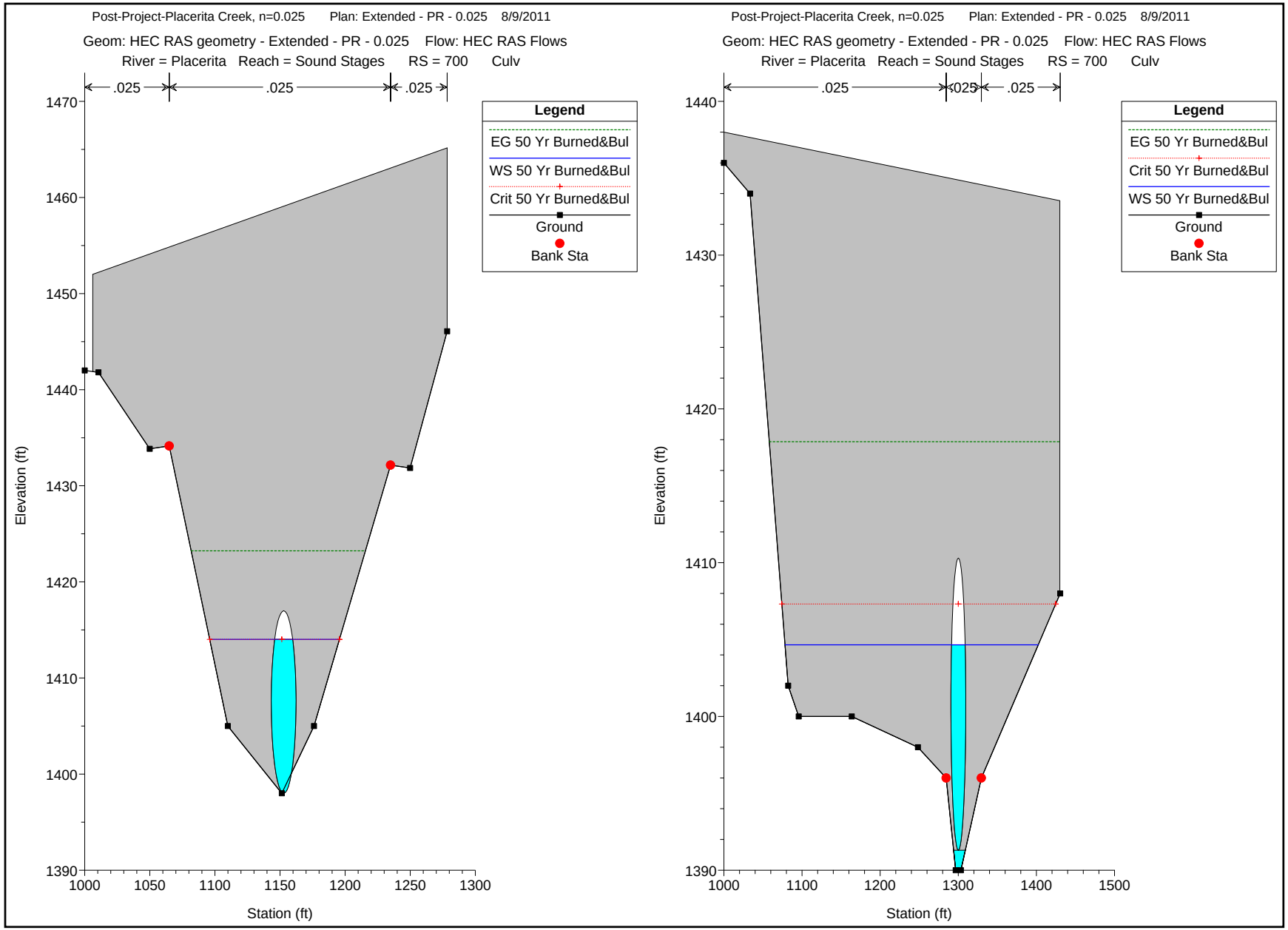
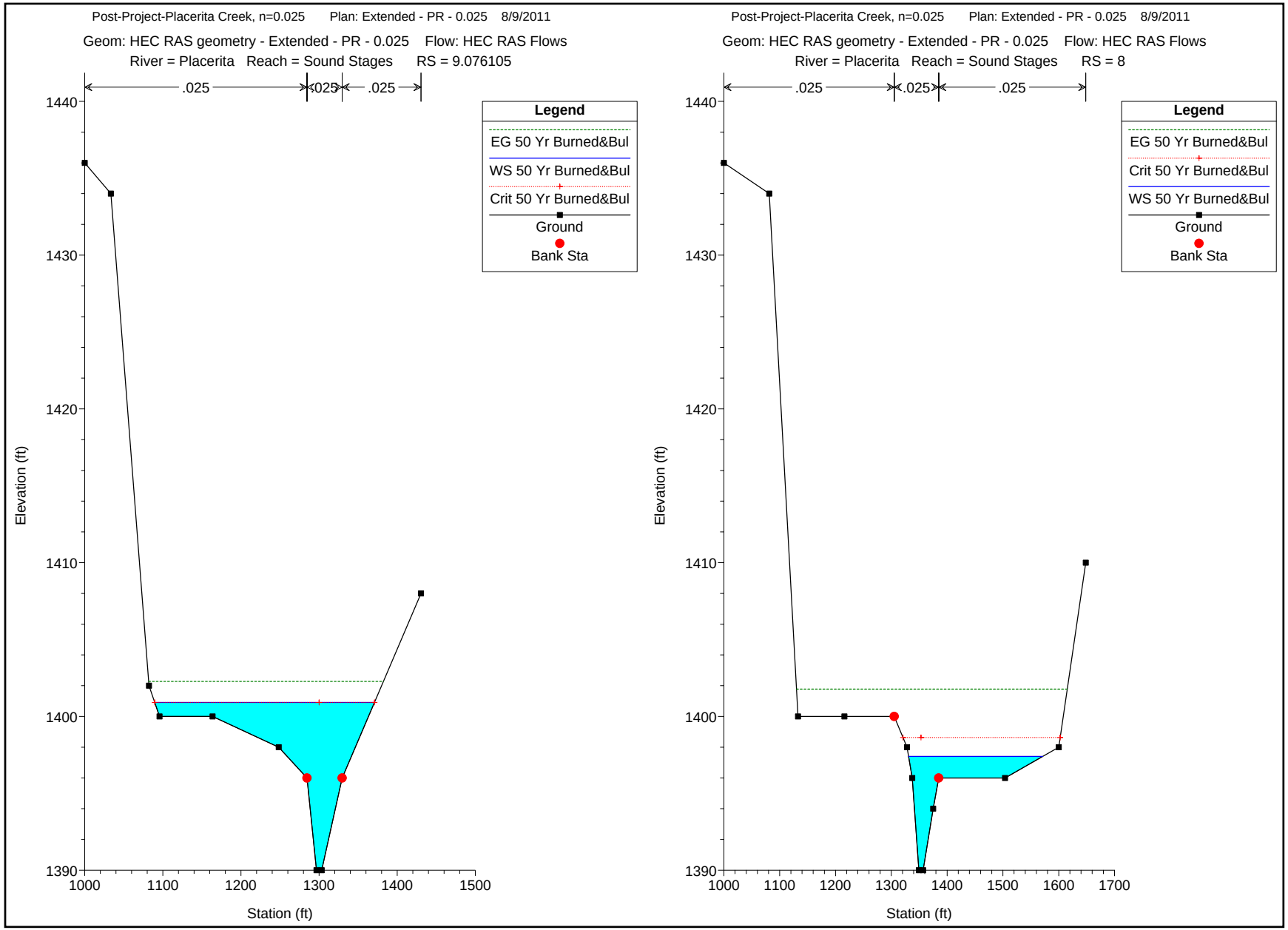
1400
1390
1000
1050
1100
1150
1200
1250
1300


Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700 Culv
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1470
1460
1450
1440
1430
1420
1410
1400
1390
1000
1050
1100
1150
1200
1250
1300
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700 Culv
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500


Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 9.076105
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1390
1400
1410
1420
1430
1440
1000
1100
1200
1300
1400
1500
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 8
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1390
1400
1410
1420
1430
1440
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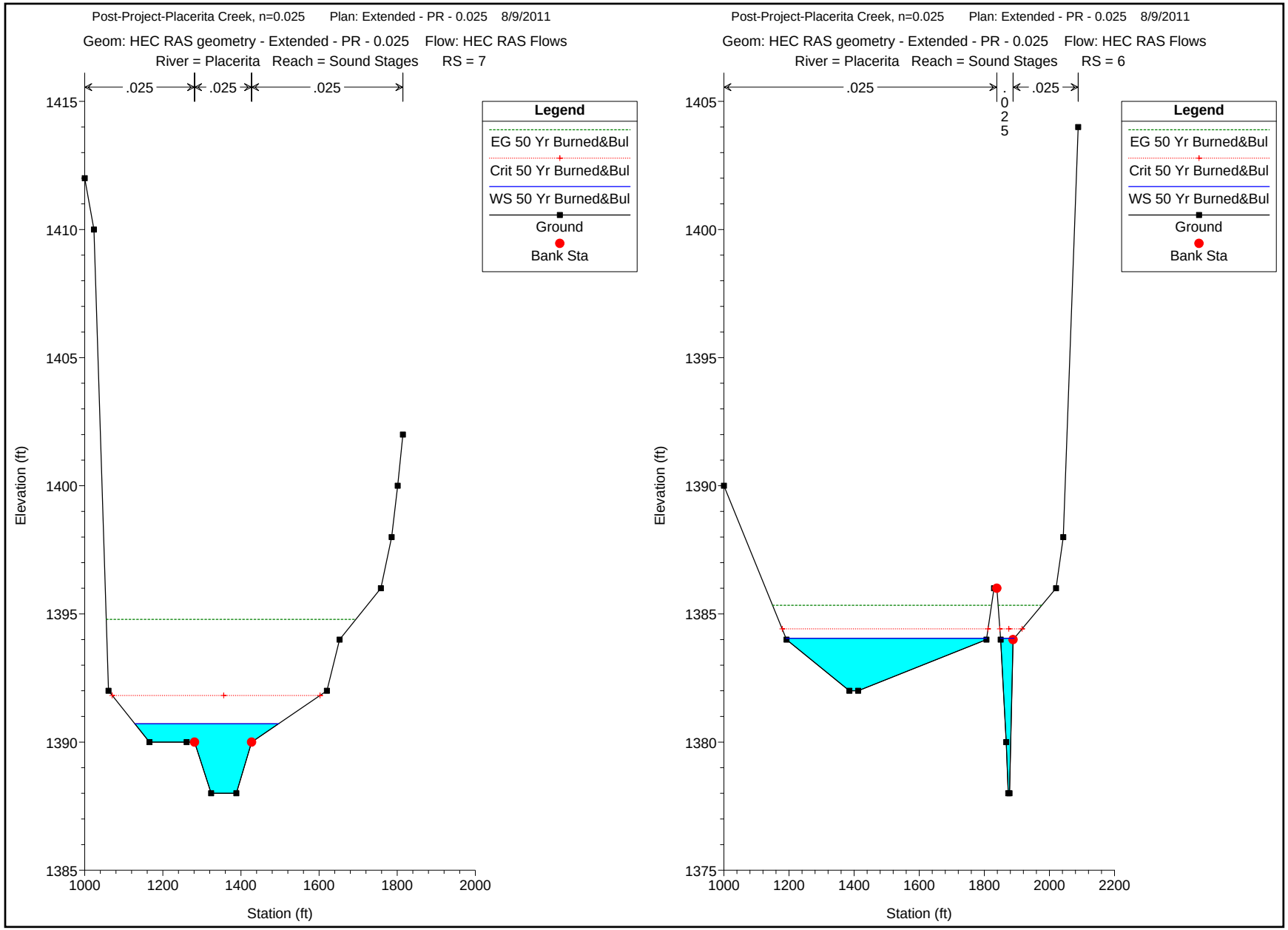
1100
1200
1300
1400
1500
1600
1700


Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 7
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1415
1410
1405
1400
1395
1390
1385
1000
1200
1400
1600
1800
2000
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 6
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
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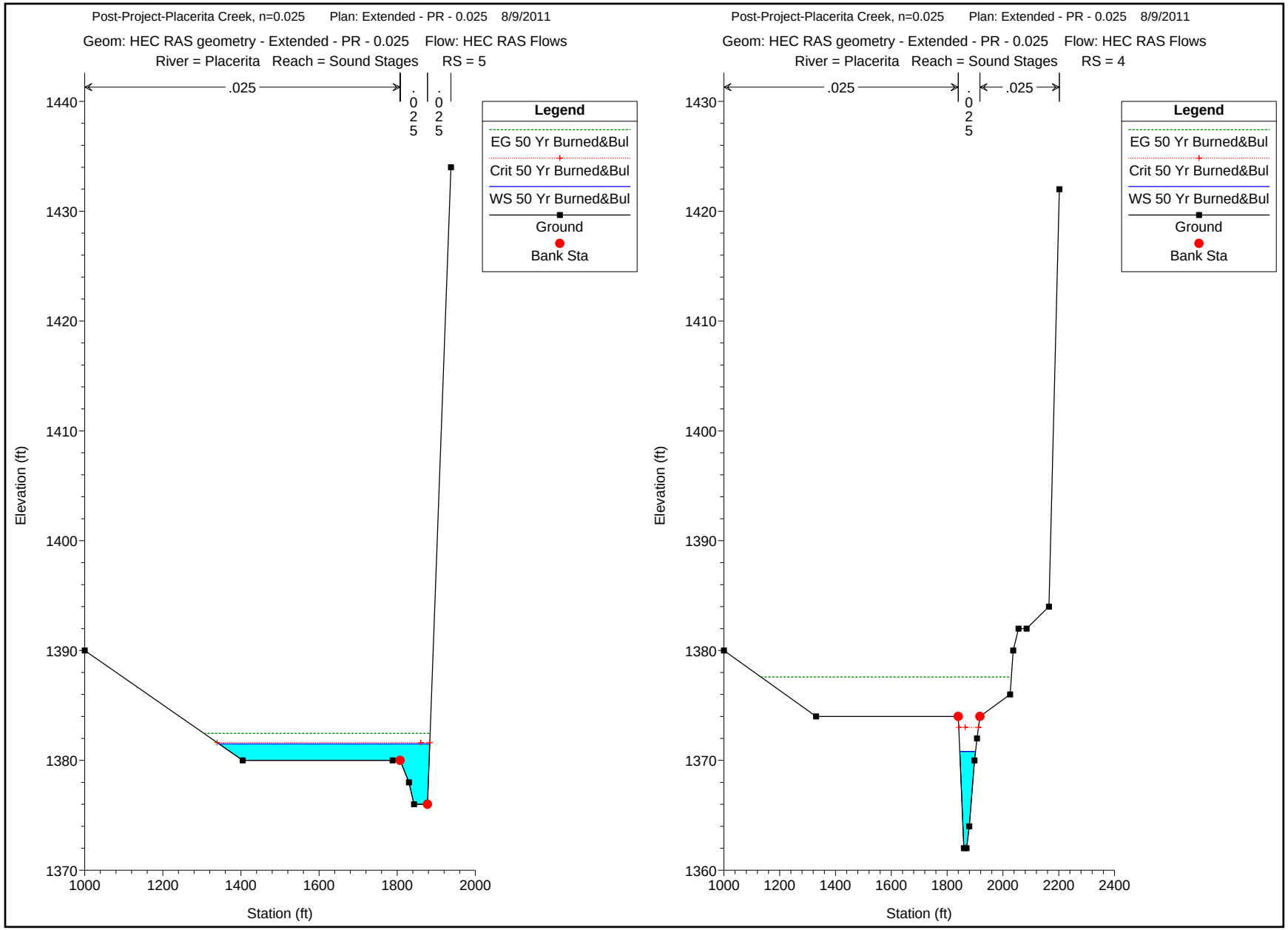
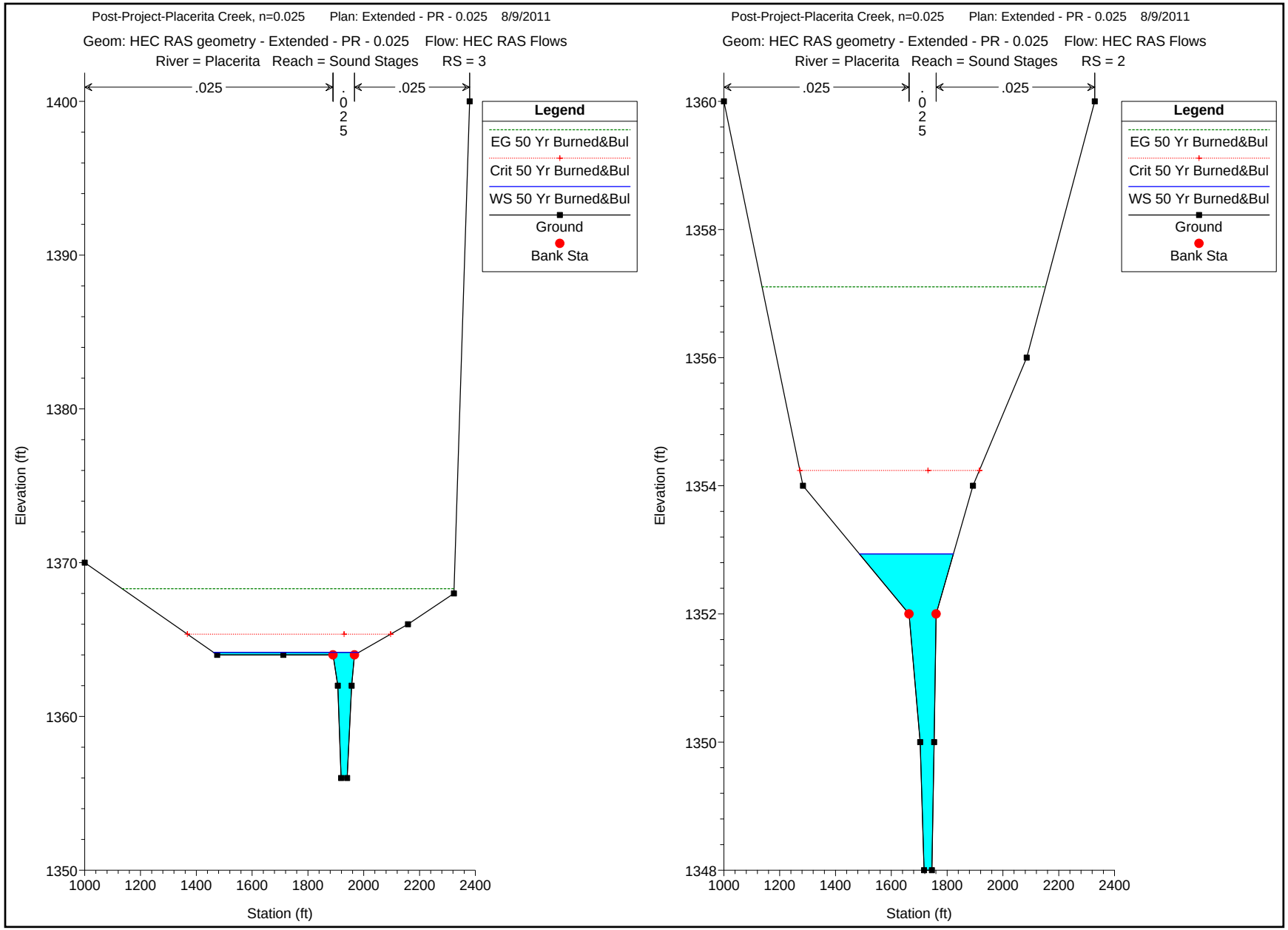
1400
1395
1390
1385
1380
1375
1000
1200
1400
1600
1800
2000
2200


Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 5
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 4
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)


Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 3
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)

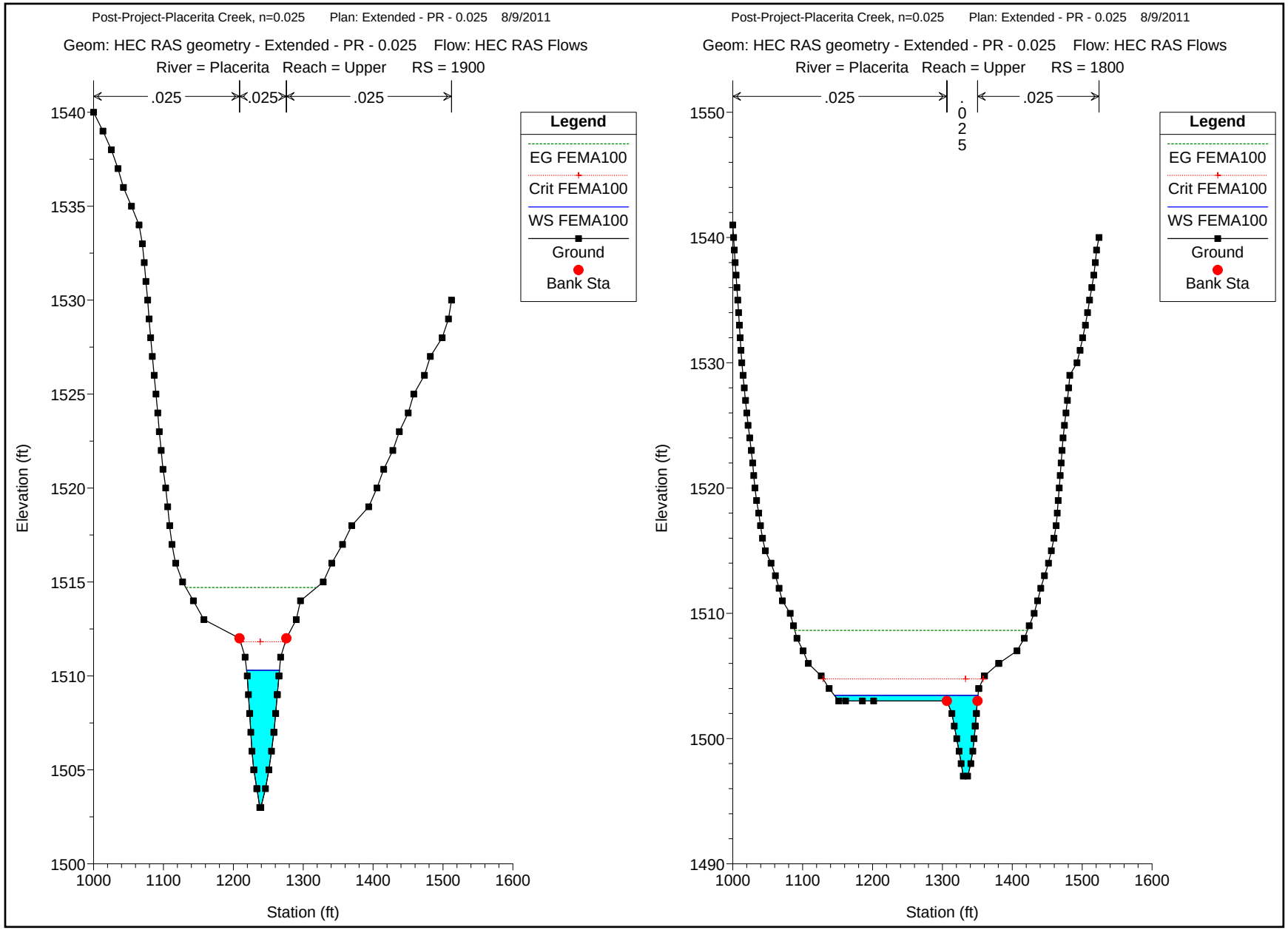
100 YEAR STORM EVENT FEMA – POST PROJECT CONDTION HEC-RAS OUTPUT

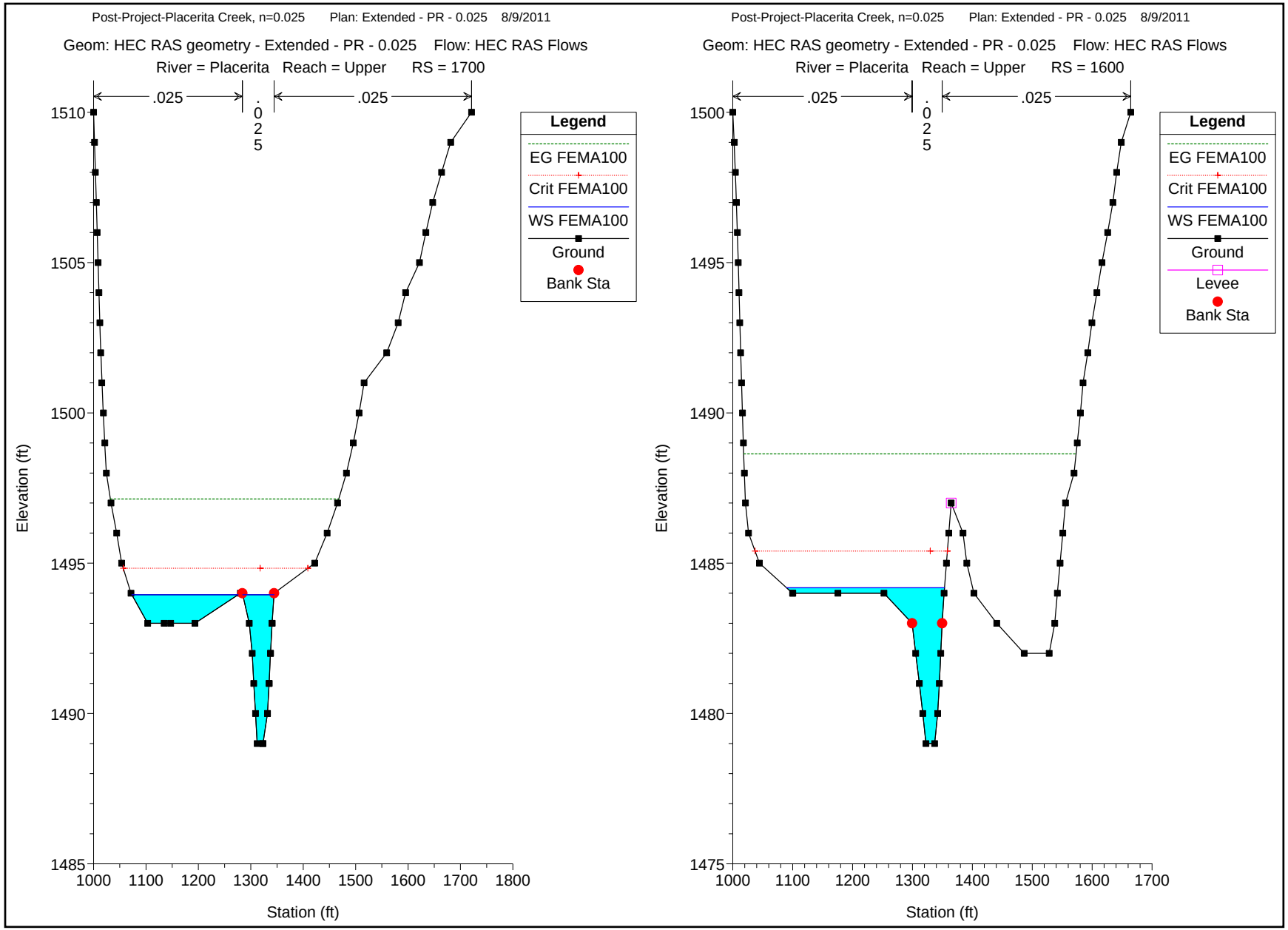
HEC-RAS Plan: Ex_PR_0.025 Profile: FEMA100

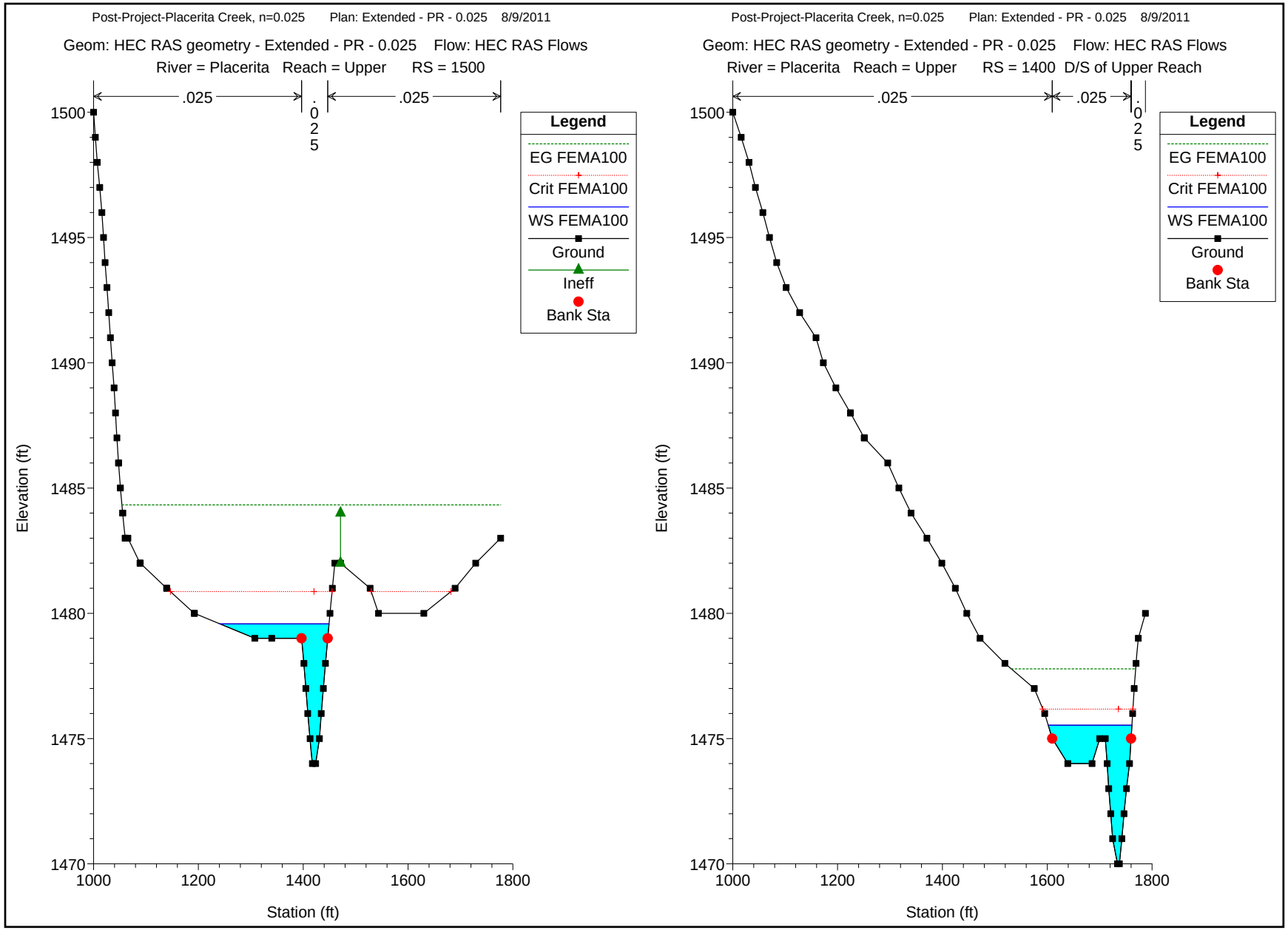
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Upper	1900	FEMA100	3550.00	1503.00	1510.30	1511.82	1514.70	0.011708	16.84	210.83	47.08	1.40
Upper	1800	FEMA100	3550.00	1497.00	1503.45	1504.76	1508.63	0.018416	19.13	239.35	205.63	1.72
Upper	1700	FEMA100	3550.00	1489.00	1493.95	1494.83	1497.14	0.019873	16.15	302.89	262.71	1.72
Upper	1600	FEMA100	3550.00	1479.00	1484.18	1485.40	1488.64	0.014767	17.43	255.41	263.87	1.57
Upper	1500	FEMA100	3550.00	1474.00	1479.58	1480.87	1484.33	0.018359	18.33	246.74	208.15	1.72
Upper	1400	FEMA100	3550.00	1470.00	1475.53	1476.18	1477.78	0.016990	12.04	296.56	159.72	1.52
Tributary	510	FEMA100	860.00	1545.00	1547.88	1548.93	1551.99	0.033814	16.28	52.82	28.23	2.10
Tributary	410	FEMA100	860.00	1524.00	1527.36	1527.90	1530.01	0.036160	14.87	84.13	151.21	2.09
Tributary	310	FEMA100	860.00	1503.00	1505.39	1505.83	1506.80	0.023673	9.61	93.30	110.14	1.63
Tributary	210	FEMA100	860.00	1486.00	1488.75	1489.68	1491.47	0.024556	13.24	64.93	37.65	1.78
Tributary	110	FEMA100	860.00	1479.00	1482.58	1483.29	1484.95	0.014981	13.01	87.10	119.87	1.45
Tributary	10	FEMA100	860.00	1471.00	1475.63	1476.61	1478.91	0.016965	14.53	59.18	20.33	1.50
Sound Stages	2527.261	FEMA100	3550.00	1432.00	1438.59	1439.77	1442.80	0.011603	16.48	215.44	49.12	1.39
Sound Stages	2268.881	FEMA100	3550.00	1425.00	1431.73	1433.70	1438.22	0.026889	20.44	173.72	53.66	2.00
Sound Stages	2007.81	FEMA100	3550.00	1422.00	1426.82	1428.30	1431.31	0.021779	17.00	208.86	75.89	1.81
Sound Stages	1841.25	FEMA100	3550.00	1419.00	1421.72	1423.08	1426.52	0.039087	17.59	201.87	109.77	2.29
Sound Stages	1644.9	FEMA100	3550.00	1416.00	1422.23	1421.57	1424.00	0.003929	10.68	332.43	65.49	0.84
Sound Stages	1615		Bridge									
Sound Stages	1526.5	FEMA100	3550.00	1414.00	1420.57	1420.57	1422.90	0.005833	12.27	289.30	62.71	1.01
Sound Stages	1368.35	FEMA100	3550.00	1412.00	1415.09	1416.82	1420.85	0.027076	19.26	184.35	65.09	2.02
Sound Stages	1258.35	FEMA100	3550.00	1410.00	1414.99	1415.84	1418.27	0.011376	14.54	244.20	68.78	1.36
Sound Stages	1052.85	FEMA100	3550.00	1405.12	1415.87	1411.04	1416.24	0.000477	4.87	729.47	96.54	0.31
Sound Stages	865.5	FEMA100	3550.00	1402.00	1415.97		1416.13	0.000164	3.27	1085.75	117.08	0.19
Sound Stages	700.65	FEMA100	3550.00	1398.00	1415.96	1406.02	1416.10	0.000114	3.01	1180.23	106.85	0.16
Sound Stages	700		Culvert									
Sound Stages	9.076105	FEMA100	3550.00	1390.00	1398.79	1398.79	1400.52	0.003243	11.13	392.00	138.34	0.79
Sound Stages	8	FEMA100	3550.00	1390.00	1396.69	1397.76	1400.10	0.012125	15.74	290.92	202.71	1.41
Sound Stages	7	FEMA100	3550.00	1388.00	1390.13	1391.11	1393.70	0.036003	15.25	246.27	281.07	2.14
Sound Stages	6	FEMA100	3550.00	1378.00	1383.62	1383.96	1384.68	0.010045	11.86	533.60	537.12	1.21
Sound Stages	5	FEMA100	3550.00	1376.00	1380.75	1381.04	1381.81	0.004824	9.68	576.85	508.36	0.90
Sound Stages	4	FEMA100	3550.00	1362.00	1367.98	1370.37	1375.49	0.024482	22.00	161.38	41.87	1.97
Sound Stages	3	FEMA100	3550.00	1356.00	1363.04	1363.45	1365.67	0.007262	13.00	273.05	63.70	1.11
Sound Stages	2	FEMA100	3550.00	1348.00	1352.04	1353.43	1355.76	0.021743	15.47	229.76	108.08	1.77
Lower	1300	FEMA100	3550.00	1468.00	1472.18	1473.46	1475.74	0.014403	15.19	242.35	132.02	1.50
Lower	1250	FEMA100	3550.00	1463.00	1468.19	1468.99	1471.29	0.014615	15.52	298.29	201.47	1.52
Lower	1200	FEMA100	3550.00	1459.00	1464.05	1464.98	1467.46	0.013021	15.85	321.77	373.38	1.47
Lower	1150	FEMA100	3550.00	1453.00	1460.80	1460.86	1463.34	0.005862	12.77	277.97	56.47	1.01
Lower	1100	FEMA100	3550.00	1447.00	1452.12	1454.76	1458.07	0.019215	19.58	181.31	47.53	1.77
Lower	1050	FEMA100	3550.00	1443.00	1448.30	1450.54	1453.39	0.017453	18.10	196.08	54.48	1.68

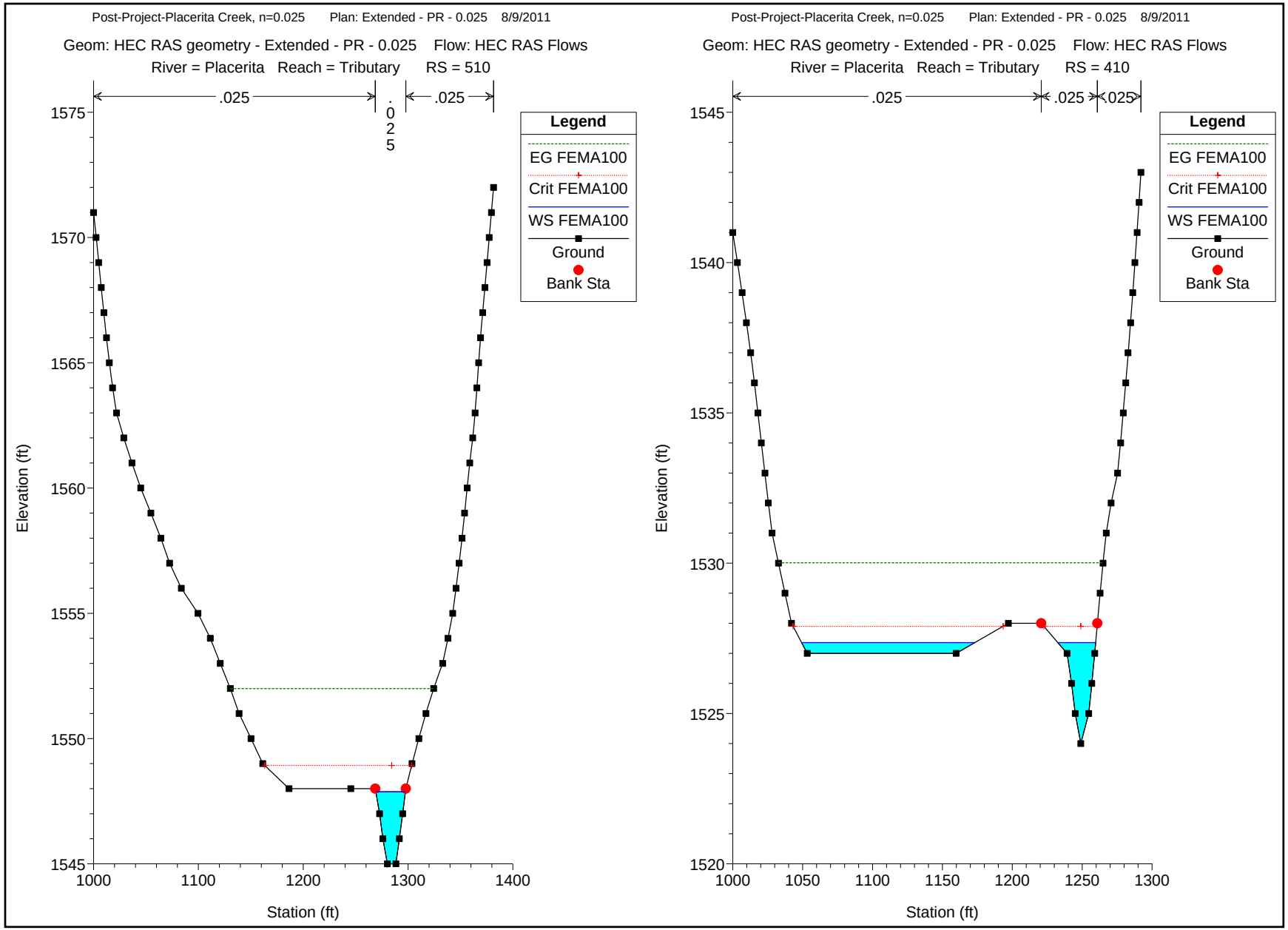
HEC-RAS Plan: Ex_PR_0.025 Profile: FEMA100 (Continued)

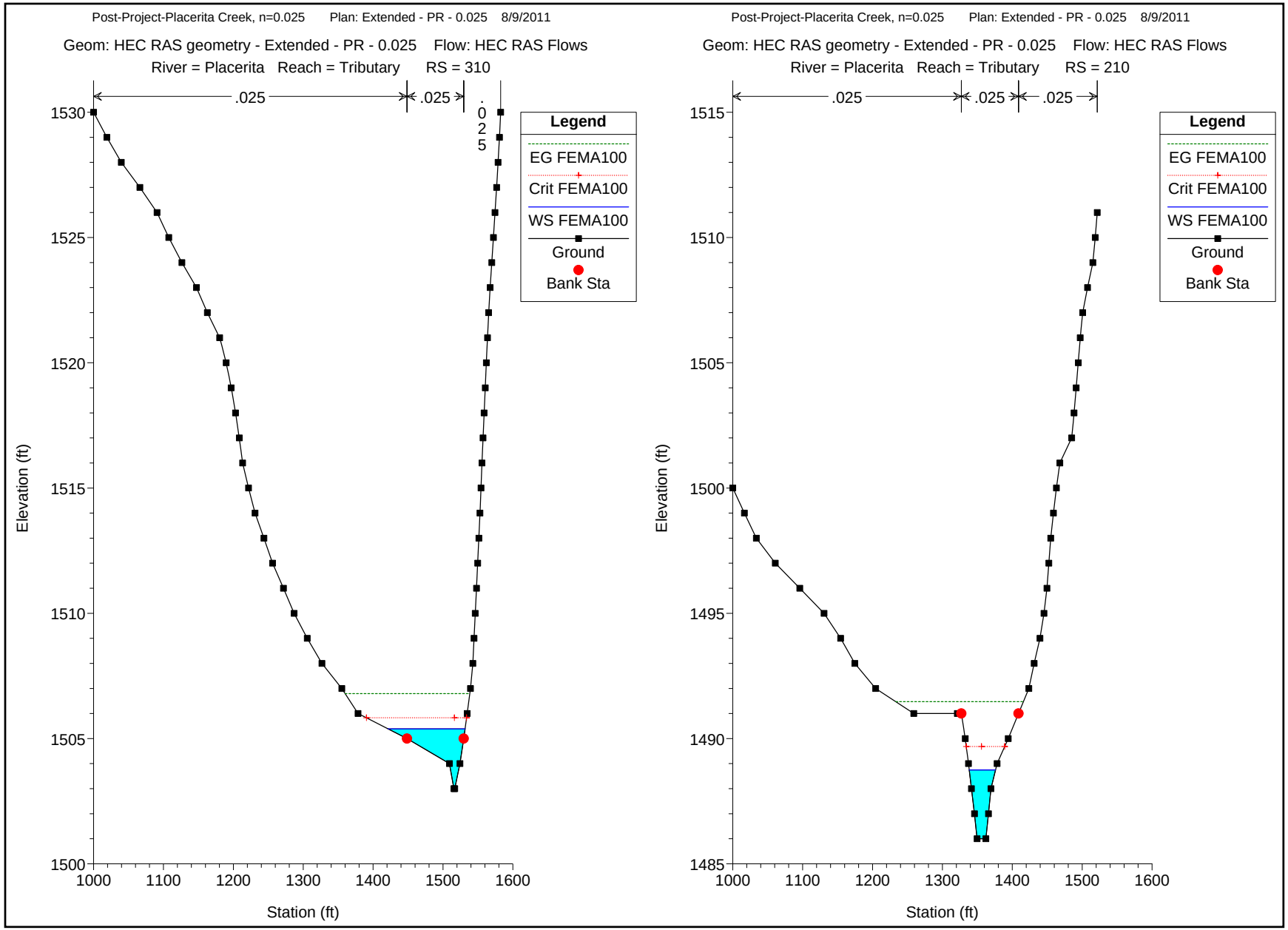
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Lower	1000	FEMA100	3550.00	1439.00	1447.83	1447.83	1450.75	0.005808	13.72	258.66	44.16	1.00

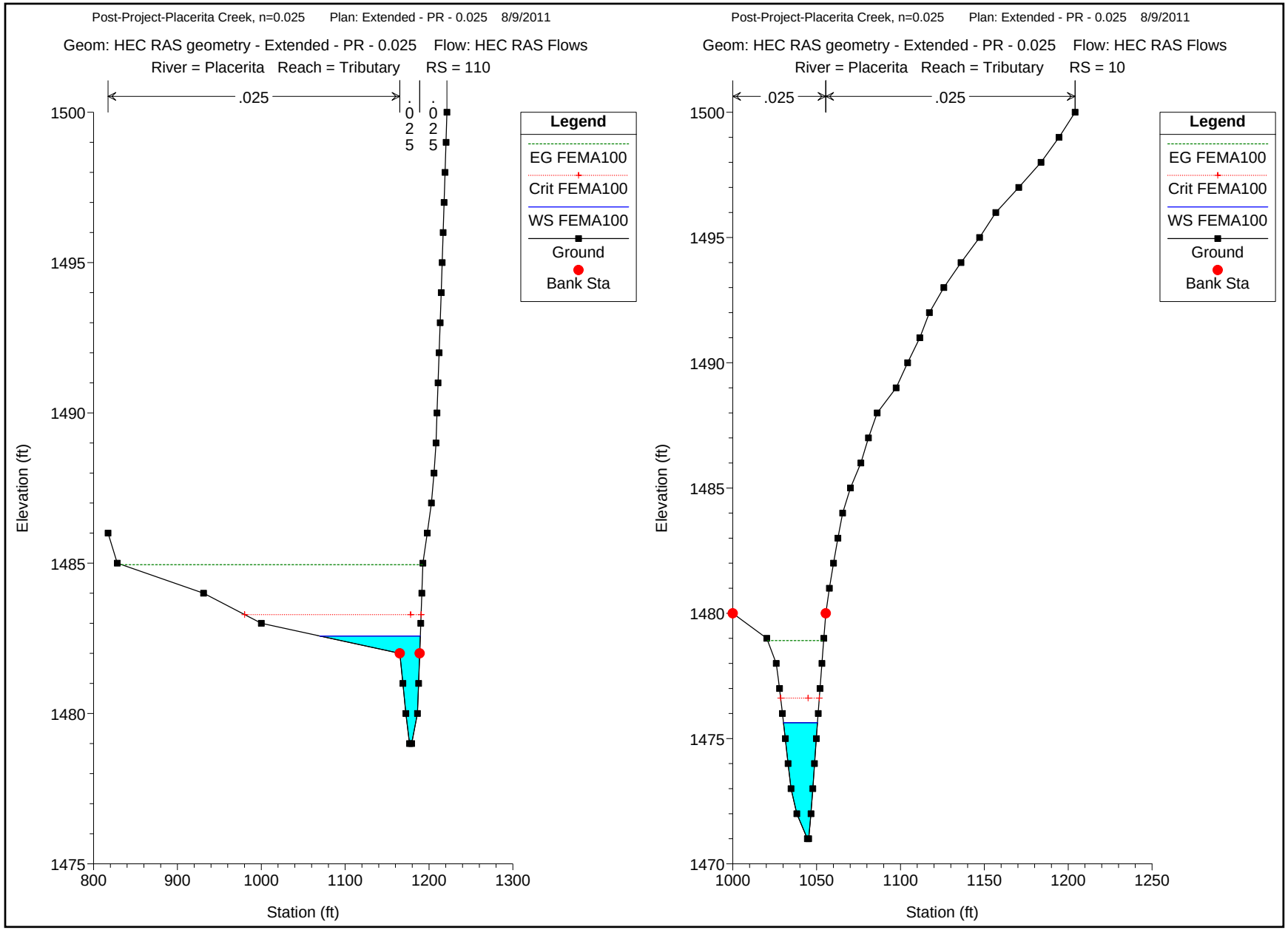

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1900
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1800
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)

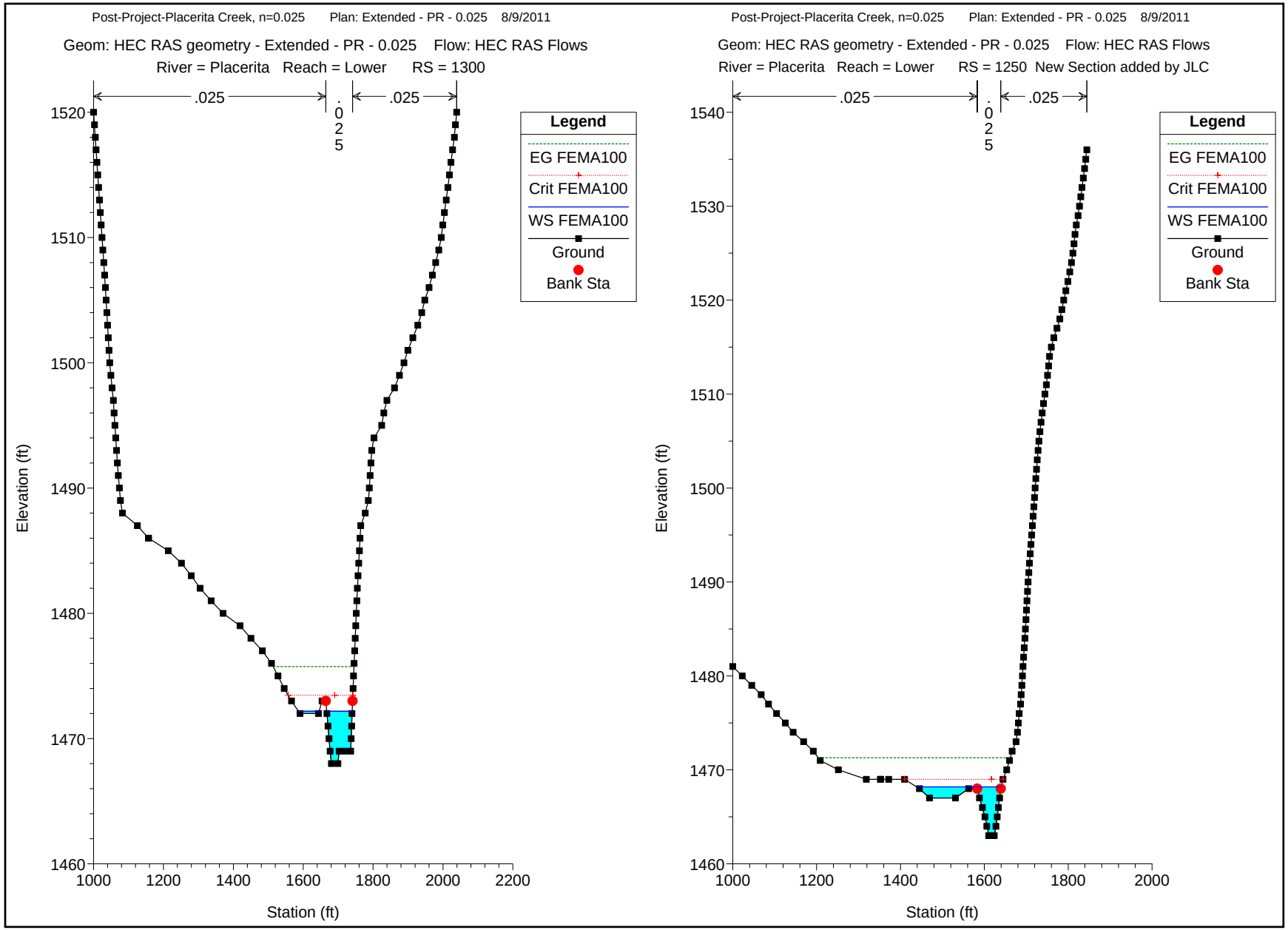

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1700
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1510
1505
1500
1495
1490
1485
1000
1100
1200
1300
1400
1500
1600
1700
1800
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1600
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1000
1100
1200
1300
1400
1500
1600
1700

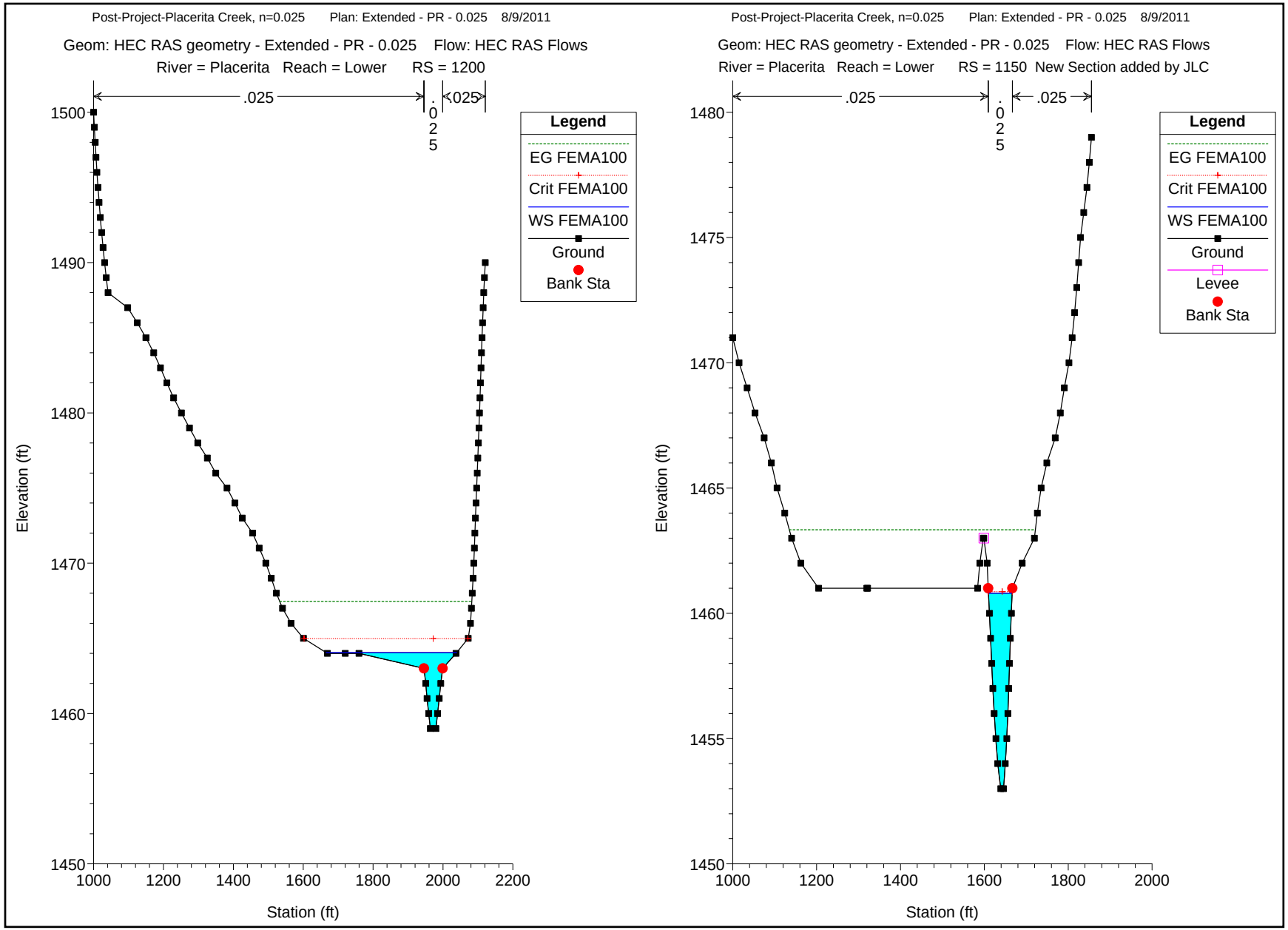

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1500
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1200
1400
1600
1800
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Upper RS = 1400 D/S of Upper Reach
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1200
1400
1600
1800

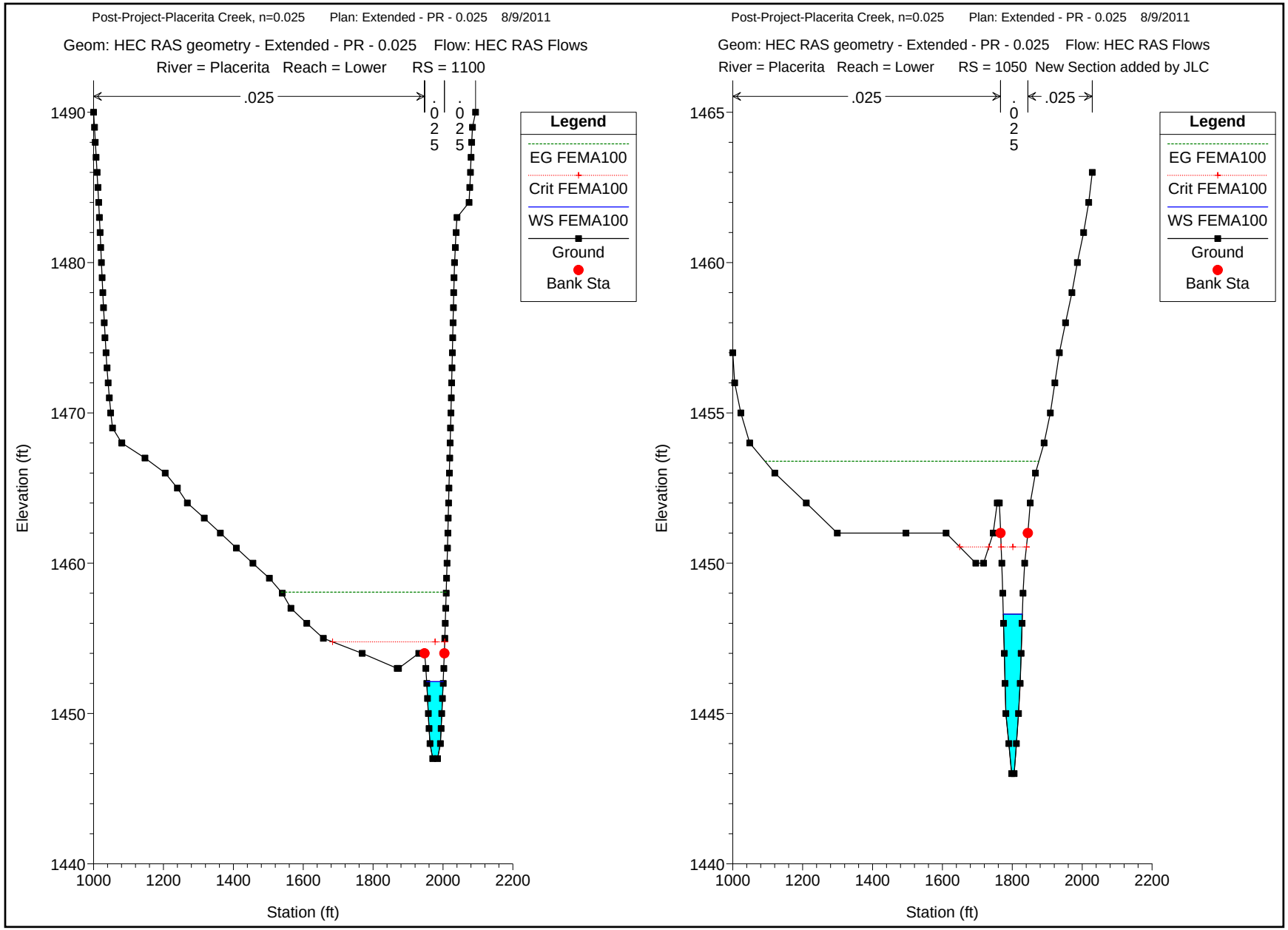

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 510
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1575
1570
1565
1560
1555
1550
1545
1000
1100
1200
1300
1400
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 410
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1545
1540
1535
1530
1525
1520
1000
1050
1100
1150
1200
1250
1300

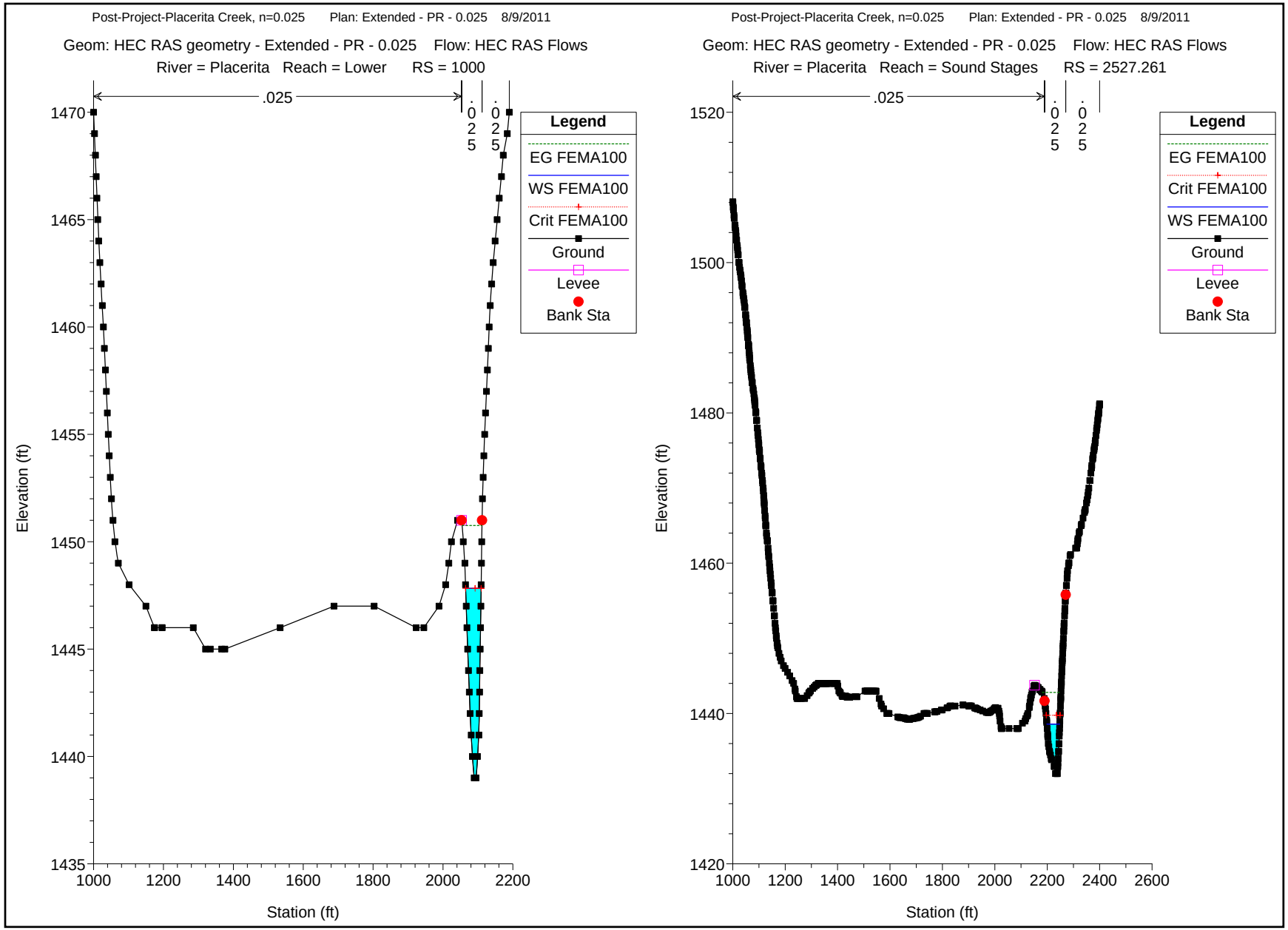

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 310
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1530
1525
1520
1515
1510
1505
1500
1000
1100
1200
1300
1400
1500
1600
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 210
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1515
1510
1505
1500
1495
1490
1485
1000
1100
1200
1300
1400
1500
1600

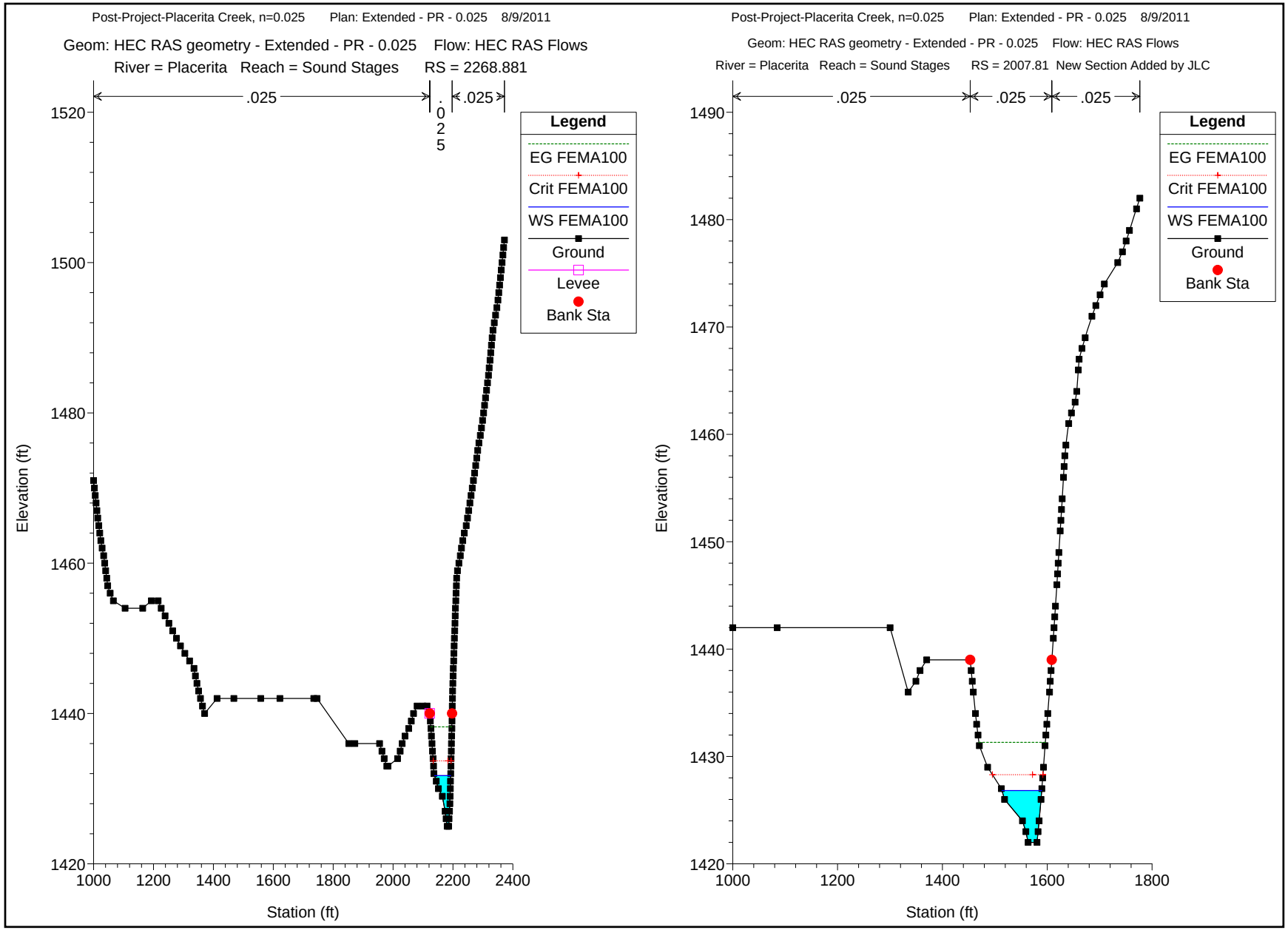

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 110
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
800
900
1000
1100
1200
1300
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Tributary RS = 10
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1050
1100
1150
1200
1250

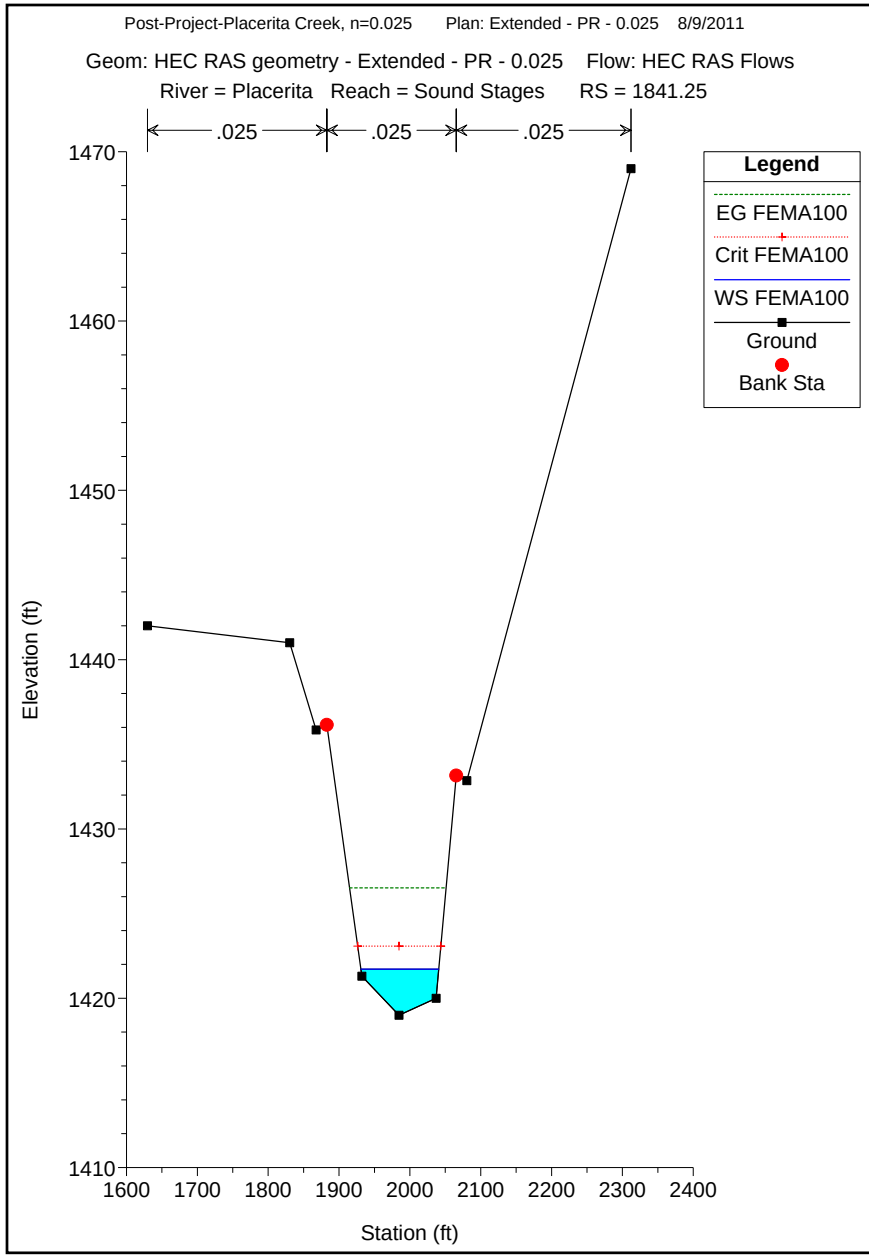

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1300
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1250 New Section added by JLC
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)

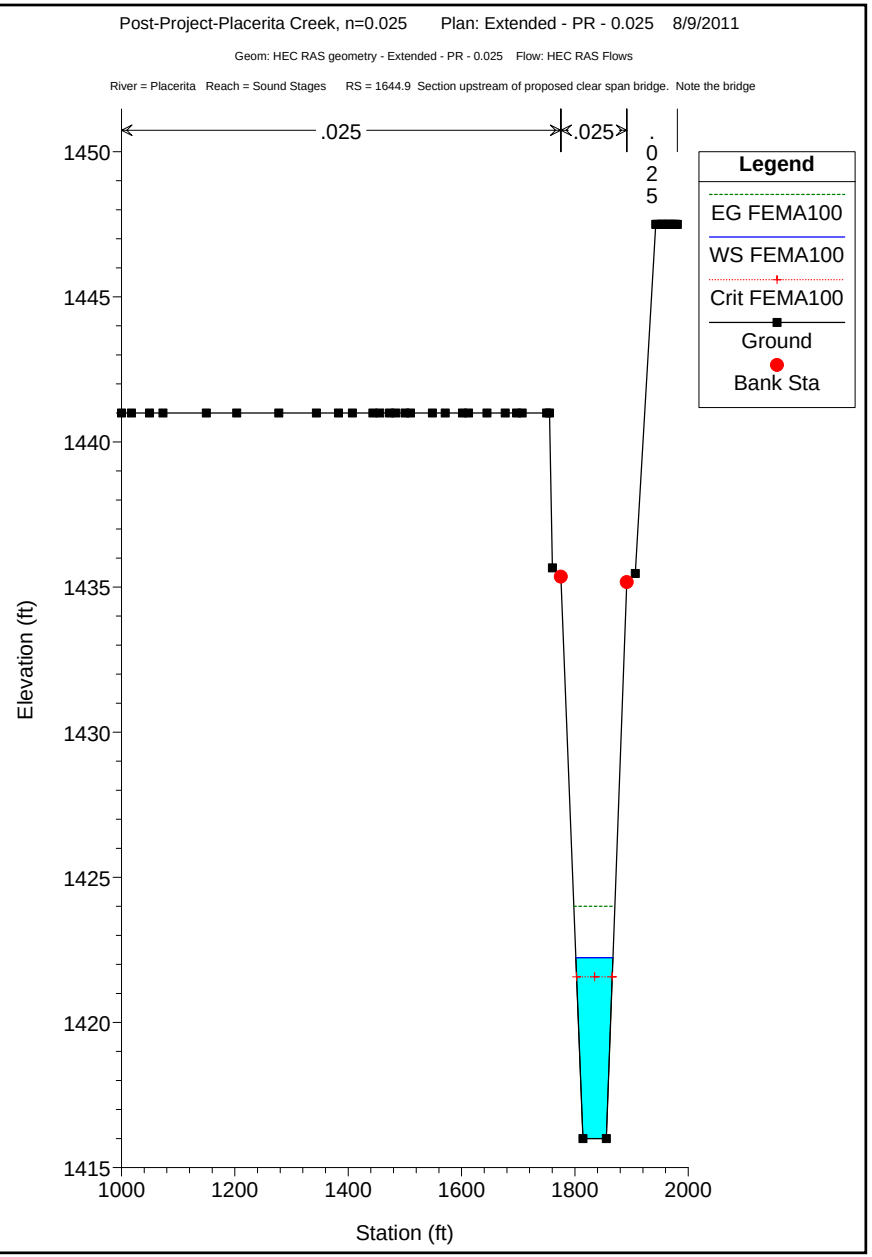

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1200
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1150 New Section added by JLC
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

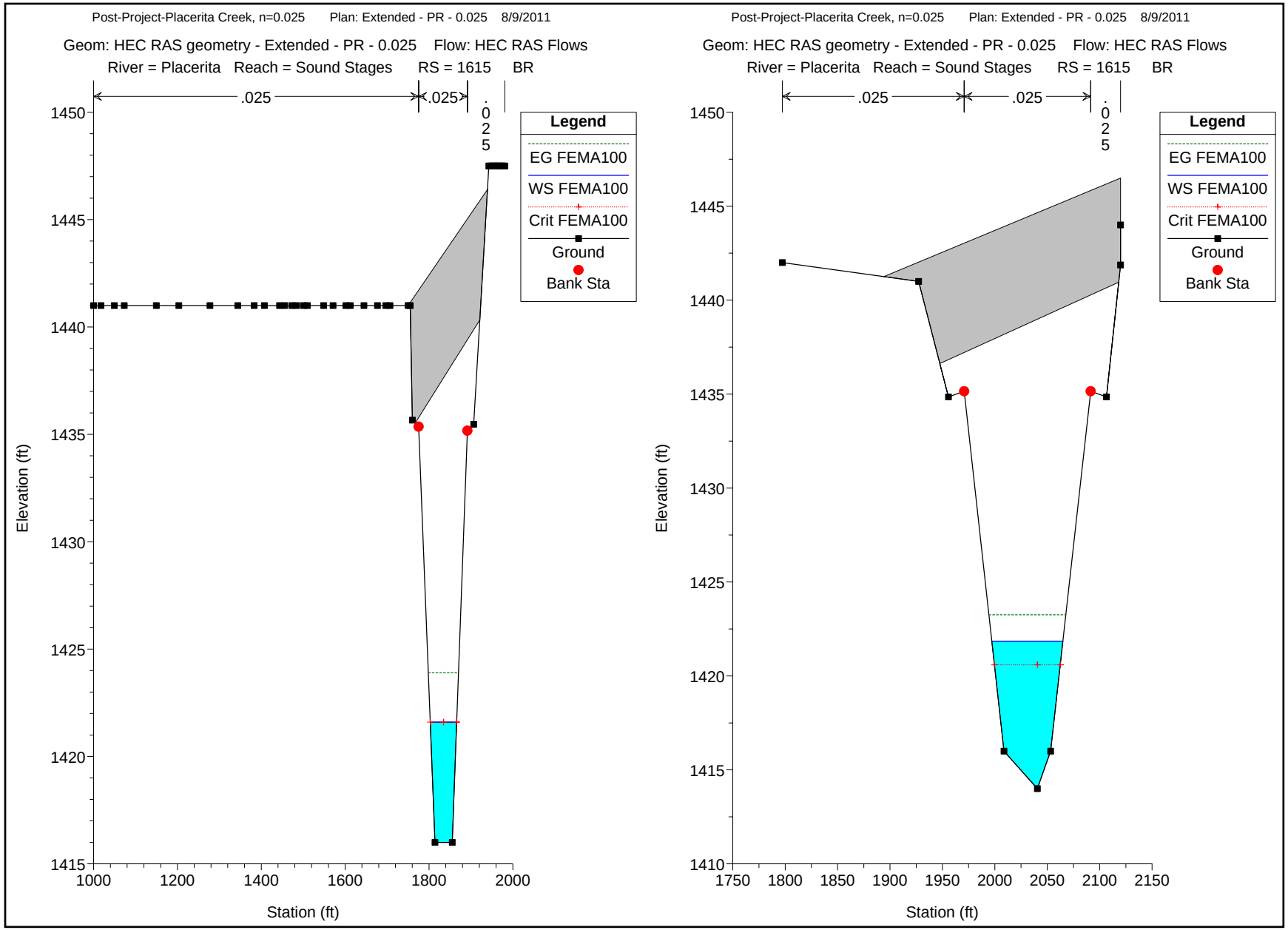

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1100
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1490
1480
1470
1460
1450
1440
1000
1200
1400
1600
1800
2000
2200
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1050 New Section added by JLC
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1465
1460
1455
1450
1445
1440
1000
1200
1400
1600
1800
2000
2200

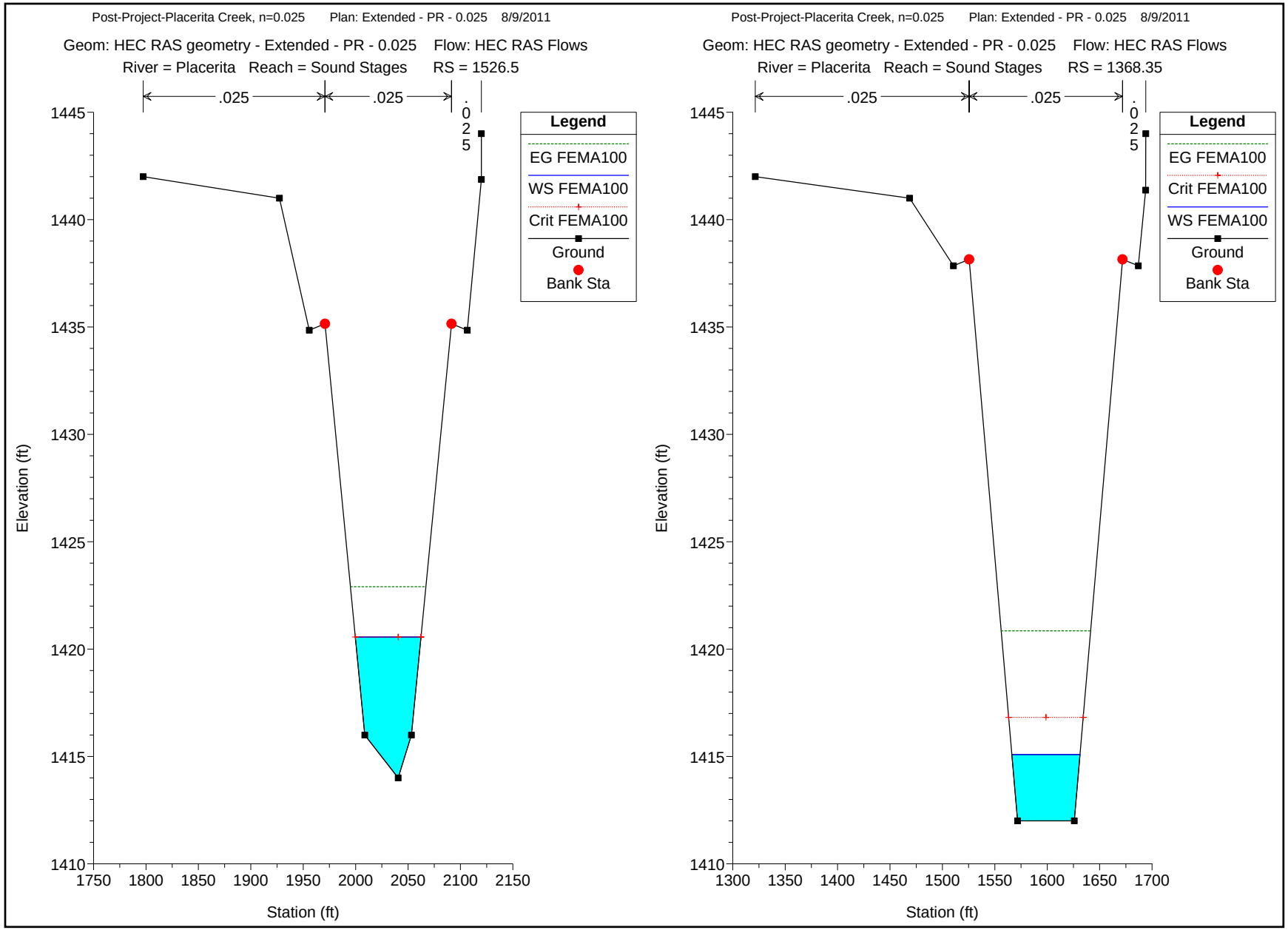

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Lower RS = 1000
.025
.025
.025
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2527.261
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

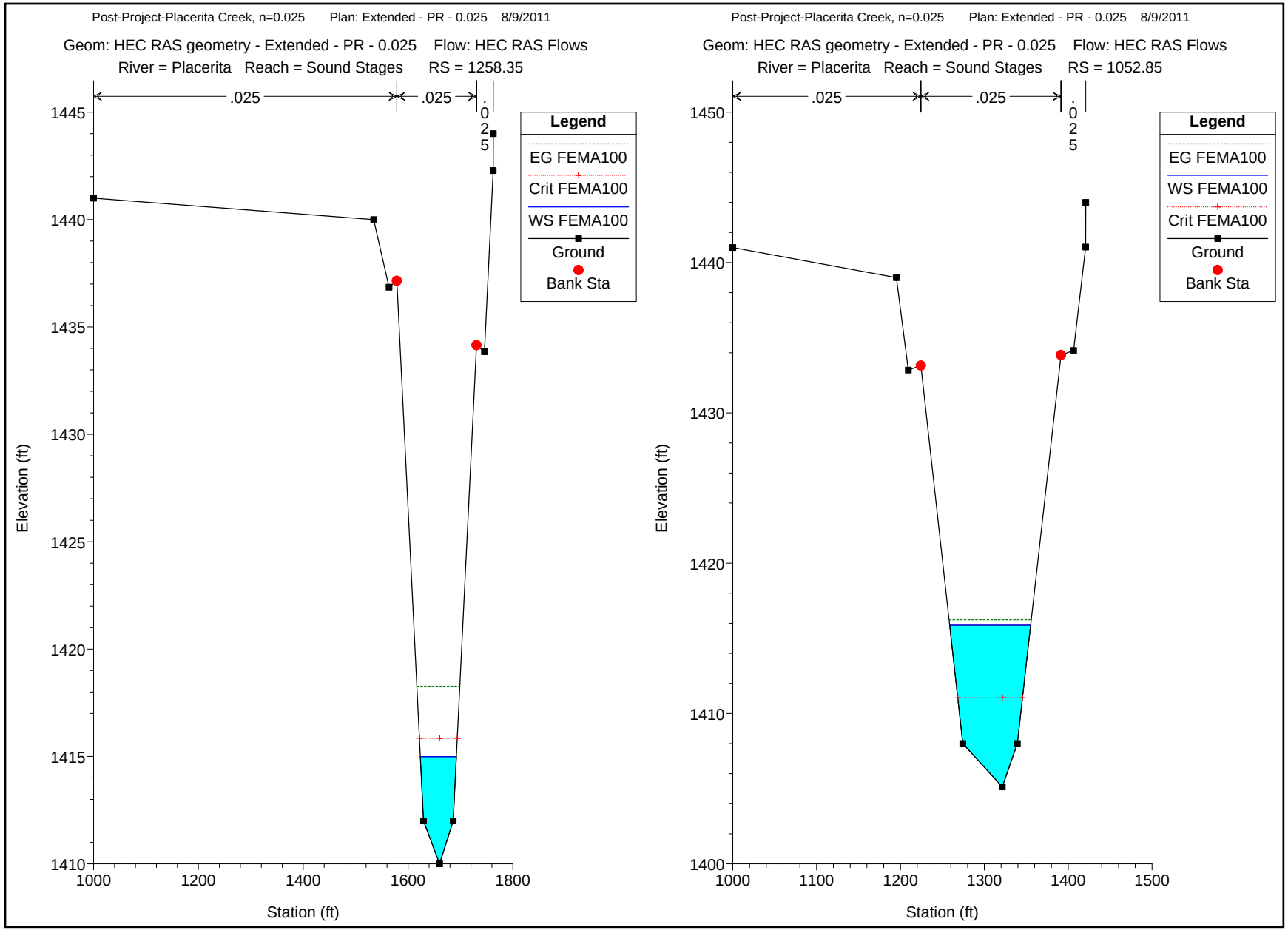

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2268.881
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2007.81 New Section Added by JLC
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)

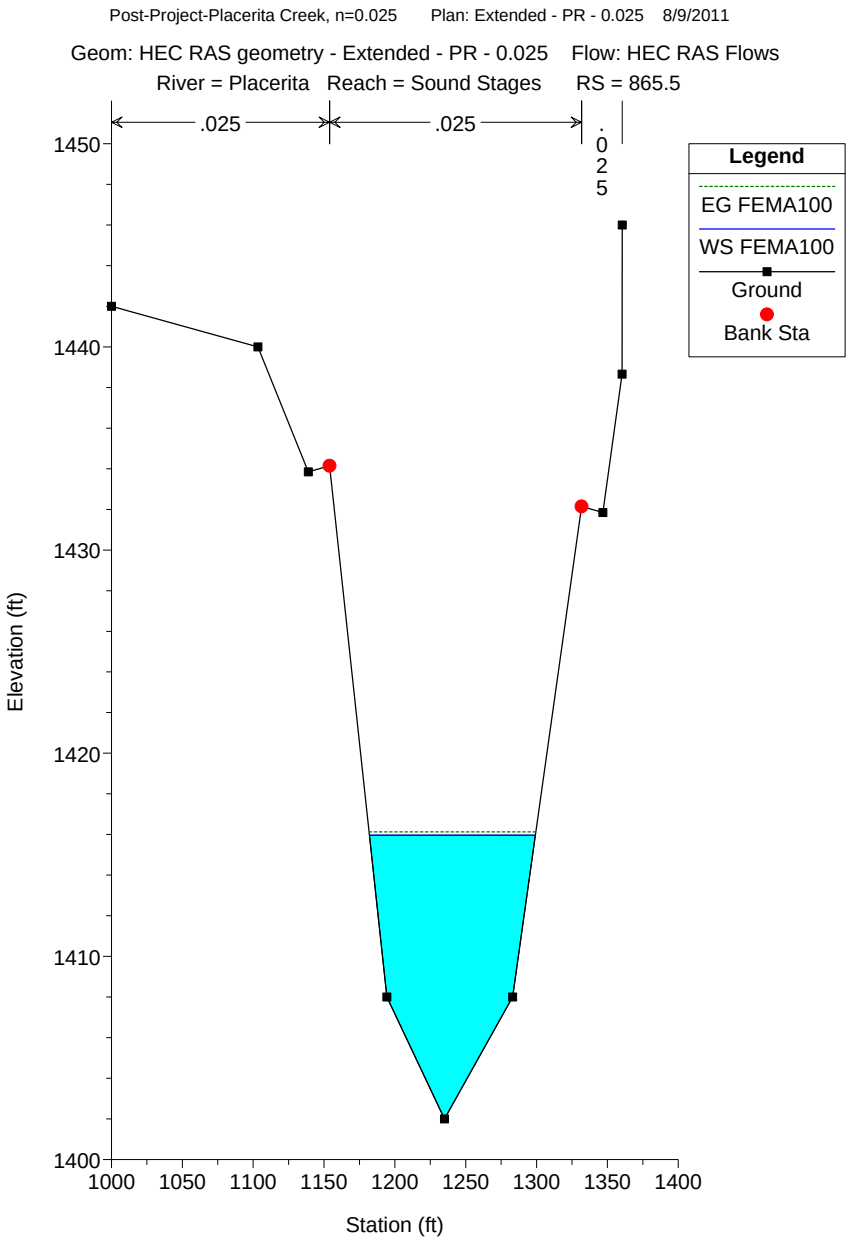

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1841.25
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
1470
1460
1450
1440
1430
1420
1410
1600
1700
1800
1900
2000
2100
2200
2300
2400
Station (ft)

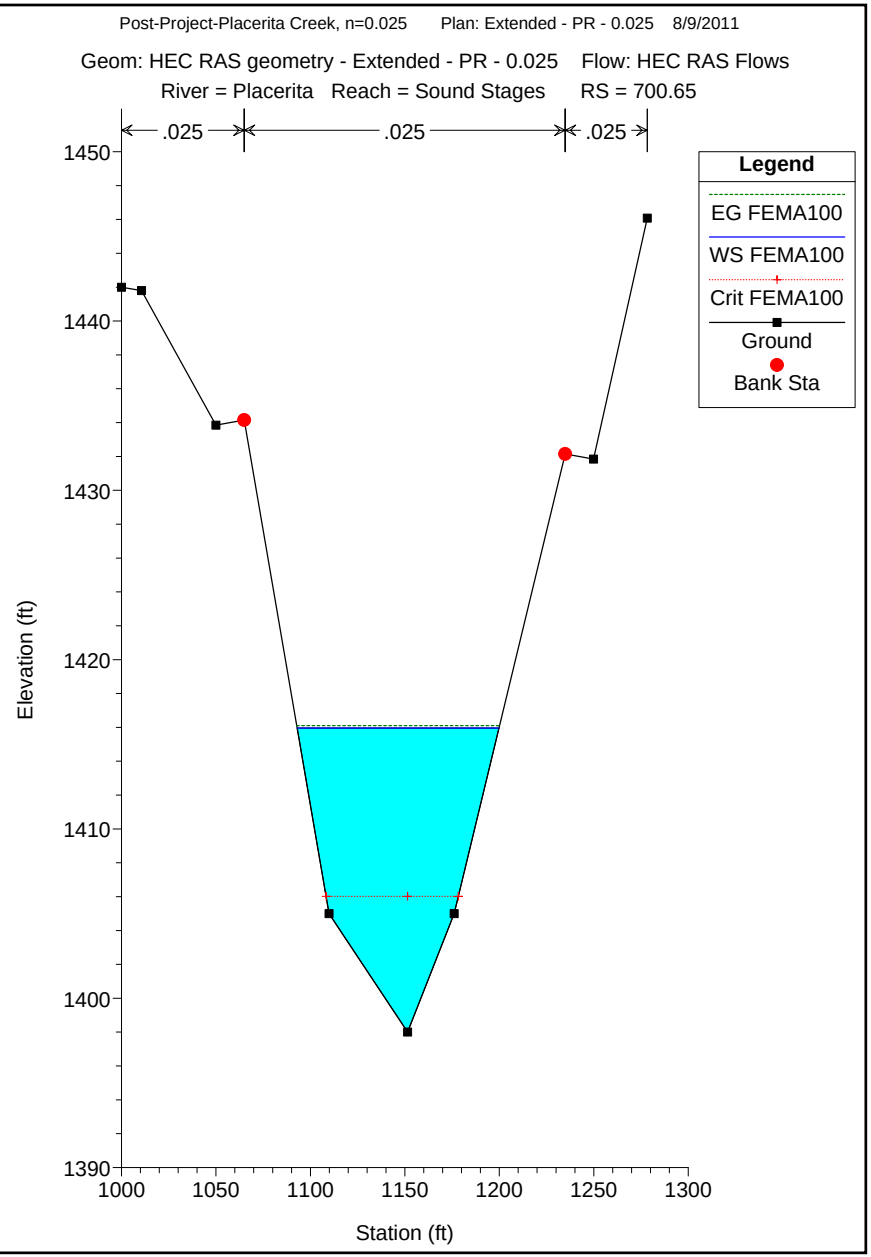

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1644.9 Section upstream of proposed clear span bridge. Note the bridge
.025
.025
.025
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
1450
1445
1440
1435
1430
1425
1420
1415
1000
1200
1400
1600
1800
2000
Station (ft)

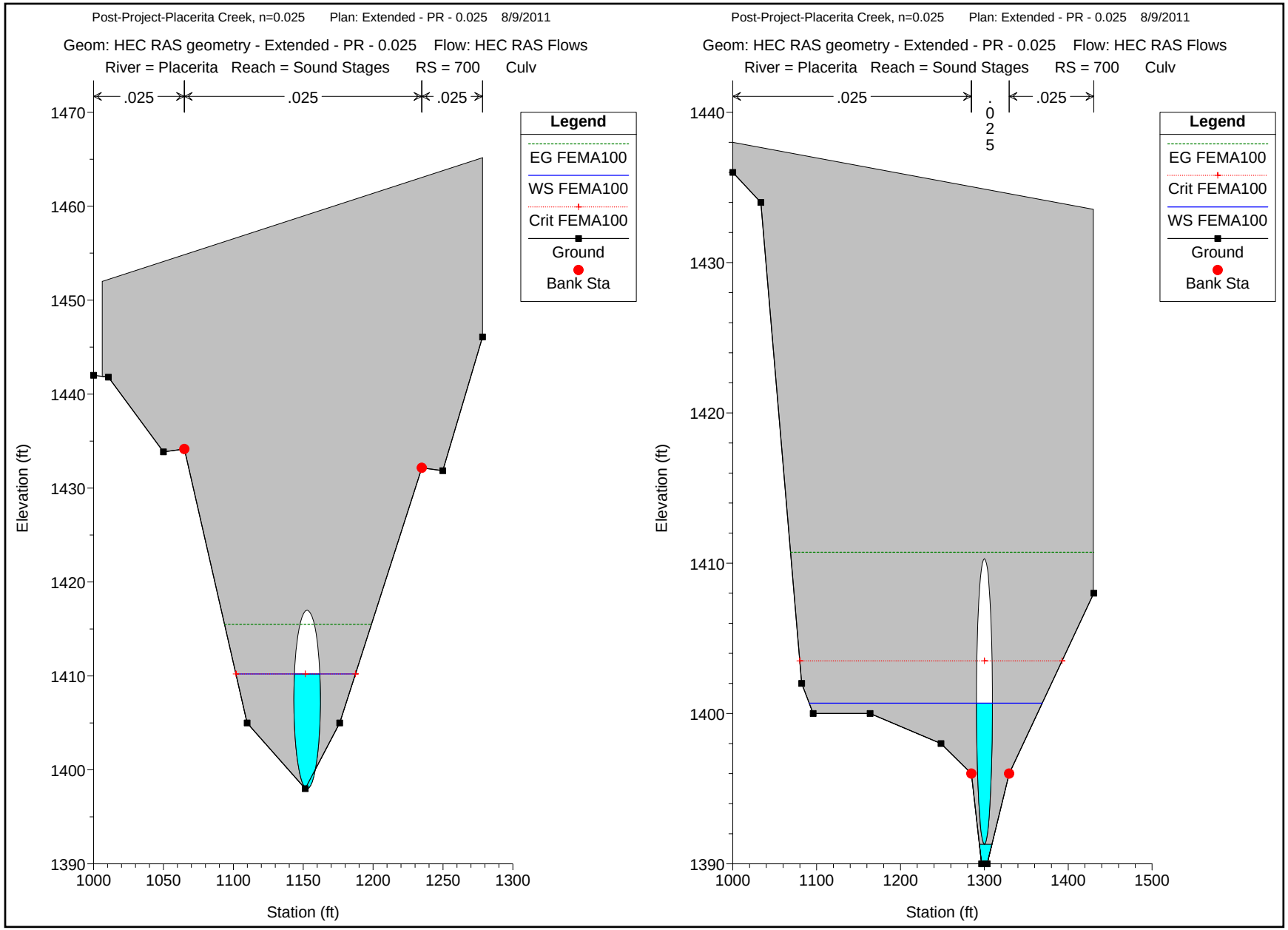

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1615 BR
.025
.025
.025
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1445
1440
1435
1430
1425
1420
1415
1000
1200
1400
1600
1800
2000
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1615 BR
.025
.025
.025
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1445
1440
1435
1430
1425
1420
1415
1410
1750
1800
1850
1900
1950
2000
2050
2100
2150

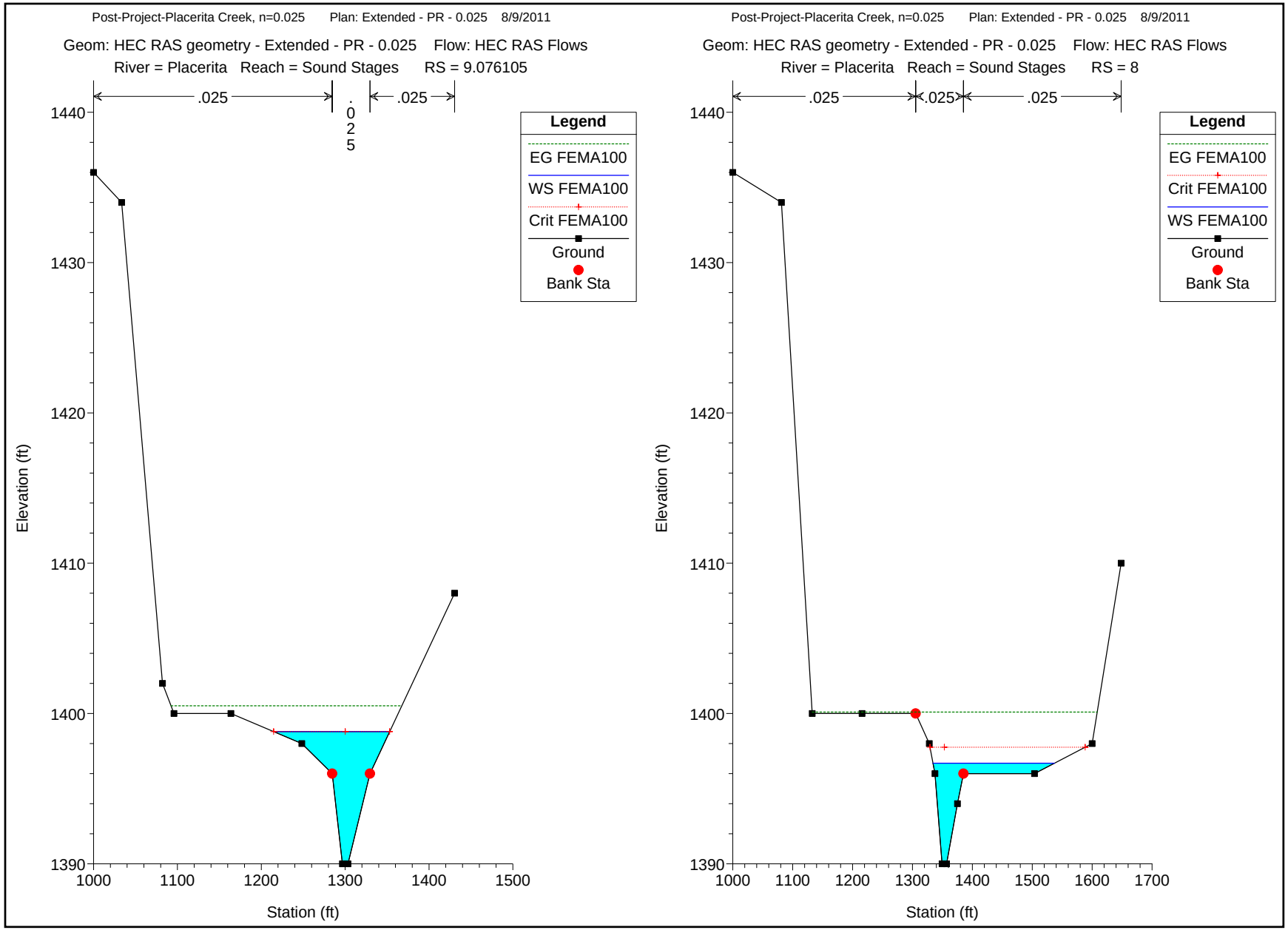

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1526.5
.025
.025
.025
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1445
1440
1435
1430
1425
1420
1415
1410
1750
1800
1850
1900
1950
2000
2050
2100
2150
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1368.35
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1445
1440
1435
1430
1425
1420
1415
1410
1300
1350
1400
1450
1500
1550
1600
1650
1700

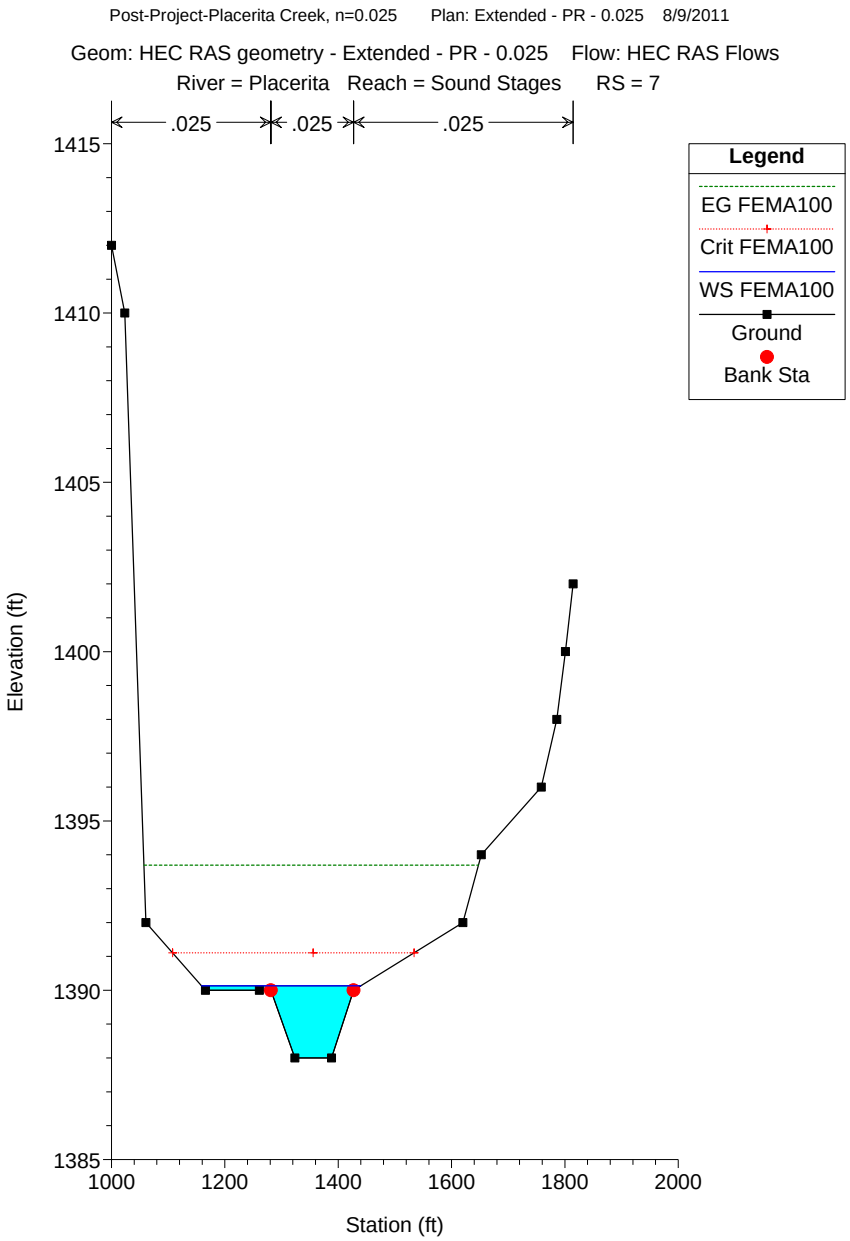

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1258.35
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1445
1440
1435
1430
1425
1420
1415
1410
1000
1200
1400
1600
1800
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 1052.85
.025
.025
.025
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1440
1430
1420
1410
1400
1000
1100
1200
1300
1400
1500

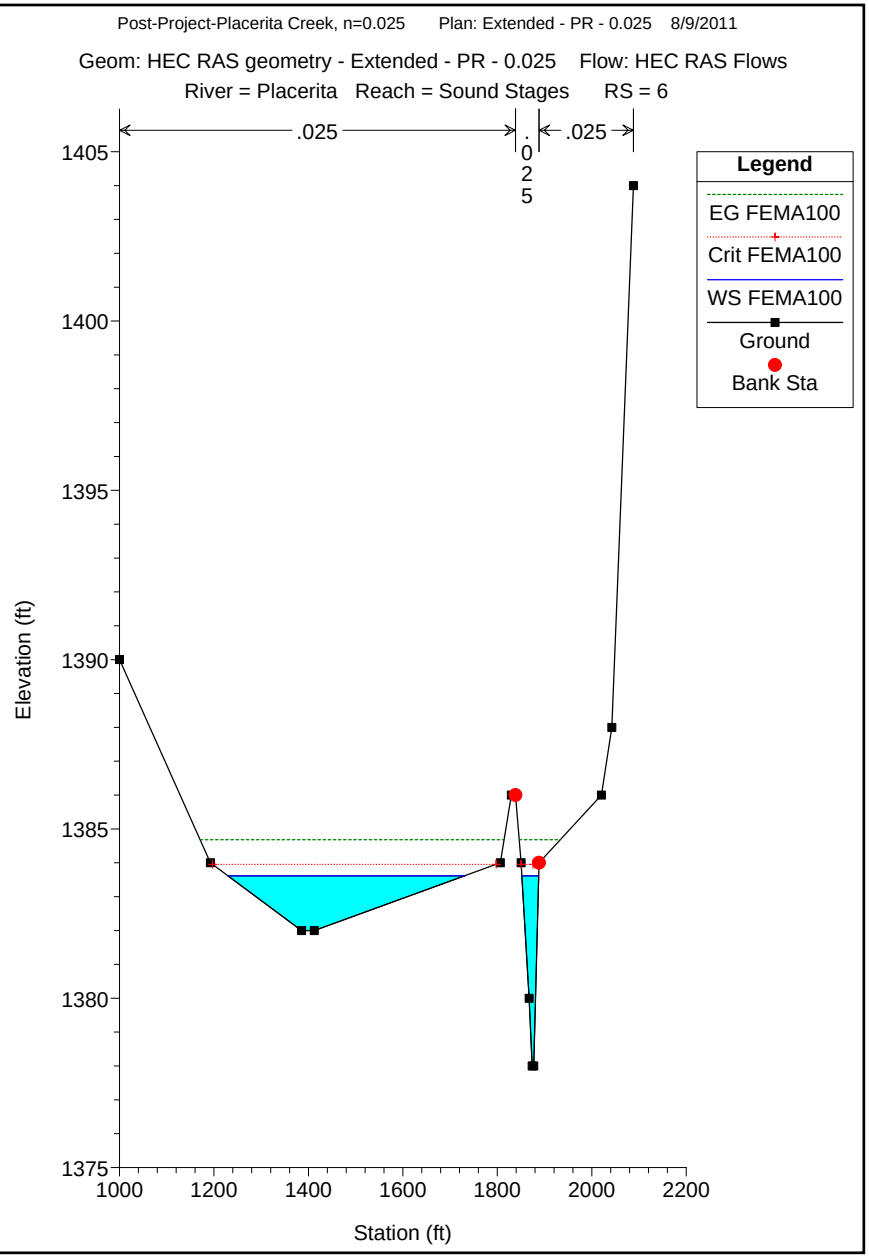

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 865.5
.025
.025
.025
Legend
EG FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1440
1430
1420
1410
1400
1000
1050
1100
1150
1200
1250
1300
1350
1400

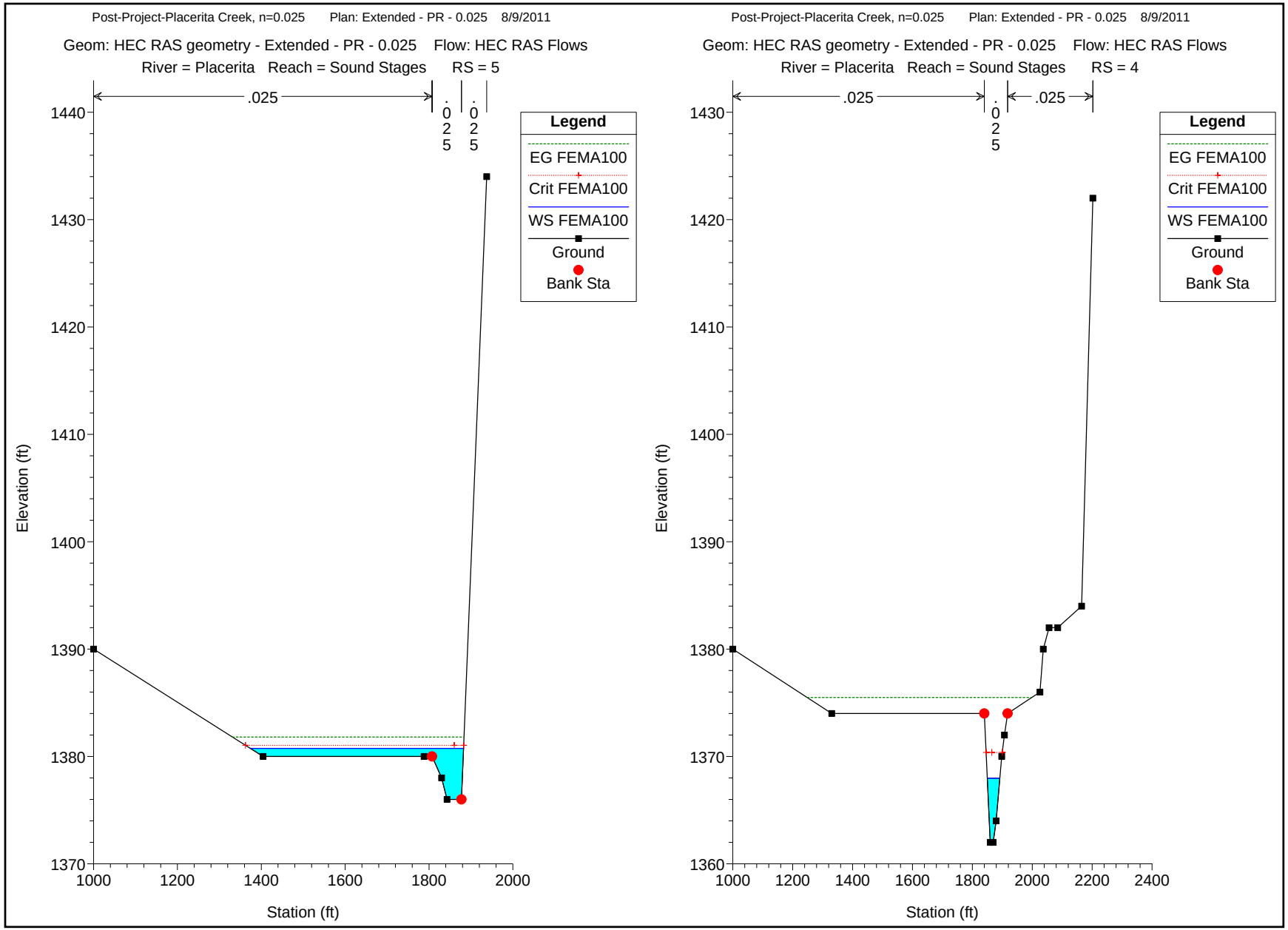

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700.65
.025
.025
.025
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1440
1430
1420
1410
1400
1390
1000
1050
1100
1150
1200
1250
1300

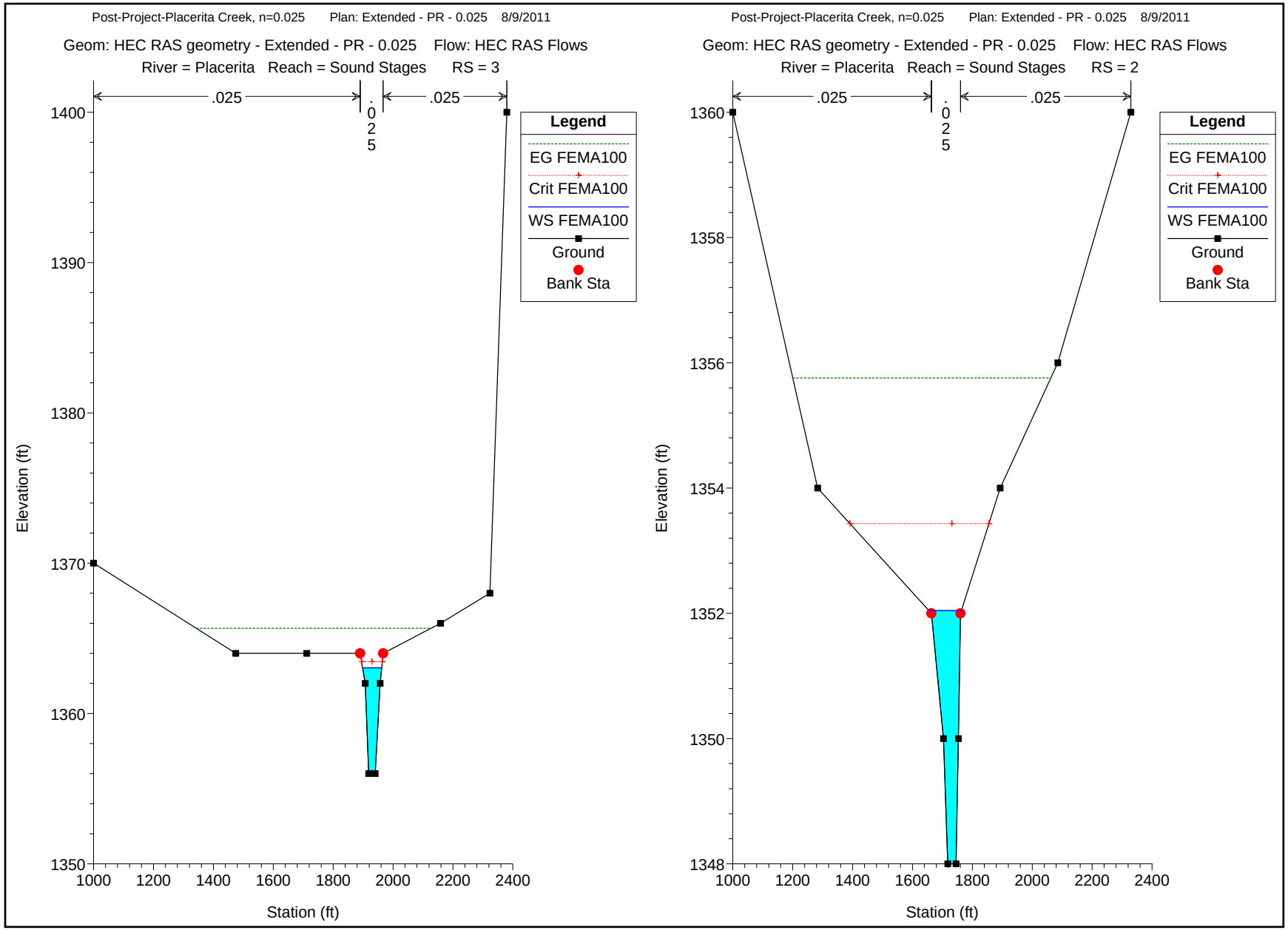

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700 Culv
.025
.025
.025
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1390
1400
1410
1420
1430
1440
1450
1460
1470
1000
1050
1100
1150
1200
1250
1300
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 700 Culv
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1390
1400
1410
1420
1430
1440
1000
1100
1200
1300
1400
1500


Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 9.076105
.025
.025
.025
Legend
EG FEMA100
WS FEMA100
Crit FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1390
1400
1410
1420
1430
1440
1000
1100
1200
1300
1400
1500
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 8
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
1390
1400
1410
1420
1430
1440
1000
1100
1200
1300
1400
1500
1600
1700


Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 7
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
1415
1410
1405
1400
1395
1390
1385
1000
1200
1400
1600
1800
2000
Station (ft)

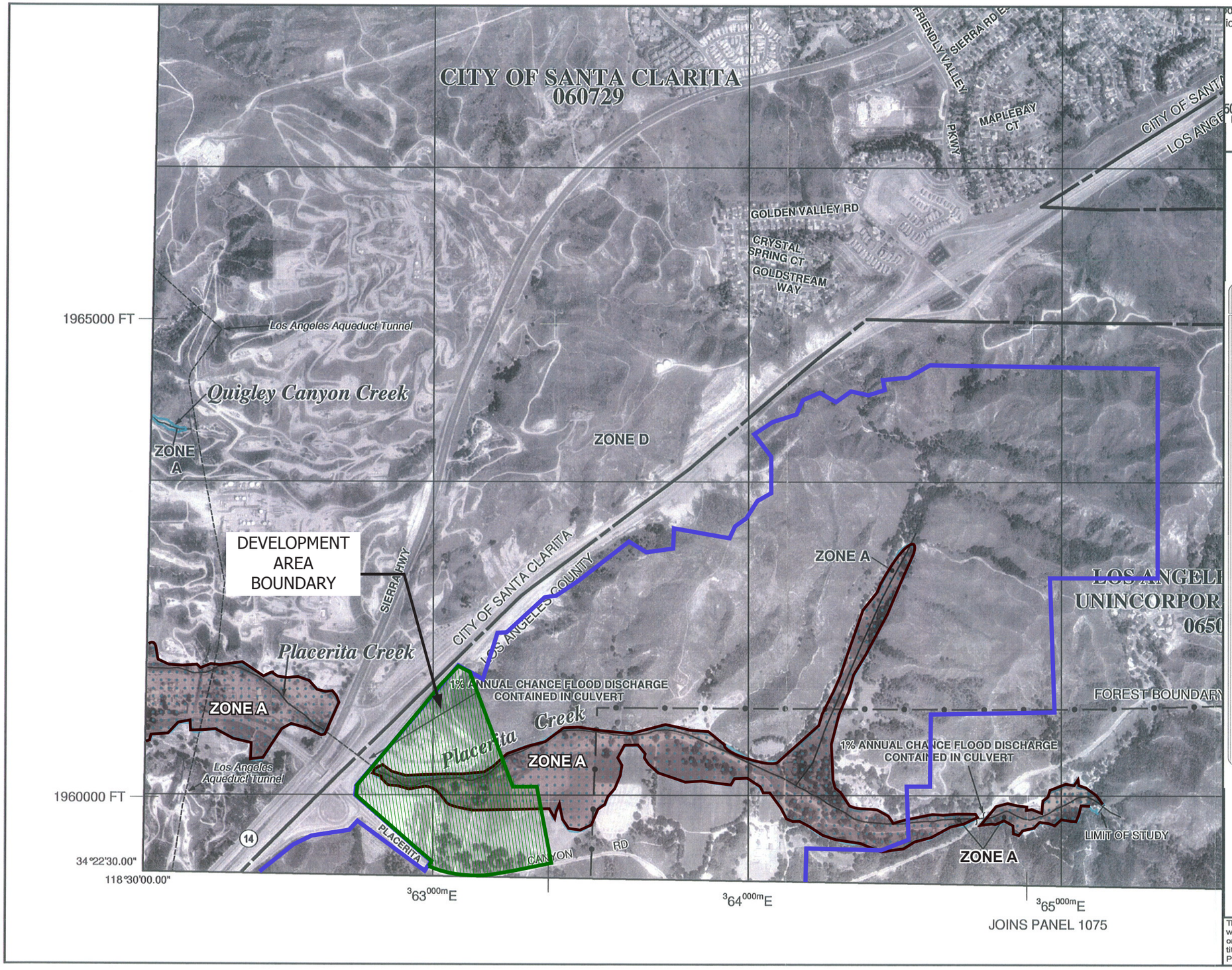

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 6
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
1405
1400
1395
1390
1385
1380
1375
1000
1200
1400
1600
1800
2000
2200
Station (ft)


Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 5
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 4
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)


Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 3
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
Geom: HEC RAS geometry - Extended - PR - 0.025 Flow: HEC RAS Flows
River = Placerita Reach = Sound Stages RS = 2
.025
.025
.025
Legend
EG FEMA100
Crit FEMA100
WS FEMA100
Ground
Bank Sta
Elevation (ft)
Station (ft)

SUB-APPENDIX 1-D.

FLOOD INSURANCE RATE MAP



d insurance is available in this community, contact your
ional Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0840F

FIRM

FLOOD INSURANCE RATE MAP

LOS ANGELES COUNTY, CALIFORNIA

AND INCORPORATED AREAS

PANEL 840 OF 2350

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LOS ANGELES COUNTY	065043	0840	F
SANTA CLARITA, CITY OF	060729	0840	F

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
06037C0840F

EFFECTIVE DATE
SEPTEMBER 26, 2008

Federal Emergency Management Agency

FIGURE 3

DISNEY | ABC STUDIOS AT THE RANCH
FLOOD PLAIN BOUNDARY
PRE-DEVELOPMENT CONDITION

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

SUB-APPENDIX 1-E.

MODIFIED RATIONAL METHOD FOR PROPOSED CONDITIONS

PROPOSED CONDITIONS

The northern portion of the Development Area, the area north of Placerita Creek, comprises approximately 16 acres and is bordered by SR-14 on the northwest, Placerita Creek on the south, and generally undeveloped hillsides on the northeast. Within that area, the northern fill pad is approximately 8 acres in size with an average elevation of 1,476 feet above mean sea level (MSL) and steep, gravelly slopes that descend to Placerita Creek. The pad drains in a southwest direction to a low point on the pad and then discharges to Placerita Creek via a concrete-lined v-ditch. The remaining area of the northern portion of the Development Area outside of the northern fill pad is approximately 8 acres with a maximum elevation of 1,567 feet above MSL and drains to Placerita Creek. The northern fill pad and the remaining northern area of the Development Area are undeveloped with an imperviousness rate of approximately 1%. Pre-development discharge from the northern fill pad is estimated at 17 cubic feet per second (cfs).

With the implementation of the Proposed Project, the northern portion of the Development Area would generate runoff of 22 cfs. Half of the northern portion of the Development Area would be drained to the southeastern corner to an underground detention system. The other half would drain to the southwest to a second underground detention system. Both underground detention systems would consist of a 60-inch diameter perforated corrugated metal pipe (CMP). The estimated total volume capacity provided by these underground detention pipe systems would be 1.38 acre-feet. This volume capacity exceeds the required volume capacity of 0.84 acre-feet, which is based on maintaining the existing condition 50-year peak flow rate. .

50yr Pre x Post Development Runoff Comparison

Subarea	Area (acres)	%imp	Frequency	Length (ft)	Slope (ft/ft)	Isohyet (in.)	Intensity (in./hr)	Flow rate (cfs)
Existing	10.12	0.01	50.00	1160	0.1163	7.53	3.84	29.53
Proposed	10.12	0.91	50.00	1160	0.1163	7.53	3.84	34.59

The southern portion of the Development Area, the area south of Placerita Creek, comprises approximately 25.6 acres bordered by Placerita Creek on the north, Placerita Canyon Road on the south, SR-14 on the west, and the main entrance road to the Ranch on the east. The southern fill pad is approximately 11.6 acres in size with an elevation of approximately 1,456 feet above MSL and steep gravelly slopes that descend to Placerita Creek on the northern side. There is an approximate 60-foot drop along the east side of the southern fill pad to the remaining southern portion of the Development Area. The southern fill pad drains to a low point located at the southwest corner of the pad and then drains into a CMP riser in which it is conveyed via an underground 36-inch drain pipe to Placerita Creek. The remaining southern

portion of the Development Area (approximately 17 acres) drains as sheet flow northerly toward Placerita Creek. This southern area is mostly undeveloped, other than the Ranch Foreman's mobile home and an uninhabited structure, with an imperviousness rate of about 1%. Pre-development discharge is estimated at 48 cfs.

The southern portion of the Development Area would generate a runoff of 67 cfs. It would be drained northwest to a detention basin, a portion of which would be aboveground and vegetated. The underground detention system design would consist of 72-inch diameter perforated CMP. The estimated total volume capacity provided by this underground detention system would be 2.7 acre-feet, which exceeds the required volume capacity of 2.02 acre-feet. The surface detention system overflow outlet would drain to Placerita Creek, and the perforated underground detention system would detain and infiltrate peak flows and the first flush before they would reach Placerita Creek or the groundwater basin. As a result, there would be no impact to the volume or quality of runoff as compared to pre-development conditions.

50 yr Pre x Post Development Runoff Comparison

Subarea	Area (acres)	%imp	Frequency	Length (ft)	Slope (ft/ft)	Isohyet (in.)	Intensity (in./hr)	Flow rate (cfs)
Existing	25.6	0.01	50.00	1,957	0.015	7.53	2.68	48.71
Proposed	25.3	0.91	50.00	1,957	0.015	7.53	2.98	64.66

Placerita Creek, with an area of approximately 14.4 acres, completes the remaining 56 acres of the Development Area.

Surface flows within the Development Area would be collected at grate inlets, designed and located to maximize interception, and then conveyed by a combination of surface gutters and underground lines to the on-site detention basins and underground CMP detention systems. The underground detention systems would capture and detain stormwater flows and provide first flush treatment before either infiltrating back into the local groundwater basin or draining via outlets to Placerita Creek. See Hydrology and Water Quality Study, Figure 6, Underground CMP Detention System.

Stormwater runoff from the northern half of the proposed parking area under the LADWP transmission lines would be intercepted at the landscaped islands between the parking rows which would function as vegetated drainage swales. Surface flows would be directed to the west to underground drainage lines and then would be conveyed north to a vegetated drainage swale running longitudinally along the top of the southern slope embankment for Placerita Creek. This vegetated swale would

incorporate stormwater treatment features and thus would function as a water quality BMP and would drain into a proposed on-site detention basin prior to discharge into Placerita Creek.

Stormwater runoff from the southern half of the proposed parking area under the LADWP transmission lines would be intercepted at the landscaped islands between the parking rows which would function as vegetated drainage swales. Surface flows would be directed to the west to underground drainage lines that drain into the proposed on-site detention basin and underground CMP detention system.

Off-site Drainage

Off-site stormwater runoff that flows to the northern portion of the Development Area would be intercepted by drainage ditches and directed around that portion of the Proposed Project site south to Placerita Creek. Energy dissipaters/velocity reducers would be used at outlets in Placerita Creek.

Off-site flows from SR-14 west of the Proposed Project site would continue to be routed to an existing 48-inch storm drain constructed by Caltrans to the north toward Placerita Creek. This existing 48-inch storm drain pipe runs under the southern fill pad and is deep enough so that it would not interfere with construction of the Proposed Project and would remain to handle off-site flows.

Off-site stormwater flows from the areas south of the Proposed Project site and Placerita Canyon Road cross under Placerita Canyon Road through existing culverts that convey flows north to Placerita Creek. These flows, along with the surface runoff from Placerita Canyon Road, would be intercepted by two proposed debris basins. Stormwater from these two basins would then flow north in a proposed underground storm drain system through the Development Area to Placerita Creek. The intent would be to maintain existing patterns for off-site drainage as much as possible. Consequently, there would be a minimal impact on off-site drainage with the Proposed Project.

Mudflows

As previously indicated, the Proposed Project site and vicinity are within a canyon with steep canyons and ridges nearby. Because of this topography, certain areas within the vicinity of the Proposed Project may be subject to inundation by a mudflow.

Any potential mudflows coming from the southeast side of Placerita Canyon Road toward the southern portion of the Development Area would be intercepted and placed in two proposed debris basins to be constructed on the northern side of Placerita Canyon Road to contain the amount of debris estimated to be generated by each of the off-site watershed subareas to the south.

The off-site area associated with watersheds Off-1a is located in DPA-3, Debris Production Area 3 of the Santa Clara River Watershed, which yields a debris production rate of 140,000 cubic yards per square mile. The off-site areas associated with watersheds Off-2a, Off-3a, Off-4a, Off-5a, Off-6a, Off-11a and Off-12a are located in DPA-5, Debris Production Area 5 of the Santa Clara River Watershed, which yields a debris production rate of 82,000 cubic yards per square mile. The off-site areas associated with watersheds Off-7a, Off-8a, Off-9a and Off-10a are located in DPA-9, Debris Production Area 9 of the Santa Clara River.

Debris Production in Proposed Debris Basin:
Santa Clara River Watershed, DPA-3, DPA-9 & DPA-5

Basin ID	Area Designation	Area (sq.miles)	Debris Production Rate (yd^3/sq.miles)	Debris (yd^3)
DB-05	Off-1a, Off-7a	0.0712, 0.0044	140000, 16500	10041
DB-06	Off-2a, Off-8a	0.0522, 0.0034	82000, 16500	4336

Basin DB-05 would be a 20-foot deep basin with side slopes of 2:1 to allow for containment of 10,258 cubic yards of debris flows and runoff from Subarea Off-1a & Off-7a. Basin DB-06 would be a 13-foot deep basin with side slopes of 2:1 and would be able to contain 6,367 cubic yards of debris flows and runoff from Subarea Off-2a & Off-8a. Off-site 3a is a much smaller area and does not empty into a debris basin. It runs directly into Placerita Creek via a 24-inch CMP installed by Caltrans during construction of SR-14. Hydrology and Water Quality Study, Figure 8, Debris Basins Plan, shows the locations of basins and drainage systems for the Proposed Project.

Peak Flow Standard – Interim

The objective of the Peak Flow Standard is to control post-development peak storm water runoff in order to prevent accelerated stream erosion and to protect stream habitat. The Peak Flow Standard requires all post-development runoff from a 2-year, 24-hour storm to not exceed the pre-development peak flow rate, burned, from a 2-year, 24-hour storm when the pre-development peak equals or exceeds five cubic feet per second. The Peak Flow Standard also requires post-development runoff from the 50-year capital storm to not exceed the pre-development peak flow rate, burned and bulked, from the 50-year capital storm.

The table below shows the clear Peak Flow Standard for 2-year and 50-year storms, and also shows clear flow rates from the 5, 10 and 25-year, 24-hour storm. Based on the routed peak flow, the Proposed Project is discharging less than pre-development flow rates.

CLEAR Qs-Peak Flow Standard for Different Year Events

		2 YR	5 YR	10 YR	25 YR	50 YR
NORTH PAD	EXISTING	4.71	11.27	16.2	23.66	29.53
	PROPOSED	9.77	16.92	22.89	30.35	34.59
	ROUTED WITH DETENTION*	8.95	7.70	9.04	10.65	11.93
SOUTH PAD	EXISTING	8.45	17.35	26.45	39.21	48.71
	PROPOSED	17.61	31.18	40.78	54.74	64.66
	ROUTED WITH DETENTION*	7.92	11.10	13.02	15.37	17.18

*See Appendix 1-G for Routed Calculations

Routing was done using CIVILCADD / CIVILDESIGN Engineering Software. Routing was done assuming one basin on the North Pad and one Basin on the South Pad even though there will actually be two basins on each pad. Therefore, this analysis is very conservative. Routed flows for all storms are below existing flows with the exception of the 2-year event on the North Pad where the existing Q is 4.71 cfs and the routed Q is 8.95 CFS. The difference of 4.24 cfs will easily be mitigated with the second detention basin.

50-YR 24-HR STORM EVENT FLOWRATES

Condition	Subarea	Area (acres)	%imp	Frequency	Soil Type	Length (ft)	Slope (ft/ft)	Isohyet (in.)	Tc-calculated (min.)	Intensity (in./hr)	Cu	Cd	Flow rate (cfs)	Burned flow rate (cfs)	Volume (acre-ft)
Existing	1a	25.6	0.01	50	97	1957	0.015	7.53	15	2.68	0.71	0.71	48.71	51.33	3.92
Proposed		25.6	0.91	50	97	1957	0.015	7.53	13	2.87	0.72	0.88	64.66	n/a	13.42
Existing	3a	2.56	0.01	50	97	629	0.015	7.53	7	3.84	0.76	0.76	7.47	7.8	0.4
Proposed		2.56	0.4	50	97	629	0.015	7.53	7	3.84	0.76	0.82	8.06	n/a	0.81
Existing	5a	4.1	0.01	50	97	485	0.03	7.53	5	4.49	0.78	0.78	14.36	14.93	0.63
Proposed		4.1	0.4	50	97	485	0.03	7.53	5	4.49	0.78	0.83	15.28	n/a	1.28
Existing	7a	10.12	0.01	50	97	1160	0.1163	7.53	7	3.84	0.76	0.76	29.53	30.83	1.58
Proposed		10.12	0.91	50	97	1160	0.1163	7.53	7	3.84	0.76	0.89	34.59	n/a	5.33

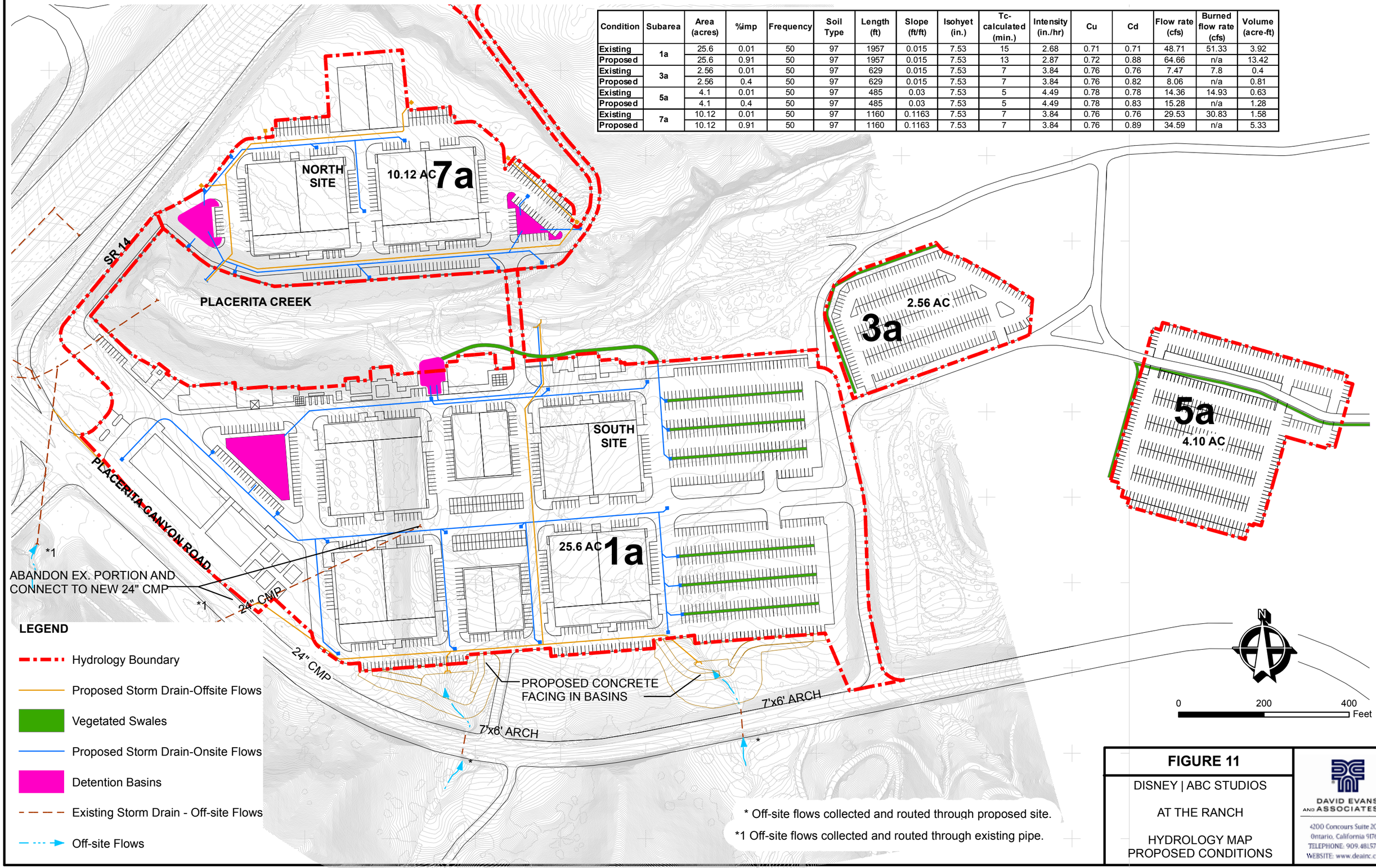


FIGURE 11

DISNEY | ABC STUDIOS

AT THE RANCH

HYDROLOGY MAP
PROPOSED CONDITIONS

DAVID EVANS AND ASSOCIATES INC.
4200 Concours Suite 200
Ontario, California 91764
TELEPHONE: 909.485.5750
WEBSITE: www.deainc.com

DISNEY/ABC STUDIOS AT THE RANCH
SOUND STAGES - NORTH SIDE
2 YR - 24 HR DISCHARGES

Subarea	Area (acres)	%imp	Freq.	Soil Type	Length (ft)	Slope (ft/ft)	Isohyet (in.)	Tc (min.)	Intensity (in./hr)	Cu	Cd	Flow rate (cfs)	Fire Factor	Burned flow rate (cfs)	Volume (acre-ft)
Exist-7a	10.12	0.01	2	97	1160	0.1163	2.91	19	0.93	0.5	0.5	4.71	0.34	5.21	0.37
Prop-7a	10.12	0.91	2	97	1160	0.1163	2.91	13	1.11	0.54	0.87	9.77	0	n/a	2.03

DISNEY/ABC STUDIOS AT THE RANCH
SOUND STAGES - NORTH SIDE
5 YR - 24 HR DISCHARGES

Subarea	Area (acres)	%imp	Freq.	Soil Type	Length (ft)	Slope (ft/ft)	Isohyet (in.)	Tc (min.)	Intensity (in./hr)	Cu	Cd	Flow rate (cfs)	Fire Factor	Burned flow rate (cfs)	Volume (acre-ft)
Exist-7a	10.12	0.01	5	97	1160	0.1163	4.4	12	1.74	0.64	0.64	11.27	0.34	12.04	0.68
Prop-7a	10.12	0.91	5	97	1160	0.1163	4.4	10	1.9	0.66	0.88	16.92	0	n/a	3.07

DISNEY/ABC STUDIOS AT THE RANCH
SOUND STAGES - NORTH SIDE
10 YR - 24 HR DISCHARGES

Subarea	Area (acres)	%imp	Freq.	Soil Type	Length (ft)	Slope (ft/ft)	Isohyet (in.)	Tc (min.)	Intensity (in./hr)	Cu	Cd	Flow rate (cfs)	Fire Factor	Burned flow rate (cfs)	Volume (acre-ft)
Exist-7a	10.12	0.01	10	97	1160	0.1163	5.38	10	2.32	0.69	0.69	16.2	0.34	17.13	0.91
Prop-7a	10.12	0.91	10	97	1160	0.1163	5.38	8	2.57	0.71	0.88	22.89	0	n/a	3.79

DISNEY/ABC STUDIOS AT THE RANCH
SOUND STAGES - NORTH SIDE
25 YR - 24 HR DISCHARGES

Subarea	Area (acres)	%imp	Freq.	Soil Type	Length (ft)	Slope (ft/ft)	Isohyet (in.)	Tc (min.)	Intensity (in./hr)	Cu	Cd	Flow rate (cfs)	Fire Factor	Burned flow rate (cfs)	Volume (acre-ft)
Exist-7a	10.12	0.01	25	97	1160	0.1163	6.61	8	3.16	0.74	0.74	23.66	0.34	24.79	1.28
Prop-7a	10.12	0.91	25	97	1160	0.1163	6.61	7	3.37	0.75	0.89	30.35	0	n/a	4.66

DISNEY/ABC STUDIOS AT THE RANCH
SOUND STAGES - NORTH SIDE
50 YR - 24 HR DISCHARGES

Subarea	Area (acres)	%imp	Freq.	Soil Type	Length (ft)	Slope (ft/ft)	Isohyet (in.)	Tc (min.)	Intensity (in./hr)	Cu	Cd	Flow rate (cfs)	Fire Factor	Burned flow rate (cfs)	Volume (acre-ft)
Exist-7a	10.12	0.01	50	97	1160	0.1163	7.53	7	3.84	0.76	0.76	29.53	0.34	30.83	1.58
Prop-7a	10.12	0.91	50	97	1160	0.1163	7.53	7	3.84	0.76	0.89	34.59	0	n/a	5.33

DISNEY/ABC STUDIOS AT THE RANCH
SOUND STAGES - SOUTH SIDE
2 YR - 24 HR DISCHARGES

Subarea	Area (acres)	%imp	Freq.	Soil Type	Length (ft)	Slope (ft/ft)	Isohyet (in.)	Tc (min.)	Intensity (in./hr)	Cu	Cd	Flow rate (cfs)	Fire Factor	Burned flow rate (cfs)	Volume (acre-ft)
Exist-1a	25.6	0.01	2	97	1957	0.015	2.91	30	0.75	0.44	0.44	8.45	0.34	9.55	0.93
Prop-1a	25.6	0.91	2	97	1957	0.015	2.91	26	0.8	0.46	0.86	17.61	0	n/a	5.11
Exist-3a	2.56	0.01	2	97	629	0.015	2.91	18	0.95	0.5	0.5	1.22	0.34	1.35	0.1
Prop-3a	2.56	0.4	2	97	629	0.015	2.91	15	1.04	0.53	0.68	1.81	0	n/a	0.27
Exist-5a	4.1	0.01	2	97	485	0.03	2.91	13	1.11	0.54	0.54	2.46	0.34	2.69	0.15
Prop-5a	4.1	0.4	2	97	485	0.03	2.91	11	1.2	0.56	0.7	3.44	0	n/a	0.44

DISNEY/ABC STUDIOS AT THE RANCH
SOUND STAGES - SOUTH SIDE
5 YR - 24 HR DISCHARGES

Subarea	Area (acres)	%imp	Freq.	Soil Type	Length (ft)	Slope (ft/ft)	Isohyet (in.)	Tc (min.)	Intensity (in./hr)	Cu	Cd	Flow rate (cfs)	Fire Factor	Burned flow rate (cfs)	Volume (acre-ft)
Exist-1a	25.6	0.01	5	97	1957	0.015	4.4	26	1.21	0.56	0.56	17.35	0.34	18.9	1.67
Prop-1a	25.6	0.91	5	97	1957	0.015	4.4	19	1.4	0.59	0.87	31.18	0	n/a	7.77
Exist-3a	2.56	0.01	5	97	629	0.015	4.4	12	1.74	0.64	0.64	2.85	0.34	3.05	0.17
Prop-3a	2.56	0.4	5	97	629	0.015	4.4	10	1.9	0.66	0.76	3.7	0	n/a	0.43
Exist-5a	4.1	0.01	5	97	485	0.03	4.4	8	2.1	0.68	0.68	5.85	0.34	6.2	0.28
Prop-5a	4.1	0.4	5	97	485	0.03	4.4	8	2.1	0.68	0.77	6.63	0	n/a	0.7

DISNEY/ABC STUDIOS AT THE RANCH
SOUND STAGES - SOUTH SIDE
10 YR - 24 HR DISCHARGES

Subarea	Area (acres)	%imp	Freq.	Soil Type	Length (ft)	Slope (ft/ft)	Isohyet (in.)	Tc (min.)	Intensity (in./hr)	Cu	Cd	Flow rate (cfs)	Fire Factor	Burned flow rate (cfs)	Volume (acre-ft)
Exist-1a	25.6	0.01	10	97	1957	0.015	5.38	21	1.64	0.63	0.63	26.45	0.34	28.33	2.28
Prop-1a	25.6	0.91	10	97	1957	0.015	5.38	17	1.81	0.65	0.88	40.78	0	n/a	9.54
Exist-3a	2.56	0.01	10	97	629	0.015	5.38	10	2.32	0.69	0.69	4.1	0.34	4.33	0.23
Prop-3a	2.56	0.4	10	97	629	0.015	5.38	9	2.44	0.7	0.78	4.87	0	n/a	0.54
Exist-5a	4.1	0.01	10	97	485	0.03	5.38	7	2.74	0.72	0.72	8.09	0.34	8.5	0.38
Prop-5a	4.1	0.4	10	97	485	0.03	5.38	7	2.74	0.72	0.79	8.87	0	n/a	0.88

DISNEY/ABC STUDIOS AT THE RANCH
SOUND STAGES - SOUTH SIDE
25 YR - 24 HR DISCHARGES

Subarea	Area (acres)	%imp	Freq.	Soil Type	Length (ft)	Slope (ft/ft)	Isohyet (in.)	Tc (min.)	Intensity (in./hr)	Cu	Cd	Flow rate (cfs)	Fire Factor	Burned flow rate (cfs)	Volume (acre-ft)
Exist-1a	25.6	0.01	25	97	1957	0.015	6.61	17	2.22	0.69	0.69	39.21	0.34	41.46	3.2
Prop-1a	25.6	0.91	25	97	1957	0.015	6.61	14	2.43	0.7	0.88	54.74	0	n/a	11.74
Exist-3a	2.56	0.01	25	97	629	0.015	6.61	8	3.16	0.74	0.74	5.99	0.34	6.27	0.32
Prop-3a	2.56	0.4	25	97	629	0.015	6.61	8	3.16	0.74	0.8	6.47	0	n/a	0.69
Exist-5a	4.1	0.01	25	97	485	0.03	6.61	6	3.62	0.76	0.76	11.28	0.34	11.77	0.51
Prop-5a	4.1	0.4	25	97	485	0.03	6.61	6	3.62	0.76	0.82	12.17	0	n/a	1.1

DISNEY/ABC STUDIOS AT THE RANCH
SOUND STAGES - SOUTH SIDE
50 YR - 24 HR DISCHARGES

Subarea	Area (acres)	%imp	Freq.	Soil Type	Length (ft)	Slope (ft/ft)	Isohyet (in.)	Tc (min.)	Intensity (in./hr)	Cu	Cd	Flow rate (cfs)	Fire Factor	Burned flow rate (cfs)	Volume (acre-ft)
Exist-1a	25.6	0.01	50	97	1957	0.015	7.53	15	2.68	0.71	0.71	48.71	0.34	51.33	3.92
Prop-1a	25.6	0.91	50	97	1957	0.015	7.53	13	2.87	0.72	0.88	64.66	0	n/a	13.42
Exist-3a	2.56	0.01	50	97	629	0.015	7.53	7	3.84	0.76	0.76	7.47	0.34	7.8	0.4
Prop-3a	2.56	0.4	50	97	629	0.015	7.53	7	3.84	0.76	0.82	8.06	0	n/a	0.81
Exist-5a	4.1	0.01	50	97	485	0.03	7.53	5	4.49	0.78	0.78	14.36	0.34	14.93	0.63
Prop-5a	4.1	0.4	50	97	485	0.03	7.53	5	4.49	0.78	0.83	15.28	0	n/a	1.28

SUB-APPENDIX 1-F.

HYDRAULICS:

Freeboard & Scour Models for Proposed Condition

REFER TO FULL SIZE (3'X4') HYDRAULICS MAP 1/2 AND 2/2 FOR CROSS-SECTIONS.

Appendix 1-F has been prepared to provide the HEC-RAS results used to assess the freeboard and scour depth requirements for the project improvements. The project will provide channel improvements using soil cement to construct a trapezoidal channel with a soft-bottom.

The project was required to assess the impacts associated with the channelization of Placerita Creek. The results included in this section were used to determine the scour protection and freeboard for the proposed improvements.

50-Year Storm Event – Freeboard and Scour Depth Table

Table B
Available Freeboard and Scour Depth Requirements for Placerita Channel Improvements

			Northerly Section of Channel			Southerly Section of Channel				
Section	Minimum Channel Elevation	Mixed Flow Water Surface Elevation	Overbank Station	Elevation of Channel Bank	Freeboard (ft)	Overbank Station	Elevation of Channel Bank	Freeboard (ft)	HEC-RAS Stream Velocity	Required Scour Depth (ft)
700.65	1398	1425.08	64.95	1434.15	9.07	234.9	1432.15	7.07	2.53	6
865.5	1402	1425.18	153.96	1434.15	8.97	1432.15	1432.15	6.97	2.52	6
1052.85	1405.12	1425.29	224.3	1433.15	7.86	391.46	1433.85	8.56	3.22	6
1258.35	1410	1425.54	578.67	1437.15	11.61	730.74	1434.15	8.61	4.99	6
1368.35	1412	1425.94	204.04	1438.15	12.21	350.42	1438.15	12.21	5.65	8
1526.5	1414	1426.71	173.43	1435.15	8.44	294.22	1435.15	8.44	9.73	10
Proposed Clear Span Bridge										
1644.9	1416	1428.15	775.37	1435.36	7.21	891.65	1435.17	7.02	11.21	10
1841.25	1419	1430.04	253.06	1436.15	6.11	435.82	1433.15	3.11	21.32	14

50-Year Storm Event Maximum Depth Condition

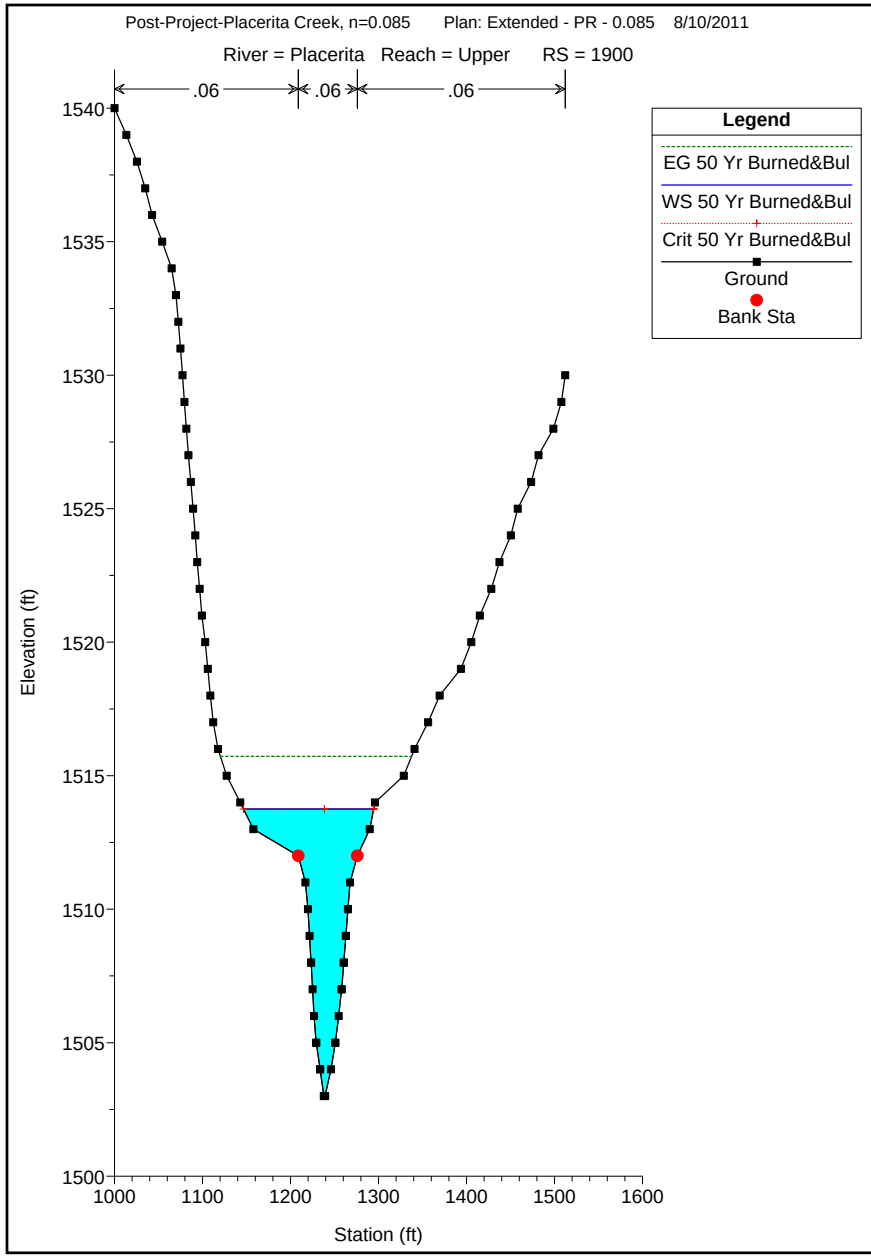
Pre-Project and Post-Project Comparison Table for Placerita Creek (Bulked 50-Year Storm Event)

				Pre-Project		Post-Project		Change in Hydraulic Parameters	
Reach	River Station	Total Flow Rate (cfs)	Min Channel Elevation (ft)	Water Surface Elevation (ft)	Channnel Velocity (ft/s)	Water Surface Elevation (ft)	Channnel Velocity (ft/s)	Water Surface Elevation (ft)	Channnel Velocity (ft/s)
Upper	1900	5214.8	1503	1513.8	11.6	1513.8	11.6	0.0	0.0
Upper	1800	5214.8	1497	1505.7	9.9	1505.7	9.9	0.0	0.0
Upper	1700	5214.8	1489	1495.4	9.2	1495.4	9.2	0.0	0.0
Upper	1600	5214.8	1479	1485.9	10.0	1485.9	10.0	0.0	0.0
Upper	1500	5214.8	1474	1482.3	7.3	1482.3	7.3	0.0	0.0
Upper	1400	5214.8	1470	1477.2	9.2	1477.2	9.2	0.0	0.0
Tributary	510	874.1	1545	1548.7	8.5	1548.7	8.5	0.0	0.0
Tributary	410	874.1	1524	1527.9	6.5	1527.9	6.5	0.0	0.0
Tributary	310	874.1	1503	1506.2	4.9	1506.2	4.9	0.0	0.0
Tributary	210	874.1	1486	1489.7	8.0	1489.7	8.0	0.0	0.0
Tributary	110	874.1	1479	1483.7	4.7	1483.7	4.8	0.0	0.0
Tributary	10	874.1	1471	1476.7	10.7	1476.7	10.7	0.0	0.0
Sound Stages	2527.261	6011.7	1432	1442.2	14.4	1442.7	13.3	0.5	-1.1
Sound Stages	2268.881	6011.7	1427	1436.9	14.2	1436.2	13.5	-0.7	-0.7
Sound Stages	2007.81	6011.7	1422	1431.7	8.3	1430.4	10.5	-1.3	2.3
Sound Stages	1841.25	6011.7	1419	1427.4	12.2	1430.0	4.6	2.7	-7.6
Sound Stages	1644.9	6011.7	1416	1426.0	6.6	1428.2	7.6	2.1	1.0
Sound Stages	1615	Bridge	N/A	N/A	N/A			N/A	N/A
Sound Stages	1526.5	6011.7	1414	1425.8	3.5	1426.7	8.0	0.9	4.6
Sound Stages	1368.35	6011.7	1412	1425.6	3.4	1425.9	5.5	0.4	2.1
Sound Stages	1258.35	6011.7	1410	1425.3	4.4	1425.5	5.0	0.3	0.6
Sound Stages	1052.85	6011.7	1405.12	1425.3	2.6	1425.3	3.3	0.0	0.7
Sound Stages	865.5	6011.7	1402	1425.2	2.2	1425.2	2.6	0.0	0.4
Sound Stages	700.65	6011.7	1398	1425.2	2.6	1425.1	2.6	-0.1	0.1
Sound Stages	700	Culvert	N/A	N/A	N/A			N/A	N/A
Sound Stages	9.076105	6011.7	1390	1400.8	10.9	1400.8	10.9	0.0	0.0
Sound Stages	8	6011.7	1390	1397.6	16.9	1397.6	16.9	0.0	0.0
Sound Stages	7	6229.5	1388	1391.8	8.8	1391.8	8.8	0.0	0.0
Sound Stages	6	6229.5	1378	1385.4	4.7	1385.4	4.7	0.0	0.0
Sound Stages	5	6229.5	1376	1382.4	6.3	1382.4	6.3	0.0	0.0
Sound Stages	4	6229.5	1362	1374.3	11.3	1374.3	11.3	0.0	0.0
Sound Stages	3	6276.6	1348	1365.5	8.5	1365.5	8.5	0.0	0.0
Sound Stages	2	6276.6	1348	1354.6	7.2	1354.6	7.2	0.0	0.0
Lower	1300	5943.5	1468	1475.0	9.7	1475.0	9.6	0.0	-0.1
Lower	1250	5943.5	1463	1470.2	10.0	1470.1	10.2	0.0	0.2
Lower	1200	5943.5	1459	1466.7	5.8	1466.4	6.4	-0.2	0.6
Lower	1150	5943.5	1453	1462.6	9.3	1463.0	7.7	0.4	-1.6
Lower	1100	5943.5	1447	1455.7	10.1	1455.1	12.7	-0.5	2.6
Lower	1050	5943.5	1443	1455.0	2.8	1455.0	2.8	0.0	0.0
Lower	1000	5943.5	1439	1450.6	15.0	1450.6	15.0	0	0

50-Year Storm Event – HEC-RAS for Maximum Depth (n value = 0.085)

HEC-RAS Plan: Ex_PR_0.085 Profile: 50 Yr Burned&Bul

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)	
Upper	1900	50 Yr Burned&Bul	5214.80	1503.00	1513.75	1513.75	1515.73	0.020126	11.61	508.82	147.94	0.82
Upper	1800	50 Yr Burned&Bul	5214.80	1497.00	1505.67	1505.36	1506.67	0.015469	9.91	743.96	259.67	0.71
Upper	1700	50 Yr Burned&Bul	5214.80	1489.00	1495.41	1495.32	1496.26	0.021420	9.23	788.65	381.84	0.80
Upper	1600	50 Yr Burned&Bul	5214.80	1479.00	1485.92	1485.92	1486.92	0.016902	9.98	788.40	332.64	0.75
Upper	1500	50 Yr Burned&Bul	5214.80	1474.00	1482.28	1481.43	1482.76	0.007769	7.26	1083.78	660.21	0.51
Upper	1400	50 Yr Burned&Bul	5214.80	1470.00	1477.22	1476.95	1478.50	0.025020	9.21	594.78	203.48	0.85
Tributary	510	50 Yr Burned&Bul	874.10	1545.00	1548.70	1548.94	1549.59	0.033813	8.53	142.15	133.14	0.93
Tributary	410	50 Yr Burned&Bul	874.10	1524.00	1527.91	1527.91	1528.35	0.039115	6.51	176.94	188.83	0.91
Tributary	310	50 Yr Burned&Bul	874.10	1503.00	1506.20	1505.85	1506.53	0.016410	4.85	207.07	161.80	0.62
Tributary	210	50 Yr Burned&Bul	874.10	1486.00	1489.72	1489.72	1490.71	0.042740	7.96	109.82	55.87	1.00
Tributary	110	50 Yr Burned&Bul	874.10	1479.00	1483.72	1483.30	1483.92	0.006999	4.76	307.39	240.59	0.44
Tributary	10	50 Yr Burned&Bul	874.10	1471.00	1476.68	1476.68	1478.45	0.041448	10.67	81.95	23.26	1.00
Sound Stages	2527.261	50 Yr Burned&Bul	5993.30	1432.00	1442.74	1442.11	1445.47	0.023039	13.28	454.23	70.59	0.87
Sound Stages	2268.881	50 Yr Burned&Bul	5993.30	1425.00	1436.19	1435.78	1439.04	0.026882	13.54	442.72	65.53	0.92
Sound Stages	2007.81	50 Yr Burned&Bul	5993.30	1422.00	1430.43	1429.88	1432.16	0.023439	10.53	568.92	120.05	0.85
Sound Stages	1841.25	50 Yr Burned&Bul	5993.30	1419.00	1430.04		1430.36	0.004171	4.59	1305.28	155.59	0.28
Sound Stages	1644.9	50 Yr Burned&Bul	5993.30	1416.00	1428.15	1423.65	1429.05	0.011163	7.60	788.45	88.56	0.45
Sound Stages	1615		Bridge									
Sound Stages	1526.5	50 Yr Burned&Bul	5993.30	1414.00	1426.71		1427.70	0.012855	8.00	749.37	87.16	0.48
Sound Stages	1368.35	50 Yr Burned&Bul	5993.30	1412.00	1425.94		1426.40	0.004572	5.46	1098.18	103.34	0.30
Sound Stages	1258.35	50 Yr Burned&Bul	5993.30	1410.00	1425.54		1425.93	0.003758	5.02	1194.01	111.29	0.27
Sound Stages	1052.85	50 Yr Burned&Bul	5993.30	1405.12	1425.29		1425.46	0.001200	3.30	1816.13	134.26	0.16
Sound Stages	865.5	50 Yr Burned&Bul	5993.30	1402.00	1425.18		1425.28	0.000621	2.59	2315.47	149.88	0.12
Sound Stages	700.65	50 Yr Burned&Bul	5993.30	1398.00	1425.08	1407.91	1425.18	0.000589	2.60	2308.45	140.65	0.11
Sound Stages	700		Culvert									
Sound Stages	9.076105	50 Yr Burned&Bul	5993.30	1390.00	1400.84	1400.84	1402.18	0.012294	10.91	824.46	280.13	0.67
Sound Stages	8	50 Yr Burned&Bul	5993.30	1390.00	1397.58	1398.58	1400.92	0.067498	16.93	490.74	249.42	1.42
Sound Stages	7	50 Yr Burned&Bul	6211.80	1388.00	1391.81	1391.81	1392.72	0.026025	8.76	925.76	530.36	0.86
Sound Stages	6	50 Yr Burned&Bul	6211.80	1378.00	1385.41	1384.41	1385.61	0.006252	4.68	1793.40	814.68	0.42
Sound Stages	5	50 Yr Burned&Bul	6211.80	1376.00	1382.42		1382.76	0.007046	6.28	1482.33	577.53	0.48
Sound Stages	4	50 Yr Burned&Bul	6211.80	1362.00	1374.27	1373.00	1376.19	0.017206	11.28	677.02	617.10	0.76
Sound Stages	3	50 Yr Burned&Bul	6259.10	1356.00	1365.46	1365.46	1366.21	0.011685	8.53	1240.88	746.53	0.62
Sound Stages	2	50 Yr Burned&Bul	6259.10	1348.00	1354.64	1354.29	1355.16	0.010201	7.23	1348.01	700.50	0.57
Lower	1300	50 Yr Burned&Bul	5943.50	1468.00	1475.04	1474.56	1476.19	0.014745	9.60	764.59	216.92	0.70
Lower	1250	50 Yr Burned&Bul	5943.50	1463.00	1470.14	1470.14	1471.13	0.019302	10.17	893.94	408.28	0.79
Lower	1200	50 Yr Burned&Bul	5943.50	1459.00	1466.44	1465.51	1466.78	0.006190	6.38	1443.42	525.54	0.46
Lower	1150	50 Yr Burned&Bul	5943.50	1453.00	1463.01	1463.01	1463.56	0.007518	7.65	1311.13	579.07	0.51
Lower	1100	50 Yr Burned&Bul	5943.50	1447.00	1455.13	1455.70	1457.04	0.025355	12.68	700.09	354.11	0.91
Lower	1050	50 Yr Burned&Bul	5943.50	1443.00	1454.96	1452.18	1455.03	0.000742	2.80	3346.93	884.54	0.17
Lower	1000	50 Yr Burned&Bul	5943.50	1439.00	1450.62	1450.62	1454.11	0.031572	15.00	396.35	56.42	1.00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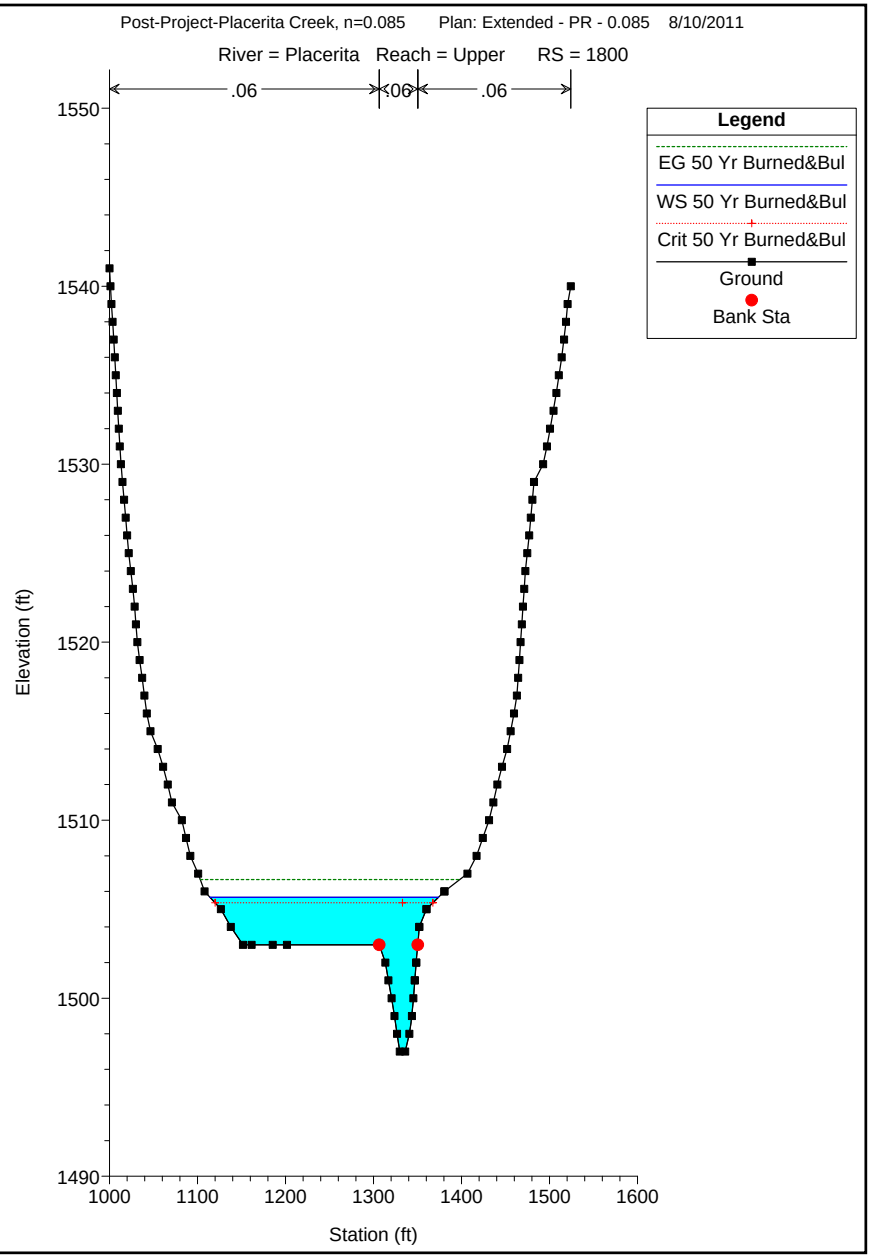
River = Placerita Reach = Upper RS = 1900
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
1540
1535
1530
1525
1520
1515
1510
1505
1500
1000
1100
1200
1300
1400
1500
1600
Station (ft)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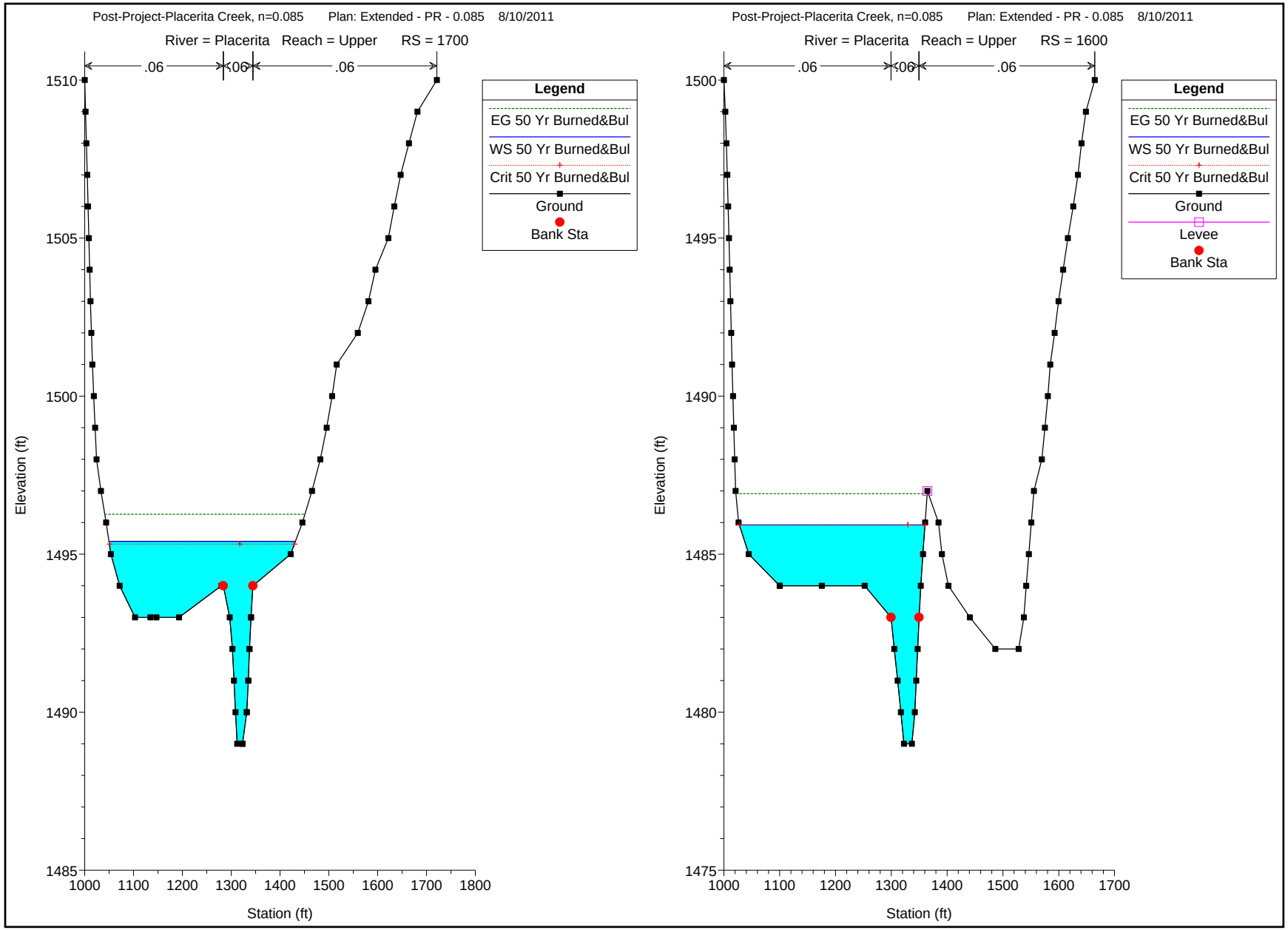
River = Placerita Reach = Upper RS = 1800
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
1550
1540
1530
1520
1510
1500
1490
1000
1100
1200
1300
1400
1500
1600
Station (ft)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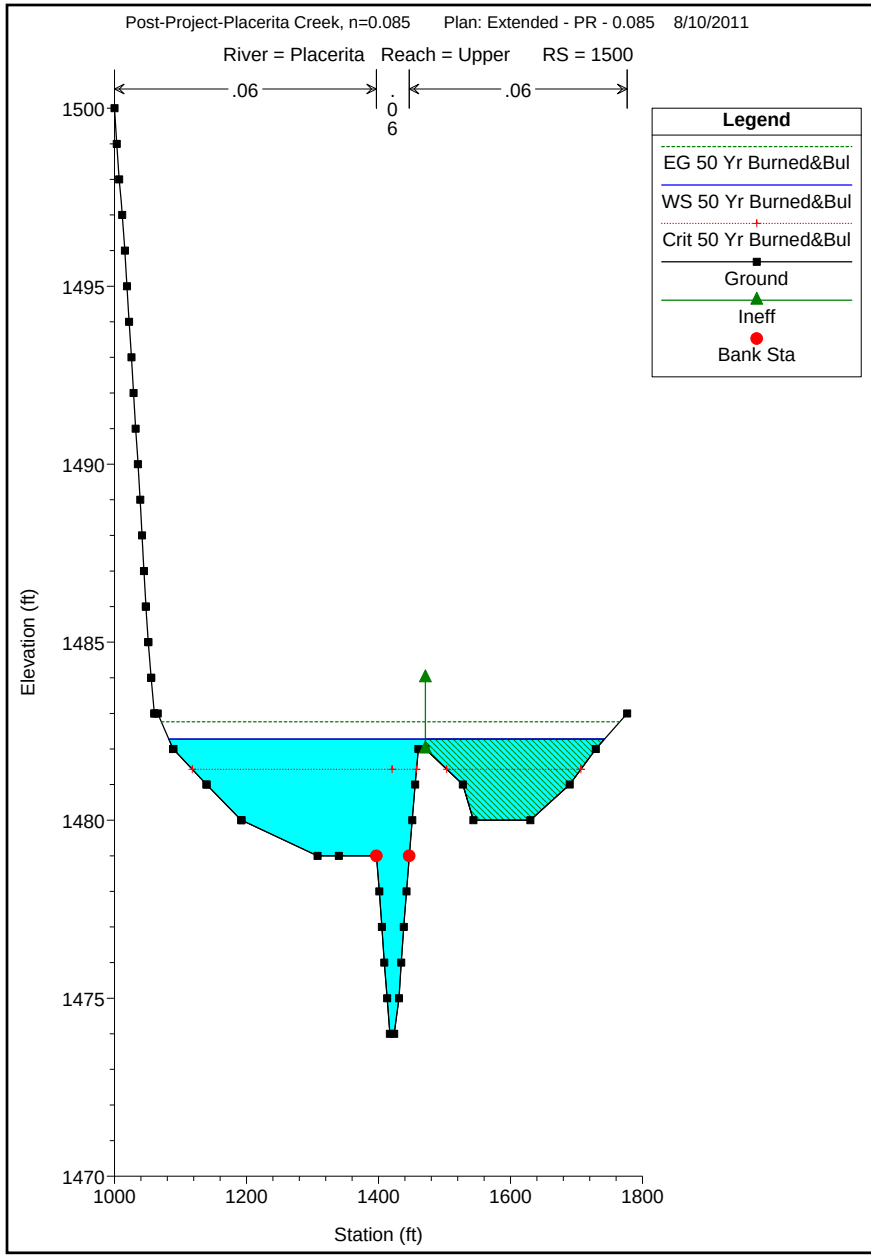
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
1510
1505
1500
1495
1490
1485
1000
1100
1200
1300
1400
1500
1600
1700
1800
Station (ft)
Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Upper RS = 1600
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Levee
Bank Sta
Elevation (ft)
1500
1495
1490
1485
1480
1475
1000
1100
1200
1300
1400
1500
1600
1700
Station (ft)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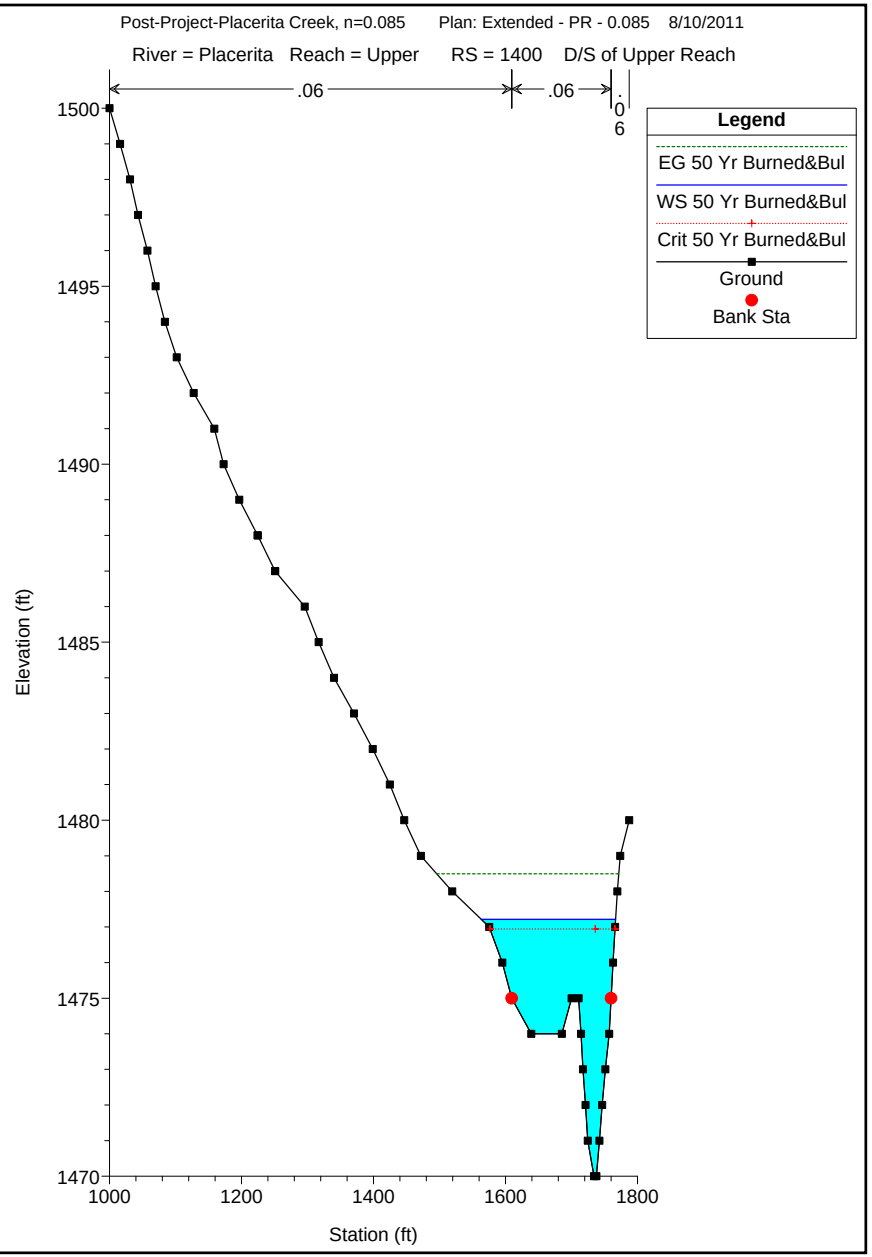
River = Placerita Reach = Upper RS = 1500
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Ineff
Bank Sta
Elevation (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1200
1400
1600
1800
Station (ft)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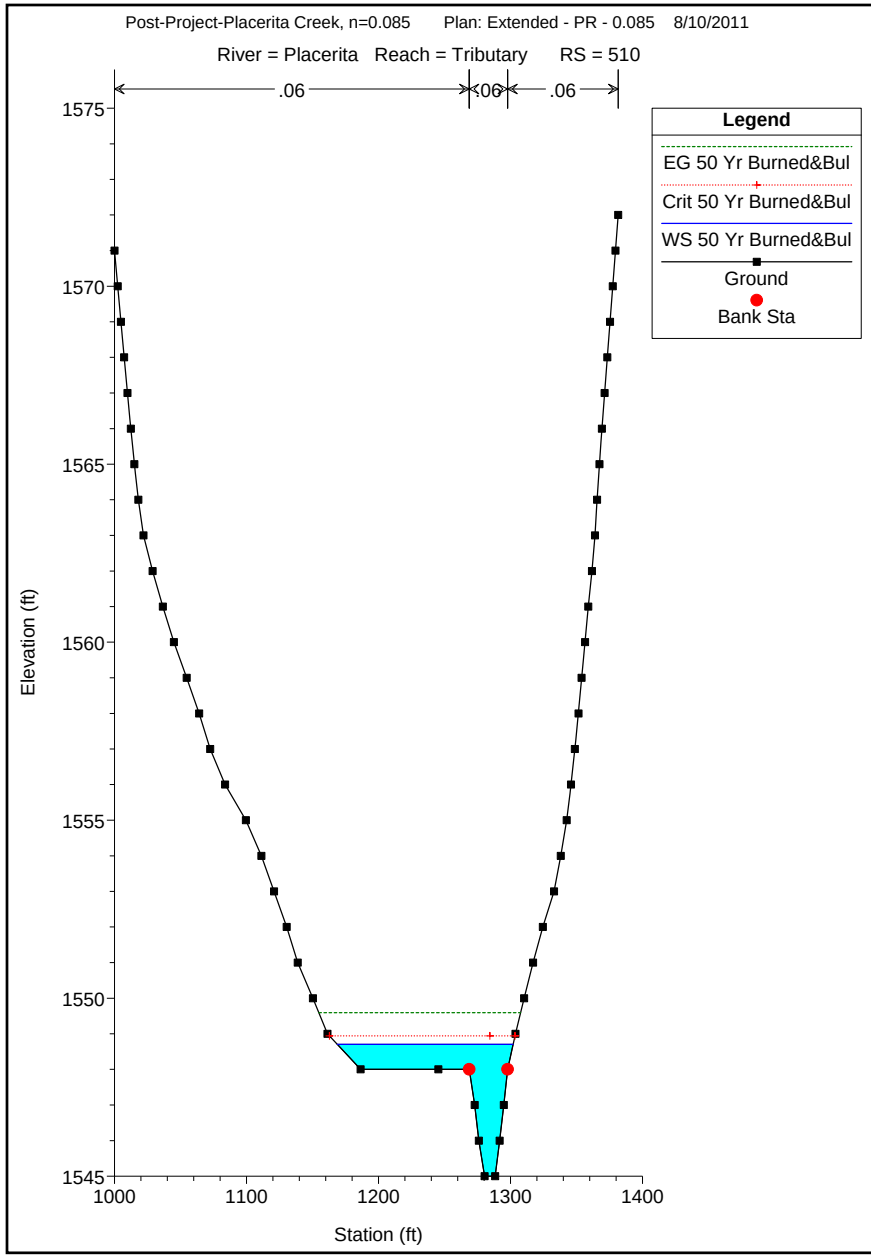
River = Placerita Reach = Upper RS = 1400 D/S of Upper Reach
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1200
1400
1600
1800
Station (ft)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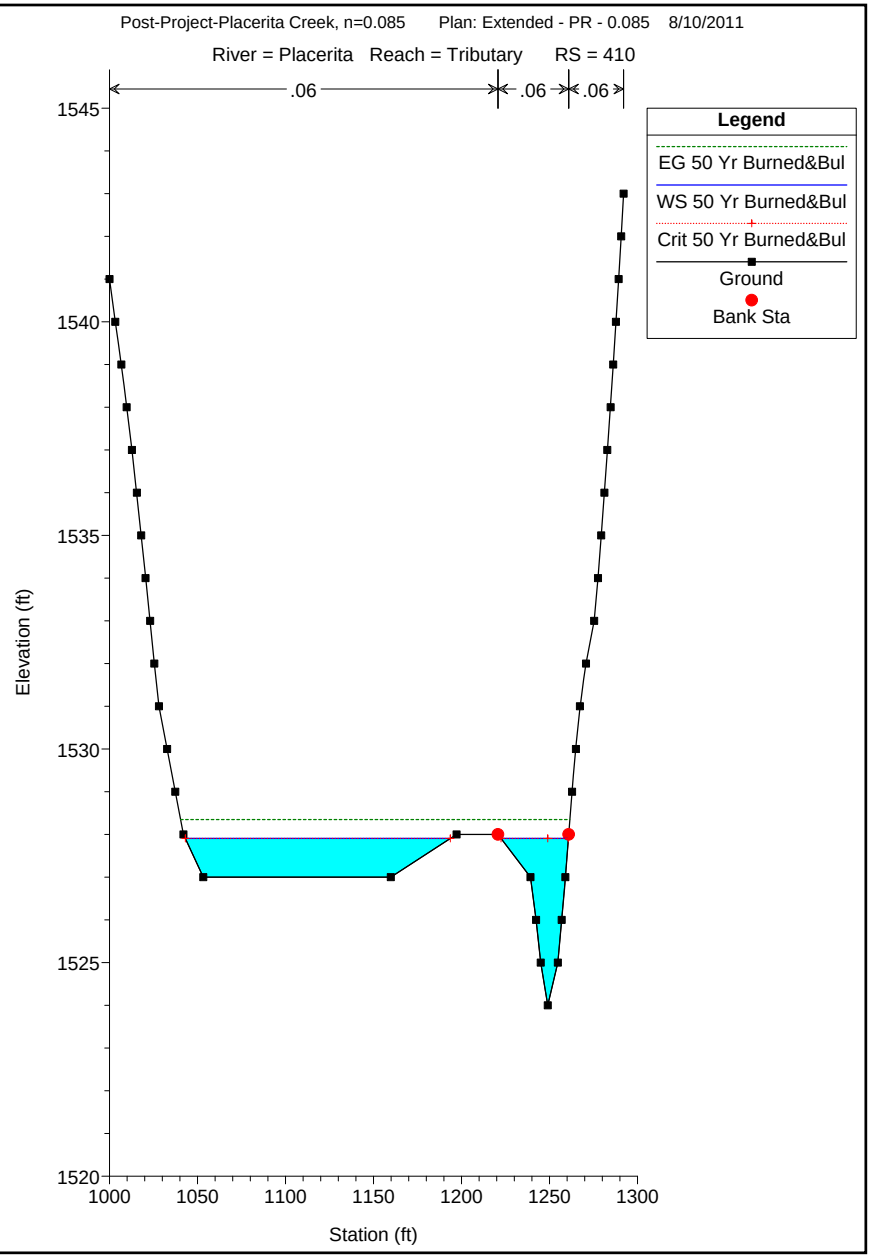
River = Placerita Reach = Tributary RS = 510
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
1575
1570
1565
1560
1555
1550
1545
1000
1100
1200
1300
1400
Station (ft)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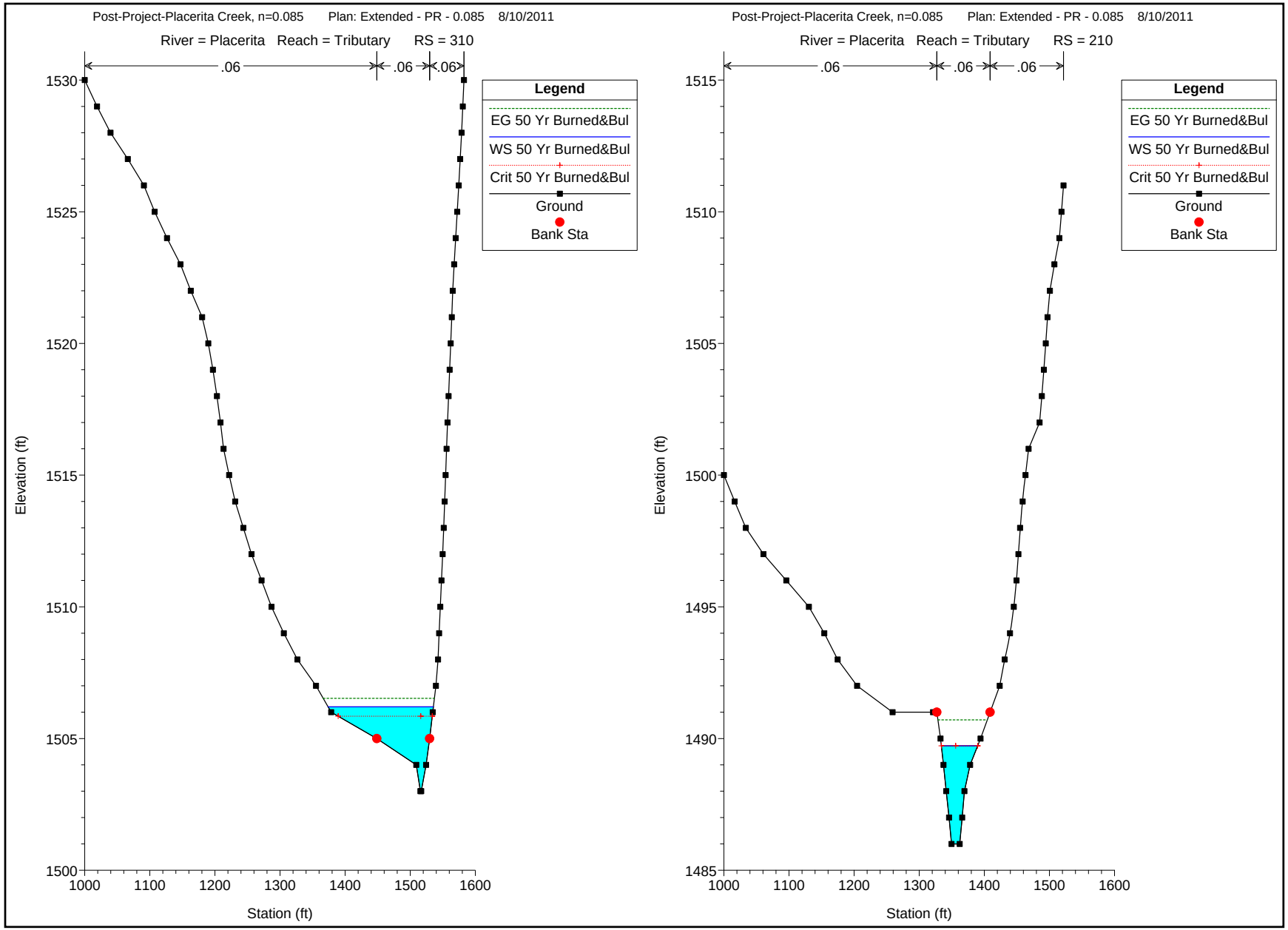
River = Placerita Reach = Tributary RS = 410
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
1545
1540
1535
1530
1525
1520
1000
1050
1100
1150
1200
1250
1300
Station (ft)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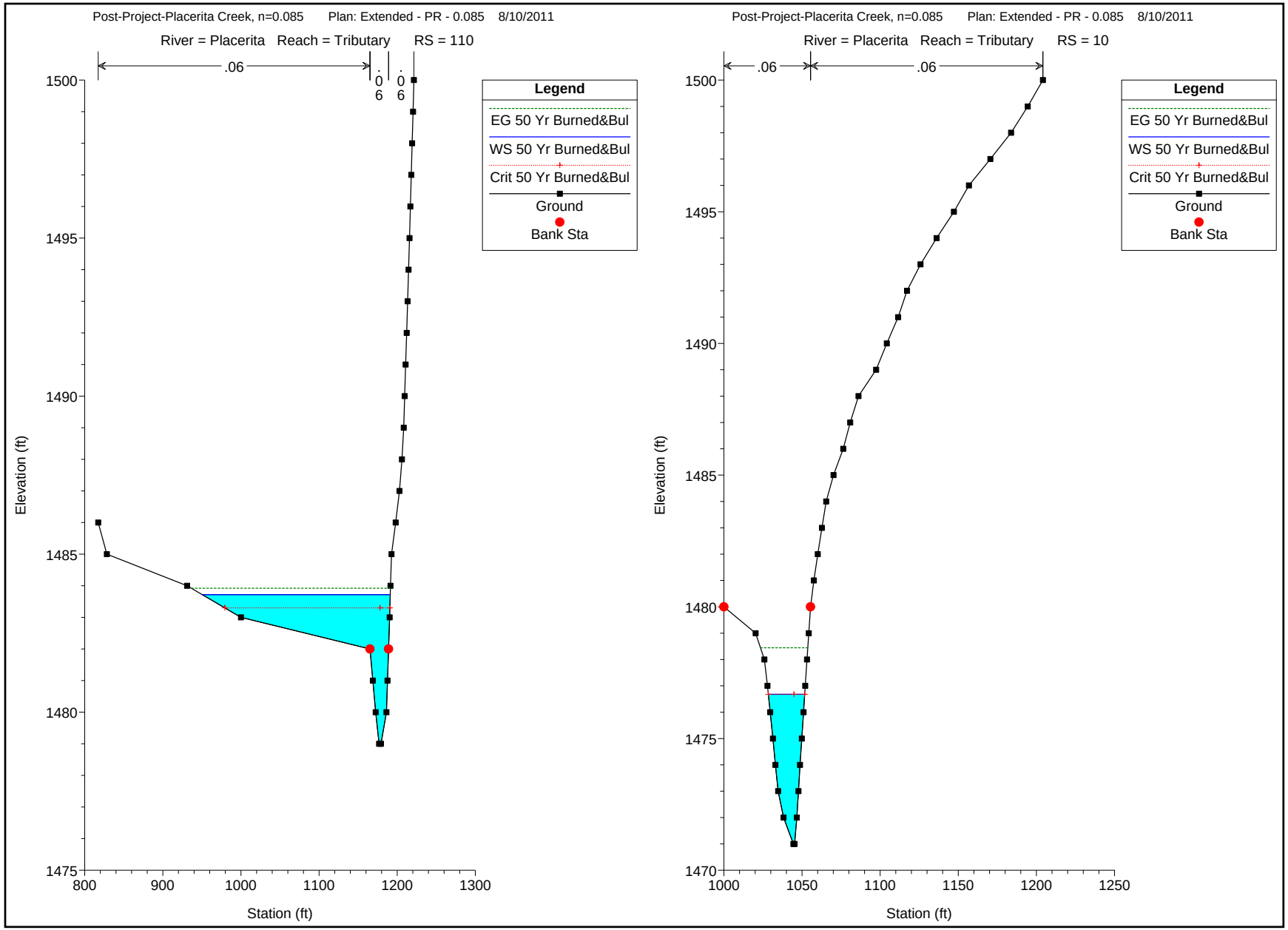
River = Placerita Reach = Tributary RS = 310
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1530
1525
1520
1515
1510
1505
1500
1000
1100
1200
1300
1400
1500
1600
Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Tributary RS = 210
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1515
1510
1505
1500
1495
1490
1485
1000
1100
1200
1300
1400
1500
1600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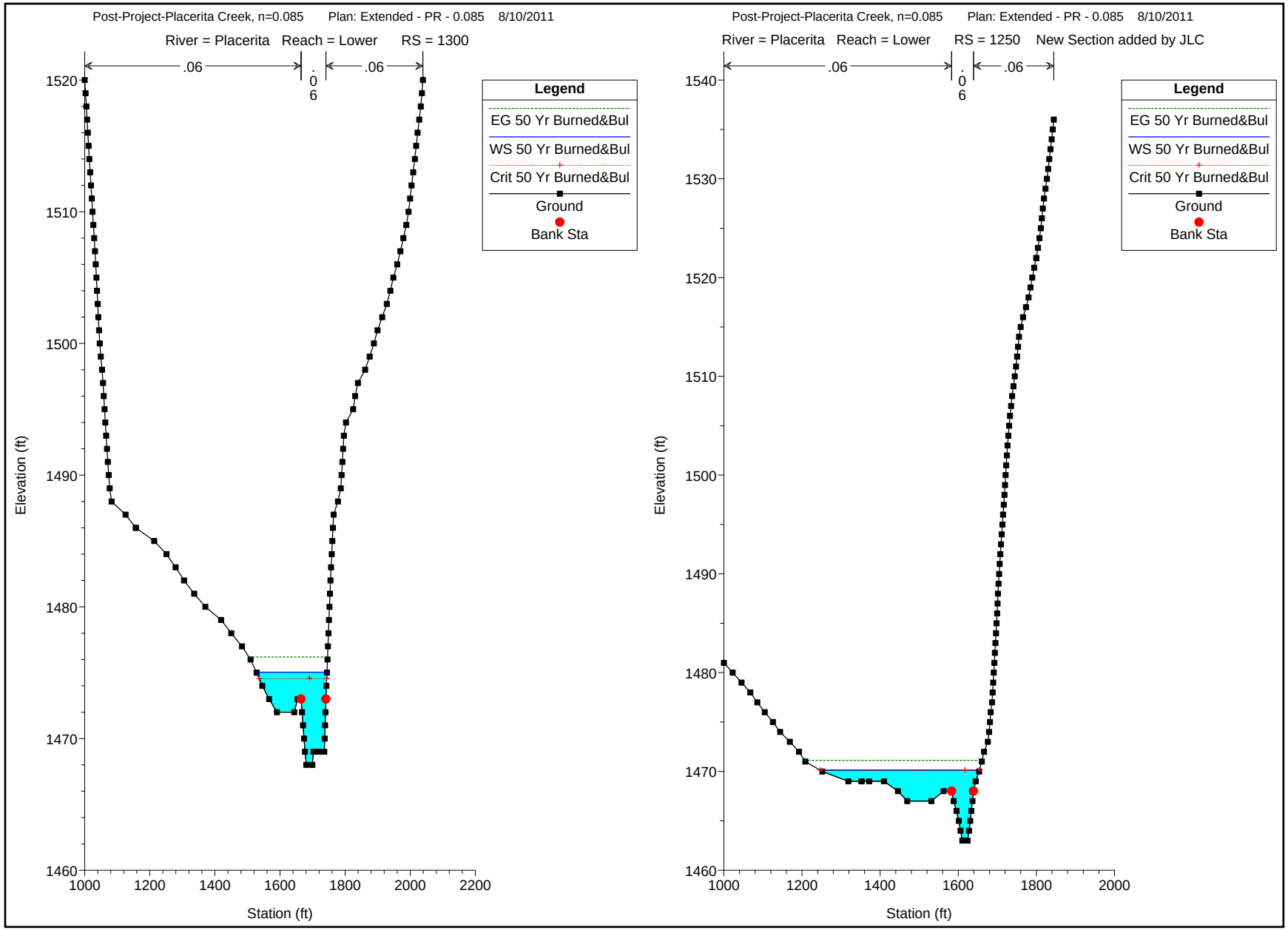
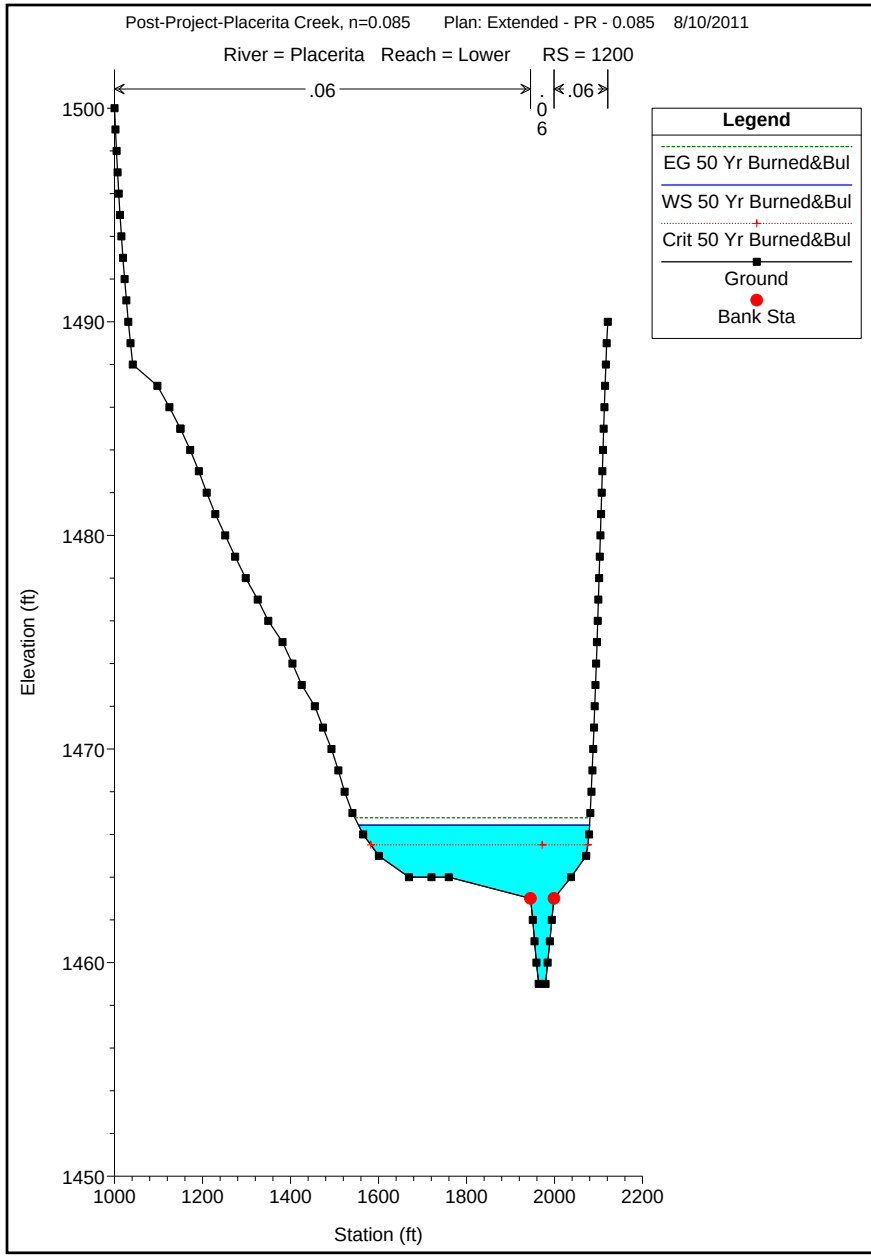
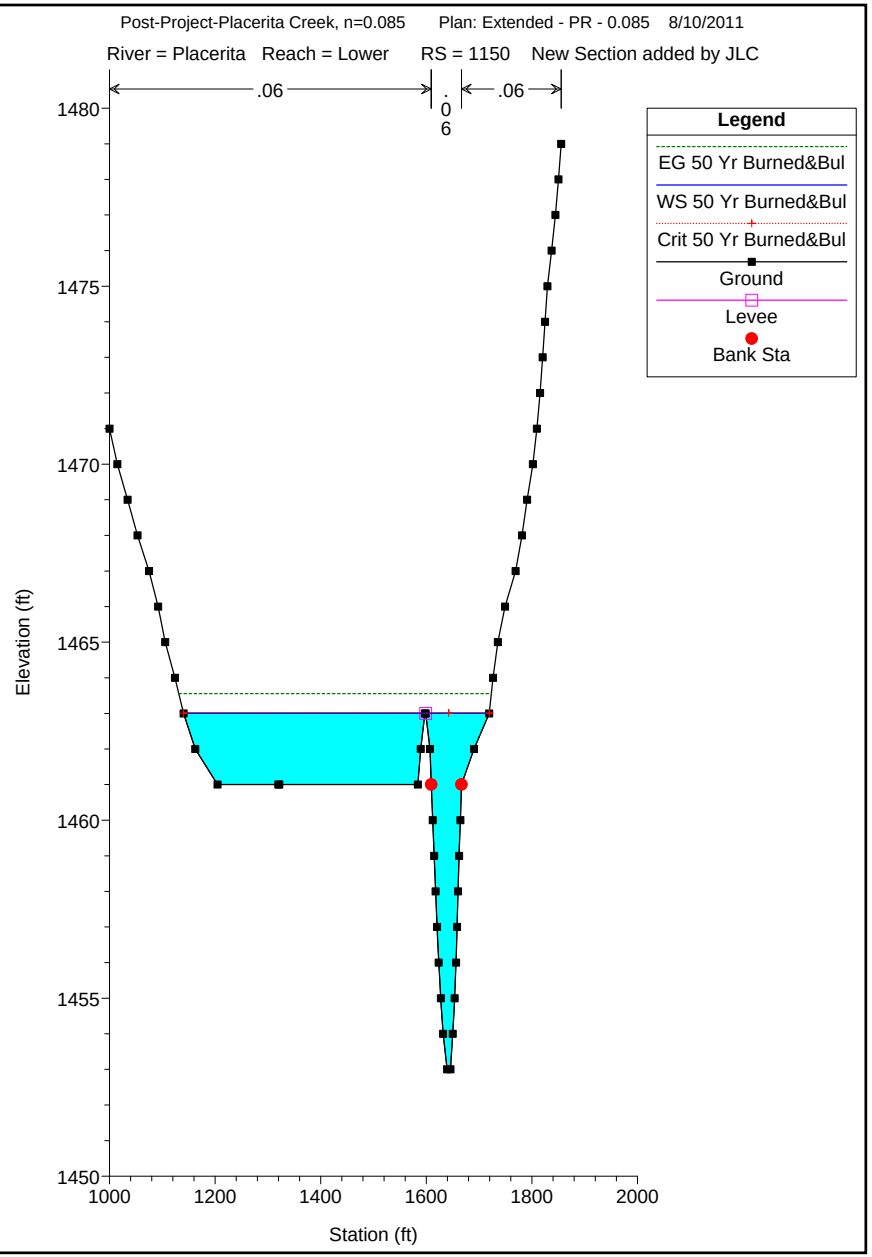
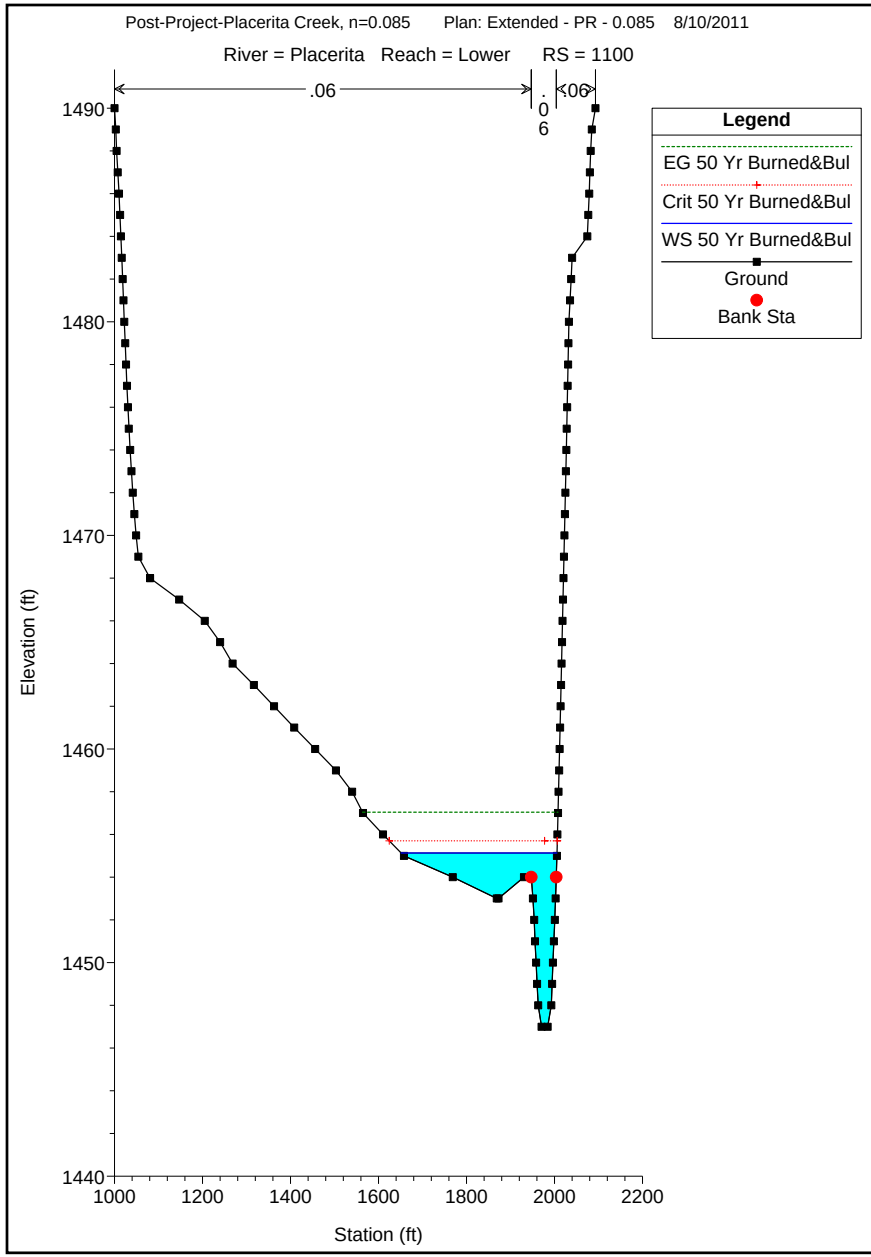
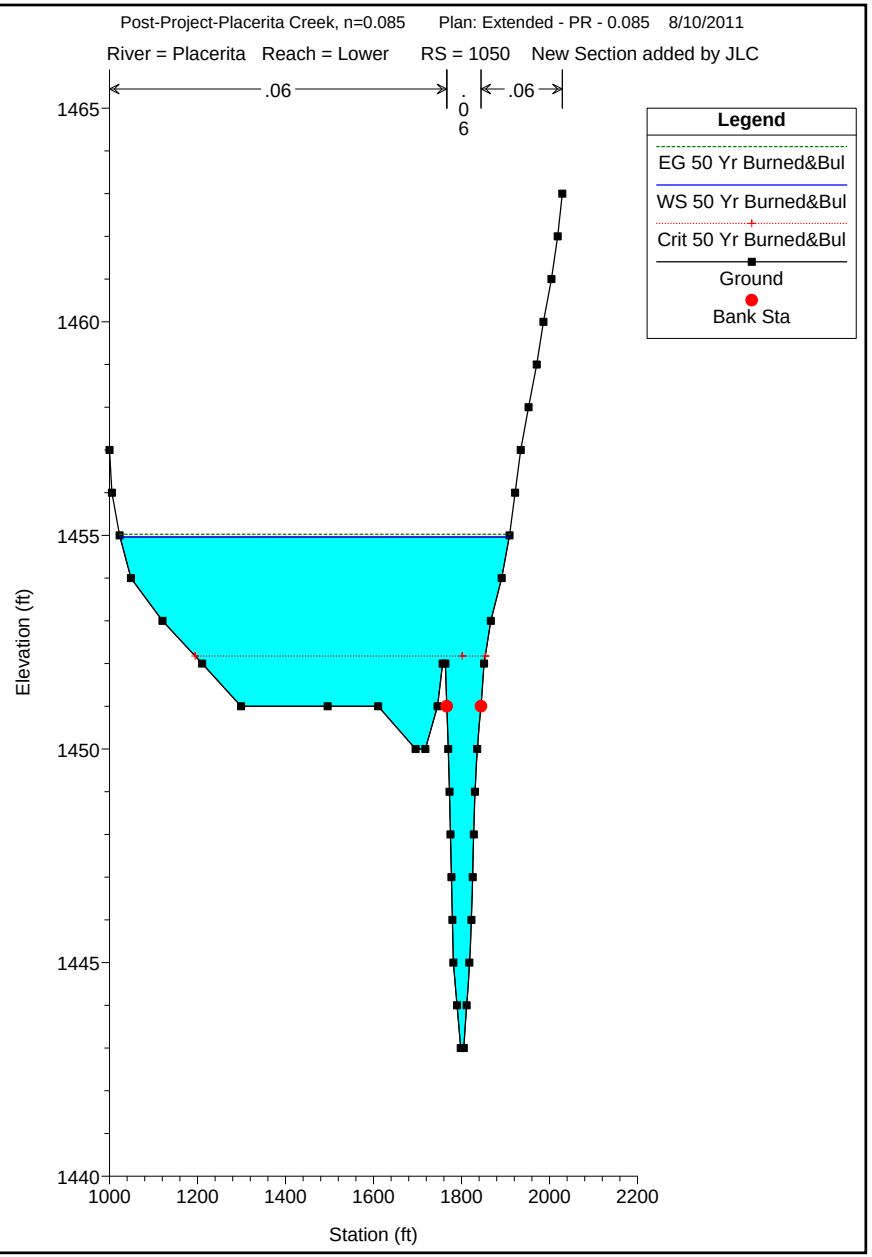
River = Placerita Reach = Tributary RS = 110
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
800
900
1000
1100
1200
1300
Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Tributary RS = 10
.06
.06
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1050
1100
1150
1200
1250

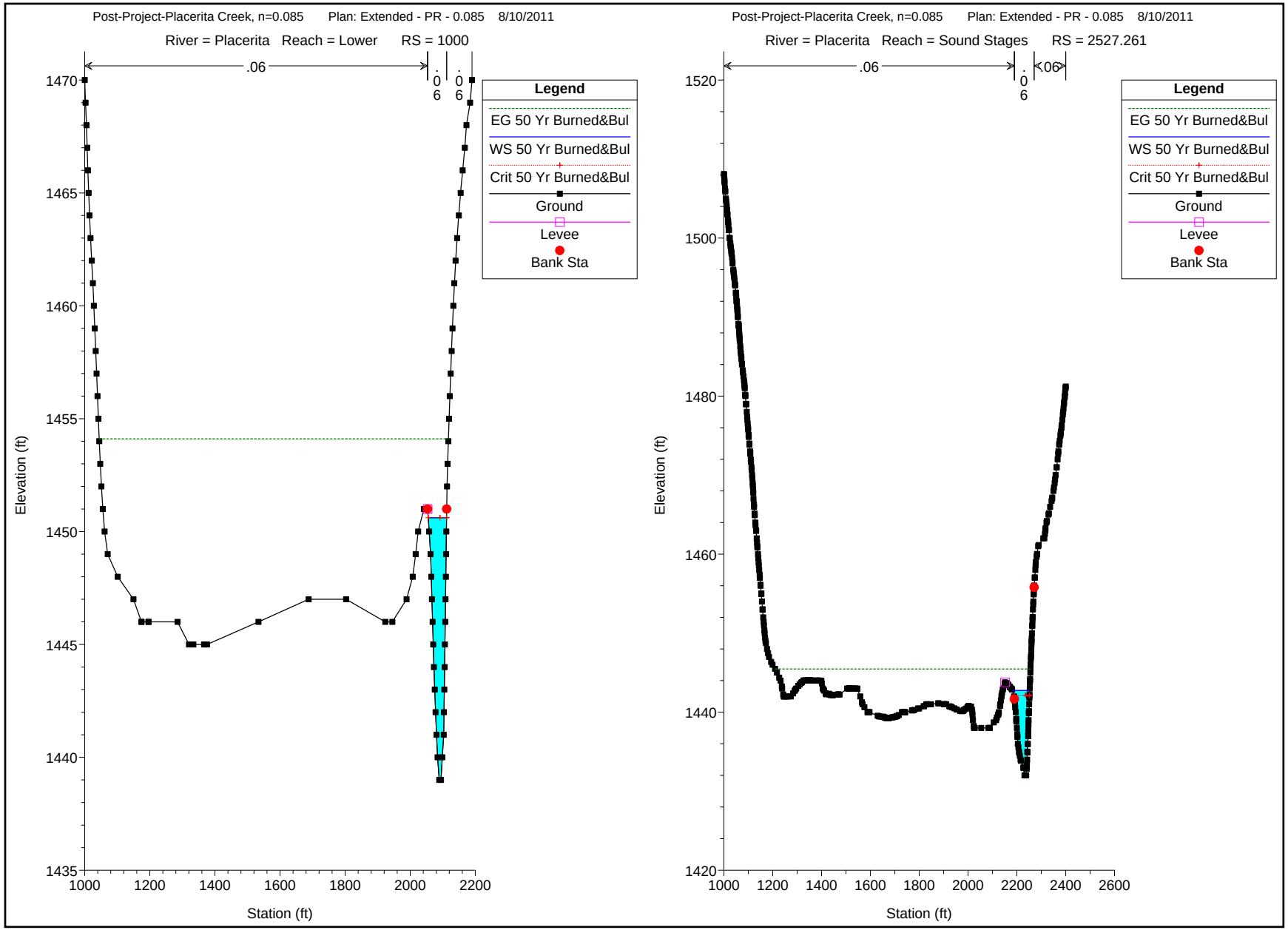

Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Lower RS = 1300
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Lower RS = 1250 New Section added by JLC
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)

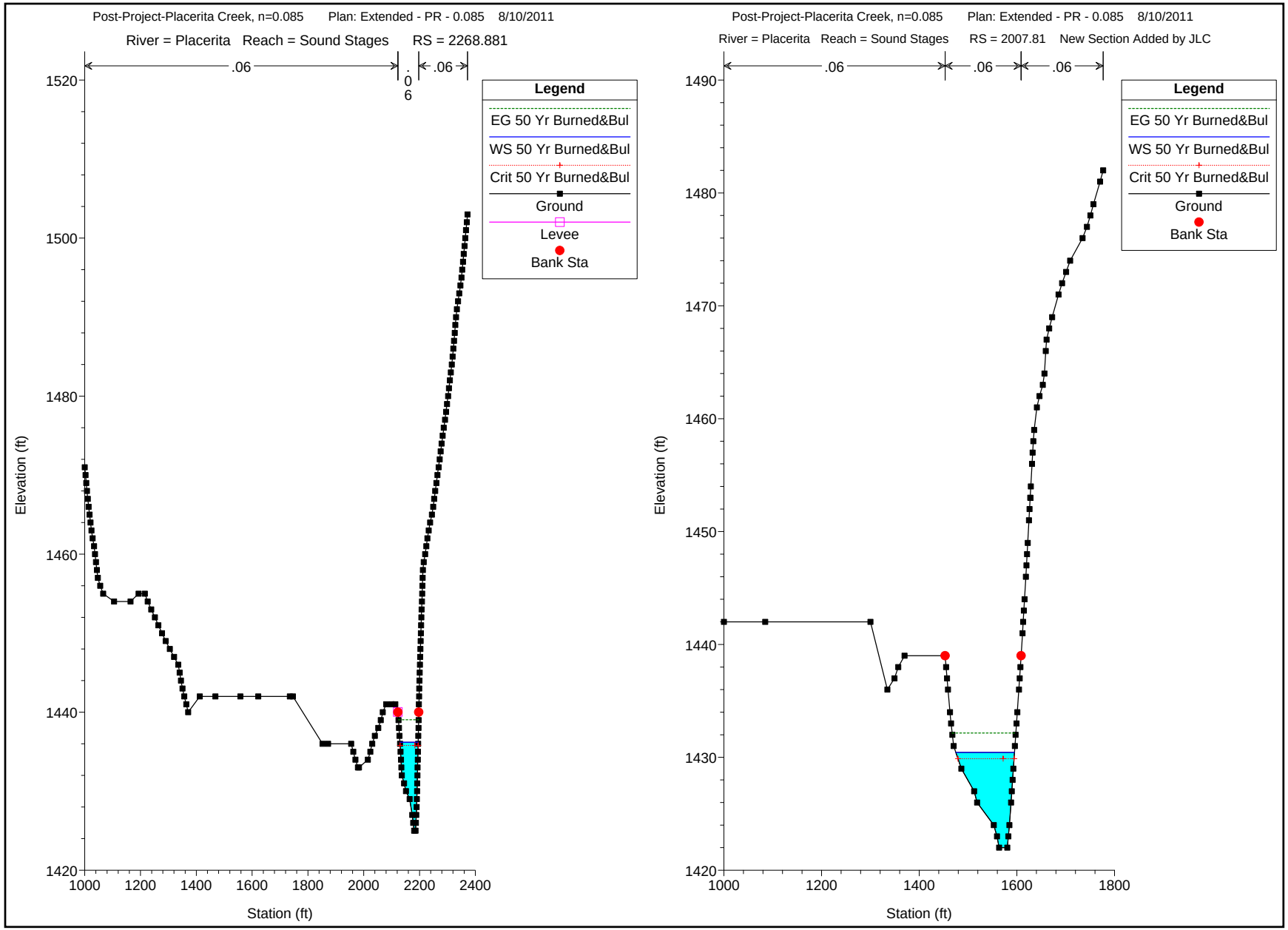

Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Lower RS = 1200
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1490
1480
1470
1460
1450
1000
1200
1400
1600
1800
2000
2200

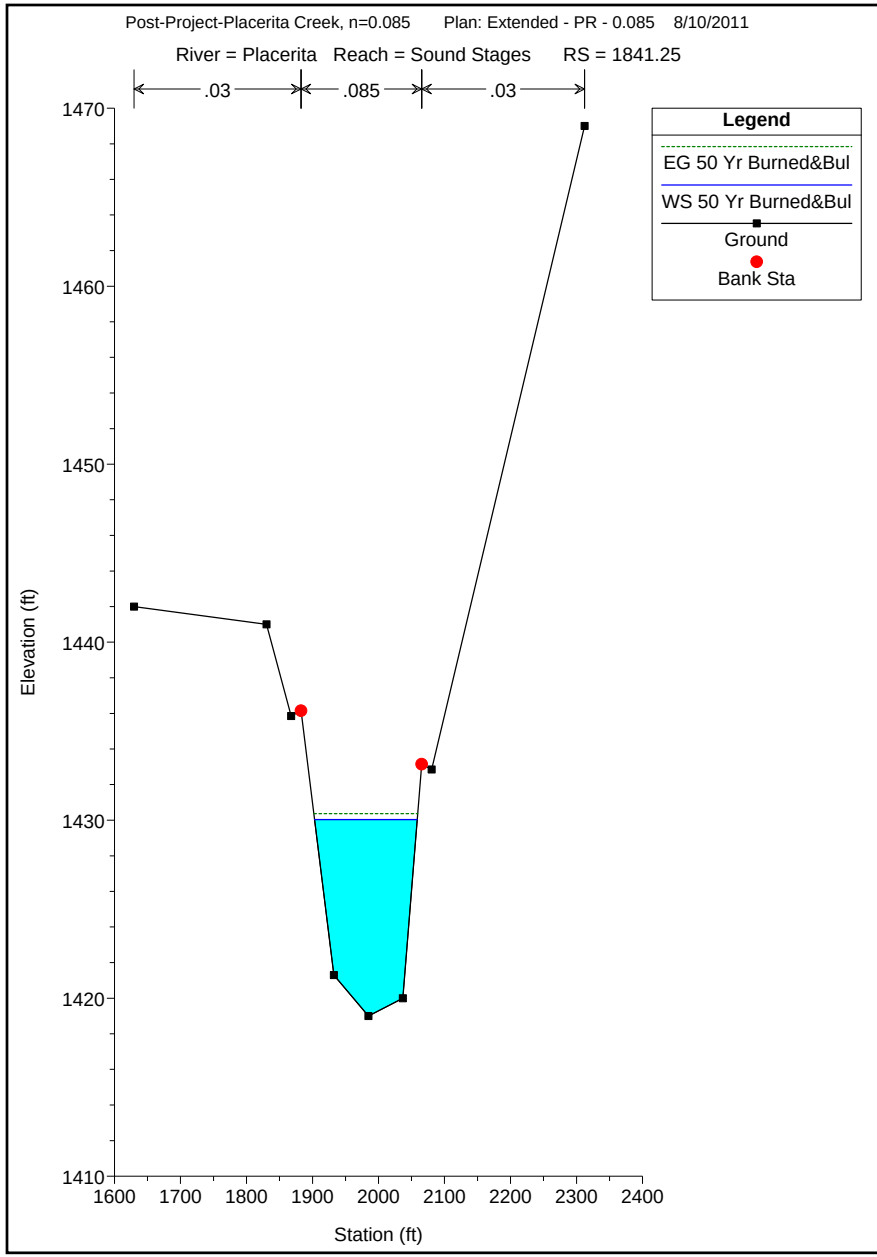

Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Lower RS = 1150 New Section added by JLC
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
1480
1475
1470
1465
1460
1455
1450
1000
1200
1400
1600
1800
2000

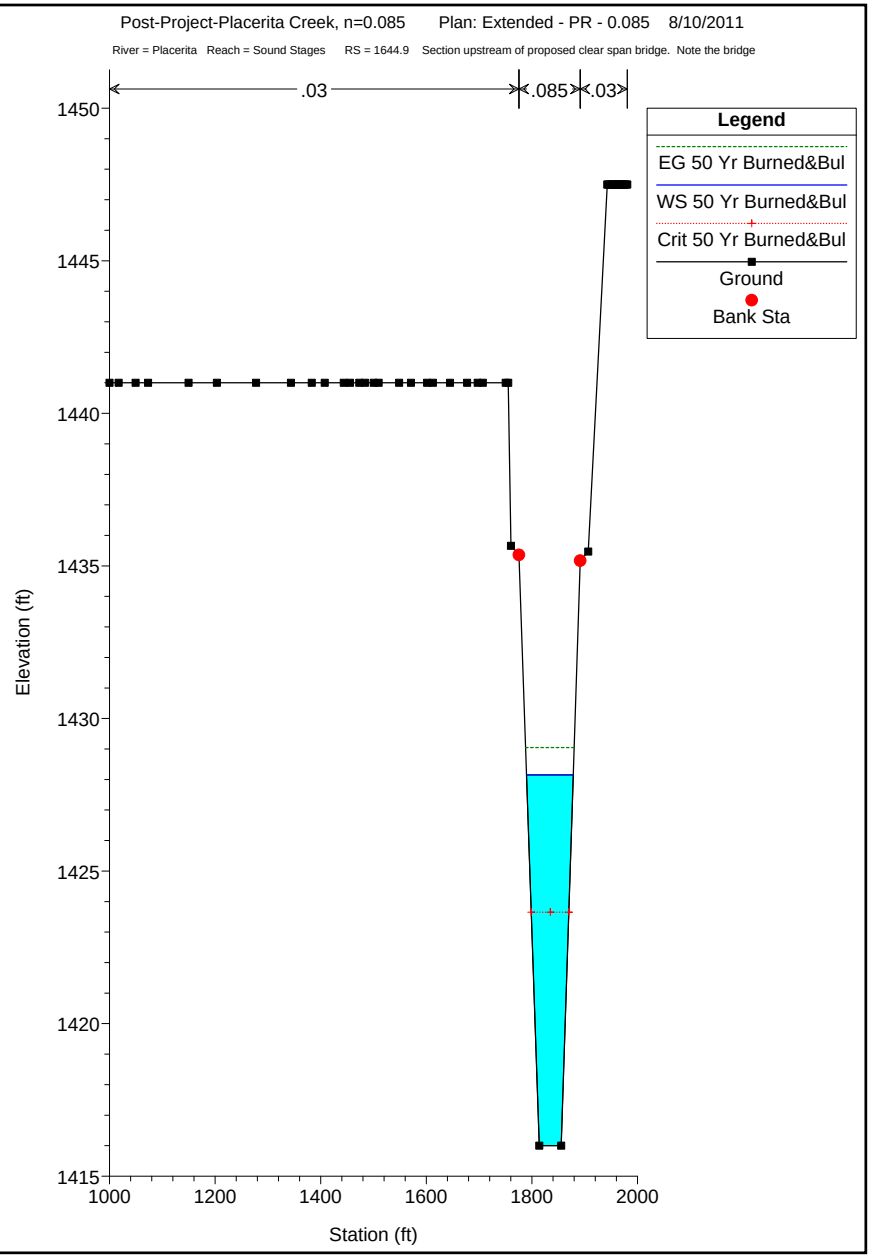

Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Lower RS = 1100
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
1490
1480
1470
1460
1450
1440
1000
1200
1400
1600
1800
2000
2200
Station (ft)

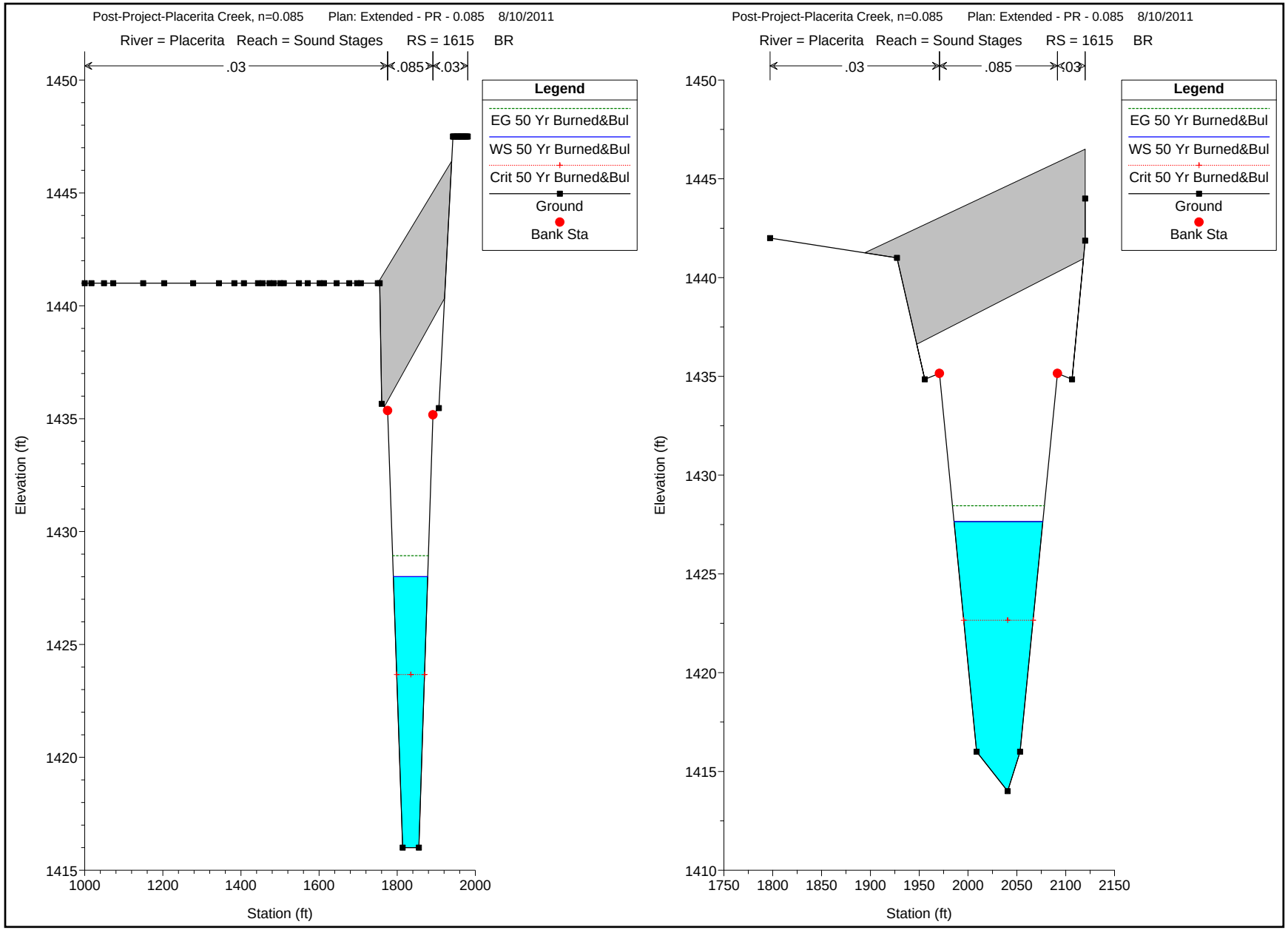

Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Lower RS = 1050 New Section added by JLC
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
1465
1460
1455
1450
1445
1440
1000
1200
1400
1600
1800
2000
2200
Station (ft)

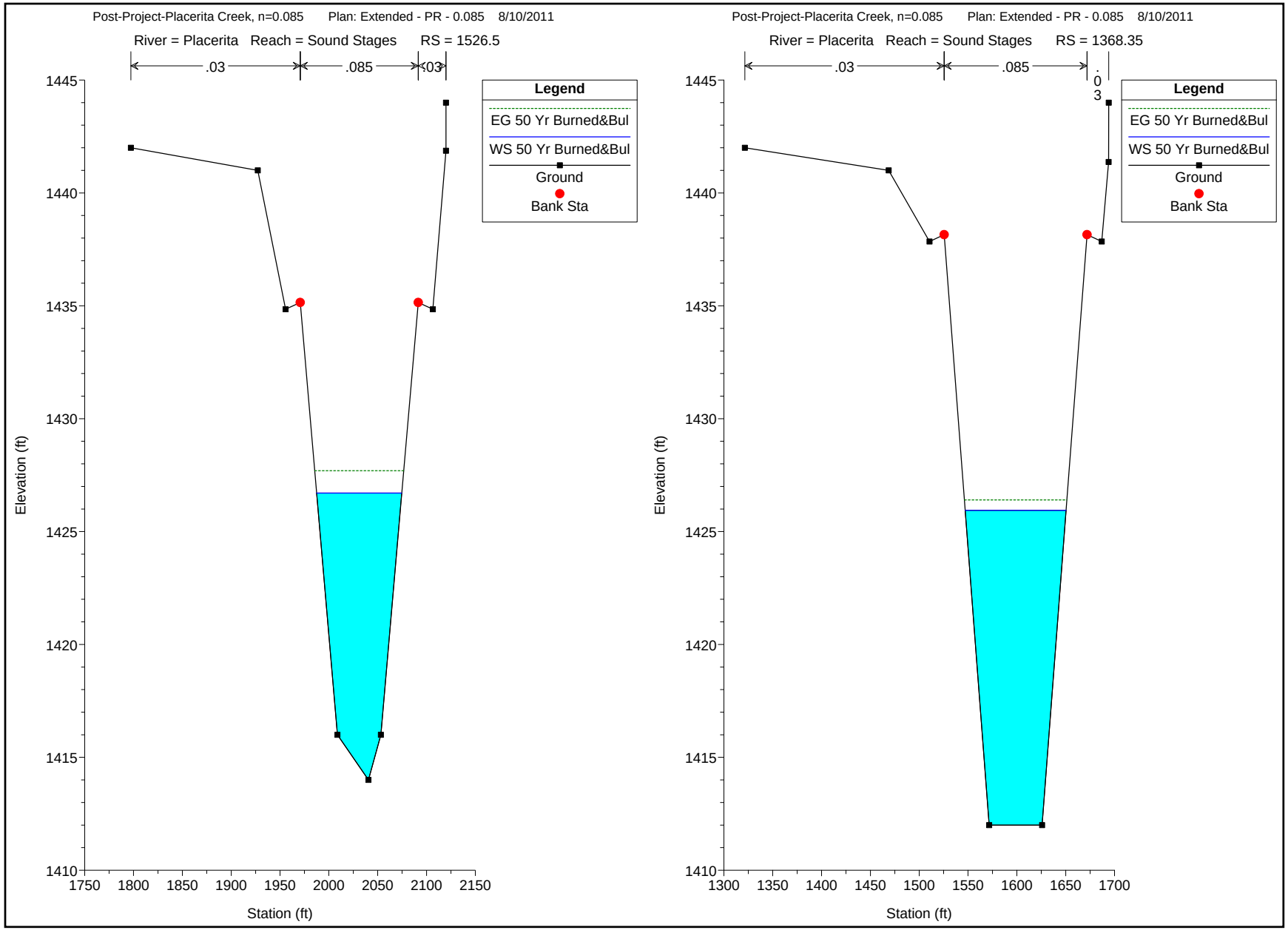

Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Lower RS = 1000
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
1470
1465
1460
1455
1450
1445
1440
1435
1000
1200
1400
1600
1800
2000
2200
Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Sound Stages RS = 2527.261
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
1520
1500
1480
1460
1440
1420
1000
1200
1400
1600
1800
2000
2200
2400
2600

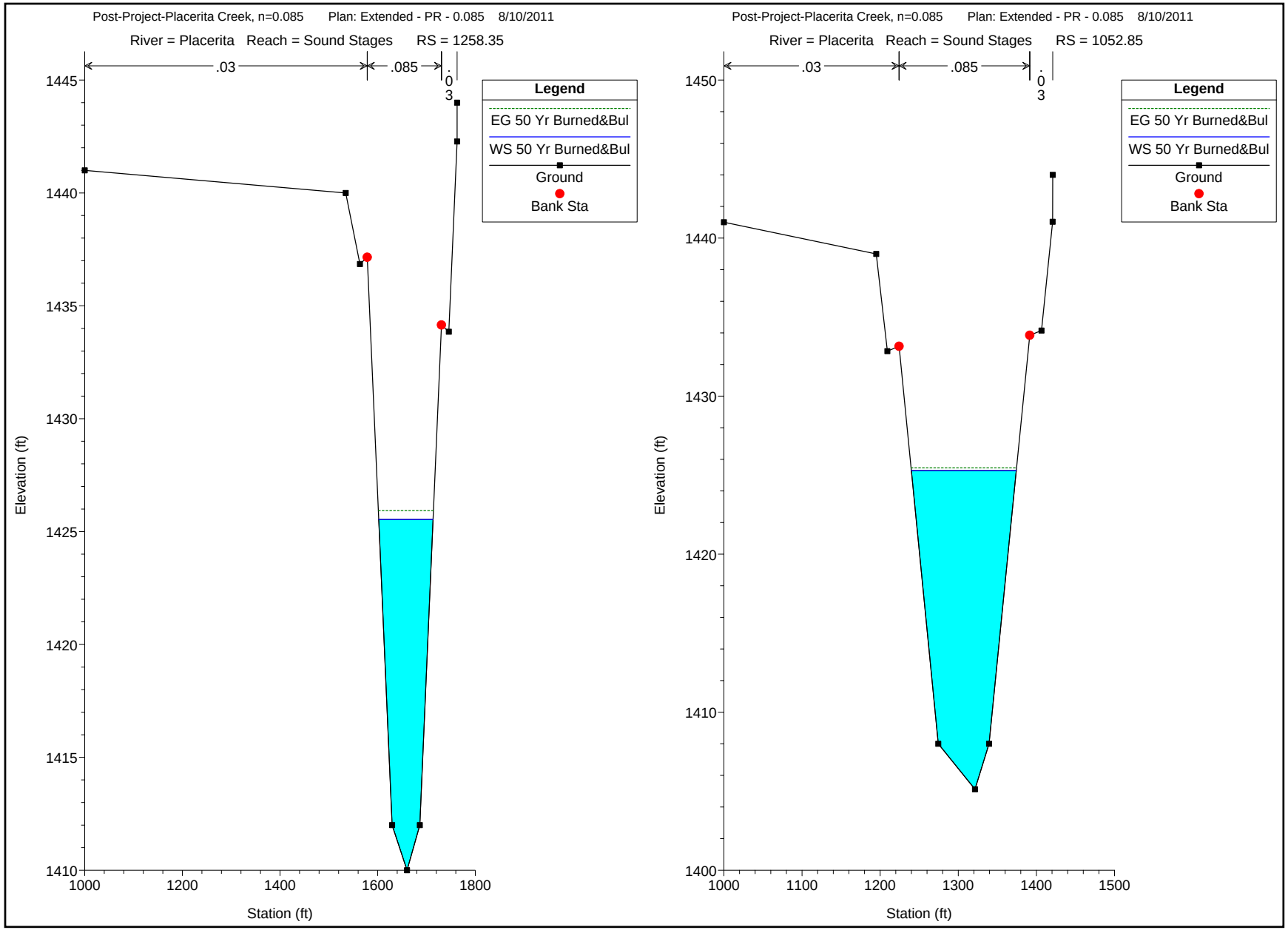

Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Sound Stages RS = 2268.881
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Sound Stages RS = 2007.81 New Section Added by JLC
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)

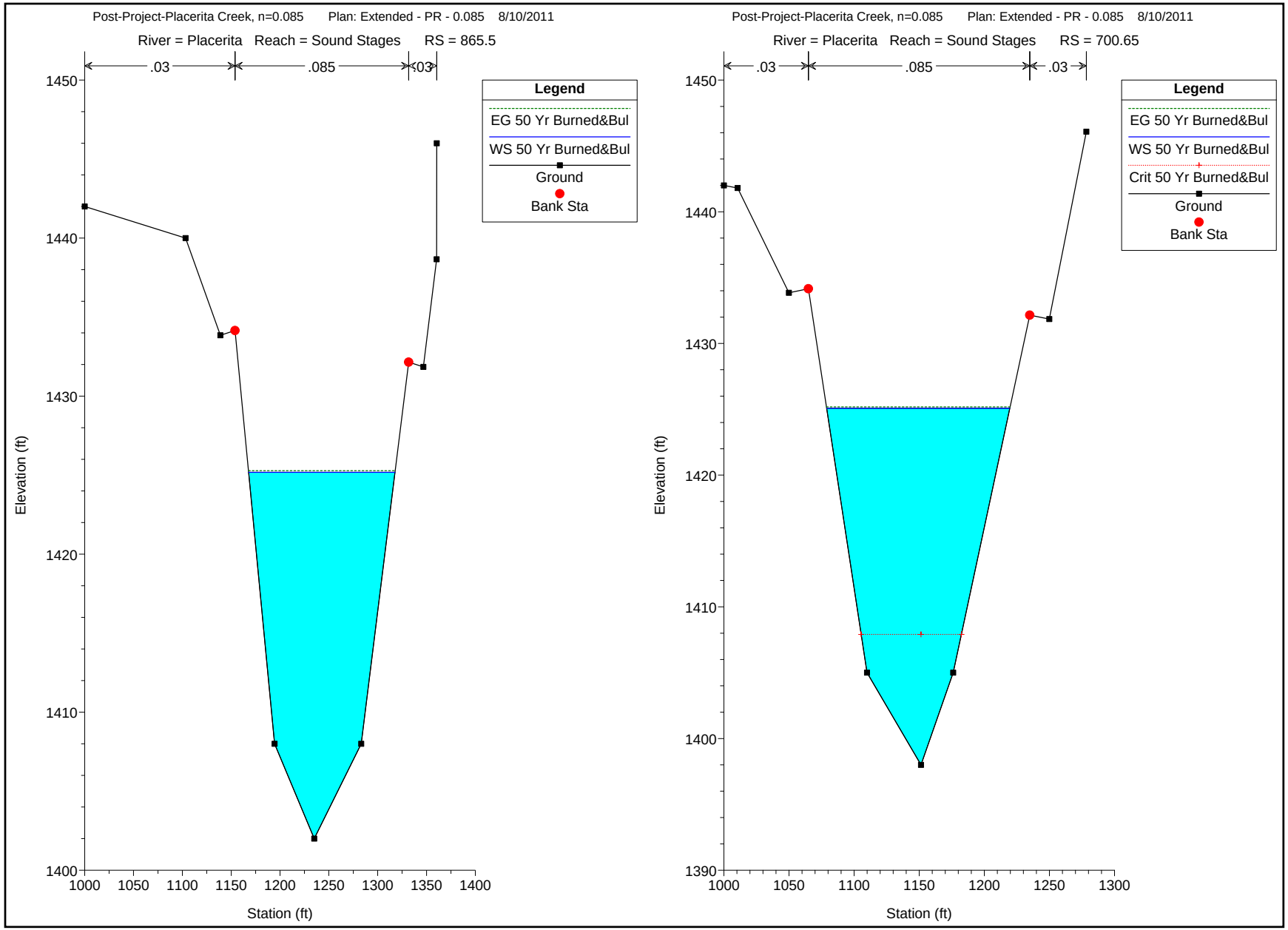

Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Sound Stages RS = 1841.25
.03
.085
.03
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1470
1460
1450
1440
1430
1420
1410
1600
1700
1800
1900
2000
2100
2200
2300
2400

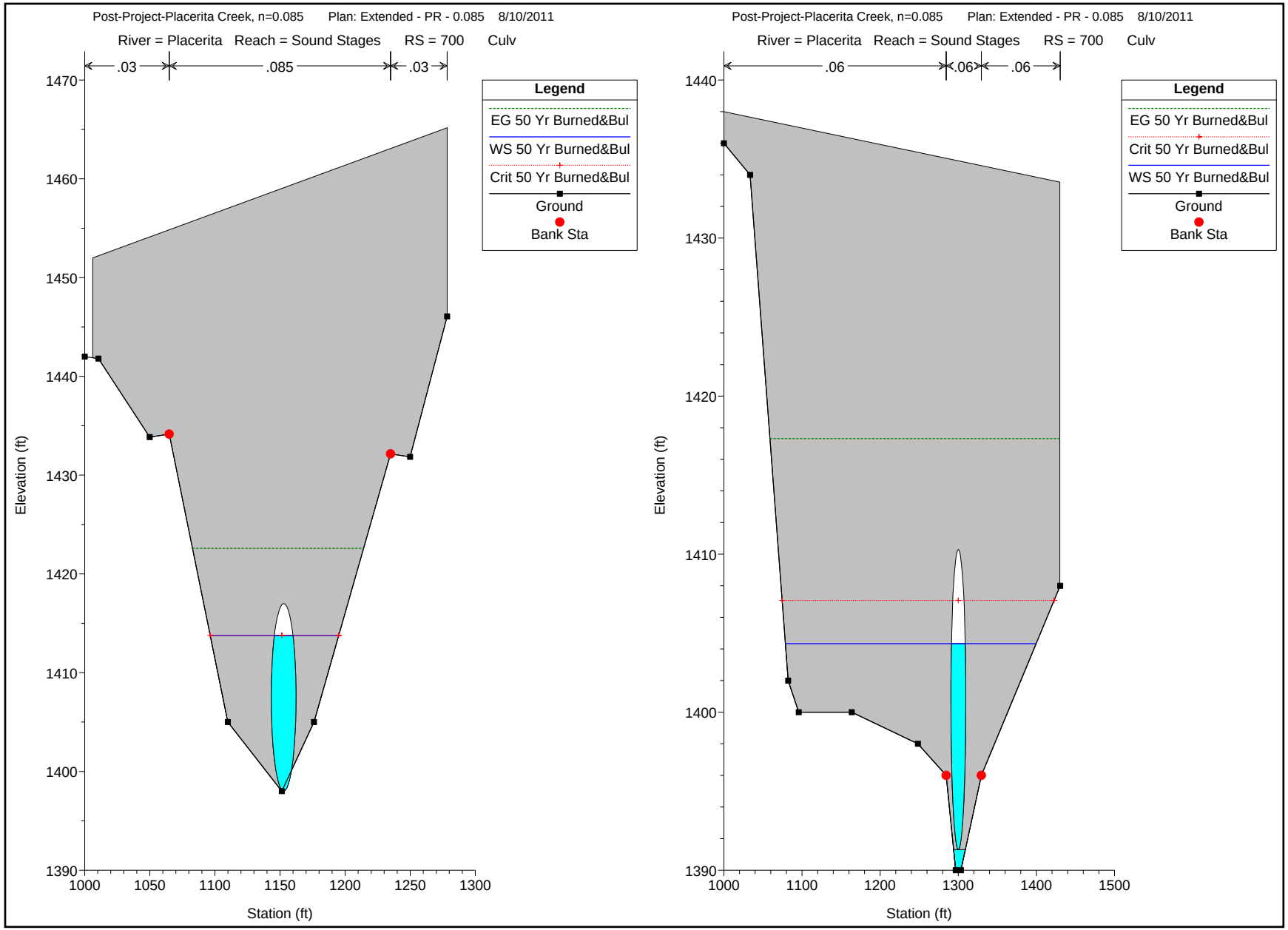

Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Sound Stages RS = 1644.9 Section upstream of proposed clear span bridge. Note the bridge
.03
.085
.03
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1445
1440
1435
1430
1425
1420
1415
1000
1200
1400
1600
1800
2000

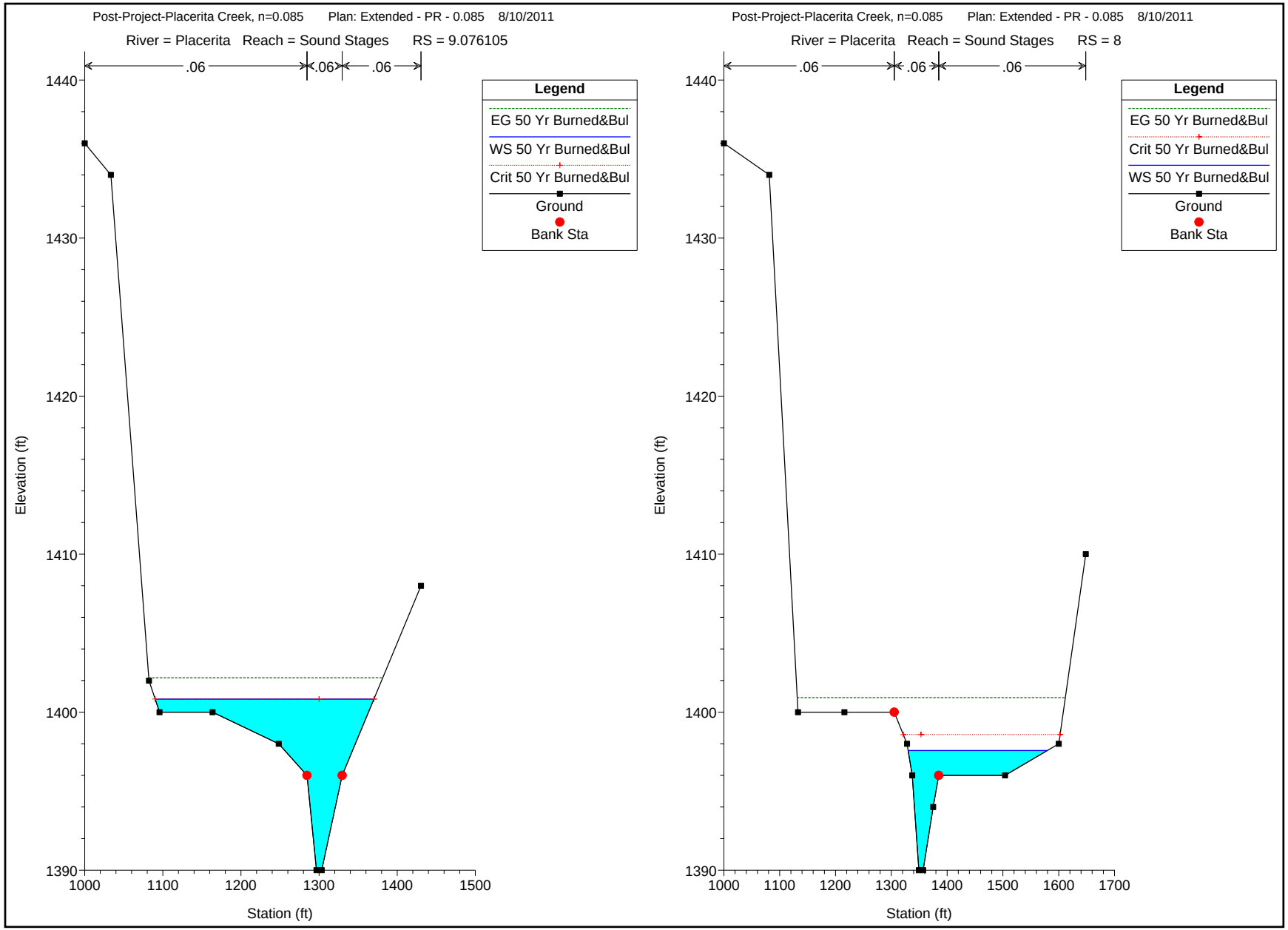

Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Sound Stages RS = 1615 BR
.03
.085
.03
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1445
1440
1435
1430
1425
1420
1415
1000
1200
1400
1600
1800
2000
Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Sound Stages RS = 1615 BR
.03
.085
.03
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1445
1440
1435
1430
1425
1420
1415
1410
1750
1800
1850
1900
1950
2000
2050
2100
2150

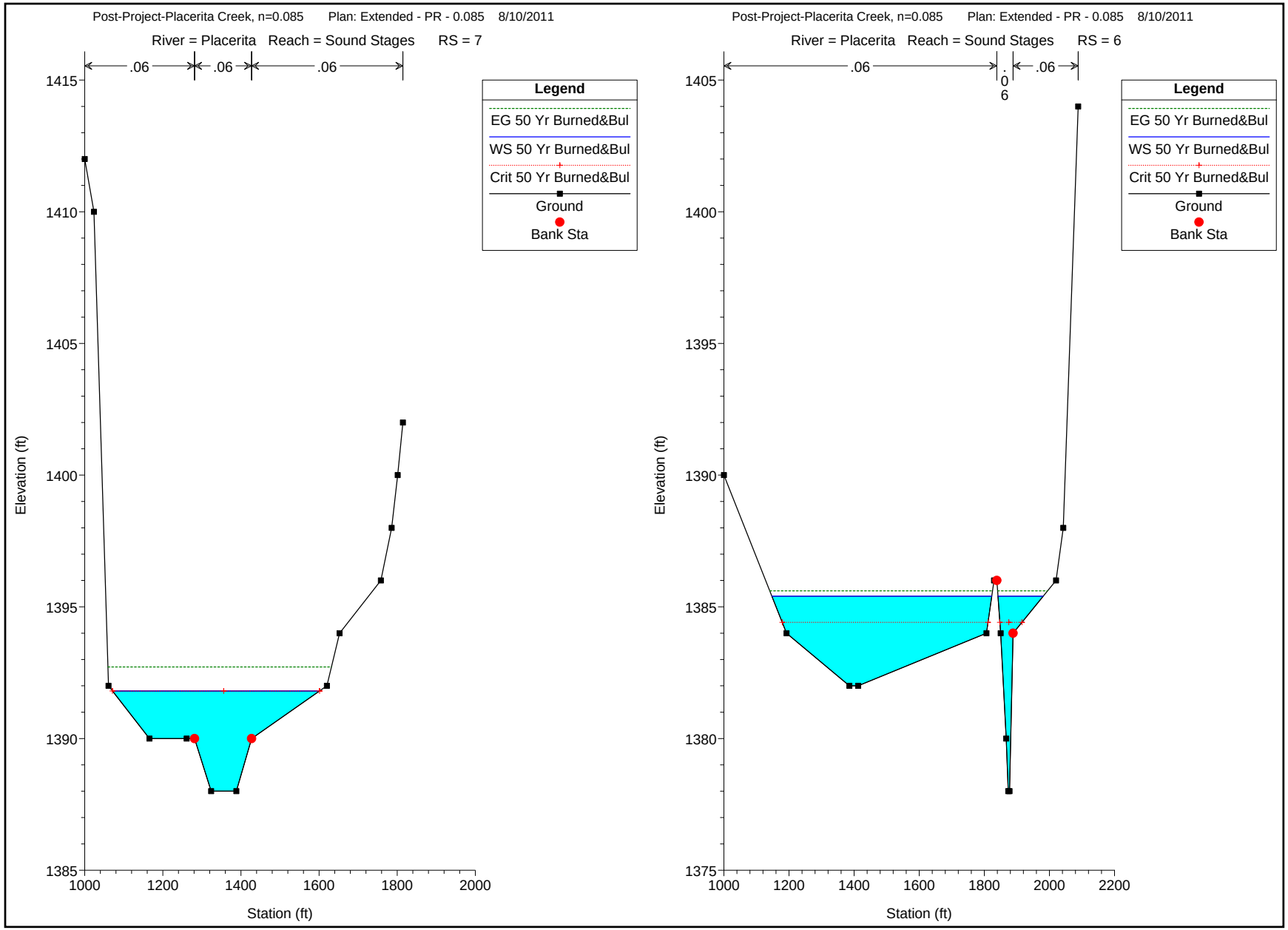

Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Sound Stages RS = 1526.5
.03
.085
.03
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
1445
1440
1435
1430
1425
1420
1415
1410
1750
1800
1850
1900
1950
2000
2050
2100
2150
Station (ft)
Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Sound Stages RS = 1368.35
.03
.085
.03
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
1445
1440
1435
1430
1425
1420
1415
1410
1300
1350
1400
1450
1500
1550
1600
1650
1700
Station (ft)

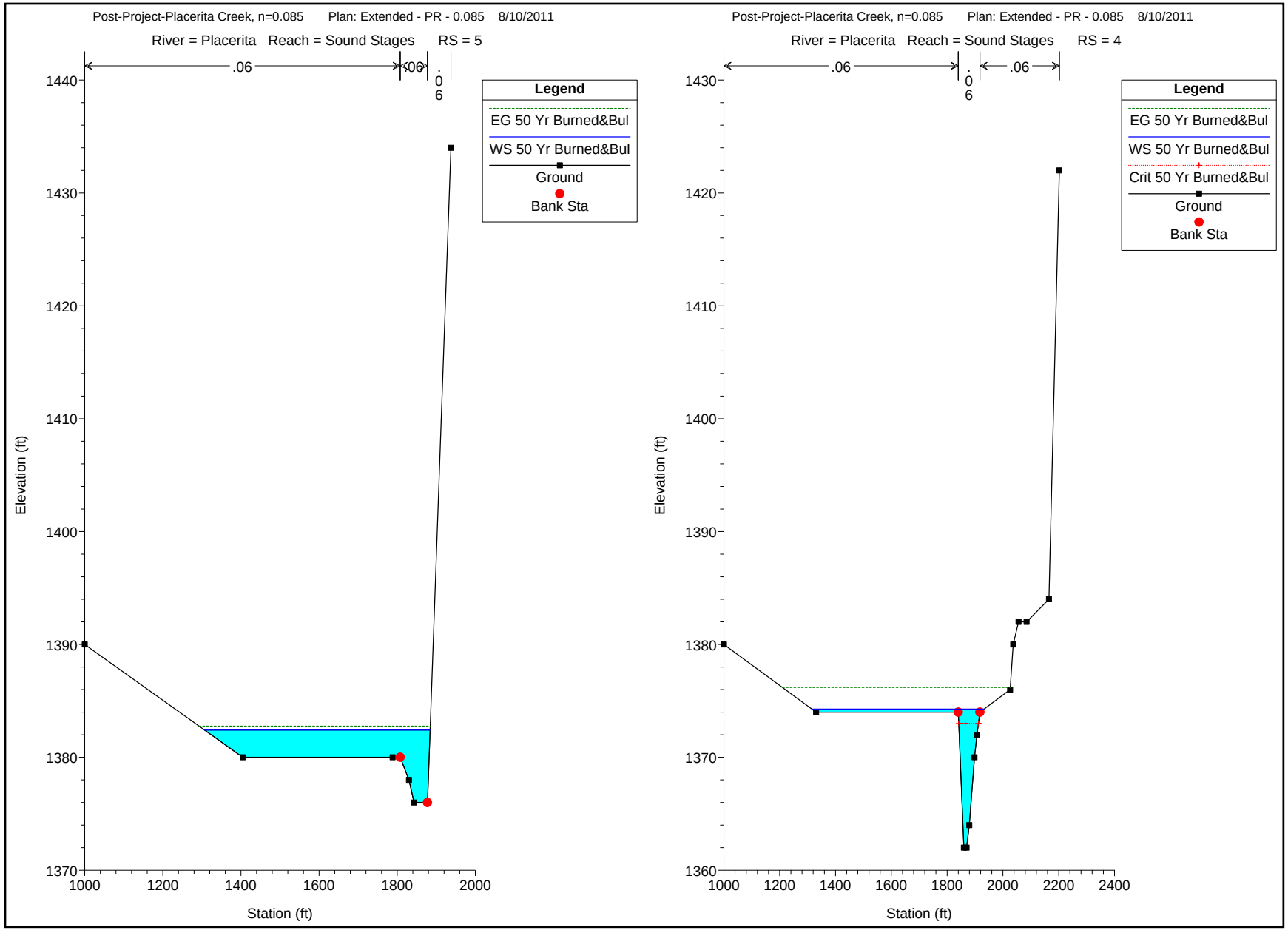

Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Sound Stages RS = 1258.35
.03
.085
.03
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1445
1440
1435
1430
1425
1420
1415
1410
1000
1200
1400
1600
1800
Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Sound Stages RS = 1052.85
.03
.085
.03
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1440
1430
1420
1410
1400
1000
1100
1200
1300
1400
1500

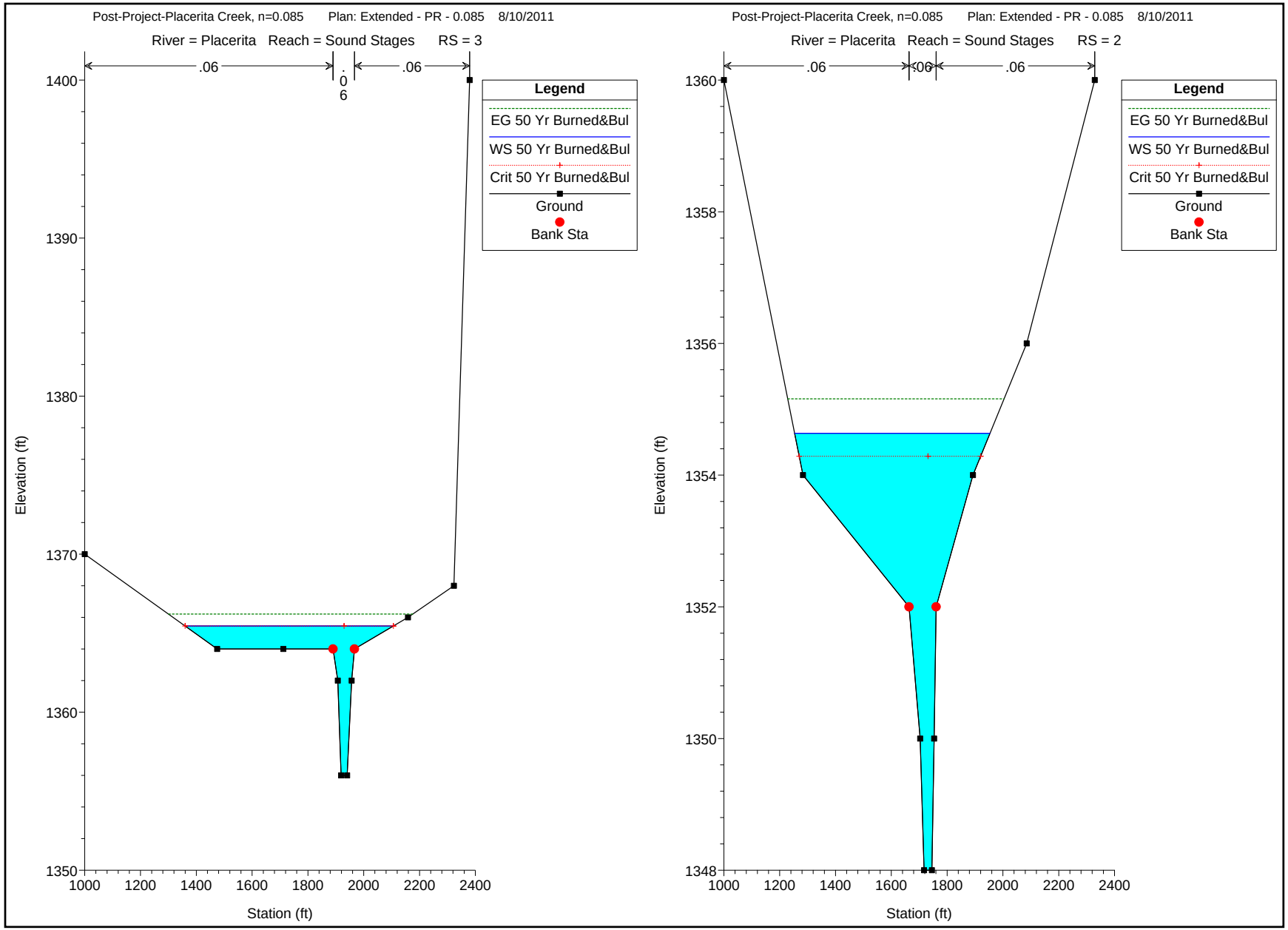

Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Sound Stages RS = 865.5
.03
.085
.03
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1440
1430
1420
1410
1400
1000
1050
1100
1150
1200
1250
1300
1350
1400
Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Sound Stages RS = 700.65
.03
.085
.03
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1440
1430
1420
1410
1400
1390
1000
1050
1100
1150
1200
1250
1300


Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Sound Stages RS = 700 Culv
.03
.085
.03
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1470
1460
1450
1440
1430
1420
1410
1400
1390
1000
1050
1100
1150
1200
1250
1300
Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Sound Stages RS = 700 Culv
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500


Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Sound Stages RS = 9.076105
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500
Station (ft)
Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Sound Stages RS = 8
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500
1600
1700
Station (ft)


Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Sound Stages RS = 7
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
1415
1410
1405
1400
1395
1390
1385
1000
1200
1400
1600
1800
2000
Station (ft)
Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Sound Stages RS = 6
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
1405
1400
1395
1390
1385
1380
1375
1000
1200
1400
1600
1800
2000
2200
Station (ft)

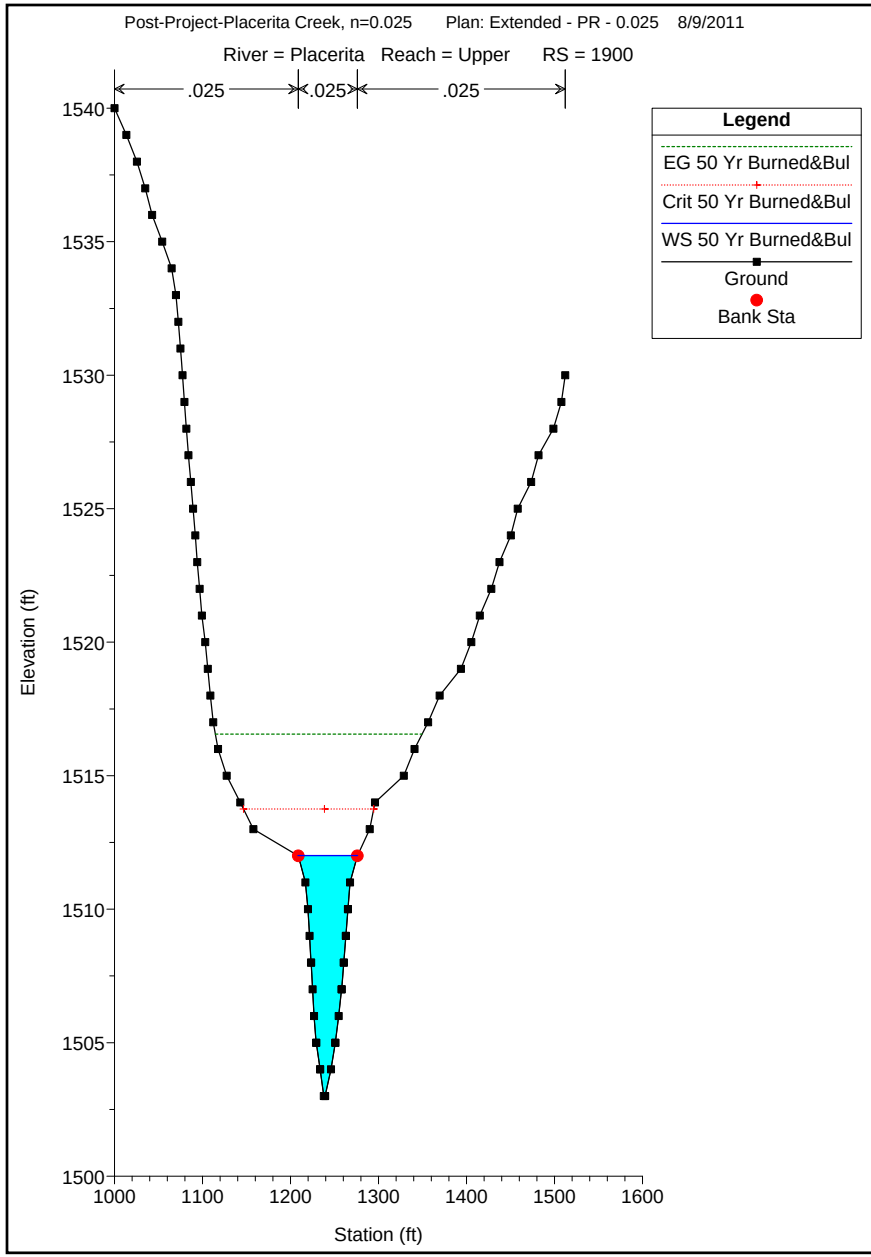

Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Sound Stages RS = 5
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Sound Stages RS = 4
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)

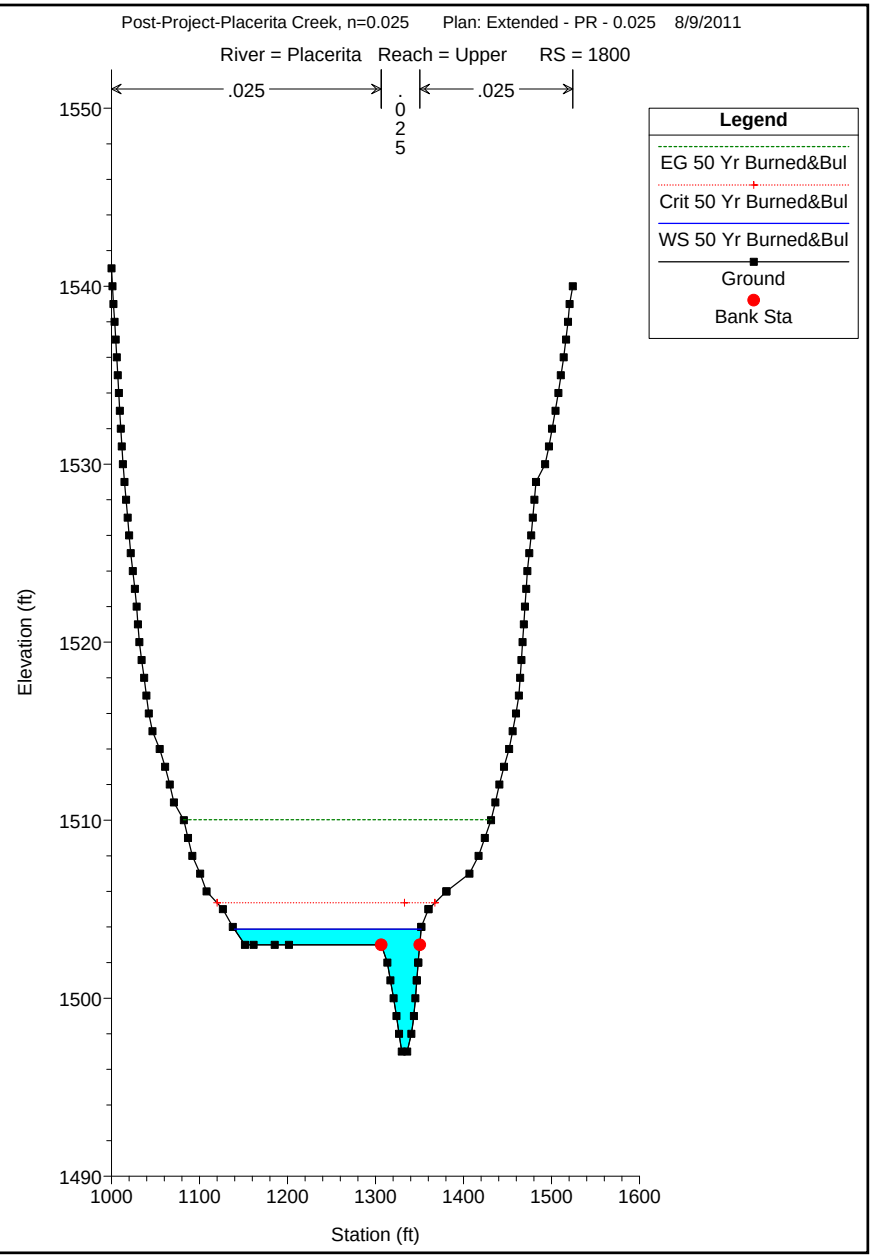

Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Sound Stages RS = 3
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita Creek, n=0.085 Plan: Extended - PR - 0.085 8/10/2011
River = Placerita Reach = Sound Stages RS = 2
.06
.06
.06
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)

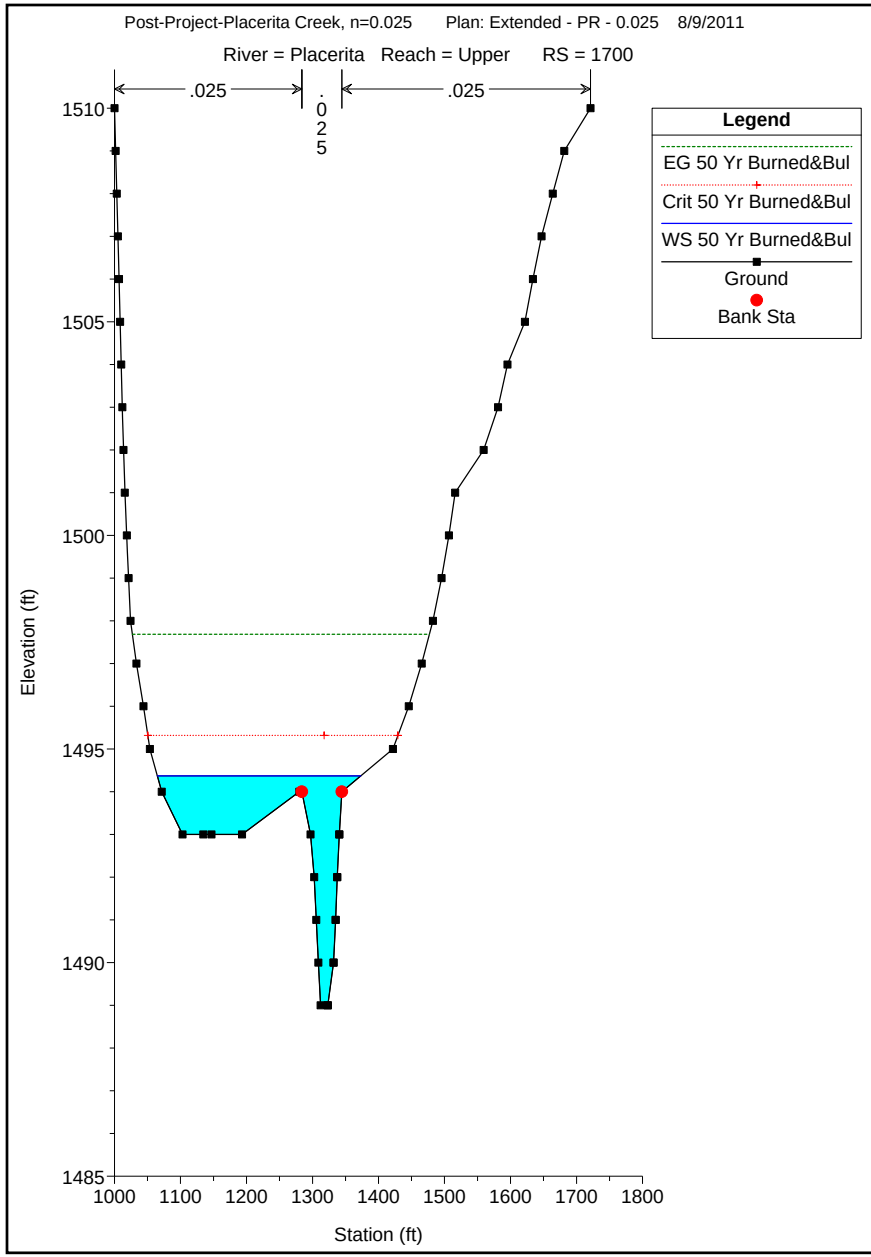
50-Year Storm Event – HEC-RAS for Maximum Scour (n value = 0.025)

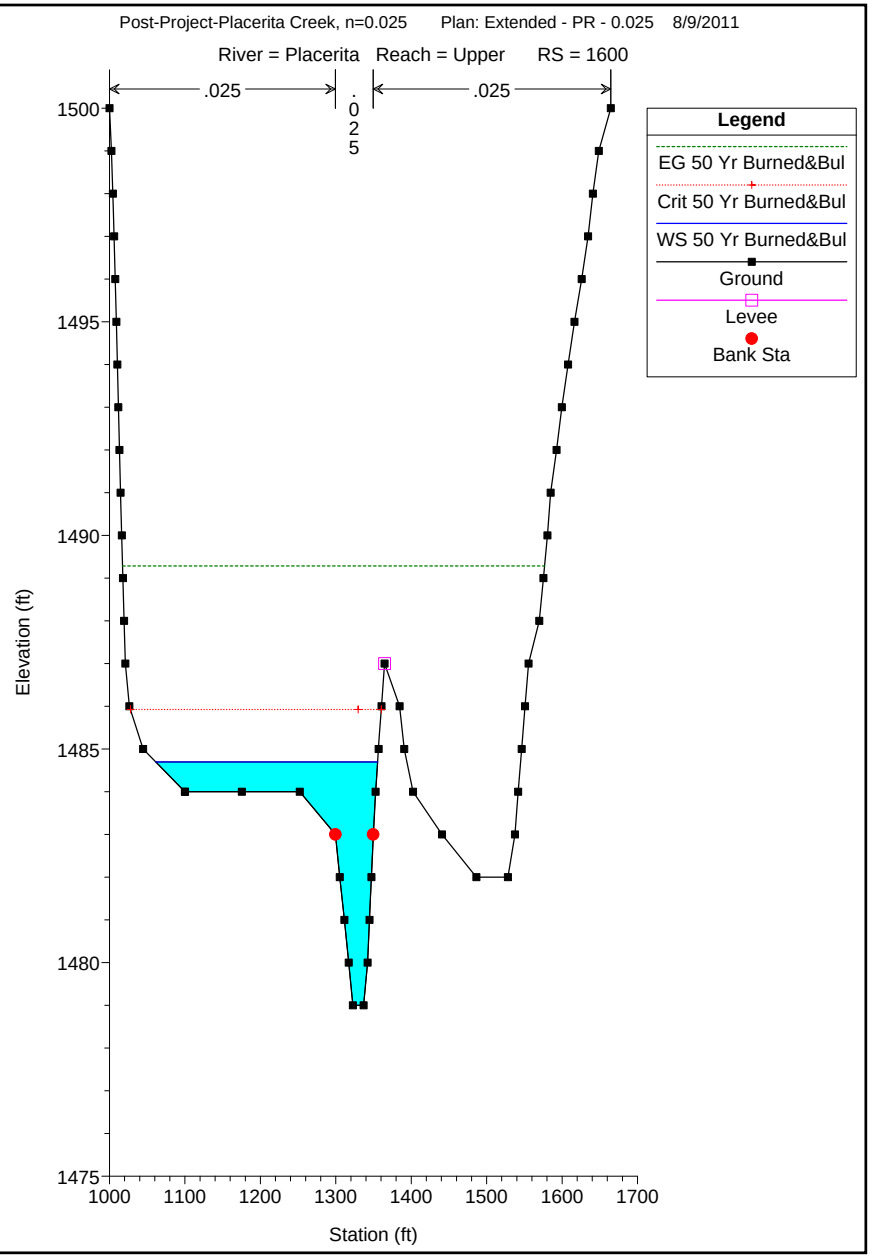
HEC-RAS Plan: Ex_PR_0.025 Profile: 50 Yr Burned&Bul

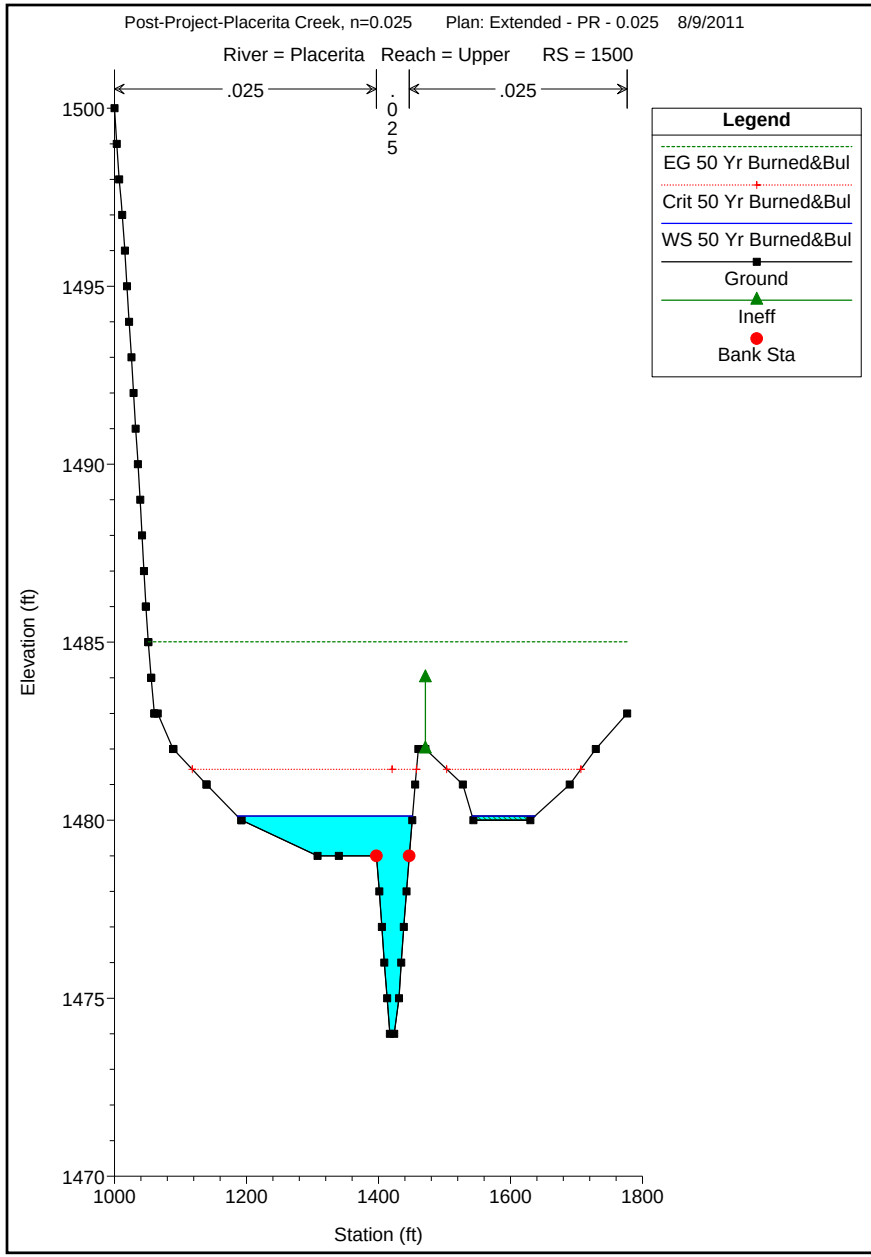
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Upper	1900	50 Yr Burned&Bul	5214.80	1503.00	1512.01	1513.75	1516.56	0.011712	17.11	304.72	67.81	1.42
Upper	1800	50 Yr Burned&Bul	5214.80	1497.00	1503.88	1505.36	1510.03	0.021211	22.03	328.77	212.23	1.88
Upper	1700	50 Yr Burned&Bul	5214.80	1489.00	1494.37	1495.32	1497.68	0.019117	17.28	423.07	308.20	1.73
Upper	1600	50 Yr Burned&Bul	5214.80	1479.00	1484.70	1485.92	1489.29	0.014923	19.05	398.02	294.17	1.61
Upper	1500	50 Yr Burned&Bul	5214.80	1474.00	1480.12	1481.43	1485.01	0.017836	19.87	376.26	361.15	1.74
Upper	1400	50 Yr Burned&Bul	5214.80	1470.00	1476.10	1476.92	1478.96	0.015519	13.63	389.37	170.04	1.51
Tributary	510	50 Yr Burned&Bul	874.10	1545.00	1547.90	1548.94	1552.05	0.033807	16.35	53.46	28.39	2.10
Tributary	410	50 Yr Burned&Bul	874.10	1524.00	1527.37	1527.91	1530.01	0.036322	14.90	85.41	151.79	2.10
Tributary	310	50 Yr Burned&Bul	874.10	1503.00	1505.40	1505.85	1506.82	0.023560	9.66	94.55	110.99	1.63
Tributary	210	50 Yr Burned&Bul	874.10	1486.00	1488.77	1489.71	1491.52	0.024603	13.30	65.72	37.91	1.78
Tributary	110	50 Yr Burned&Bul	874.10	1479.00	1482.59	1483.30	1484.98	0.015024	13.08	88.77	122.17	1.45
Tributary	10	50 Yr Burned&Bul	874.10	1471.00	1475.68	1476.66	1478.96	0.016772	14.53	60.14	20.46	1.49
Sound Stages	2527.261	50 Yr Burned&Bul	6211.80	1432.00	1440.58	1442.27	1446.42	0.011618	19.40	320.23	56.58	1.44
Sound Stages	2268.881	50 Yr Burned&Bul	6211.80	1425.00	1433.30	1435.96	1441.98	0.023879	23.65	262.65	58.75	1.97
Sound Stages	2007.81	50 Yr Burned&Bul	6211.80	1422.00	1427.84	1430.00	1434.84	0.027104	21.24	292.46	89.57	2.07
Sound Stages	1841.25	50 Yr Burned&Bul	6211.80	1419.00	1422.52	1424.53	1429.58	0.037248	21.32	291.34	114.18	2.35
Sound Stages	1644.9	50 Yr Burned&Bul	6211.80	1416.00	1425.33	1423.79	1427.28	0.002788	11.21	554.15	77.57	0.74
Sound Stages	1615		Bridge									
Sound Stages	1526.5	50 Yr Burned&Bul	6211.80	1414.00	1425.39		1426.86	0.001869	9.73	638.30	81.93	0.61
Sound Stages	1368.35	50 Yr Burned&Bul	6211.80	1412.00	1425.95		1426.45	0.000424	5.65	1098.99	103.37	0.31
Sound Stages	1258.35	50 Yr Burned&Bul	6211.80	1410.00	1425.99		1426.37	0.000311	4.99	1244.42	113.10	0.27
Sound Stages	1052.85	50 Yr Burned&Bul	6211.80	1405.12	1426.11		1426.27	0.000095	3.22	1927.85	137.55	0.15
Sound Stages	865.5	50 Yr Burned&Bul	6211.80	1402.00	1426.14		1426.24	0.000049	2.52	2461.76	153.32	0.11
Sound Stages	700.65	50 Yr Burned&Bul	6211.80	1398.00	1426.14	1408.06	1426.23	0.000046	2.53	2459.22	144.57	0.11
Sound Stages	700		Culvert									
Sound Stages	9.076105	50 Yr Burned&Bul	6211.80	1390.00	1400.91	1400.91	1402.28	0.002161	11.04	845.61	281.28	0.67
Sound Stages	8	50 Yr Burned&Bul	6211.80	1390.00	1397.40	1398.63	1401.78	0.015430	19.11	448.13	240.22	1.62
Sound Stages	7	50 Yr Burned&Bul	6259.10	1388.00	1390.71	1391.82	1394.79	0.030072	17.19	434.98	367.67	2.06
Sound Stages	6	50 Yr Burned&Bul	6259.10	1378.00	1384.05	1384.42	1385.34	0.011890	13.51	793.54	657.70	1.33
Sound Stages	5	50 Yr Burned&Bul	6259.10	1376.00	1381.49	1381.62	1382.46	0.004104	10.12	967.94	539.33	0.86
Sound Stages	4	50 Yr Burned&Bul	6259.10	1362.00	1370.81	1373.01	1377.59	0.014527	20.89	299.59	56.46	1.60
Sound Stages	3	50 Yr Burned&Bul	5943.50	1356.00	1364.16	1365.35	1368.31	0.010583	16.51	421.97	520.30	1.36
Sound Stages	2	50 Yr Burned&Bul	5943.50	1348.00	1352.94	1354.24	1357.10	0.017325	17.10	428.92	337.15	1.67
Lower	1300	50 Yr Burned&Bul	5993.30	1468.00	1473.34	1474.58	1477.21	0.012080	16.61	424.68	182.37	1.43
Lower	1250	50 Yr Burned&Bul	5993.30	1463.00	1468.80	1470.15	1472.94	0.017037	18.80	428.93	226.60	1.69
Lower	1200	50 Yr Burned&Bul	5993.30	1459.00	1464.54	1465.52	1468.43	0.015188	18.64	518.22	424.10	1.62
Lower	1150	50 Yr Burned&Bul	5993.30	1453.00	1463.01	1463.01	1463.56	0.001327	7.71	1311.13	579.07	0.51
Lower	1100	50 Yr Burned&Bul	5993.30	1447.00	1453.69	1455.72	1461.20	0.018795	22.28	301.50	167.53	1.80
Lower	1050	50 Yr Burned&Bul	5993.30	1443.00	1454.56	1452.18	1454.64	0.000181	3.21	2991.92	866.87	0.20
Lower	1000	50 Yr Burned&Bul	5993.30	1439.00	1450.67	1450.67	1454.17	0.005481	15.02	399.12	56.69	1.00

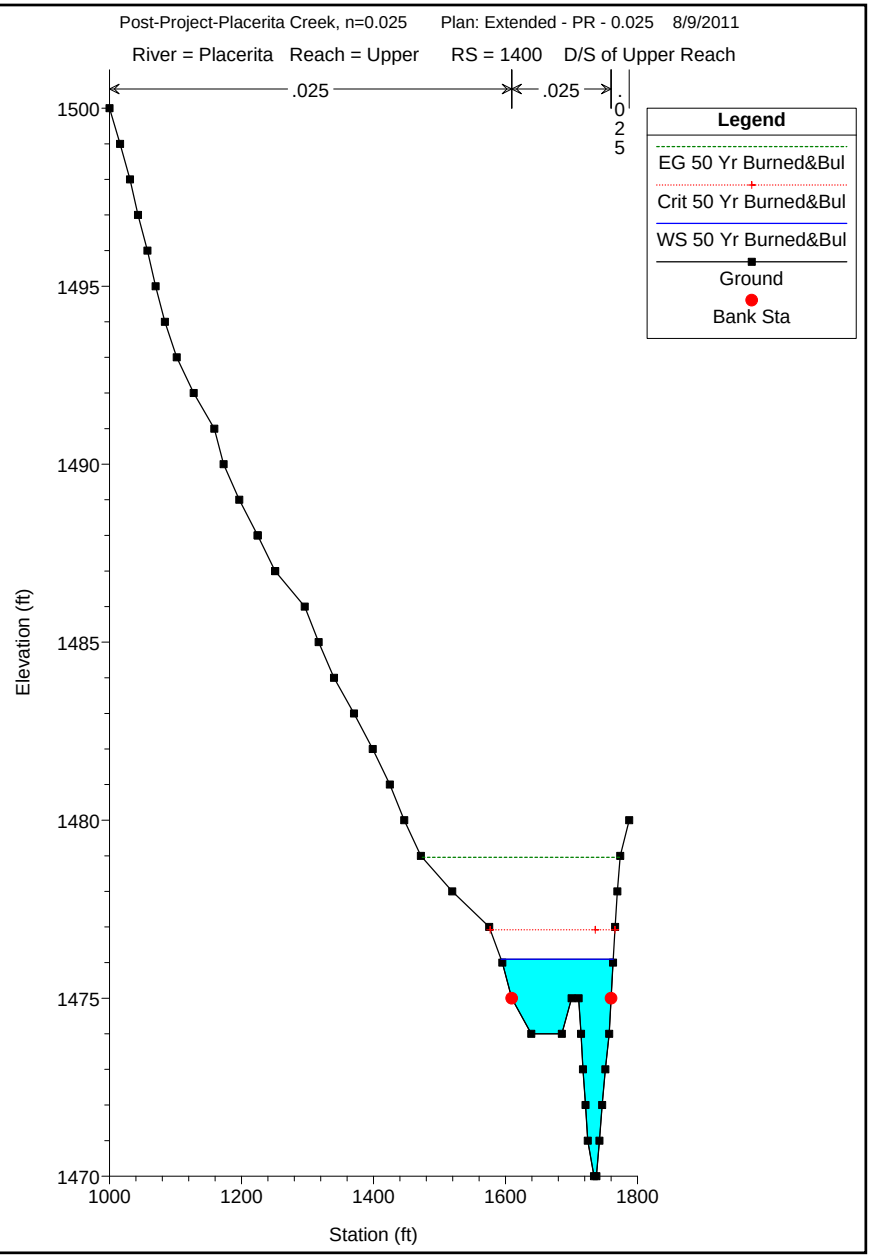

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Upper RS = 1900
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1540
1535
1530
1525
1520
1515
1510
1505
1500
1000
1100
1200
1300
1400
1500
1600

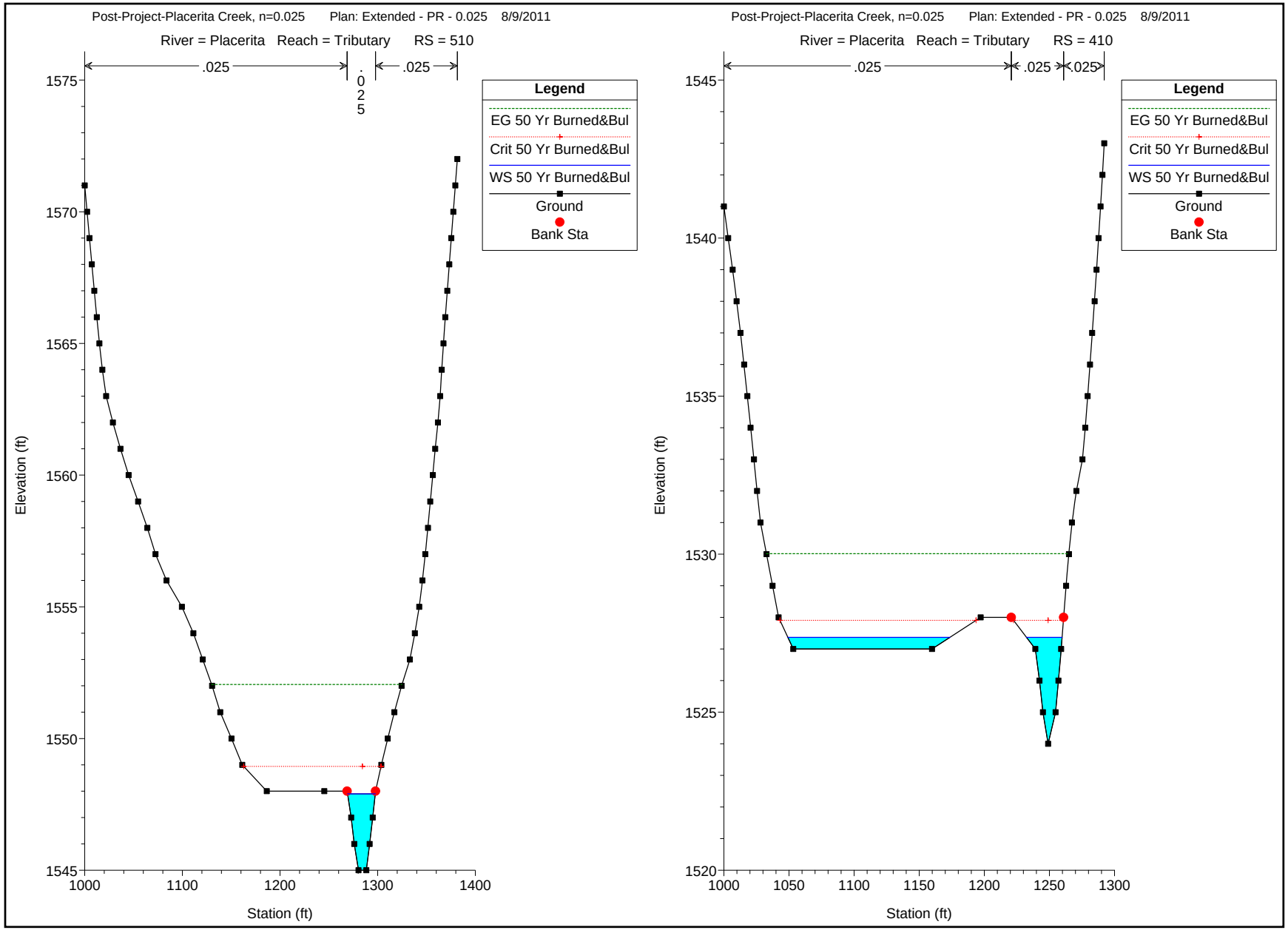

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Upper RS = 1800
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1550
1540
1530
1520
1510
1500
1490
1000
1100
1200
1300
1400
1500
1600

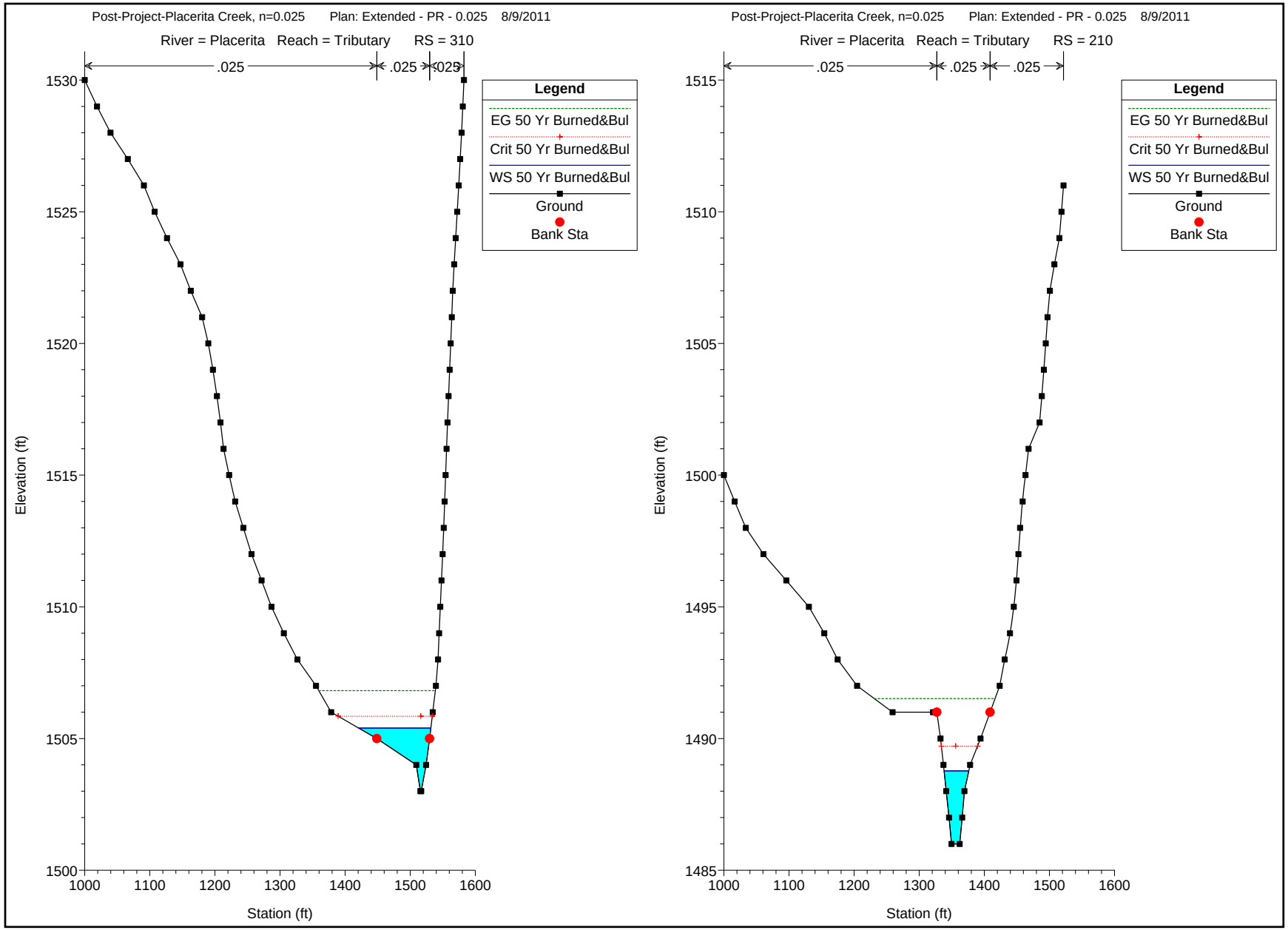

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Upper RS = 1700
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1510
1505
1500
1495
1490
1485
1000
1100
1200
1300
1400
1500
1600
1700
1800

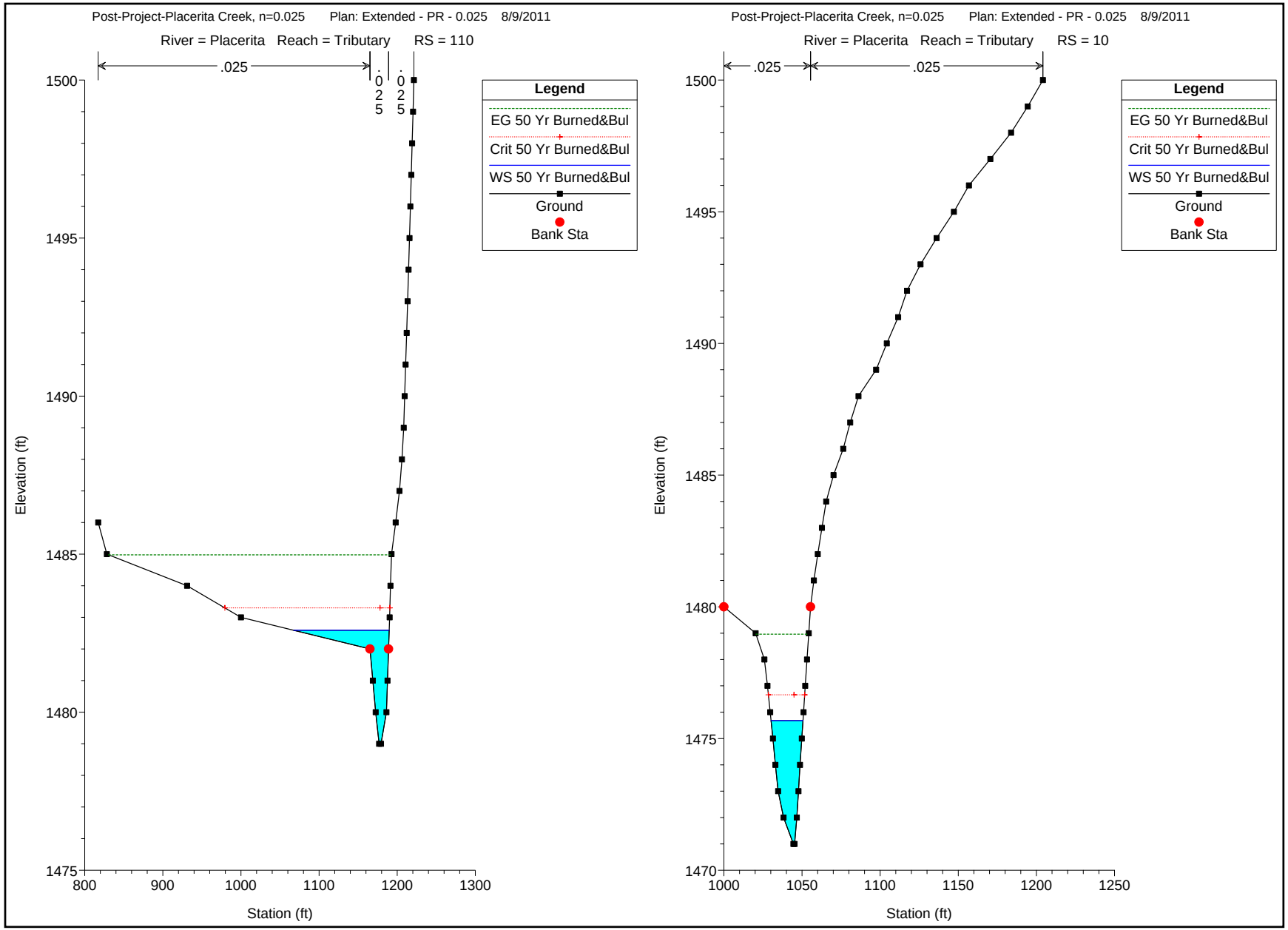

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Upper RS = 1600
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1000
1100
1200
1300
1400
1500
1600
1700

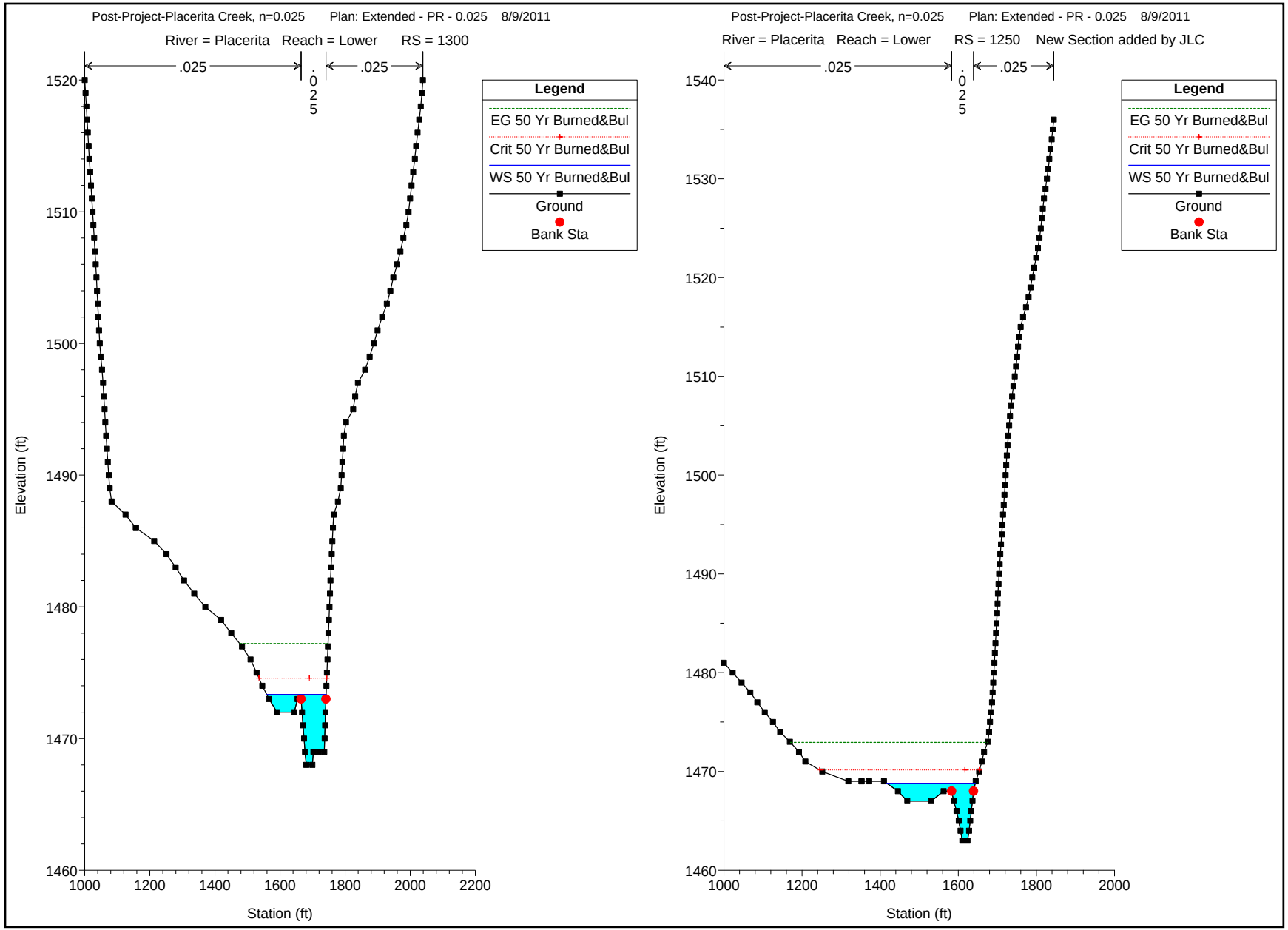

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Upper RS = 1500
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1200
1400
1600
1800

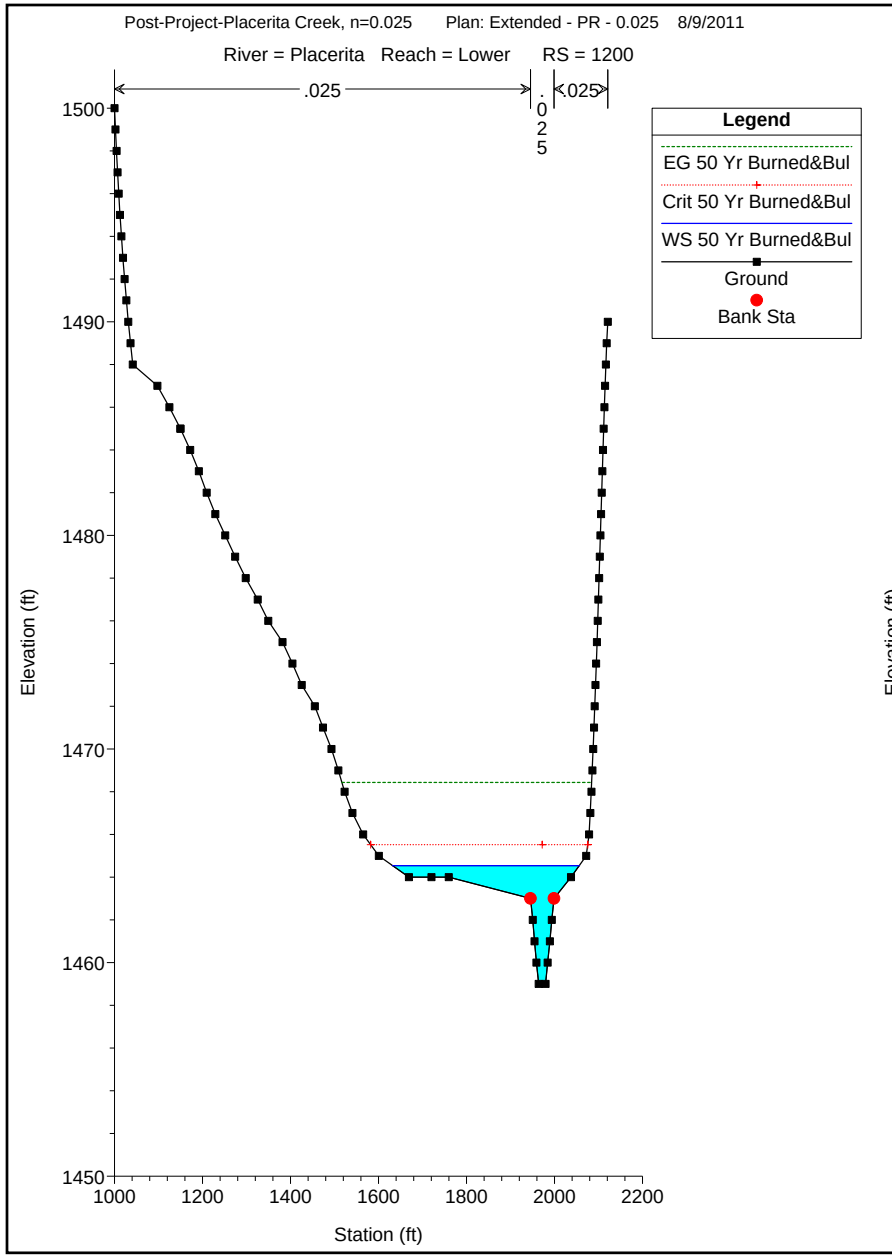

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Upper RS = 1400 D/S of Upper Reach
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1200
1400
1600
1800

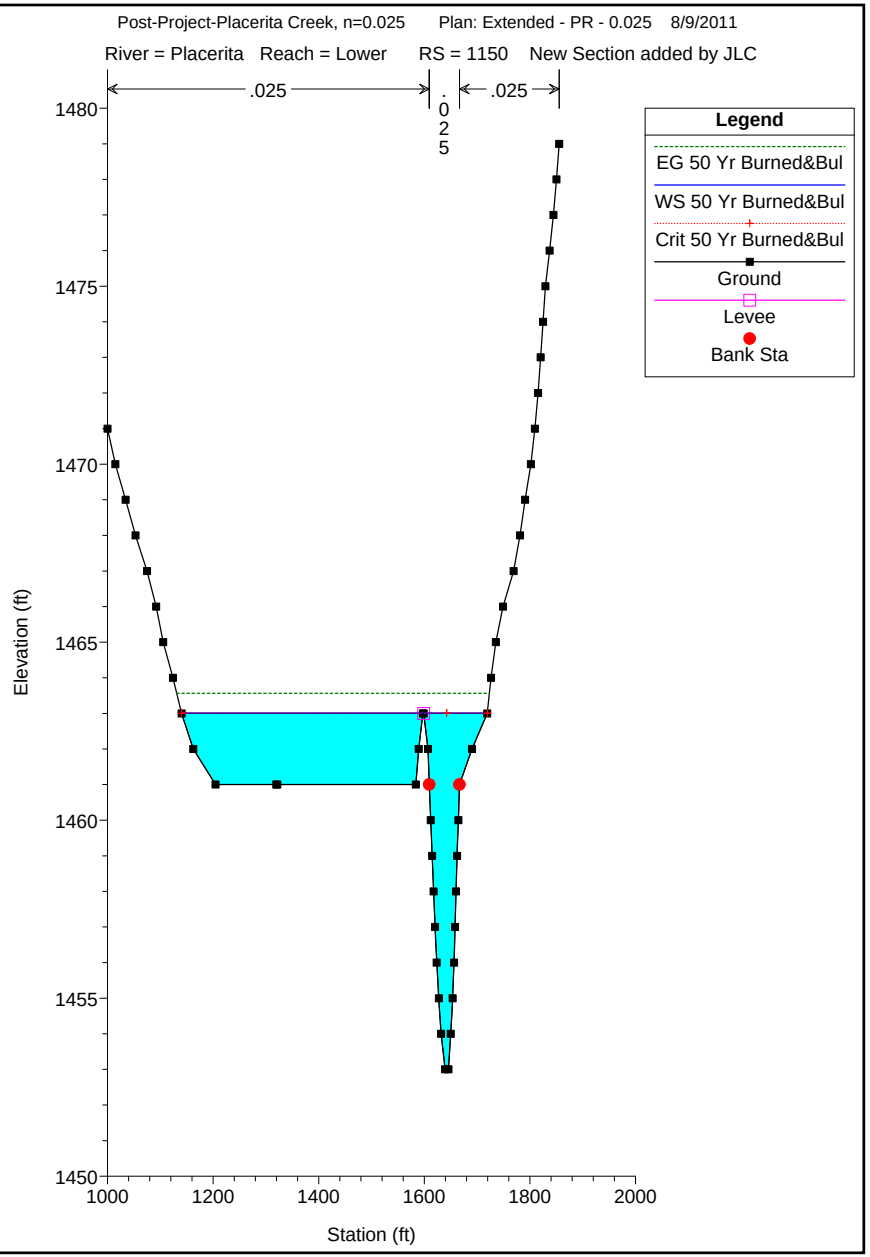

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Tributary RS = 510
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1545
1550
1555
1560
1565
1570
1575
1000
1100
1200
1300
1400
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Tributary RS = 410
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1520
1525
1530
1535
1540
1545
1000
1050
1100
1150
1200
1250
1300

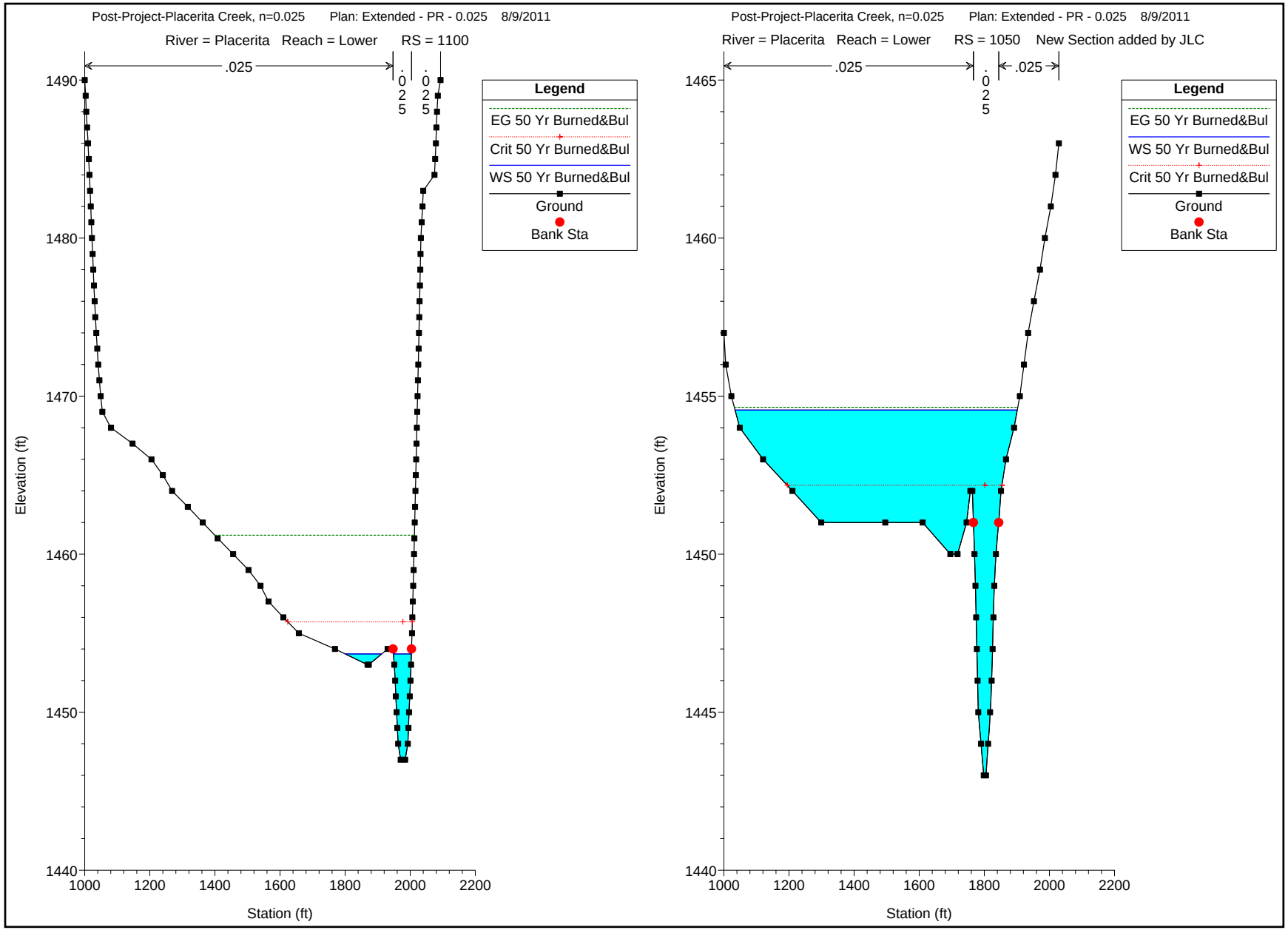

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Tributary RS = 310
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1530
1525
1520
1515
1510
1505
1500
1000
1100
1200
1300
1400
1500
1600
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Tributary RS = 210
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1515
1510
1505
1500
1495
1490
1485
1000
1100
1200
1300
1400
1500
1600

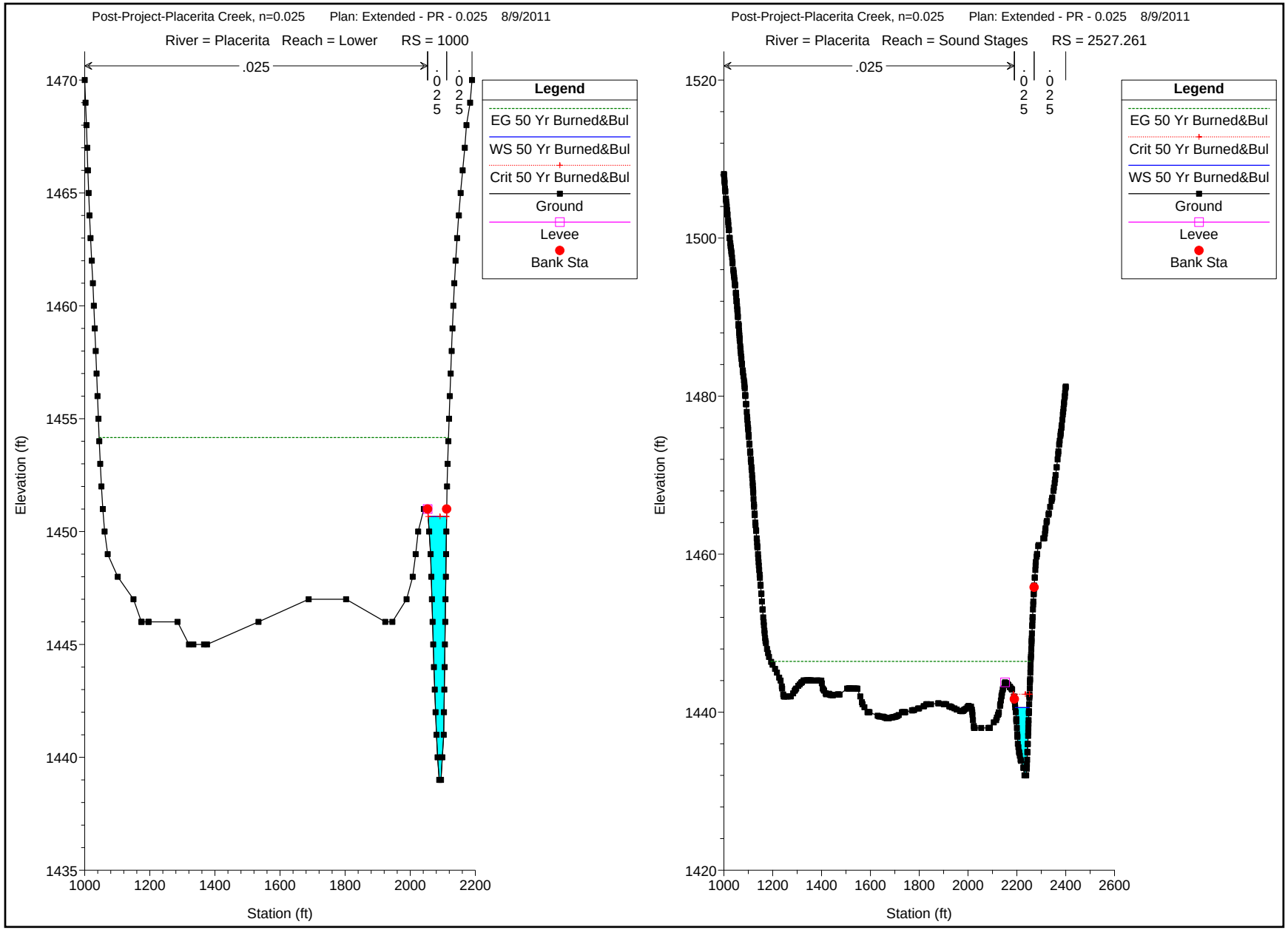

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Tributary RS = 110
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
800
900
1000
1100
1200
1300
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Tributary RS = 10
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1495
1490
1485
1480
1475
1470
1000
1050
1100
1150
1200
1250

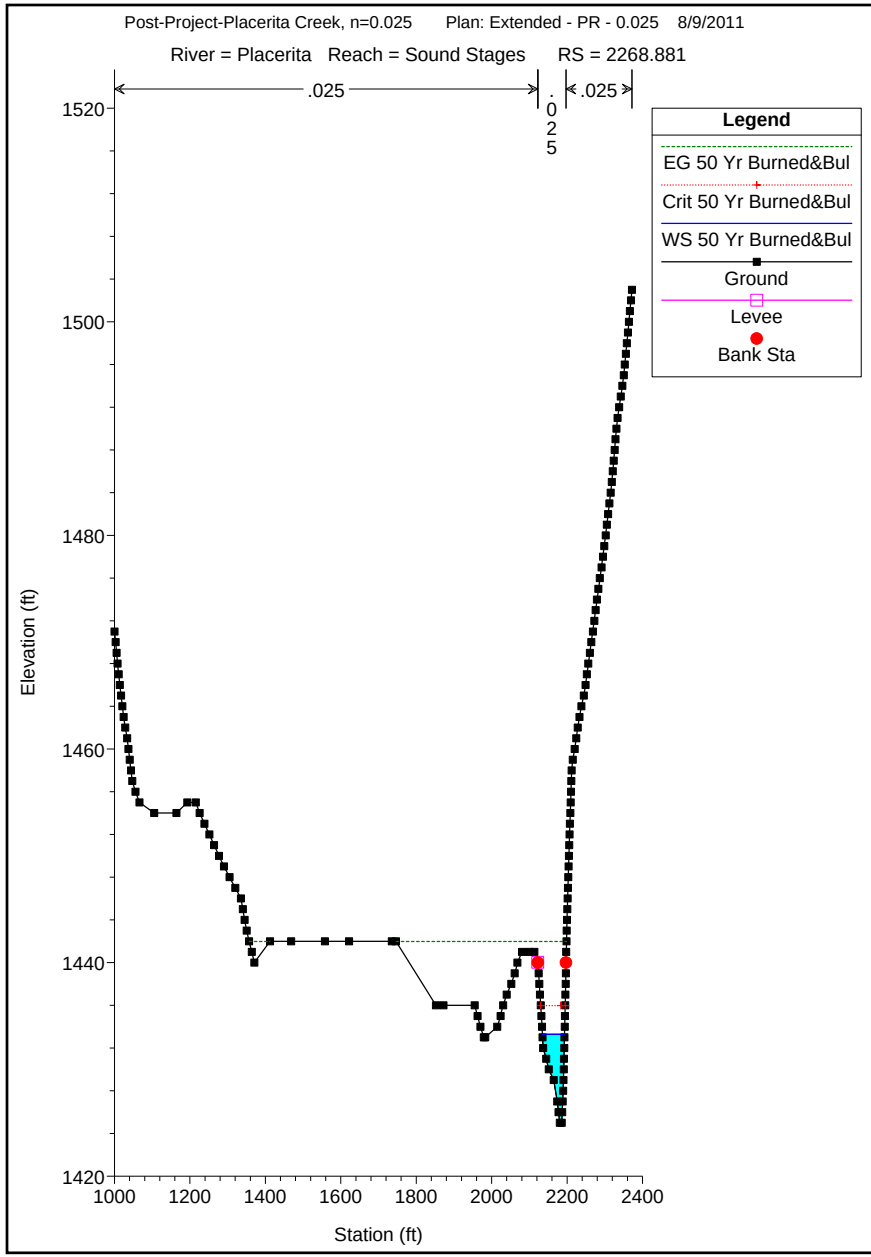

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Lower RS = 1300
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Lower RS = 1250 New Section added by JLC
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)

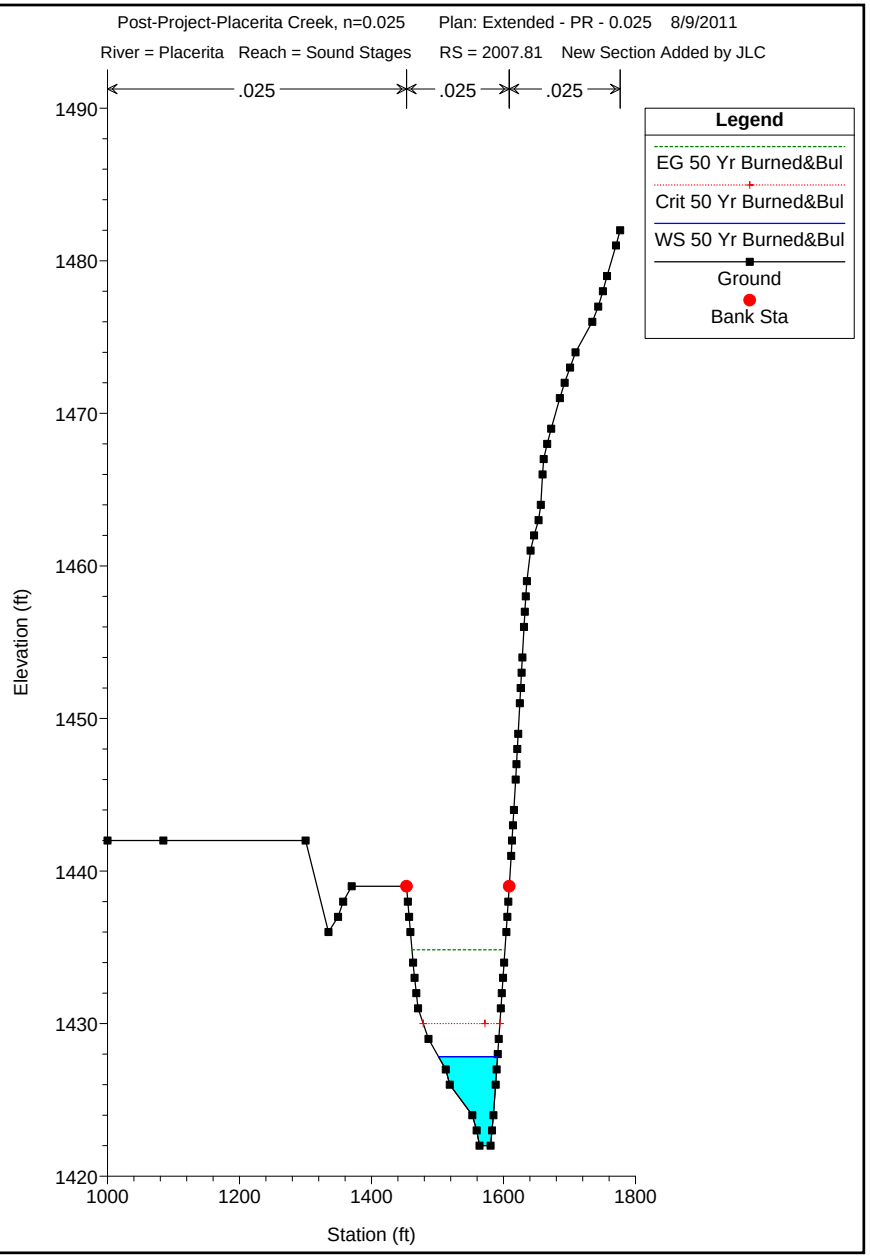

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Lower RS = 1200
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1500
1490
1480
1470
1460
1450
1000
1200
1400
1600
1800
2000
2200

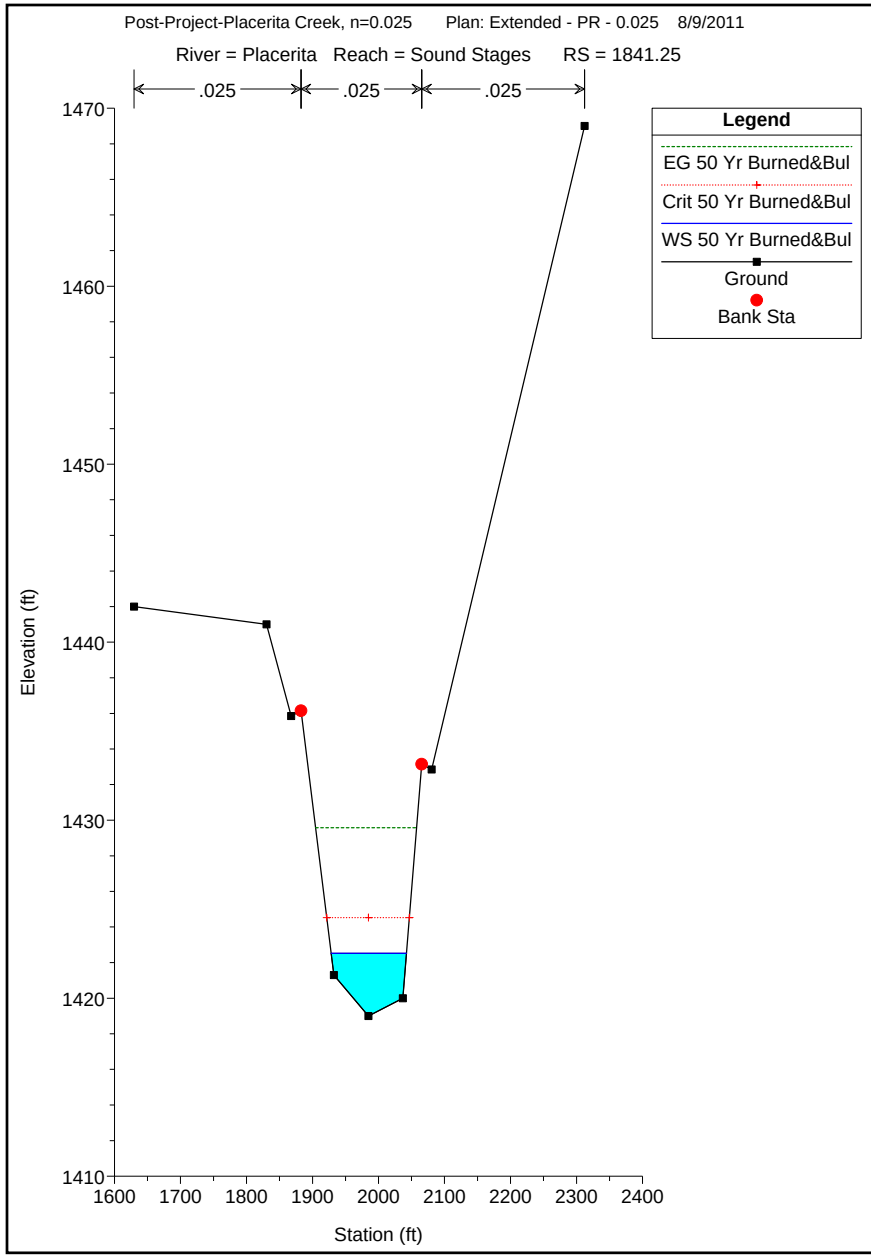

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Lower RS = 1150 New Section added by JLC
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
1480
1475
1470
1465
1460
1455
1450
1000
1200
1400
1600
1800
2000

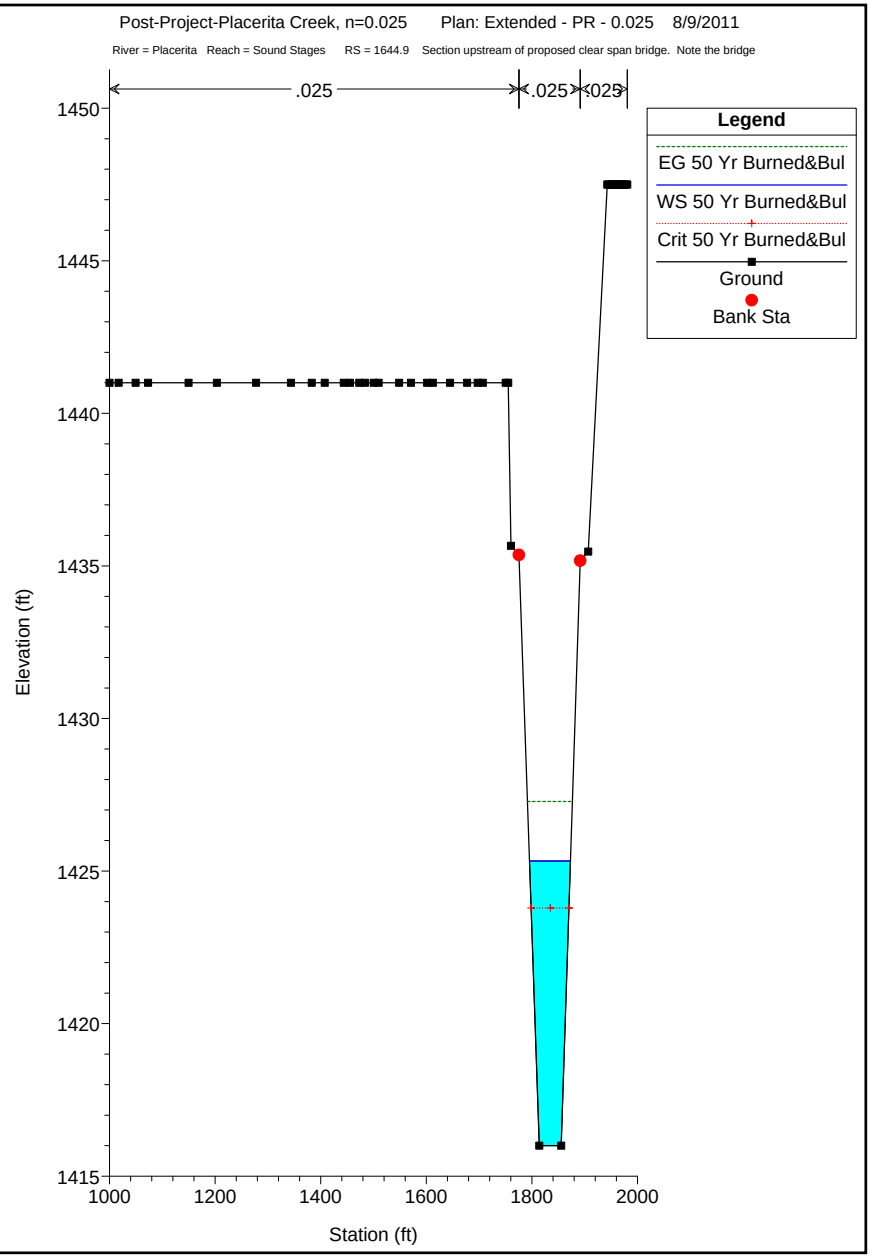

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Lower RS = 1100
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1490
1480
1470
1460
1450
1440
1000
1200
1400
1600
1800
2000
2200
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Lower RS = 1050 New Section added by JLC
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1465
1460
1455
1450
1445
1440
1000
1200
1400
1600
1800
2000
2200

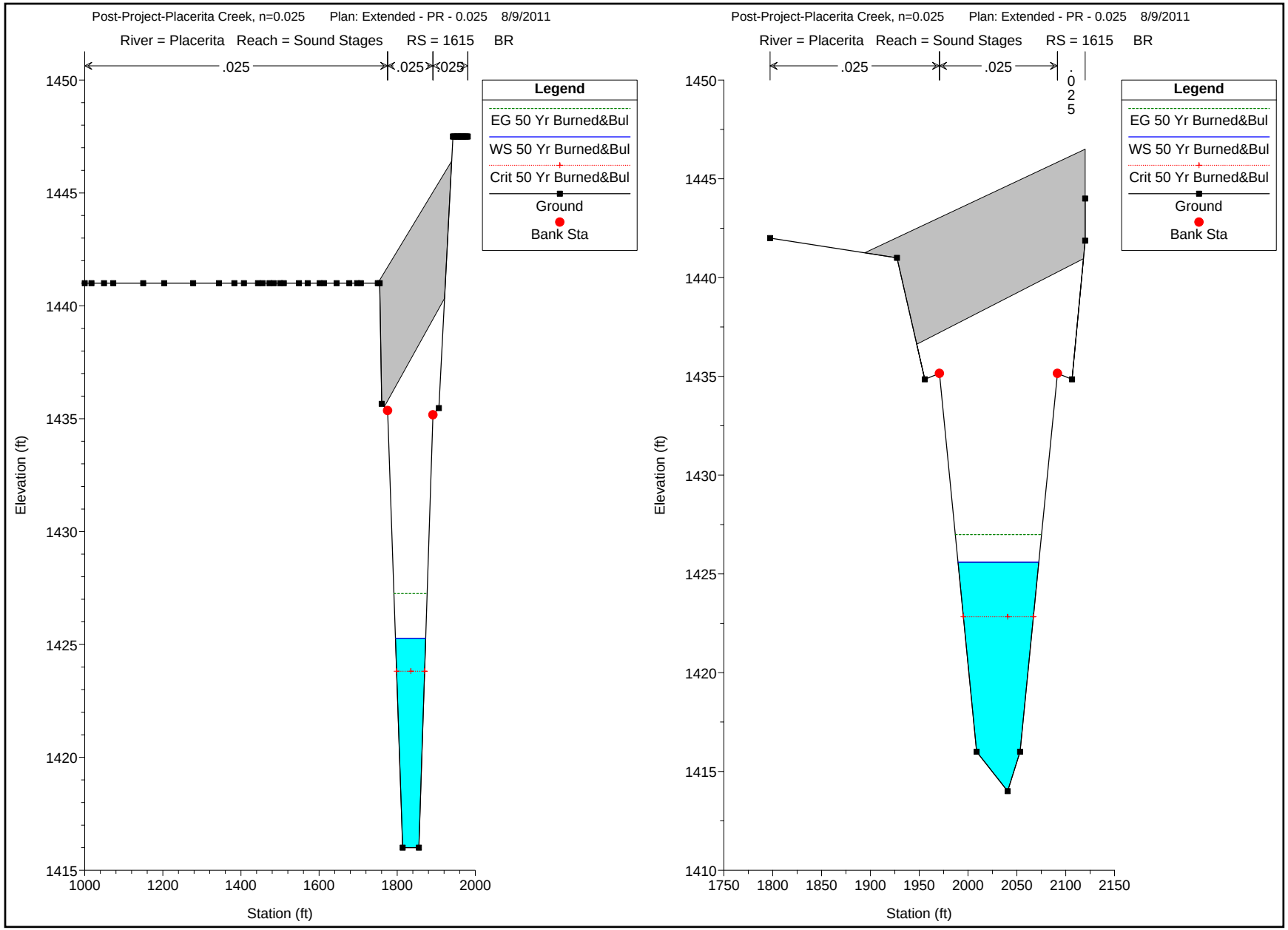

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Lower RS = 1000
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
1470
1465
1460
1455
1450
1445
1440
1435
1000
1200
1400
1600
1800
2000
2200
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Sound Stages RS = 2527.261
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
1520
1500
1480
1460
1440
1420
1000
1200
1400
1600
1800
2000
2200
2400
2600

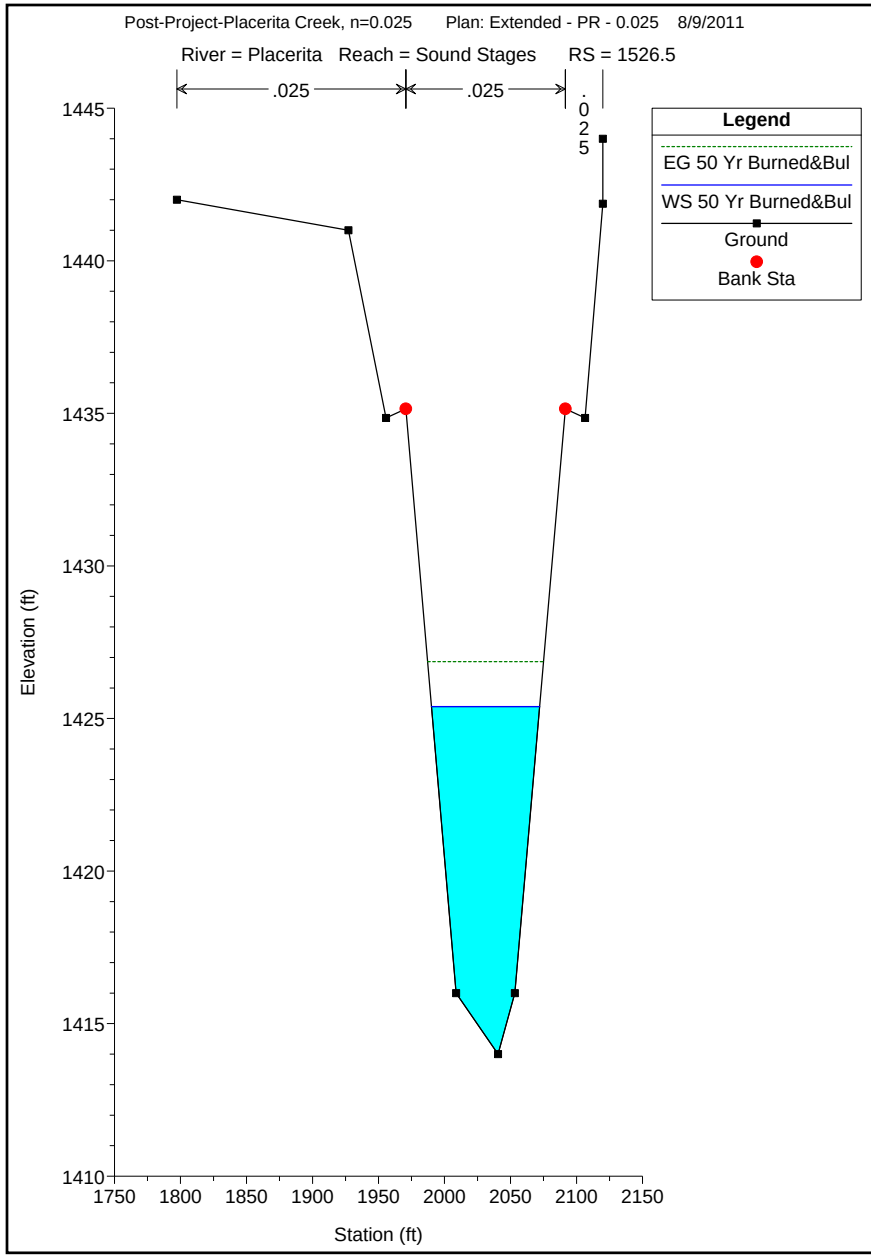

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Sound Stages RS = 2268.881
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
1520
1500
1480
1460
1440
1420
1000
1200
1400
1600
1800
2000
2200
2400

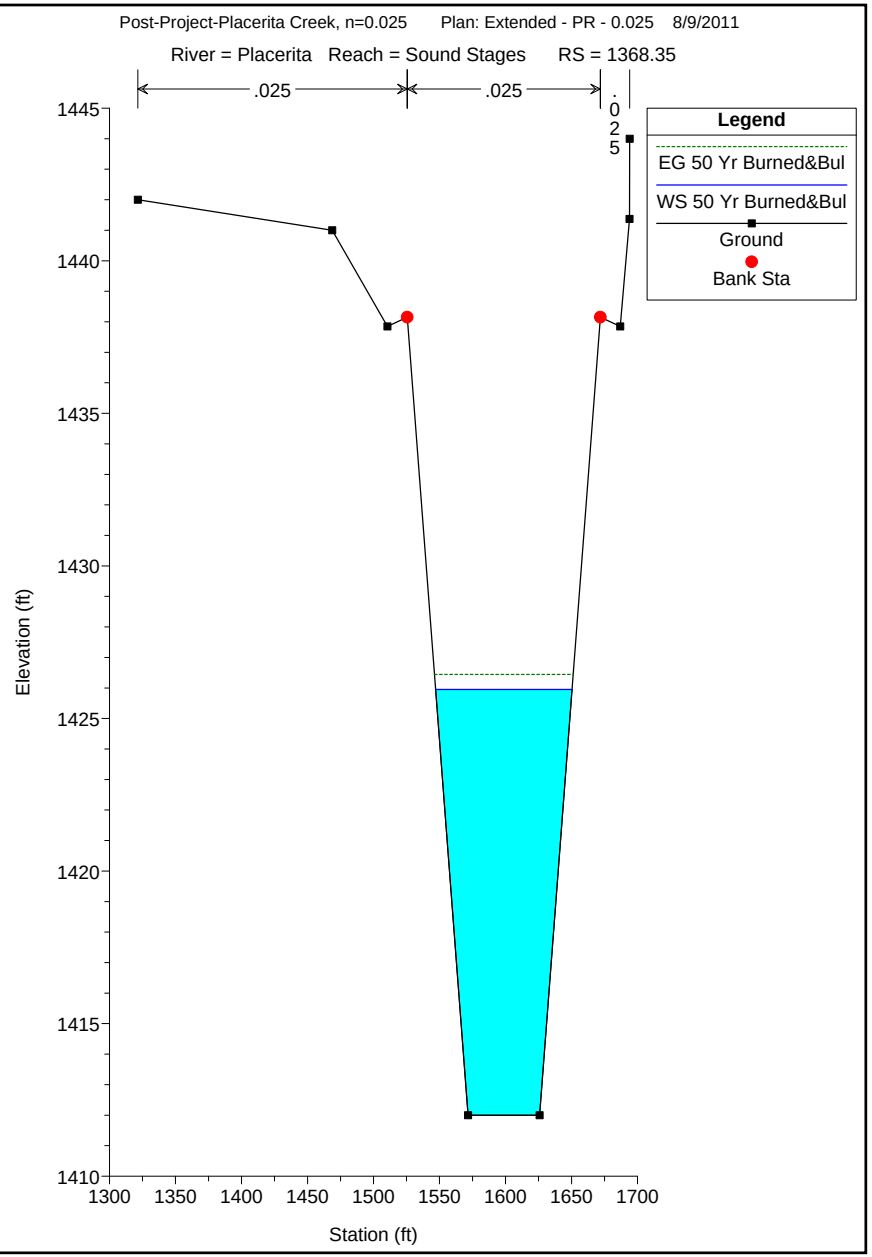

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Sound Stages RS = 2007.81 New Section Added by JLC
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1490
1480
1470
1460
1450
1440
1430
1420
1000
1200
1400
1600
1800

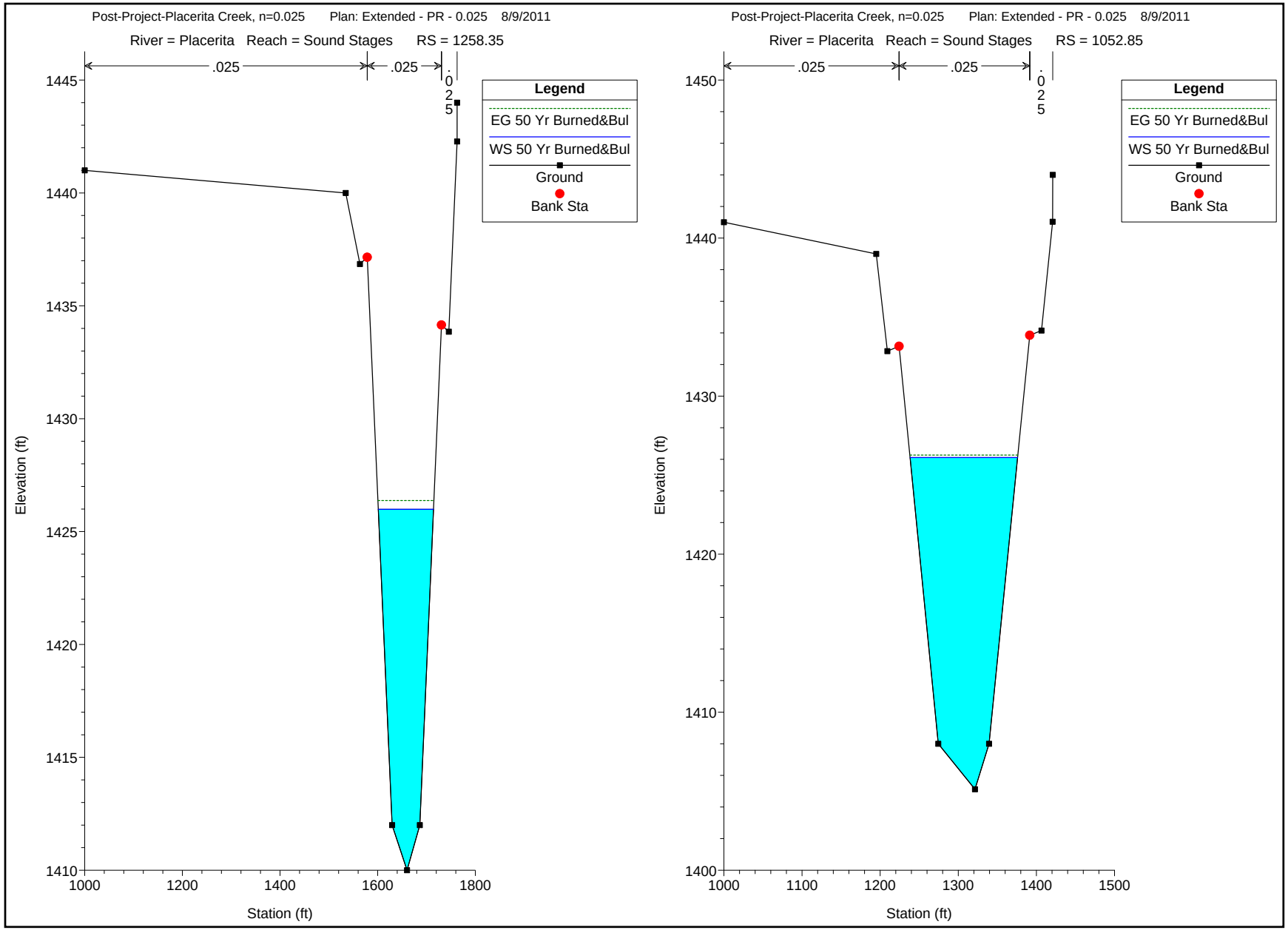

Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Sound Stages RS = 1841.25
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1410
1420
1430
1440
1450
1460
1470
1600
1700
1800
1900
2000
2100
2200
2300
2400


Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Sound Stages RS = 1644.9 Section upstream of proposed clear span bridge. Note the bridge
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1415
1420
1425
1430
1435
1440
1445
1450
1000
1200
1400
1600
1800
2000


Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Sound Stages RS = 1615 BR
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1445
1440
1435
1430
1425
1420
1415
1000
1200
1400
1600
1800
2000
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Sound Stages RS = 1615 BR
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1445
1440
1435
1430
1425
1420
1415
1410
1750
1800
1850
1900
1950
2000
2050
2100
2150


Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Sound Stages RS = 1526.5
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
1445
1440
1435
1430
1425
1420
1415
1410
1750
1800
1850
1900
1950
2000
2050
2100
2150
Station (ft)


Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Sound Stages RS = 1368.35
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
1445
1440
1435
1430
1425
1420
1415
1410
1300
1350
1400
1450
1500
1550
1600
1650
1700
Station (ft)


Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Sound Stages RS = 1258.35
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1445
1440
1435
1430
1425
1420
1415
1410
1000
1200
1400
1600
1800
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Sound Stages RS = 1052.85
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
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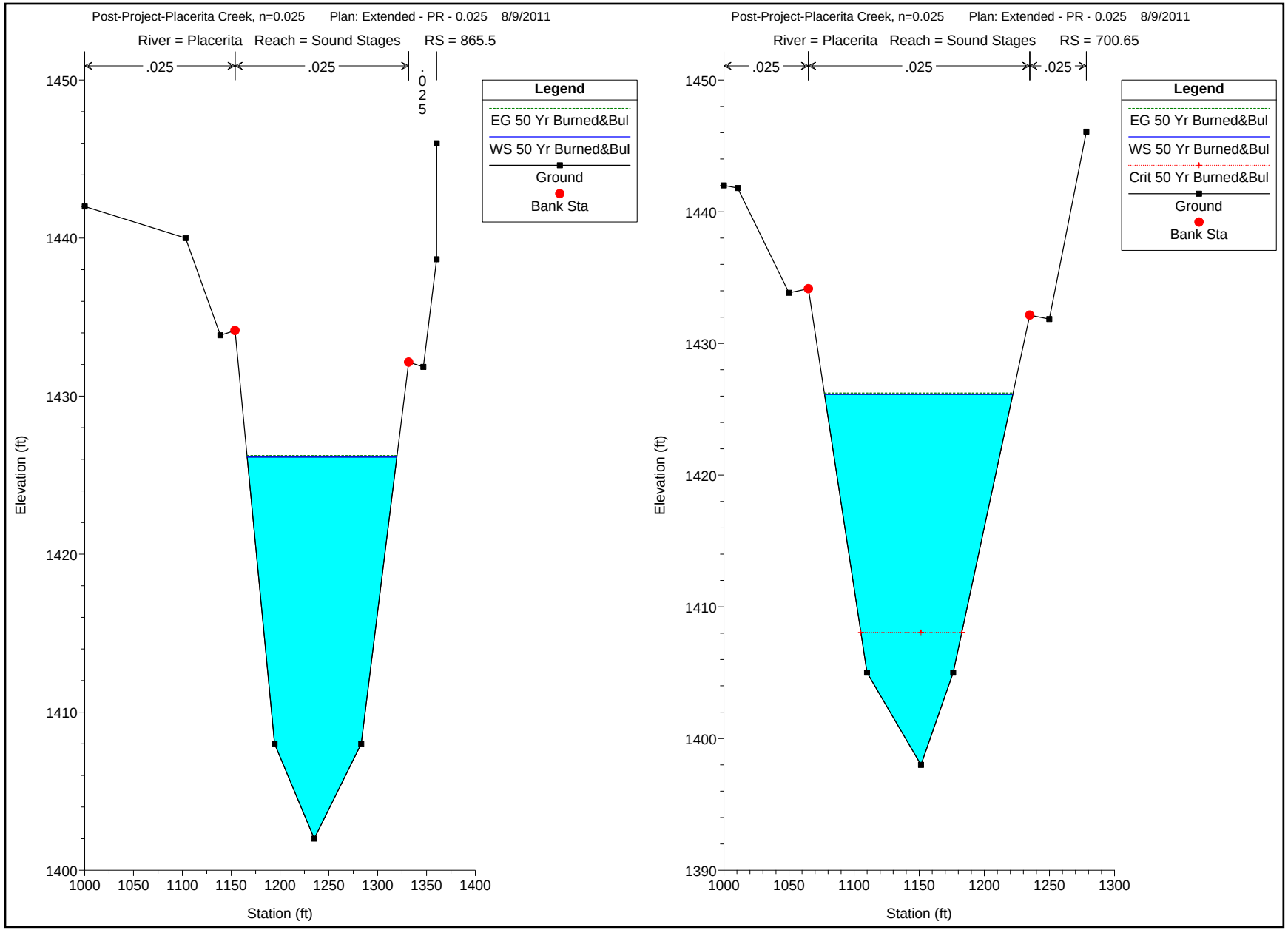
1410
1400
1000
1100
1200
1300
1400
1500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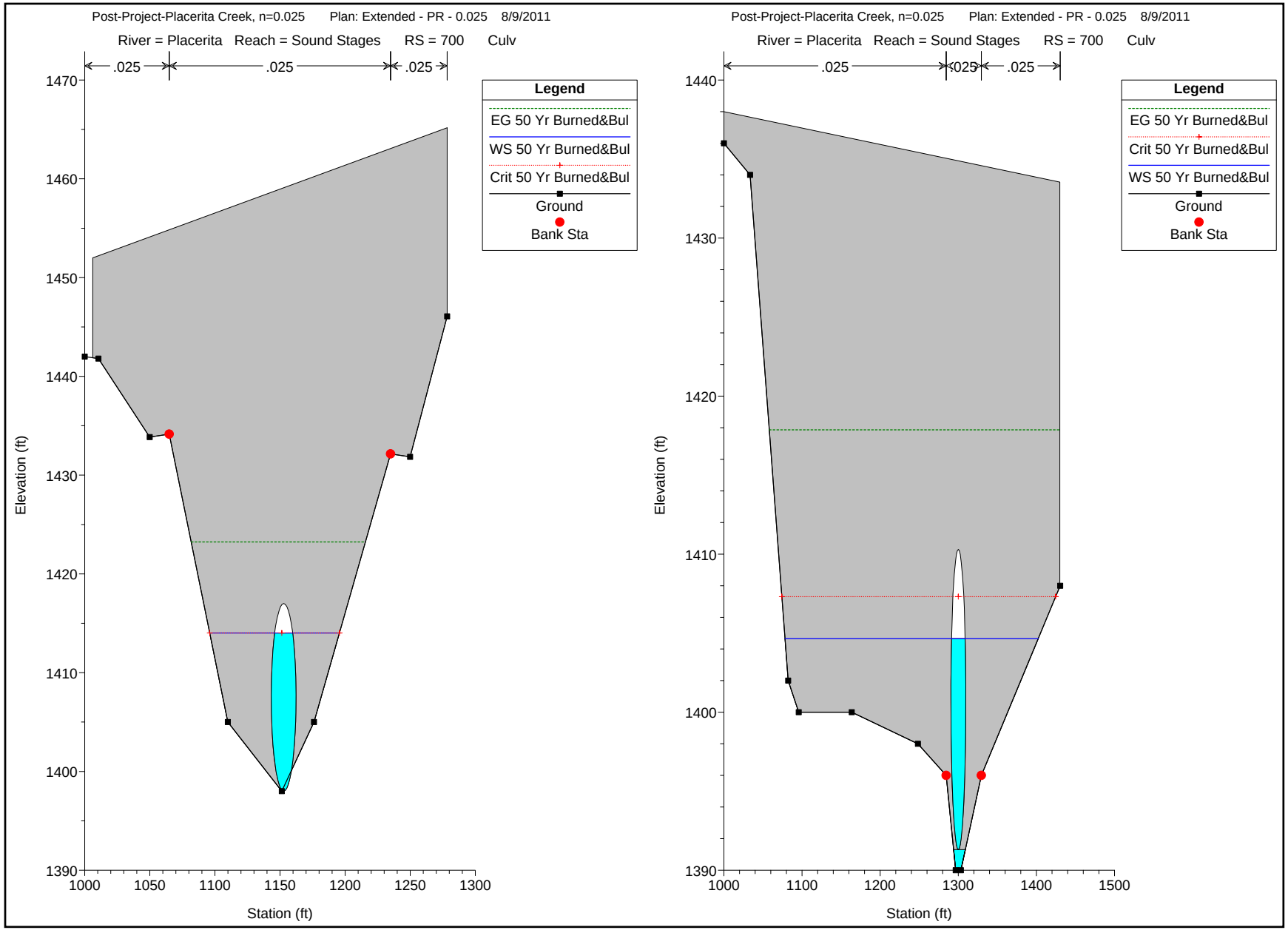
River = Placerita Reach = Sound Stages RS = 865.5
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1440
1430
1420
1410
1400
1000
1050
1100
1150
1200
1250
1300
1350
1400
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Sound Stages RS = 700.65
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1450
1440
1430
1420
1410
1400
1390
1000
1050
1100
1150
1200
1250
1300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River = Placerita Reach = Sound Stages RS = 700 Culv
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1470
1460
1450
1440
1430
1420
1410
1400
1390
1000
1050
1100
1150
1200
1250
1300
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Sound Stages RS = 700 Culv
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
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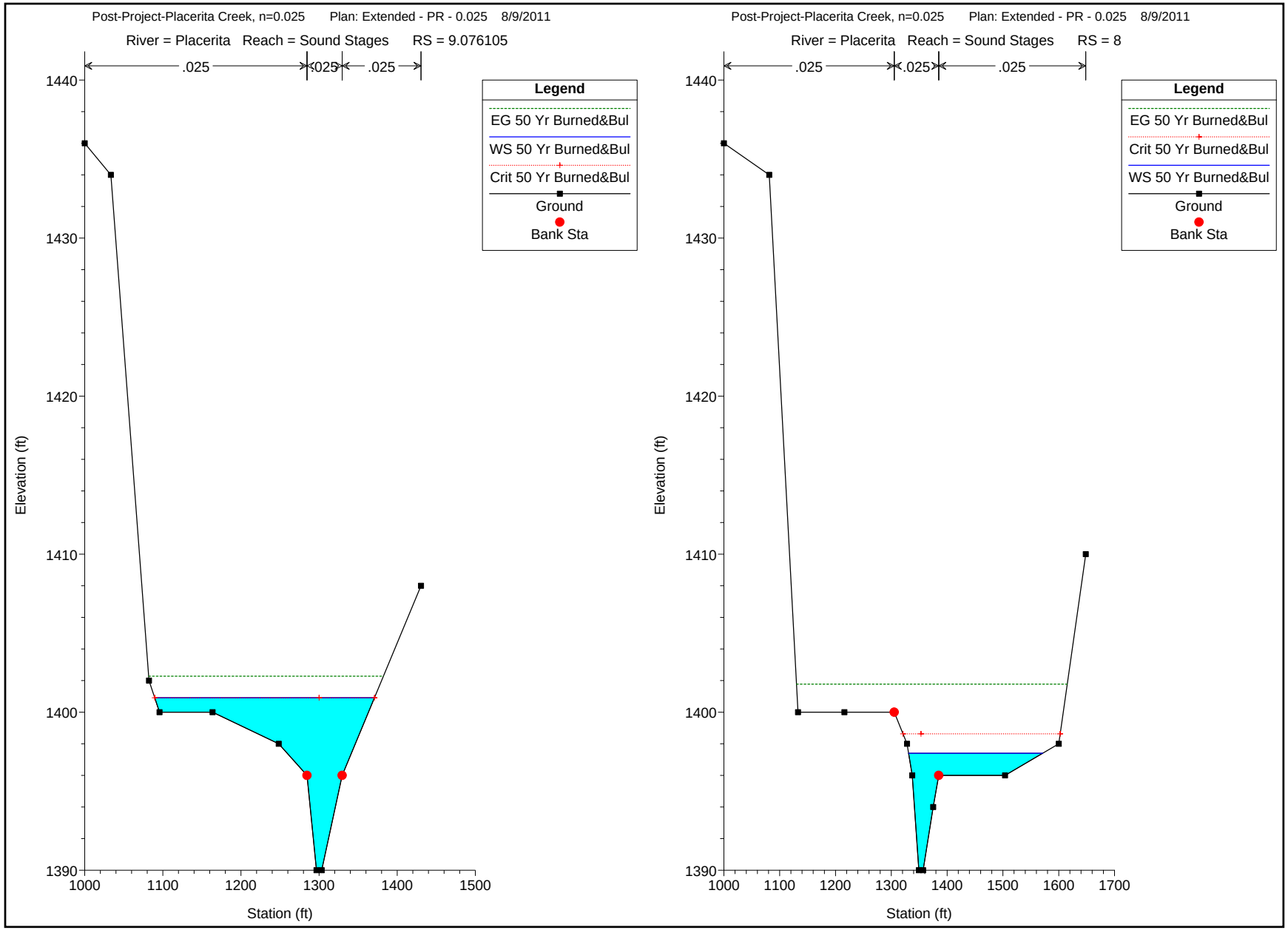
1000
1100
1200
1300
1400
1500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River = Placerita Reach = Sound Stages RS = 9.076105
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
1440
1430
1420
1410
1400
1390
1000
1100
1200
1300
1400
1500
Station (ft)
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Sound Stages RS = 8
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
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1410
1400
1390
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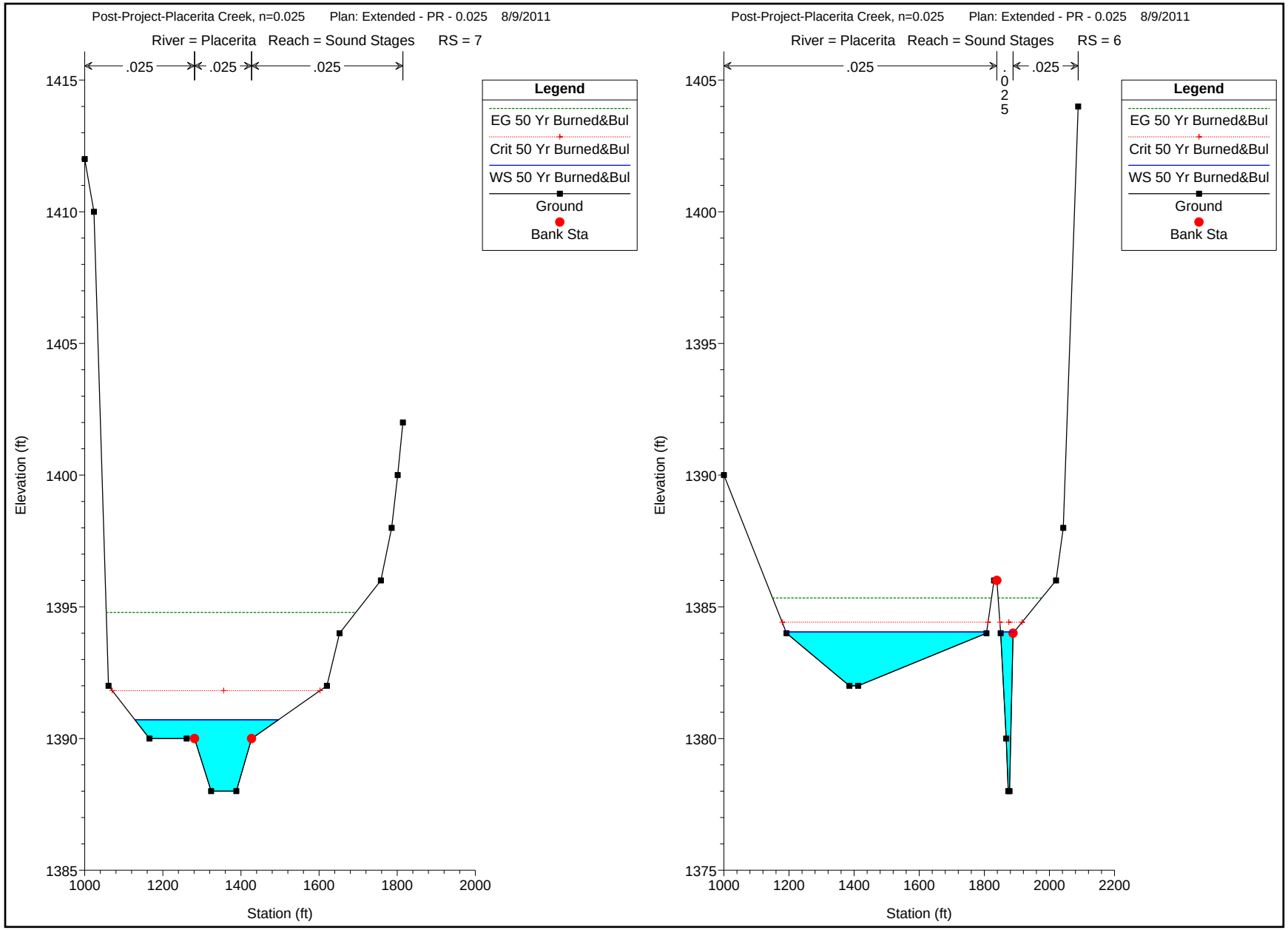
1100
1200
1300
1400
1500
1600
1700
Station (ft)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River = Placerita Reach = Sound Stages RS = 7
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
1415
1410
1405
1400
1395
1390
1385
1000
1200
1400
1600
1800
2000
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Sound Stages RS = 6
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
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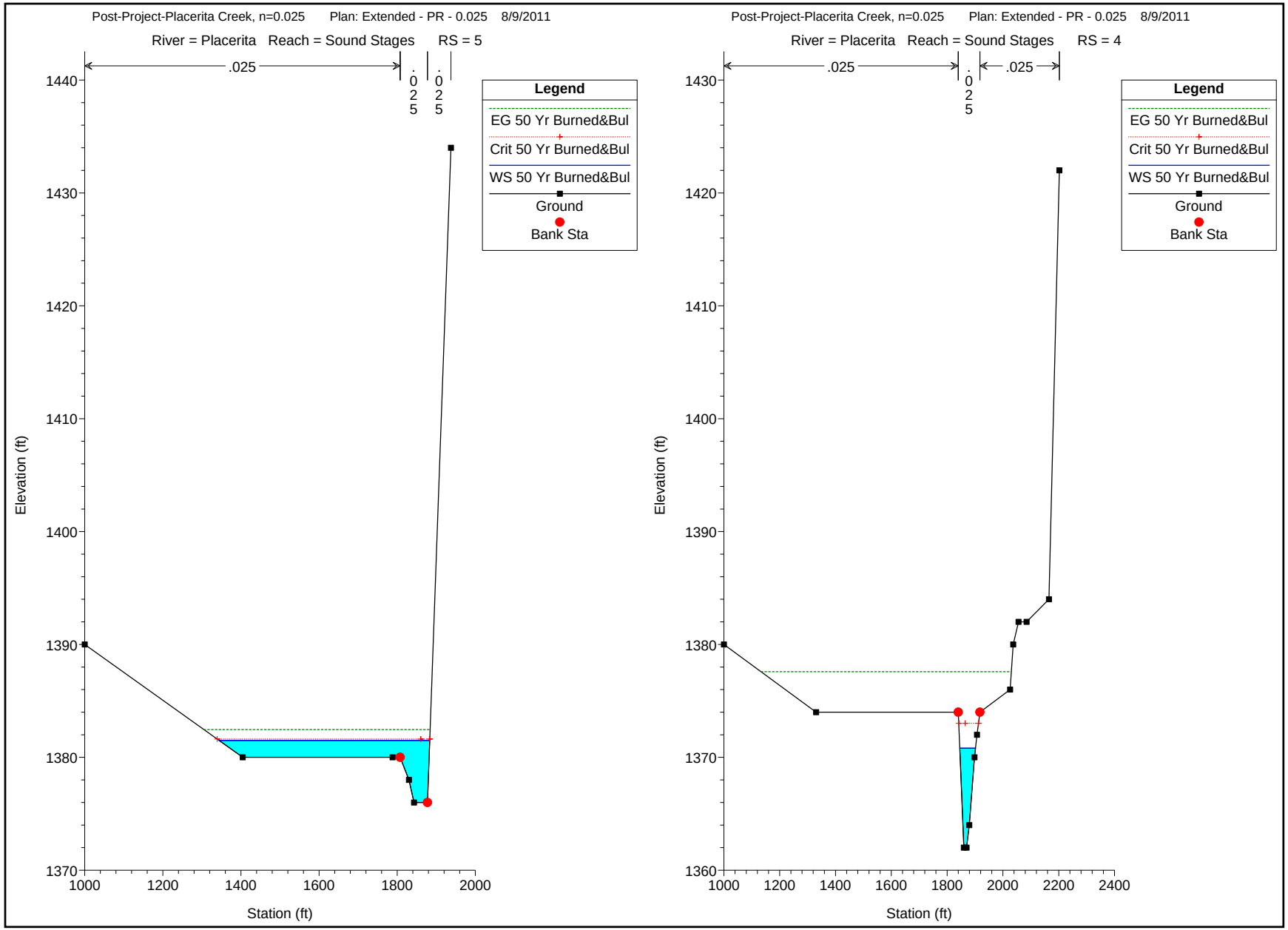
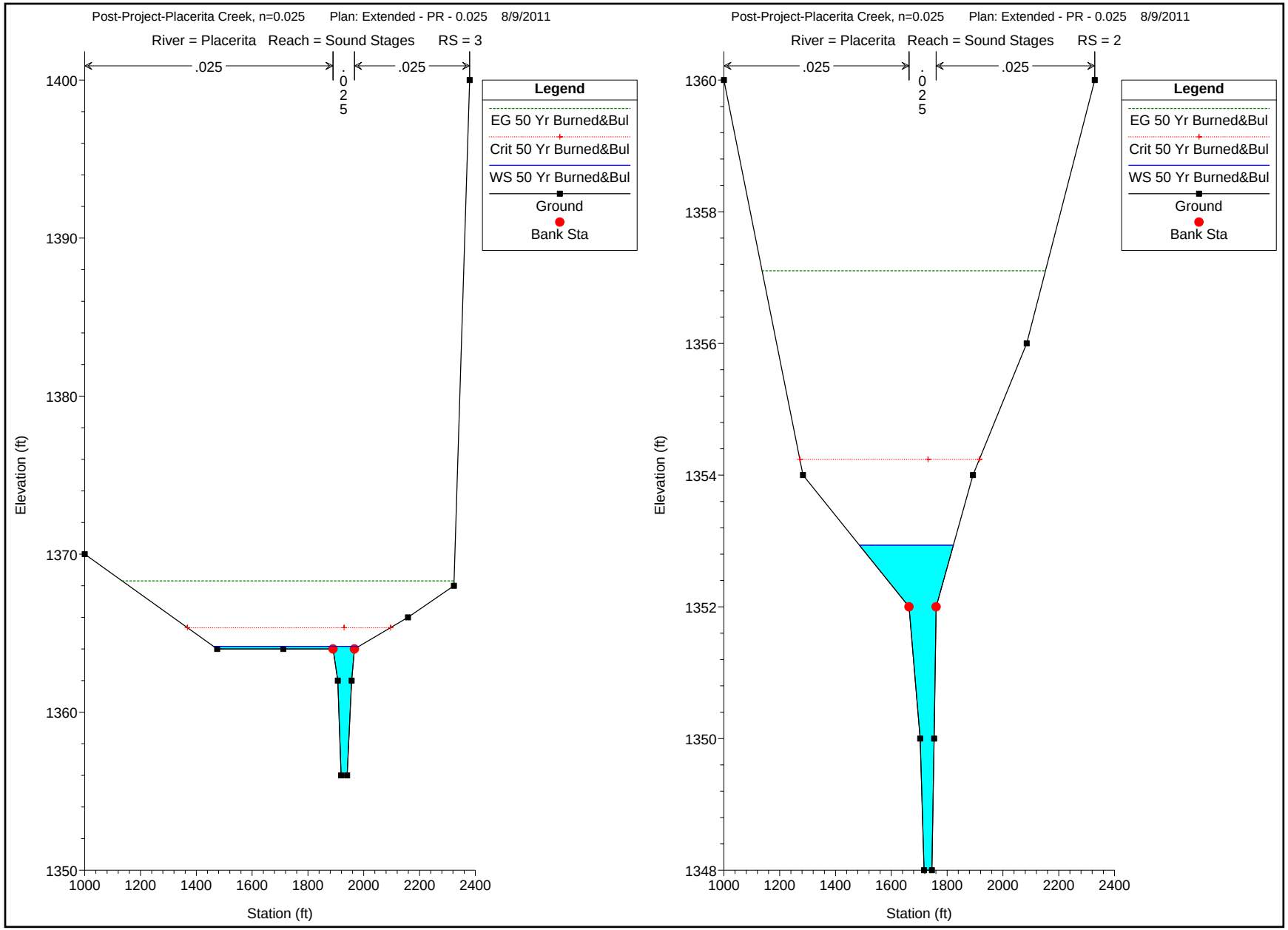
1400
1395
1390
1385
1380
1375
1000
1200
1400
1600
1800
2000
2200


Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Sound Stages RS = 5
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Sound Stages RS = 4
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)


Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Sound Stages RS = 3
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)
Post-Project-Placerita Creek, n=0.025 Plan: Extended - PR - 0.025 8/9/2011
River = Placerita Reach = Sound Stages RS = 2
.025
.025
.025
Legend
EG 50 Yr Burned&Bul
Crit 50 Yr Burned&Bul
WS 50 Yr Burned&Bul
Ground
Bank Sta
Elevation (ft)
Station (ft)

SUB-APPENDIX 1-G.

DETENTION BASIN ROUTING AND UNDERGROUND STORAGE SYSTEMS

(Provided for reference only; Design shall be reviewed and approved with improvement plan)

SOUND STAGE AT THE RANCH

BASIN DB-05

DEBRIS BASIN VOLUME

ELEVATION (FT)	CONTOUR INTERVAL	AREA (SQ. FT)	MEAN AREA (SQ. FT)	VOLUME (CU YD)	TOTAL VOLUME (CU YD)
1423.00	1	8950.00	9253.50	342.72	342.72
1424.00	1	9557.00	9870.00	365.56	708.28
1425.00	1	10183.00	10504.50	389.06	1097.33
1426.00	1	10826.00	11158.00	413.26	1510.59
1427.00	1	11490.00	11832.00	438.22	1948.81
1428.00	1	12174.00	12528.00	464.00	2412.81
1429.00	1	12882.00	13250.50	490.76	2903.57
1430.00	1	13619.00	14000.50	518.54	3422.11
1431.00	1	14382.00	14770.00	547.04	3969.15
1432.00	1	15158.00	15553.00	576.04	4545.19
1433.00	1	15948.00	16350.00	605.56	5150.74
1434.00	1	16752.00	17160.50	635.57	5786.31
1435.00	1	17569.00	17984.50	666.09	6452.41
1436.00	1	18400.00	18822.00	697.11	7149.52
1437.00	1	19244.00	19673.00	728.63	7878.15
1438.00	1	20102.00	20537.50	760.65	8638.80
1439.00	1	20973.00	21416.00	793.19	9431.98
1440.00	1	21859.00	22320.72	826.69	10258.67
1441.00	1	22782.43	-	-	-

-See SHEET 300 for Offsite Subareas

DP Rate Off-2a = 82000 cy/mi^2 Area = 33.40 Acres = 0.0522 mi^2

DP Rate Off-8a = 16500 cy/mi^2 Area = 2.16 Acres = 0.0034 mi^2

Debris Volume (cy) = [Area ac x 0.0015625 mi^2/ac] DP Rate (cy/mi^2)

=0.0522 mi^2 x 82000 cy/mi^2

Off-2a = 4280 cy

Debris Volume (cy) = [Area ac x 0.0015625 mi^2/ac] DP Rate (cy/mi^2)

=0.0034 mi^2 x 16500 cy/mi^2

Off-8a = 56 cy

∑ Off-1a + Off-7a = 9968+73= **10041 cy**

SOUND STAGES AT THE RANCH

BASIN DB-06

DEBRIS BASIN VOLUME

ELEVATION (FT)	CONTOUR INTERVAL	AREA (SQ. FT)	MEAN AREA (SQ. FT)	VOLUME (CU YD)	TOTAL VOLUME (CU YD)
1427.00	1	6715.48	7110.44	263.35	263.35
1428.00	2	7505.39	8322.66	616.49	879.84
1430.00	2	9139.93	10032.00	743.11	1622.95
1432.00	2	10924.07	11883.01	880.22	2503.18
1434.00	2	12841.95	13938.85	1032.51	3535.68
1436.00	2	15035.74	16170.84	1197.84	4733.52
1438.00	2	17305.93	18482.12	1369.05	6102.57
1440.00	1	19658.31	9829.16	364.04	6466.61
1441.00	1		-	-	-

-See SHEET 300 for Offsite Subareas

DP Rate Off-1a = 140000 cy/mi^2 Area = 45.54 Acres = 0.0712 mi^2

DP Rate Off-7a = 16500 cy/mi^2 Area = 2.84 Acres = 0.0044 mi^2

Debris Volume (cy) = [Area ac x 0.0015625 mi^2/ac] DP Rate (cy/mi^2)

=0.0712 mi^2 x 140000 cy/mi^2

Off-1a = 9968 cy

Debris Volume (cy) = [Area ac x 0.0015625 mi^2/ac] DP Rate (cy/mi^2)

=0.0034 mi^2 x 16500 cy/mi^2

Off-7a = 73 cy

∑ Off-2a + Off-8a = 4280+56= **4336 cy**

Debris Production Analysis
for 50-Year Storm Event

Debris Production Rates (yds^3/mi^2)

337d	Total Area	Area 1 $Area_{DPR-3}$	Area 2 $Area_{DPR-5}$	Area 3 $Area_{DPR-9}$
DPA ZONE	5.9 sq mi	3.7 sq mi	1.9 sq mi	0.3 sq mi
3	42,000	46,000	N/A	N/A
5	26,000	N/A	31,000	N/A
9	5,200	N/A	N/A	10,000

Debris Production Rates from Figure B-2

	A1	A2	A3
Area (sq. mi)	3.7	1.9	0.3
Area Ratios $Area_i$/Total Area	0.63	0.32	0.05

Debris Production = DP-1 + DP-2 + DP-3

$$DP-1 = DPR_{1(AT)} A_1 \left(\frac{A_1}{A_T}\right) + DPR_{1(A1)} (A_1)\left(\frac{A_2}{A_T}\right) + DPR_{1(A1)} (A_1)\left(\frac{A_3}{A_T}\right)$$

$$DP-2 = DPR_{2(AT)} (A_2)\left(\frac{A_2}{A_T}\right) + DPR_{2(A2)} (A_2)\left(\frac{A_1}{A_T}\right) + DPR_{2(A2)} (A_2)\left(\frac{A_3}{A_T}\right)$$

$$DP-3 = DPR_{3(AT)} (A_3 - A_{D3})\left(\frac{A_3 - A_{D3}}{A_T}\right) + DPR_{3(A3)} (A_3)\left(\frac{A_1}{A_T}\right) + DPR_{3(A3)} (A_3)\left(\frac{A_2}{A_T}\right)$$

Where: DPR: Debris Production Rate, A1: Area for Debris Zone A1, A2: Area for Debris Zone A2, A3: Area for Debris Zone A3
AT: Total Area of watershed.

Debris Production Analysis
for 50-Year Storm Event

DP-1 (Debris Production DP-3)

DPR 3 (yd^3/mi^2)	42000	46000	46000	
A1 (mi^2)	3.7	3.7	3.7	**DP-1**
Ai/AT	0.63	0.32	0.05	**Production (yd^3)**
	97902	54464	8510	**160,876**

DP-2 (Debris Production DP-5)

DPR 5 (yd^3/mi^2)	26000	31000	31000	
A2 (mi^2)	1.9	1.9	1.9	**DP-2**
Ai/AT	0.32	0.63	0.05	**Production (yd^3)**
	15808	37107	2945	**55,860**

DP-9 (Debris Production DP-9)

DPR 9 (yd^3/mi^2)	5200	10000	10000	
A3 (mi^2)	0.3	0.3	0.3	**DP-3**
Ai/AT	0.05	0.63	0.32	**Production (yd^3)**
	78	1890	960	**2,928**

Total Debris Production (DP-1+DP-2+DP-3	**219,664**
	yd^3
Total Debris Yield	**37,231**
	yd^3/mi^2
Peak Concentratio by Volume (%)	**26%**

Debris Production Analysis
for 50-Year Storm Event

Debris Production Rates (yds^3/mi^2)

337d	Total Area	Area 1 $Area_{DPR-3}$	Area 2 $Area_{DPR-5}$	Area 3 $Area_{DPR-9}$
DPA ZONE	5.84 sq mi	3.7 sq mi	1.9 sq mi	0.24 sq mi
3	42,000	46,000	N/A	N/A
5	26,000	N/A	31,000	N/A
9	5,200	N/A	N/A	10,000

Debris Production Rates from Figure B-2

	A1	A2	A3
Area (sq. mi)	3.7	1.9	0.24
Area Ratios $Area_i$/Total Area	0.63	0.33	0.04

Debris Production = DP-1 + DP-2 + DP-3

$$DP-1 = DPR_{1(AT)} A_1 \left(\frac{A_1}{A_T}\right) + DPR_{1(A1)} (A_1)\left(\frac{A_2}{A_T}\right) + DPR_{1(A1)} (A_1)\left(\frac{A_3}{A_T}\right)$$

$$DP-2 = DPR_{2(AT)} (A_2)\left(\frac{A_2}{A_T}\right) + DPR_{2(A2)} (A_2)\left(\frac{A_1}{A_T}\right) + DPR_{2(A2)} (A_2)\left(\frac{A_3}{A_T}\right)$$

$$DP-3 = DPR_{3(AT)} (A_3 - A_{D3})\left(\frac{A_3 - A_{D3}}{A_T}\right) + DPR_{3(A3)} (A_3)\left(\frac{A_1}{A_T}\right) + DPR_{3(A3)} (A_3)\left(\frac{A_2}{A_T}\right)$$

Where: DPR: Debris Production Rate, A1: Area for Debris Zone A1, A2: Area for Debris Zone A2, A3: Area for Debris Zone A3
AT: Total Area of watershed.

Debris Production Analysis
for 50-Year Storm Event

DP-1 (Debris Production DP-3)

DPR 3 (yd^3/mi^2)	42000	46000	46000	
A1 (mi^2)	3.7	3.7	3.7	**DP-1**
Ai/AT	0.63	0.33	0.04	**Production (yd^3)**
	98455	55373	6995	**160,823**

DP-2 (Debris Production DP-5)

DPR 5 (yd^3/mi^2)	26000	31000	31000	
A2 (mi^2)	1.9	1.9	1.9	**DP-2**
Ai/AT	0.33	0.63	0.04	**Production (yd^3)**
	16072	37317	2421	**55,809**

DP-9 (Debris Production DP-9)

DPR 9 (yd^3/mi^2)	5200	10000	10000	
A3 (mi^2)	0.3	0.3	0.3	**DP-3**
Ai/AT	0.04	0.63	0.33	**Production (yd^3)**
	64	1901	976	**2,941**

Total Debris Production (DP-1+DP-2+DP-3	**219,573**
	yd^3
Total Debris Yield	**37,216**
	yd^3/mi^2
Peak Concentratio by Volume (%)	**26%**

INFILTRATION CALCULATIONS:

The project has been designed to infiltrate both the SUSMP Volumes (Figure 12) and the ΔV LID Volumes (Figure 13). SUSMP Volumes were larger than LID volumes. Therefore, infiltration basins will be sized to handle the SUSMP volumes. See Below for approximate infiltration basin sizes based on a range of infiltration rates

- **AREA 1a+2a+3a+4a**

ΔV to be Infiltrated = 0.95 Ac-ft = 41382 ft^3

- In 72 Hours @ 1”/24 Hours
- D=3”
  - Area = 41382 ft^3 / (3/12)ft
  - = 165528 ft^2
  - = 407 ft x407 ft

- In 72 Hours @ 1/4” per Hour or 6”/24 Hours
- D=18”
  - Area = 41382 ft^3 / (18/12)ft
  - = 27588 ft^2
  - = 167 ft x167 ft

- **AREA 5a+6a+7a+8a**

ΔV to be Infiltrated = 0.37 Ac-ft = 16117 ft^3

- In 72 Hours @ 1”/24 Hours
- D=3”
  - Area = 16117 ft^3 / (3/12)ft
  - = 64468 ft^2
  - = 254 ft x254 ft

- In 72 Hours @ 1/4” per Hour or 6”/24 Hours
- D=18”
  - Area = 16117 ft^3 / (18/12)ft
  - = 10745 ft^2
  - = 104 ft x104 ft

- **AREA 9a**

ΔV to be Infiltrated = 0.23 Ac-ft = 10019 ft^3

- In 72 Hours @ 1”/24 Hours
- D=3”
  - Area = 10019 ft^3 / (3/12)ft
  - = 40076 ft^2
  - = 201 ft x201 ft

- In 72 Hours @ 1/4” per Hour or 6”/24 Hours
- D=18”
  - Area = 10019 ft^3 / (18/12)ft
  - = 6679 ft^2
  - = 82 ft x82 ft

- **AREA 10a**

ΔV to be Infiltrated = 0.29 Ac-ft = 12632 ft^3

- In 72 Hours @ 1”/24 Hours
- D=3”
  - Area = 12632 ft^3 / (3/12)ft
  - = 50530 ft^2
  - = 225 ft x225 ft

- In 72 Hours @ 1/4” per Hour or 6”/24 Hours
- D=18”
  - Area = 12632 ft^3 / (18/12)ft
  - = 8422 ft^2
  - = 92 ft x92 ft

$\sum \Delta$V to be Infiltrated = (1a+2a+3a+4a)+(5a+6a+7a+8a)+9a+10a
= 0.95+0.37+0.23+0.29
= **<u>1.84 ac-ft</u>**

UNDERGROUND STORAGE CALCULATIONS:

- **NORTH AREA:**

  - Undeveloped Water Quality (Typ.) Volume:
    V=C*(P/12)*A

    C= 0.72
    P= 7.53 V=0.72*(7.53/12)*10.12
    A= 10.12 V= 4.57 Ac-ft

  - Developed Water Quality (Typ.) Volume:

    C= 0.88
    P= 7.53 V=0.88*(7.53/12)*10.12
    A= 10.12 V= 5.59 Ac-ft

    ΔV= 1.02 Ac-ft (44431 ft^3)

- **SOUTH AREA:**

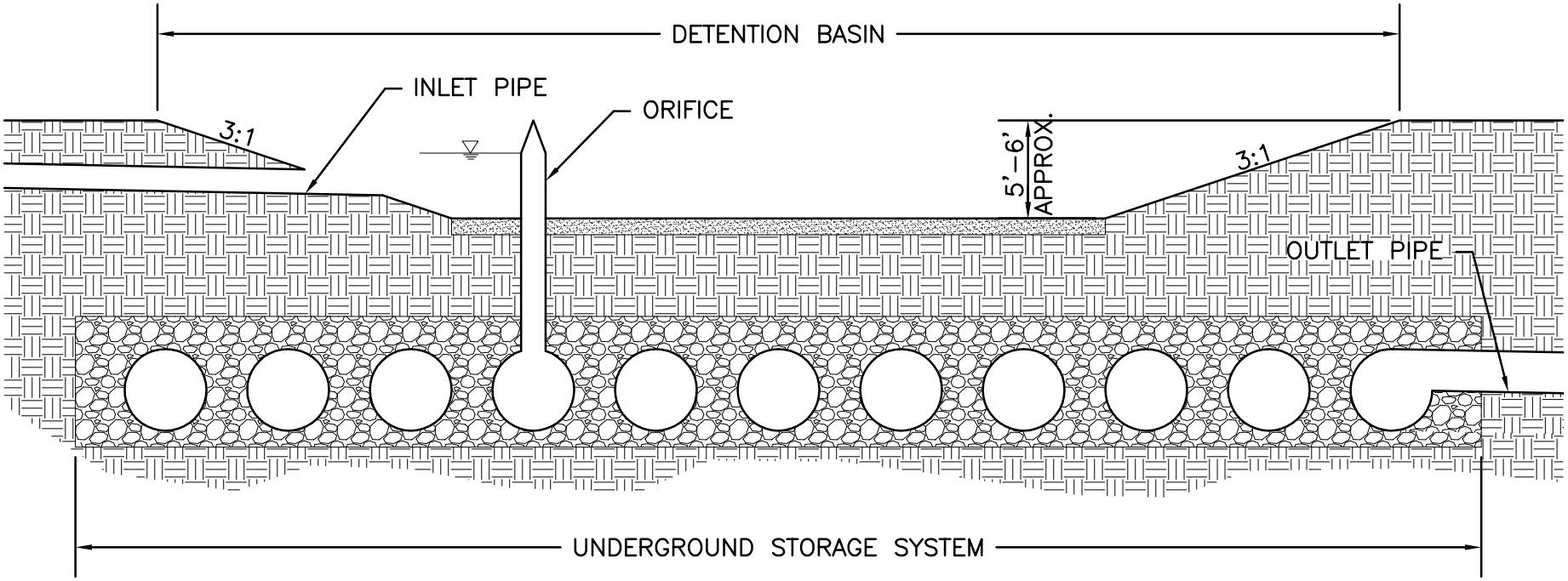
  - Undeveloped Water Quality (Typ.) Volume:
    V=C*(P/12)*A

    C= 0.72
    P= 7.53 V=0.72*(7.53/12)*25.6
    A= 25.6 V= 11.57 Ac-ft

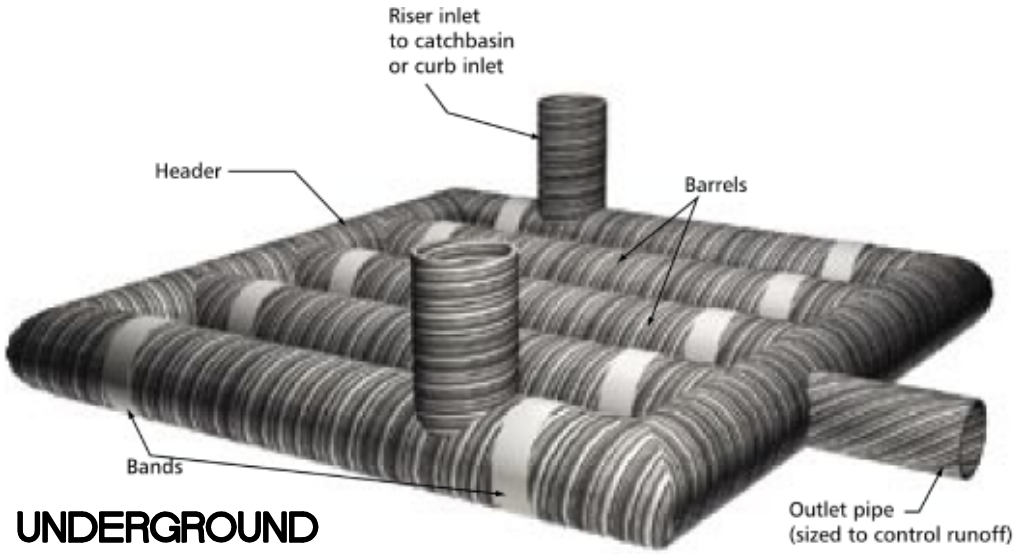
  - Developed Water Quality (Typ.) Volume:

    C= 0.88
    P= 7.53 V=0.88*(7.53/12)*25.6
    A= 25.6 V= 14.13 Ac-ft

    ΔV= 2.56 Ac-ft (111514 ft^3)



SECTION VIEW



UNDERGROUND STORAGE SYSTEM

FIGURE 6

DISNEY|ABC STUDIOS
AT THE RANCH
UNDERGROUND CMP
DETENTION SYSTEM
OR APPROVED EQUIVALENT

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P:\W\MATE00000002\0600INFO\0670Reports\Hydrology & Water Quality Report\Exhibits\DETENTION BASIN-SECTION.dwg Apr 26, 2011 - 3:33pm

2-YEAR NORTH PAD

Program Package Serial Number: 2090

08/10/11 FILE: dsnypo INPUT DATA: English Units RAINFALL SOIL FILE: English (In) OUTPUT DATA: English Units PAGE 1

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT PROG F0601M

MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 2 SOIL DATA FILE: C:\civild\lasoilx.dat

Disney/ABC Studio North Area 10.12 Acres STORM DAY 4

LOCATION	SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	RAIN ZONE	PCT IMPV
6601 1A	10.1	17.79	10.1	17.79	3	100.	.02000	.00	.00	0.	97	13	A37	.91
6601 2A	.0	.00	10.1	17.78	0	0.	.00000	.00	.00	0.	97	99	A37	.00

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  CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1997-2004 Version 6.4
-------------------------------------------------------------------
Study Date : 08/10/11 Input hydrograph file name : dsnypo.hyd
Output hydrograph file name: DisBasNorth.hin
Disney/ABC Studio Northerly Basin 2-year



-------------------------------------------------------------------


User entry of depth-outflow-storage data
-------------------------------------------------------------------
Hydrograph time unit varies
Initial depth in storage basin =   0.00(Ft.)
-------------------------------------------------------------------
-------------------------------------------------------------------
Initial basin depth =   0.00 (Ft.)
Initial basin storage =      0.00 (Ac.Ft)
Initial basin outflow =   0.00 (CFS)
-----------------------------------------------------------------------
-------------------------------------------------------------------
Depth vs. Storage and Depth vs. Discharge data @ 1 Min. Intervals:
 Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
     (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
-----------------------------------------------------------------------
    0.000      0.000      0.000      0.000        0.000
    1.000      0.050      2.840      0.048        0.052
    2.000      0.213      6.850      0.208        0.218
    3.000      0.511     11.760      0.503        0.519
    4.000      0.975     17.430      0.963        0.987
    5.000      1.642     56.120      1.603        1.681
-------------------------------------------------------------------
            Hydrograph Detention Basin Routing
Hydrograph at 6601 2 A Storm Day: 4 Drainage Area =   10.10
Total flood hydrograph volume this storm day =    3.48 Ac. Ft.
```

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    ---------------------------------------------------------------------

    Graph values: 'I'= unit inflow; 'O'=outflow at time shown
    ---------------------------------------------------------------------
Time   Inflow  Outflow    Storage                                          Depth
(Min)  (CFS)   (CFS)     (Ac.Ft) .0       4.5     9.0    13.5    18.0 (Ft.)
    0     0.0     0.0      0.000  O       |       |       |       |      0.0
  100     1.0     0.9      0.015  |O      |       |       |       |      0.3
  200     1.0     1.0      0.018  |O      |       |       |       |      0.4
  300     1.0     1.0      0.018  |O      |       |       |       |      0.4
  400     1.0     1.0      0.018  |O      |       |       |       |      0.4
  500     1.0     1.0      0.018  |O      |       |       |       |      0.4
  600     1.0     1.0      0.018  |O      |       |       |       |      0.4
  700     1.0     1.0      0.018  |O      |       |       |       |      0.4
  800     2.0     1.9      0.033  |  O    |       |       |       |      0.7
  900     2.0     2.0      0.035  |  O    |       |       |       |      0.7
 1000     2.0     2.0      0.035  |  O    |       |       |       |      0.7
 1050     3.0     2.8      0.049  |   OI  |       |       |       |      1.0
 1100     4.0     3.5      0.076  |     OI|       |       |       |      1.2
 1110     4.0     3.6      0.082  |     OI|       |       |       |      1.2
 1120     5.0     3.9      0.093  |     O I       |       |       |      1.3
 1130     6.0     4.4      0.113  |      O| I     |       |       |      1.4
 1131     6.0     4.4      0.115  |      O| I     |       |       |      1.4
 1132     6.0     4.5      0.117  |      O| I     |       |       |      1.4
 1133     6.0     4.5      0.119  |       O I     |       |       |      1.4
 1134     6.0     4.6      0.121  |       O I     |       |       |      1.4
 1135     6.0     4.6      0.123  |       O I     |       |       |      1.4
 1136     6.0     4.7      0.125  |       O I     |       |       |      1.5
 1137     6.0     4.7      0.127  |       O I     |       |       |      1.5
 1138     7.0     4.8      0.130  |       O   I   |       |       |      1.5
 1139     7.0     4.9      0.133  |       O   I   |       |       |      1.5
 1140     7.0     4.9      0.136  |       O   I   |       |       |      1.5
 1141     7.0     5.0      0.138  |       O   I   |       |       |      1.5
 1142     7.0     5.1      0.141  |       |O  I   |       |       |      1.6
 1143     8.0     5.2      0.145  |       |O    I |       |       |      1.6
 1144     8.0     5.3      0.149  |       |O    I |       |       |      1.6
 1145     8.0     5.4      0.153  |       |O    I |       |       |      1.6
 1146     9.0     5.5      0.158  |       |O      I       |       |      1.7
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1147     9.0     5.6      0.162  |        |O      I       |        |      1.7
1148    10.0     5.7      0.168  |        | O     |I      |        |      1.7
1149    11.0     5.9      0.175  |        | O     |  I    |        |      1.8
1150    12.0     6.1      0.184  |        | O     |    I  |        |      1.8
1151    14.0     6.4      0.194  |        |  O    |       I        |      1.9
1152    15.0     6.7      0.206  |        |  O    |        | I     |      2.0
1153    17.0     7.0      0.220  |        |   O   |        |     I |      2.0
1154    18.0     7.2      0.235  |        |   O   |        |       I      2.1
1155    18.0     7.5      0.250  |        |    O  |        |       I      2.1
1156    18.0     7.7      0.264  |        |    O  |        |       I      2.2
1157    18.0     7.9      0.278  |        |     O |        |       I      2.2
1158    17.0     8.1      0.290  |        |     O |        |     I |      2.3
1159    17.0     8.3      0.303  |        |     O |        |     I |      2.3
1160    16.0     8.5      0.313  |        |      O|        |   I   |      2.3
1161    16.0     8.7      0.323  |        |      O|        |   I   |      2.4
1162    15.0     8.8      0.332  |        |      O|        | I     |      2.4
1163    13.0     8.9      0.338  |        |      O|      I|        |      2.4
1164    11.0     8.9      0.340  |        |      O|  I    |        |      2.4
1165     9.0     9.0      0.340  |        |      OI       |        |      2.4
1166     8.0     8.9      0.339  |        |     IO|       |        |      2.4
1167     6.0     8.9      0.335  |        | I    O|       |        |      2.4
1168     6.0     8.8      0.331  |        | I    O|       |        |      2.4
1169     5.0     8.7      0.326  |       I      O|       |        |      2.4
1170     5.0     8.6      0.321  |       I      O|       |        |      2.4
1171     5.0     8.5      0.316  |       I      O|       |        |      2.3
1172     4.0     8.4      0.310  |      I|      O|       |        |      2.3
1173     4.0     8.3      0.304  |      I|     O |       |        |      2.3
1174     4.0     8.2      0.298  |      I|     O |       |        |      2.3
1175     4.0     8.2      0.292  |      I|     O |       |        |      2.3
1176     4.0     8.1      0.286  |      I|     O |       |        |      2.2
1177     4.0     8.0      0.281  |      I|     O |       |        |      2.2
1178     4.0     7.9      0.276  |      I|     O |       |        |      2.2
1179     4.0     7.8      0.270  |      I|    O  |       |        |      2.2
1180     3.0     7.7      0.264  |    I  |    O  |       |        |      2.2
1181     3.0     7.6      0.257  |    I  |    O  |       |        |      2.1
1182     3.0     7.5      0.251  |    I  |    O  |       |        |      2.1
1183     3.0     7.4      0.245  |    I  |    O  |       |        |      2.1
1184     3.0     7.3      0.239  |    I  |   O   |       |        |      2.1
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1185     3.0     7.2      0.233  |    I  |   O   |       |       |      2.1
1186     3.0     7.1      0.228  |    I  |   O   |       |       |      2.0
1187     3.0     7.0      0.222  |    I  |   O   |       |       |      2.0
1188     3.0     6.9      0.217  |    I  |   O   |       |       |      2.0
1189     3.0     6.8      0.211  |    I  |   O   |       |       |      2.0
1190     3.0     6.7      0.206  |    I  |  O    |       |       |      2.0
1191     3.0     6.6      0.201  |    I  |  O    |       |       |      1.9
1192     3.0     6.4      0.196  |    I  |  O    |       |       |      1.9
1193     3.0     6.3      0.192  |    I  |  O    |       |       |      1.9
1194     3.0     6.2      0.187  |    I  |  O    |       |       |      1.8
1195     3.0     6.1      0.183  |    I  | O     |       |       |      1.8
1196     3.0     6.0      0.179  |    I  | O     |       |       |      1.8
1197     3.0     5.9      0.174  |    I  | O     |       |       |      1.8
1198     3.0     5.8      0.171  |    I  | O     |       |       |      1.7
1199     2.0     5.7      0.165  |  I    | O     |       |       |      1.7
1200     2.0     5.6      0.160  |  I    |O      |       |       |      1.7
1201     2.0     5.4      0.156  |  I    |O      |       |       |      1.6
1202     2.0     5.3      0.151  |  I    |O      |       |       |      1.6
1203     2.0     5.2      0.146  |  I    |O      |       |       |      1.6
1204     2.0     5.1      0.142  |  I    |O      |       |       |      1.6
1205     2.0     5.0      0.138  |  I    O       |       |       |      1.5
1206     2.0     4.9      0.134  |  I    O       |       |       |      1.5
1207     2.0     4.8      0.130  |  I    O       |       |       |      1.5
1208     2.0     4.7      0.126  |  I    O       |       |       |      1.5
1209     2.0     4.6      0.122  |  I    O       |       |       |      1.4
1210     2.0     4.5      0.119  |  I    O       |       |       |      1.4
1211     2.0     4.4      0.115  |  I   O|       |       |       |      1.4
1212     2.0     4.4      0.112  |  I   O|       |       |       |      1.4
1213     2.0     4.3      0.109  |  I   O|       |       |       |      1.4
1214     2.0     4.2      0.106  |  I   O|       |       |       |      1.3
1215     2.0     4.1      0.103  |  I   O|       |       |       |      1.3
1216     2.0     4.1      0.100  |  I   O|       |       |       |      1.3
1217     2.0     4.0      0.097  |  I   O|       |       |       |      1.3
1218     2.0     3.9      0.094  |  I  O |       |       |       |      1.3
1219     2.0     3.9      0.092  |  I  O |       |       |       |      1.3
1220     2.0     3.8      0.089  |  I  O |       |       |       |      1.2
1221     2.0     3.7      0.087  |  I  O |       |       |       |      1.2
1222     2.0     3.7      0.084  |  I  O |       |       |       |      1.2
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1223	2.0	3.6	0.082	I O				1.2
1224	2.0	3.6	0.080	I O				1.2
1225	2.0	3.5	0.078	I O				1.2
1226	2.0	3.5	0.076	I O				1.2
1227	2.0	3.4	0.074	I O				1.1
1228	2.0	3.4	0.072	I O				1.1
1229	2.0	3.3	0.070	I O				1.1
1230	2.0	3.3	0.068	I O				1.1
1231	2.0	3.2	0.066	I O				1.1
1232	2.0	3.2	0.065	I O				1.1
1233	2.0	3.2	0.063	I O				1.1
1234	2.0	3.1	0.062	I O				1.1
1235	2.0	3.1	0.060	I O				1.1
1236	2.0	3.0	0.059	I O				1.1
1237	2.0	3.0	0.057	I O				1.0
1238	2.0	3.0	0.056	I O				1.0
1239	2.0	2.9	0.054	I O				1.0
1240	2.0	2.9	0.053	I O				1.0
1241	2.0	2.9	0.052	I O				1.0
1242	2.0	2.9	0.051	I O				1.0
1243	2.0	2.8	0.050	I O				1.0
1244	2.0	2.8	0.048	IO				1.0
1245	2.0	2.7	0.047	IO				0.9
1246	2.0	2.6	0.047	IO				0.9
1247	2.0	2.6	0.046	IO				0.9
1248	2.0	2.5	0.045	IO				0.9
1249	2.0	2.5	0.044	IO				0.9
1250	2.0	2.5	0.043	IO				0.9
1251	2.0	2.4	0.043	IO				0.9
1252	2.0	2.4	0.042	IO				0.8
1253	2.0	2.4	0.042	IO				0.8
1254	2.0	2.3	0.041	IO				0.8
1255	2.0	2.3	0.041	IO				0.8
1256	2.0	2.3	0.040	IO				0.8
1257	2.0	2.3	0.040	IO				0.8
1258	2.0	2.3	0.040	IO				0.8
1259	2.0	2.2	0.039	O				0.8
1260	2.0	2.2	0.039	O				0.8

1261	2.0	2.2	0.039	O				0.8
1262	2.0	2.2	0.038	O				0.8
1263	2.0	2.2	0.038	O				0.8
1264	2.0	2.2	0.038	O				0.8
1265	2.0	2.1	0.038	O				0.8
1266	2.0	2.1	0.038	O				0.8
1267	2.0	2.1	0.037	O				0.7
1268	2.0	2.1	0.037	O				0.7
1269	2.0	2.1	0.037	O				0.7
1270	2.0	2.1	0.037	O				0.7
1271	2.0	2.1	0.037	O				0.7
1272	2.0	2.1	0.037	O				0.7
1273	2.0	2.1	0.037	O				0.7
1274	2.0	2.1	0.036	O				0.7
1275	2.0	2.1	0.036	O				0.7
1276	1.0	2.0	0.035	I O				0.7
1277	1.0	1.9	0.034	I O				0.7
1278	1.0	1.8	0.032	I O				0.6
1279	1.0	1.8	0.031	I O				0.6
1280	1.0	1.7	0.030	I O				0.6
1281	1.0	1.7	0.029	IO				0.6
1282	1.0	1.6	0.028	IO				0.6
1283	1.0	1.6	0.028	IO				0.6
1284	1.0	1.5	0.027	IO				0.5
1285	1.0	1.5	0.026	IO				0.5
1286	1.0	1.5	0.026	IO				0.5
1287	1.0	1.4	0.025	IO				0.5
1288	1.0	1.4	0.024	IO				0.5
1289	1.0	1.4	0.024	IO				0.5
1290	1.0	1.3	0.023	IO				0.5
1291	1.0	1.3	0.023	IO				0.5
1292	1.0	1.3	0.023	IO				0.5
1293	1.0	1.3	0.022	IO				0.4
1294	1.0	1.2	0.022	IO				0.4
1295	1.0	1.2	0.022	IO				0.4
1296	1.0	1.2	0.021	IO				0.4
1297	1.0	1.2	0.021	IO				0.4
1298	1.0	1.2	0.021	IO				0.4

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1299     1.0     1.2      0.020  |IO     |       |       |       |      0.4
1300     1.0     1.2      0.020  |IO     |       |       |       |      0.4
1310     1.0     1.1      0.019  |O      |       |       |       |      0.4
1320     1.0     1.0      0.018  |O      |       |       |       |      0.4
1330     1.0     1.0      0.018  |O      |       |       |       |      0.4
1340     1.0     1.0      0.018  |O      |       |       |       |      0.4
1350     1.0     1.0      0.018  |O      |       |       |       |      0.4
1360     1.0     1.0      0.018  |O      |       |       |       |      0.4
1370     1.0     1.0      0.018  |O      |       |       |       |      0.4
1380     1.0     1.0      0.018  |O      |       |       |       |      0.4
1390     1.0     1.0      0.018  |O      |       |       |       |      0.4
1400     1.0     1.0      0.018  |O      |       |       |       |      0.4
1420     1.0     1.0      0.018  |O      |       |       |       |      0.4
1440     1.0     1.0      0.018  |O      |       |       |       |      0.4
1460     1.0     1.0      0.018  |O      |       |       |       |      0.4
1500     1.0     0.9      0.016  |O      |       |       |       |      0.3

   Remaining water in basin =    0.02 (Ac.Ft)
   Peak flow out of basin =     8.95(CFS)
   Peak flow time = 1165 Min., time interval # = 51
   Maximum depth in basin =    2.43(Ft.)
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5-YEAR NORTH PAD

Program Package Serial Number: 2090

08/10/11 FILE: DsnyPo INPUT DATA: English Units RAINFALL SOIL FILE: English (In) OUTPUT DATA: English Units PAGE 1

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT PROG F0601M

MODIFIED RATIONAL METHOD HYDROLOGY - **STORM YEAR = 5** SOIL DATA FILE: C:\civild\lasoilx.dat

Disney/ABC Studio North Area 10.12 Acres STORM DAY 4

LOCATION	SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	RAIN ZONE	PCT IMPV
6601 1A	10.1	16.50	10.1	16.50	3	100.	.02000	.00	.00	0.	97	10	A37	.91
6601 2A	.0	.00	10.1	16.39	0	0.	.00000	.00	.00	0.	97	99	A37	.00

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1997-2004 Version 6.4

Study Date : 08/10/11 Input hydrograph file name : dsnypo.hyd
Output hydrograph file name: DisBasNorth.hin
Disney/ABC Studio Northerly Basin 5-year

User entry of depth-outflow-storage data

Hydrograph time unit varies
Initial depth in storage basin = 0.00(Ft.)

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

Depth vs. Storage and Depth vs. Discharge data @ 1 Min. Intervals:

Basin Depth (Ft.)	Storage (Ac.Ft)	Outflow (CFS)	(S-O*dt/2) (Ac.Ft)	(S+O*dt/2) (Ac.Ft)
0.000	0.000	0.000	0.000	0.000
1.000	0.050	2.840	0.048	0.052
2.000	0.213	6.850	0.208	0.218
3.000	0.511	11.760	0.503	0.519
4.000	0.975	17.430	0.963	0.987
5.000	1.642	56.120	1.603	1.681

Hydrograph Detention Basin Routing
Hydrograph at 6601 2 A Storm Day: 4 Drainage Area = 10.10
Total flood hydrograph volume this storm day = 3.02 Ac. Ft.

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    ---------------------------------------------------------------------

    Graph values: 'I'= unit inflow; 'O'=outflow at time shown
    ---------------------------------------------------------------------
Time   Inflow  Outflow    Storage                                          Depth
(Min)  (CFS)   (CFS)     (Ac.Ft) .0       4.0     8.0    12.0    16.0 (Ft.)
    0     0.0     0.0      0.000  O       |       |       |       |      0.0
  100     1.0     0.9      0.015  |OI     |       |       |       |      0.3
  200     1.0     1.0      0.018  |OI     |       |       |       |      0.4
  300     1.0     1.0      0.018  |OI     |       |       |       |      0.4
  400     1.0     1.0      0.018  |OI     |       |       |       |      0.4
  500     1.0     1.0      0.018  |OI     |       |       |       |      0.4
  600     1.0     1.0      0.018  |OI     |       |       |       |      0.4
  700     1.0     1.0      0.018  |OI     |       |       |       |      0.4
  800     1.0     1.0      0.018  |OI     |       |       |       |      0.4
  900     2.0     1.9      0.033  |  OI   |       |       |       |      0.7
 1000     2.0     2.0      0.035  |  OI   |       |       |       |      0.7
 1050     2.0     2.0      0.035  |  OI   |       |       |       |      0.7
 1100     3.0     2.8      0.049  |    OI |       |       |       |      1.0
 1110     4.0     3.0      0.058  |     O I       |       |       |      1.0
 1120     4.0     3.3      0.069  |     O I       |       |       |      1.1
 1130     5.0     3.7      0.084  |      O| I     |       |       |      1.2
 1131     5.0     3.7      0.086  |      O| I     |       |       |      1.2
 1132     5.0     3.8      0.087  |      O| I     |       |       |      1.2
 1133     5.0     3.8      0.089  |      O| I     |       |       |      1.2
 1134     5.0     3.8      0.091  |      O| I     |       |       |      1.2
 1135     5.0     3.9      0.092  |      O| I     |       |       |      1.3
 1136     5.0     3.9      0.094  |      O| I     |       |       |      1.3
 1137     5.0     4.0      0.095  |      O| I     |       |       |      1.3
 1138     6.0     4.0      0.098  |       O   I   |       |       |      1.3
 1139     6.0     4.1      0.101  |       O   I   |       |       |      1.3
 1140     6.0     4.2      0.103  |       O   I   |       |       |      1.3
 1141     6.0     4.2      0.106  |       O   I   |       |       |      1.3
 1142     6.0     4.3      0.108  |       O   I   |       |       |      1.4
 1143     7.0     4.4      0.112  |       O     I |       |       |      1.4
 1144     7.0     4.5      0.115  |       O     I |       |       |      1.4
 1145     7.0     4.5      0.119  |       |O    I |       |       |      1.4
 1146     8.0     4.7      0.124  |       |O      I       |       |      1.5
```

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1147     8.0     4.8      0.128  |       |O      I       |       |      1.5
1148     8.0     4.9      0.133  |       |O      I       |       |      1.5
1149     9.0     5.0      0.138  |       | O     | I     |       |      1.5
1150    11.0     5.2      0.146  |       | O     |     I |       |      1.6
1151    12.0     5.4      0.155  |       | O     |       I       |      1.6
1152    14.0     5.7      0.167  |       |  O    |       |   I   |      1.7
1153    16.0     6.1      0.181  |       |   O   |       |       I      1.8
1154    16.0     6.4      0.194  |       |   O   |       |       I      1.9
1155    16.0     6.7      0.207  |       |    O  |       |       I      2.0
1156    16.0     7.0      0.220  |       |    O  |       |       I      2.0
1157    16.0     7.2      0.232  |       |     O |       |       I      2.1
1158    15.0     7.3      0.243  |       |     O |       |     I |      2.1
1159    14.0     7.5      0.252  |       |     O |       |   I   |      2.1
1160    12.0     7.6      0.258  |       |      O|       I       |      2.2
1161    11.0     7.7      0.263  |       |      O|     I |       |      2.2
1162     9.0     7.7      0.265  |       |      O| I     |       |      2.2
1163     7.0     7.7      0.264  |       |     IO|       |       |      2.2
1164     6.0     7.6      0.261  |       |   I  O|       |       |      2.2
1165     5.0     7.6      0.258  |       | I    O|       |       |      2.2
1166     5.0     7.5      0.254  |       | I    O|       |       |      2.1
1167     4.0     7.5      0.249  |       I     O |       |       |      2.1
1168     4.0     7.4      0.245  |       I     O |       |       |      2.1
1169     4.0     7.3      0.240  |       I     O |       |       |      2.1
1170     4.0     7.2      0.236  |       I     O |       |       |      2.1
1171     3.0     7.1      0.230  |     I |     O |       |       |      2.1
1172     3.0     7.0      0.224  |     I |     O |       |       |      2.0
1173     3.0     6.9      0.219  |     I |    O  |       |       |      2.0
1174     3.0     6.9      0.213  |     I |    O  |       |       |      2.0
1175     3.0     6.7      0.208  |     I |    O  |       |       |      2.0
1176     3.0     6.6      0.203  |     I |    O  |       |       |      1.9
1177     3.0     6.5      0.198  |     I |   O   |       |       |      1.9
1178     3.0     6.4      0.194  |     I |   O   |       |       |      1.9
1179     3.0     6.3      0.189  |     I |   O   |       |       |      1.9
1180     3.0     6.2      0.185  |     I |   O   |       |       |      1.8
1181     3.0     6.0      0.180  |     I |   O   |       |       |      1.8
1182     3.0     5.9      0.176  |     I |  O    |       |       |      1.8
1183     3.0     5.8      0.172  |     I |  O    |       |       |      1.7
1184     2.0     5.7      0.167  |   I   |  O    |       |       |      1.7
```

```
1185     2.0     5.6      0.162  |   I   |  O    |       |       |      1.7
1186     2.0     5.5      0.157  |   I   | O     |       |       |      1.7
1187     2.0     5.4      0.152  |   I   | O     |       |       |      1.6
1188     2.0     5.2      0.148  |   I   | O     |       |       |      1.6
1189     2.0     5.1      0.143  |   I   | O     |       |       |      1.6
1190     2.0     5.0      0.139  |   I   | O     |       |       |      1.5
1191     2.0     4.9      0.135  |   I   |O      |       |       |      1.5
1192     2.0     4.8      0.131  |   I   |O      |       |       |      1.5
1193     2.0     4.7      0.127  |   I   |O      |       |       |      1.5
1194     2.0     4.6      0.124  |   I   |O      |       |       |      1.5
1195     2.0     4.6      0.120  |   I   |O      |       |       |      1.4
1196     2.0     4.5      0.116  |   I   O       |       |       |      1.4
1197     2.0     4.4      0.113  |   I   O       |       |       |      1.4
1198     2.0     4.3      0.110  |   I   O       |       |       |      1.4
1199     2.0     4.2      0.107  |   I   O       |       |       |      1.3
1200     2.0     4.2      0.104  |   I   O       |       |       |      1.3
1201     2.0     4.1      0.101  |   I   O       |       |       |      1.3
1202     2.0     4.0      0.098  |   I   O       |       |       |      1.3
1203     2.0     4.0      0.095  |   I  O|       |       |       |      1.3
1204     2.0     3.9      0.093  |   I  O|       |       |       |      1.3
1205     2.0     3.8      0.090  |   I  O|       |       |       |      1.2
1206     2.0     3.8      0.088  |   I  O|       |       |       |      1.2
1207     2.0     3.7      0.085  |   I  O|       |       |       |      1.2
1208     2.0     3.6      0.083  |   I  O|       |       |       |      1.2
1209     2.0     3.6      0.081  |   I  O|       |       |       |      1.2
1210     2.0     3.5      0.078  |   I  O|       |       |       |      1.2
1211     2.0     3.5      0.076  |   I O |       |       |       |      1.2
1212     2.0     3.4      0.074  |   I O |       |       |       |      1.1
1213     2.0     3.4      0.072  |   I O |       |       |       |      1.1
1214     2.0     3.3      0.071  |   I O |       |       |       |      1.1
1215     2.0     3.3      0.069  |   I O |       |       |       |      1.1
1216     2.0     3.3      0.067  |   I O |       |       |       |      1.1
1217     2.0     3.2      0.065  |   I O |       |       |       |      1.1
1218     2.0     3.2      0.064  |   I O |       |       |       |      1.1
1219     2.0     3.1      0.062  |   I O |       |       |       |      1.1
1220     2.0     3.1      0.060  |   I O |       |       |       |      1.1
1221     2.0     3.1      0.059  |   I O |       |       |       |      1.1
1222     2.0     3.0      0.058  |   I O |       |       |       |      1.0
```

1223	2.0	3.0	0.056	IO				1.0
1224	2.0	3.0	0.055	IO				1.0
1225	2.0	2.9	0.054	IO				1.0
1226	2.0	2.9	0.052	IO				1.0
1227	2.0	2.9	0.051	IO				1.0
1228	2.0	2.8	0.050	IO				1.0
1229	2.0	2.8	0.049	IO				1.0
1230	2.0	2.7	0.048	IO				1.0
1231	2.0	2.7	0.047	IO				0.9
1232	2.0	2.6	0.046	IO				0.9
1233	2.0	2.6	0.045	IO				0.9
1234	2.0	2.5	0.044	IO				0.9
1235	1.0	2.4	0.042	I O				0.8
1236	1.0	2.3	0.041	I O				0.8
1237	1.0	2.2	0.039	I O				0.8
1238	1.0	2.1	0.037	I O				0.7
1239	1.0	2.0	0.036	I O				0.7
1240	1.0	2.0	0.034	IO				0.7
1241	1.0	1.9	0.033	IO				0.7
1242	1.0	1.8	0.032	IO				0.6
1243	1.0	1.8	0.031	IO				0.6
1244	1.0	1.7	0.030	IO				0.6
1245	1.0	1.6	0.029	IO				0.6
1246	1.0	1.6	0.028	IO				0.6
1247	1.0	1.5	0.027	IO				0.5
1248	1.0	1.5	0.027	IO				0.5
1249	1.0	1.5	0.026	O				0.5
1250	1.0	1.4	0.025	O				0.5
1251	1.0	1.4	0.025	O				0.5
1252	1.0	1.4	0.024	O				0.5
1253	1.0	1.3	0.024	O				0.5
1254	1.0	1.3	0.023	O				0.5
1255	1.0	1.3	0.023	O				0.5
1256	1.0	1.3	0.022	O				0.4
1257	1.0	1.3	0.022	O				0.4
1258	1.0	1.2	0.022	O				0.4
1259	1.0	1.2	0.021	O				0.4
1260	1.0	1.2	0.021	O				0.4

1261	1.0	1.2	0.021	O				0.4
1262	1.0	1.2	0.021	O				0.4
1263	1.0	1.2	0.020	O				0.4
1264	1.0	1.1	0.020	O				0.4
1265	1.0	1.1	0.020	O				0.4
1266	1.0	1.1	0.020	O				0.4
1267	1.0	1.1	0.020	O				0.4
1268	1.0	1.1	0.019	O				0.4
1269	1.0	1.1	0.019	O				0.4
1270	1.0	1.1	0.019	O				0.4
1271	1.0	1.1	0.019	O				0.4
1272	1.0	1.1	0.019	O				0.4
1273	1.0	1.1	0.019	O				0.4
1274	1.0	1.1	0.019	O				0.4
1275	1.0	1.1	0.019	O				0.4
1276	1.0	1.1	0.019	O				0.4
1277	1.0	1.1	0.019	O				0.4
1278	1.0	1.0	0.018	O				0.4
1279	1.0	1.0	0.018	O				0.4
1280	1.0	1.0	0.018	O				0.4
1281	1.0	1.0	0.018	O				0.4
1282	1.0	1.0	0.018	O				0.4
1283	1.0	1.0	0.018	O				0.4
1284	1.0	1.0	0.018	O				0.4
1285	1.0	1.0	0.018	O				0.4
1286	1.0	1.0	0.018	O				0.4
1287	1.0	1.0	0.018	O				0.4
1288	1.0	1.0	0.018	O				0.4
1289	1.0	1.0	0.018	O				0.4
1290	1.0	1.0	0.018	O				0.4
1291	1.0	1.0	0.018	O				0.4
1292	1.0	1.0	0.018	O				0.4
1293	1.0	1.0	0.018	O				0.4
1294	1.0	1.0	0.018	O				0.4
1295	1.0	1.0	0.018	O				0.4
1296	1.0	1.0	0.018	O				0.4
1297	1.0	1.0	0.018	O				0.4
1298	1.0	1.0	0.018	O				0.4

1299	1.0	1.0	0.018	| O	|	|	|	|	0.4
1300	1.0	1.0	0.018	| O	|	|	|	|	0.4
1310	1.0	1.0	0.018	| O	|	|	|	|	0.4
1320	1.0	1.0	0.018	| O	|	|	|	|	0.4
1330	1.0	1.0	0.018	| O	|	|	|	|	0.4
1340	1.0	1.0	0.018	| O	|	|	|	|	0.4
1350	1.0	1.0	0.018	| O	|	|	|	|	0.4
1360	1.0	1.0	0.018	| O	|	|	|	|	0.4
1370	1.0	1.0	0.018	| O	|	|	|	|	0.4
1380	1.0	1.0	0.018	| O	|	|	|	|	0.4
1390	1.0	1.0	0.018	| O	|	|	|	|	0.4
1400	1.0	1.0	0.018	| O	|	|	|	|	0.4
1420	1.0	1.0	0.018	| O	|	|	|	|	0.4
1440	1.0	1.0	0.018	| O	|	|	|	|	0.4
1460	1.0	1.0	0.018	| O	|	|	|	|	0.4
1500	1.0	0.9	0.016	|OI	|	|	|	|	0.3

```
Remaining water in basin =    0.02 (Ac.Ft)
Peak flow out of basin =     7.70(CFS)
Peak flow time = 1162 Min., time interval # = 48
Maximum depth in basin =    2.17(Ft.)
```

10-YEAR NORTH PAD

Program Package Serial Number: 2090

08/10/11 FILE: DsnyPo INPUT DATA: English Units RAINFALL SOIL FILE: English (In) OUTPUT DATA: English Units PAGE 1

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT PROG F0601M

MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 10 SOIL DATA FILE: C:\civild\lasoilx.dat

Disney/ABC Studio North Area 10.12 Acres STORM DAY 4

LOCATION	SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	RAIN ZONE	PCT IMPV
6601 1A	10.1	22.24	10.1	22.24	3	100.	.02000	.00	.00	0.	97	8	A37	.91
6601 2A	.0	.00	10.1	22.24	0	0.	.00000	.00	.00	0.	97	99	A37	.00

```
  CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1997-2004 Version 6.4
-------------------------------------------------------------------
Study Date : 08/10/11 Input hydrograph file name : dsnypo.hyd
Output hydrograph file name: DisBAsNorth.hin
Disney/ABC Studio Northerly Basin 10-year



-------------------------------------------------------------------


User entry of depth-outflow-storage data
-------------------------------------------------------------------
Hydrograph time unit varies
Initial depth in storage basin =   0.00(Ft.)
-------------------------------------------------------------------
-------------------------------------------------------------------
Initial basin depth =   0.00 (Ft.)
Initial basin storage =      0.00 (Ac.Ft)
Initial basin outflow =   0.00 (CFS)
-----------------------------------------------------------------------
-------------------------------------------------------------------
Depth vs. Storage and Depth vs. Discharge data @ 1 Min. Intervals:
 Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
     (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
-----------------------------------------------------------------------
    0.000      0.000      0.000      0.000        0.000
    1.000      0.050      2.840      0.048        0.052
    2.000      0.213      6.850      0.208        0.218
    3.000      0.511     11.760      0.503        0.519
    4.000      0.975     17.430      0.963        0.987
    5.000      1.642     56.120      1.603        1.681
-------------------------------------------------------------------
            Hydrograph Detention Basin Routing
Hydrograph at 6601 2 A Storm Day: 4 Drainage Area =   10.10
Total flood hydrograph volume this storm day =    3.46 Ac. Ft.
```

```
    ---------------------------------------------------------------------

    Graph values: 'I'= unit inflow; 'O'=outflow at time shown
    ---------------------------------------------------------------------
Time   Inflow  Outflow    Storage                                          Depth
(Min)  (CFS)   (CFS)     (Ac.Ft) .0       5.5    11.0    16.5    22.0 (Ft.)
    0     0.0     0.0      0.000  O       |       |       |       |      0.0
  100     1.0     0.9      0.015  |O      |       |       |       |      0.3
  200     1.0     1.0      0.018  |O      |       |       |       |      0.4
  300     1.0     1.0      0.018  |O      |       |       |       |      0.4
  400     1.0     1.0      0.018  |O      |       |       |       |      0.4
  500     1.0     1.0      0.018  |O      |       |       |       |      0.4
  600     1.0     1.0      0.018  |O      |       |       |       |      0.4
  700     1.0     1.0      0.018  |O      |       |       |       |      0.4
  800     2.0     1.9      0.033  | O     |       |       |       |      0.7
  900     2.0     2.0      0.035  | O     |       |       |       |      0.7
 1000     2.0     2.0      0.035  | O     |       |       |       |      0.7
 1050     3.0     2.8      0.049  |   O   |       |       |       |      1.0
 1100     4.0     3.5      0.076  |    O  |       |       |       |      1.2
 1110     4.0     3.6      0.082  |    O  |       |       |       |      1.2
 1120     5.0     3.9      0.093  |    O I|       |       |       |      1.3
 1130     6.0     4.4      0.113  |     O I       |       |       |      1.4
 1131     6.0     4.4      0.115  |     O I       |       |       |      1.4
 1132     6.0     4.5      0.117  |     O I       |       |       |      1.4
 1133     6.0     4.5      0.119  |     O I       |       |       |      1.4
 1134     6.0     4.6      0.121  |     O I       |       |       |      1.4
 1135     6.0     4.6      0.123  |     O I       |       |       |      1.4
 1136     7.0     4.7      0.126  |     O | I     |       |       |      1.5
 1137     7.0     4.8      0.129  |     O | I     |       |       |      1.5
 1138     7.0     4.9      0.132  |      O| I     |       |       |      1.5
 1139     7.0     4.9      0.135  |      O| I     |       |       |      1.5
 1140     8.0     5.0      0.139  |      O|  I    |       |       |      1.5
 1141     8.0     5.1      0.143  |      O|  I    |       |       |      1.6
 1142     8.0     5.2      0.147  |      O|  I    |       |       |      1.6
 1143     8.0     5.3      0.151  |      O|  I    |       |       |      1.6
 1144     9.0     5.4      0.156  |      O|    I  |       |       |      1.7
 1145     9.0     5.6      0.161  |       O    I  |       |       |      1.7
 1146    10.0     5.7      0.167  |       O     I |       |       |      1.7
```

```
1147    10.0     5.9      0.173  |       O     I |       |       |      1.8
1148    11.0     6.0      0.180  |       O       I       |       |      1.8
1149    12.0     6.2      0.188  |       |O      |I      |       |      1.8
1150    14.0     6.5      0.198  |       |O      |   I   |       |      1.9
1151    17.0     6.8      0.212  |       |O      |       I       |      2.0
1152    19.0     7.1      0.229  |       | O     |       |  I    |      2.1
1153    21.0     7.4      0.248  |       | O     |       |     I |      2.1
1154    22.0     7.8      0.268  |       |  O    |       |       I      2.2
1155    22.0     8.1      0.287  |       |  O    |       |       I      2.2
1156    22.0     8.4      0.306  |       |   O   |       |       I      2.3
1157    20.0     8.6      0.322  |       |   O   |       |    I  |      2.4
1158    17.0     8.8      0.333  |       |   O   |       I       |      2.4
1159    15.0     9.0      0.342  |       |    O  |    I  |       |      2.4
1160    12.0     9.0      0.346  |       |    O  |I      |       |      2.4
1161     9.0     9.0      0.346  |       |    O  |       |       |      2.4
1162     7.0     9.0      0.343  |       | I  O  |       |       |      2.4
1163     6.0     8.9      0.339  |       I   O   |       |       |      2.4
1164     6.0     8.9      0.335  |       I   O   |       |       |      2.4
1165     6.0     8.8      0.331  |       I   O   |       |       |      2.4
1166     5.0     8.7      0.326  |      I|   O   |       |       |      2.4
1167     5.0     8.6      0.321  |      I|   O   |       |       |      2.4
1168     5.0     8.5      0.316  |      I|   O   |       |       |      2.3
1169     4.0     8.4      0.310  |    I  |   O   |       |       |      2.3
1170     4.0     8.3      0.304  |    I  |   O   |       |       |      2.3
1171     4.0     8.2      0.298  |    I  |  O    |       |       |      2.3
1172     4.0     8.2      0.292  |    I  |  O    |       |       |      2.3
1173     4.0     8.1      0.286  |    I  |  O    |       |       |      2.2
1174     4.0     8.0      0.281  |    I  |  O    |       |       |      2.2
1175     4.0     7.9      0.275  |    I  |  O    |       |       |      2.2
1176     4.0     7.8      0.270  |    I  |  O    |       |       |      2.2
1177     3.0     7.7      0.264  |   I   |  O    |       |       |      2.2
1178     3.0     7.6      0.257  |   I   |  O    |       |       |      2.1
1179     3.0     7.5      0.251  |   I   | O     |       |       |      2.1
1180     3.0     7.4      0.245  |   I   | O     |       |       |      2.1
1181     3.0     7.3      0.239  |   I   | O     |       |       |      2.1
1182     3.0     7.2      0.233  |   I   | O     |       |       |      2.1
1183     3.0     7.1      0.227  |   I   | O     |       |       |      2.0
1184     3.0     7.0      0.222  |   I   | O     |       |       |      2.0
```

```
1185     3.0     6.9      0.216  |   I   | O     |       |       |      2.0
1186     3.0     6.8      0.211  |   I   |O      |       |       |      2.0
1187     3.0     6.7      0.206  |   I   |O      |       |       |      2.0
1188     3.0     6.6      0.201  |   I   |O      |       |       |      1.9
1189     3.0     6.4      0.196  |   I   |O      |       |       |      1.9
1190     3.0     6.3      0.192  |   I   |O      |       |       |      1.9
1191     3.0     6.2      0.187  |   I   |O      |       |       |      1.8
1192     3.0     6.1      0.183  |   I   O       |       |       |      1.8
1193     3.0     6.0      0.178  |   I   O       |       |       |      1.8
1194     3.0     5.9      0.174  |   I   O       |       |       |      1.8
1195     3.0     5.8      0.170  |   I   O       |       |       |      1.7
1196     2.0     5.7      0.165  | I     O       |       |       |      1.7
1197     2.0     5.6      0.160  | I     O       |       |       |      1.7
1198     2.0     5.4      0.156  | I    O|       |       |       |      1.6
1199     2.0     5.3      0.151  | I    O|       |       |       |      1.6
1200     2.0     5.2      0.146  | I    O|       |       |       |      1.6
1201     2.0     5.1      0.142  | I    O|       |       |       |      1.6
1202     2.0     5.0      0.138  | I    O|       |       |       |      1.5
1203     2.0     4.9      0.134  | I    O|       |       |       |      1.5
1204     2.0     4.8      0.130  | I   O |       |       |       |      1.5
1205     2.0     4.7      0.126  | I   O |       |       |       |      1.5
1206     2.0     4.6      0.122  | I   O |       |       |       |      1.4
1207     2.0     4.5      0.119  | I   O |       |       |       |      1.4
1208     2.0     4.4      0.115  | I   O |       |       |       |      1.4
1209     2.0     4.4      0.112  | I   O |       |       |       |      1.4
1210     2.0     4.3      0.109  | I   O |       |       |       |      1.4
1211     2.0     4.2      0.106  | I   O |       |       |       |      1.3
1212     2.0     4.1      0.103  | I   O |       |       |       |      1.3
1213     2.0     4.1      0.100  | I  O  |       |       |       |      1.3
1214     2.0     4.0      0.097  | I  O  |       |       |       |      1.3
1215     2.0     3.9      0.094  | I  O  |       |       |       |      1.3
1216     2.0     3.9      0.092  | I  O  |       |       |       |      1.3
1217     2.0     3.8      0.089  | I  O  |       |       |       |      1.2
1218     2.0     3.7      0.087  | I  O  |       |       |       |      1.2
1219     2.0     3.7      0.084  | I  O  |       |       |       |      1.2
1220     2.0     3.6      0.082  | I  O  |       |       |       |      1.2
1221     2.0     3.6      0.080  | I  O  |       |       |       |      1.2
1222     2.0     3.5      0.078  | I  O  |       |       |       |      1.2
```

1223	2.0	3.5	0.076	I O				1.2
1224	2.0	3.4	0.074	I O				1.1
1225	2.0	3.4	0.072	I O				1.1
1226	2.0	3.3	0.070	I O				1.1
1227	2.0	3.3	0.068	I O				1.1
1228	2.0	3.2	0.066	I O				1.1
1229	2.0	3.2	0.065	I O				1.1
1230	2.0	3.2	0.063	I O				1.1
1231	2.0	3.1	0.061	I O				1.1
1232	2.0	3.1	0.060	I O				1.1
1233	2.0	3.0	0.059	I O				1.1
1234	2.0	3.0	0.057	I O				1.0
1235	2.0	3.0	0.056	I O				1.0
1236	2.0	2.9	0.054	I O				1.0
1237	2.0	2.9	0.053	I O				1.0
1238	2.0	2.9	0.052	I O				1.0
1239	2.0	2.9	0.051	I O				1.0
1240	2.0	2.8	0.050	I O				1.0
1241	2.0	2.8	0.048	I O				1.0
1242	2.0	2.7	0.047	IO				0.9
1243	2.0	2.6	0.047	IO				0.9
1244	2.0	2.6	0.046	IO				0.9
1245	2.0	2.5	0.045	IO				0.9
1246	2.0	2.5	0.044	IO				0.9
1247	2.0	2.5	0.043	IO				0.9
1248	2.0	2.4	0.043	IO				0.9
1249	2.0	2.4	0.042	IO				0.8
1250	2.0	2.4	0.042	IO				0.8
1251	2.0	2.3	0.041	IO				0.8
1252	2.0	2.3	0.041	IO				0.8
1253	2.0	2.3	0.040	IO				0.8
1254	2.0	2.3	0.040	IO				0.8
1255	2.0	2.3	0.040	IO				0.8
1256	2.0	2.2	0.039	IO				0.8
1257	2.0	2.2	0.039	IO				0.8
1258	2.0	2.2	0.039	IO				0.8
1259	2.0	2.2	0.038	IO				0.8
1260	2.0	2.2	0.038	IO				0.8

1261	2.0	2.2	0.038	IO				0.8
1262	2.0	2.1	0.038	IO				0.8
1263	2.0	2.1	0.038	IO				0.8
1264	2.0	2.1	0.037	IO				0.7
1265	2.0	2.1	0.037	IO				0.7
1266	2.0	2.1	0.037	IO				0.7
1267	2.0	2.1	0.037	IO				0.7
1268	2.0	2.1	0.037	IO				0.7
1269	2.0	2.1	0.037	IO				0.7
1270	2.0	2.1	0.037	IO				0.7
1271	1.0	2.0	0.035	IO				0.7
1272	1.0	1.9	0.034	IO				0.7
1273	2.0	1.9	0.034	O				0.7
1274	2.0	1.9	0.034	O				0.7
1275	1.0	1.9	0.033	IO				0.7
1276	1.0	1.8	0.032	IO				0.6
1277	1.0	1.7	0.031	IO				0.6
1278	1.0	1.7	0.030	IO				0.6
1279	1.0	1.6	0.029	IO				0.6
1280	1.0	1.6	0.028	IO				0.6
1281	1.0	1.5	0.027	IO				0.5
1282	1.0	1.5	0.026	IO				0.5
1283	1.0	1.5	0.026	IO				0.5
1284	1.0	1.4	0.025	IO				0.5
1285	1.0	1.4	0.025	IO				0.5
1286	1.0	1.4	0.024	O				0.5
1287	1.0	1.3	0.024	O				0.5
1288	1.0	1.3	0.023	O				0.5
1289	1.0	1.3	0.023	O				0.5
1290	1.0	1.3	0.022	O				0.4
1291	1.0	1.2	0.022	O				0.4
1292	1.0	1.2	0.022	O				0.4
1293	1.0	1.2	0.021	O				0.4
1294	1.0	1.2	0.021	O				0.4
1295	1.0	1.2	0.021	O				0.4
1296	1.0	1.2	0.021	O				0.4
1297	1.0	1.2	0.020	O				0.4
1298	1.0	1.1	0.020	O				0.4

1299	1.0	1.1	0.020	|O	|	|	|	|	0.4
1300	1.0	1.1	0.020	|O	|	|	|	|	0.4
1310	1.0	1.1	0.019	|O	|	|	|	|	0.4
1320	1.0	1.0	0.018	|O	|	|	|	|	0.4
1330	1.0	1.0	0.018	|O	|	|	|	|	0.4
1340	1.0	1.0	0.018	|O	|	|	|	|	0.4
1350	1.0	1.0	0.018	|O	|	|	|	|	0.4
1360	1.0	1.0	0.018	|O	|	|	|	|	0.4
1370	1.0	1.0	0.018	|O	|	|	|	|	0.4
1380	1.0	1.0	0.018	|O	|	|	|	|	0.4
1390	1.0	1.0	0.018	|O	|	|	|	|	0.4
1400	1.0	1.0	0.018	|O	|	|	|	|	0.4
1420	1.0	1.0	0.018	|O	|	|	|	|	0.4
1440	1.0	1.0	0.018	|O	|	|	|	|	0.4
1460	1.0	1.0	0.018	|O	|	|	|	|	0.4
1500	1.0	0.9	0.016	|O	|	|	|	|	0.3

```
Remaining water in basin =    0.02 (Ac.Ft)
Peak flow out of basin =     9.04(CFS)
Peak flow time = 1160 Min., time interval # = 46
Maximum depth in basin =    2.45(Ft.)
```

25-YEAR NORTH PAD

Program Package Serial Number: 2090

08/09/11 FILE: DsnyPo INPUT DATA: English Units RAINFALL SOIL FILE: English (In) OUTPUT DATA: English Units PAGE 1

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT PROG F0601M

MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 25 SOIL DATA FILE: C:\civild\lasoilx.dat

Disney/ABC Studio North Area 10.12 Acres STORM DAY 4

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	RAIN ZONE	PCT IMPV
6601	1A	10.1	29.23	10.1	29.23	3	100.	.02000	.00	.00	0.	97	7	A37	.91
6601	2A	.0	.00	10.1	29.17	0	0.	.00000	.00	.00	0.	97	99	A37	.00

```
  CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1997-2004 Version 6.4
-------------------------------------------------------------------
Study Date : 08/09/11 Input hydrograph file name : dsnypo.hyd
Output hydrograph file name: DisBasNorth.hin
Disney/ABC Studio Northerly Basin 25-year



-------------------------------------------------------------------


User entry of depth-outflow-storage data
-------------------------------------------------------------------
Hydrograph time unit varies
Initial depth in storage basin =   0.00(Ft.)
-------------------------------------------------------------------
-------------------------------------------------------------------
Initial basin depth =   0.00 (Ft.)
Initial basin storage =      0.00 (Ac.Ft)
Initial basin outflow =   0.00 (CFS)
-----------------------------------------------------------------------
-------------------------------------------------------------------
Depth vs. Storage and Depth vs. Discharge data @ 1 Min. Intervals:
 Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
     (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
-----------------------------------------------------------------------
    0.000      0.000      0.000      0.000        0.000
    1.000      0.050      2.840      0.048        0.052
    2.000      0.213      6.850      0.208        0.218
    3.000      0.511     11.760      0.503        0.519
    4.000      0.975     17.430      0.963        0.987
    5.000      1.642     56.120      1.603        1.681
-------------------------------------------------------------------
            Hydrograph Detention Basin Routing
Hydrograph at 6601 2 A Storm Day: 4 Drainage Area =   10.10
Total flood hydrograph volume this storm day =    4.29 Ac. Ft.
```

```
    ---------------------------------------------------------------------

    Graph values: 'I'= unit inflow; 'O'=outflow at time shown
    ---------------------------------------------------------------------
Time   Inflow  Outflow    Storage                                          Depth
(Min)  (CFS)   (CFS)     (Ac.Ft) .0       7.3    14.5    21.8    29.0 (Ft.)
    0     0.0     0.0      0.000  O       |       |       |       |      0.0
  100     1.0     0.9      0.015  OI      |       |       |       |      0.3
  200     1.0     1.0      0.018  |O      |       |       |       |      0.4
  300     1.0     1.0      0.018  |O      |       |       |       |      0.4
  400     1.0     1.0      0.018  |O      |       |       |       |      0.4
  500     2.0     1.9      0.033  | O     |       |       |       |      0.7
  600     2.0     2.0      0.035  | O     |       |       |       |      0.7
  700     2.0     2.0      0.035  | O     |       |       |       |      0.7
  800     2.0     2.0      0.035  | O     |       |       |       |      0.7
  900     2.0     2.0      0.035  | O     |       |       |       |      0.7
 1000     3.0     2.9      0.051  |  O    |       |       |       |      1.0
 1050     3.0     3.0      0.055  |  O    |       |       |       |      1.0
 1100     4.0     3.5      0.078  |  OI   |       |       |       |      1.2
 1110     5.0     3.8      0.090  |   OI  |       |       |       |      1.2
 1120     6.0     4.3      0.111  |   O I |       |       |       |      1.4
 1130     7.0     5.0      0.137  |    O I|       |       |       |      1.5
 1131     7.0     5.0      0.140  |    O I|       |       |       |      1.5
 1132     7.0     5.1      0.142  |    O I|       |       |       |      1.6
 1133     8.0     5.2      0.146  |    O  I       |       |       |      1.6
 1134     8.0     5.3      0.150  |    O  I       |       |       |      1.6
 1135     8.0     5.4      0.154  |    O  I       |       |       |      1.6
 1136     8.0     5.5      0.157  |     O I       |       |       |      1.7
 1137     9.0     5.6      0.162  |     O |I      |       |       |      1.7
 1138     9.0     5.7      0.166  |     O |I      |       |       |      1.7
 1139     9.0     5.8      0.171  |     O |I      |       |       |      1.7
 1140     9.0     5.9      0.175  |     O |I      |       |       |      1.8
 1141    10.0     6.1      0.181  |     O |  I    |       |       |      1.8
 1142    10.0     6.2      0.186  |     O |  I    |       |       |      1.8
 1143    11.0     6.3      0.193  |      O|   I   |       |       |      1.9
 1144    11.0     6.5      0.199  |      O|   I   |       |       |      1.9
 1145    11.0     6.7      0.205  |      O|   I   |       |       |      2.0
 1146    12.0     6.8      0.212  |      O|    I  |       |       |      2.0
```

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1147    13.0     7.0      0.221  |      O|     I |       |       |      2.0
1148    14.0     7.1      0.230  |      O|      I|       |       |      2.1
1149    15.0     7.3      0.241  |       O       I       |       |      2.1
1150    19.0     7.6      0.257  |       O       |   I   |       |      2.1
1151    22.0     7.9      0.277  |       O       |       I       |      2.2
1152    25.0     8.3      0.300  |       |O      |       |  I    |      2.3
1153    28.0     8.7      0.327  |       |O      |       |     I |      2.4
1154    29.0     9.2      0.354  |       | O     |       |       I      2.5
1155    29.0     9.6      0.381  |       | O     |       |       I      2.6
1156    27.0    10.0      0.405  |       |  O    |       |    I  |      2.6
1157    23.0    10.3      0.423  |       |  O    |       |I      |      2.7
1158    19.0    10.5      0.434  |       |  O    |   I   |       |      2.7
1159    16.0    10.6      0.442  |       |  O    |I      |       |      2.8
1160    12.0    10.7      0.444  |       |  O I  |       |       |      2.8
1161     9.0    10.6      0.442  |       |I O    |       |       |      2.8
1162     8.0    10.6      0.438  |       I  O    |       |       |      2.8
1163     7.0    10.5      0.433  |      I|  O    |       |       |      2.7
1164     7.0    10.4      0.428  |      I|  O    |       |       |      2.7
1165     7.0    10.3      0.424  |      I|  O    |       |       |      2.7
1166     6.0    10.2      0.418  |     I |  O    |       |       |      2.7
1167     6.0    10.1      0.412  |     I |  O    |       |       |      2.7
1168     6.0    10.0      0.407  |     I |  O    |       |       |      2.6
1169     5.0     9.9      0.400  |    I  | O     |       |       |      2.6
1170     5.0     9.8      0.393  |    I  | O     |       |       |      2.6
1171     5.0     9.7      0.386  |    I  | O     |       |       |      2.6
1172     5.0     9.6      0.380  |    I  | O     |       |       |      2.6
1173     5.0     9.5      0.374  |    I  | O     |       |       |      2.5
1174     5.0     9.4      0.368  |    I  | O     |       |       |      2.5
1175     4.0     9.3      0.360  |   I   | O     |       |       |      2.5
1176     4.0     9.2      0.353  |   I   | O     |       |       |      2.5
1177     4.0     9.0      0.346  |   I   |O      |       |       |      2.4
1178     4.0     8.9      0.339  |   I   |O      |       |       |      2.4
1179     4.0     8.8      0.332  |   I   |O      |       |       |      2.4
1180     4.0     8.7      0.326  |   I   |O      |       |       |      2.4
1181     4.0     8.6      0.319  |   I   |O      |       |       |      2.4
1182     4.0     8.5      0.313  |   I   |O      |       |       |      2.3
1183     4.0     8.4      0.307  |   I   |O      |       |       |      2.3
1184     4.0     8.3      0.301  |   I   |O      |       |       |      2.3
```

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1185     4.0     8.2      0.295  |   I   |O      |        |        |      2.3
1186     4.0     8.1      0.290  |   I   O       |        |        |      2.3
1187     3.0     8.0      0.283  |  I    O       |        |        |      2.2
1188     3.0     7.9      0.276  |  I    O       |        |        |      2.2
1189     3.0     7.8      0.269  |  I    O       |        |        |      2.2
1190     3.0     7.7      0.263  |  I    O       |        |        |      2.2
1191     3.0     7.6      0.256  |  I    O       |        |        |      2.1
1192     3.0     7.5      0.250  |  I    O       |        |        |      2.1
1193     3.0     7.4      0.244  |  I    O       |        |        |      2.1
1194     3.0     7.3      0.238  |  I    O       |        |        |      2.1
1195     3.0     7.2      0.232  |  I   O|       |        |        |      2.1
1196     3.0     7.1      0.227  |  I   O|       |        |        |      2.0
1197     3.0     7.0      0.221  |  I   O|       |        |        |      2.0
1198     3.0     6.9      0.216  |  I   O|       |        |        |      2.0
1199     3.0     6.8      0.210  |  I   O|       |        |        |      2.0
1200     3.0     6.7      0.205  |  I   O|       |        |        |      2.0
1201     3.0     6.5      0.200  |  I   O|       |        |        |      1.9
1202     3.0     6.4      0.195  |  I   O|       |        |        |      1.9
1203     3.0     6.3      0.191  |  I  O |       |        |        |      1.9
1204     3.0     6.2      0.186  |  I  O |       |        |        |      1.8
1205     3.0     6.1      0.182  |  I  O |       |        |        |      1.8
1206     3.0     6.0      0.178  |  I  O |       |        |        |      1.8
1207     3.0     5.9      0.174  |  I  O |       |        |        |      1.8
1208     3.0     5.8      0.170  |  I  O |       |        |        |      1.7
1209     3.0     5.7      0.166  |  I  O |       |        |        |      1.7
1210     3.0     5.6      0.162  |  I  O |       |        |        |      1.7
1211     3.0     5.5      0.159  |  I  O |       |        |        |      1.7
1212     3.0     5.4      0.155  |  I O  |       |        |        |      1.6
1213     3.0     5.4      0.152  |  I O  |       |        |        |      1.6
1214     3.0     5.3      0.149  |  I O  |       |        |        |      1.6
1215     3.0     5.2      0.146  |  I O  |       |        |        |      1.6
1216     3.0     5.1      0.143  |  I O  |       |        |        |      1.6
1217     2.0     5.0      0.139  | I  O  |       |        |        |      1.5
1218     2.0     4.9      0.135  | I  O  |       |        |        |      1.5
1219     2.0     4.8      0.131  | I  O  |       |        |        |      1.5
1220     2.0     4.7      0.127  | I  O  |       |        |        |      1.5
1221     2.0     4.6      0.123  | I  O  |       |        |        |      1.4
1222     2.0     4.6      0.120  | I  O  |       |        |        |      1.4
```

1223	2.0	4.5	0.116	I O				1.4
1224	2.0	4.4	0.113	I O				1.4
1225	2.0	4.3	0.110	I O				1.4
1226	2.0	4.2	0.106	I O				1.3
1227	2.0	4.2	0.103	I O				1.3
1228	2.0	4.1	0.100	I O				1.3
1229	2.0	4.0	0.098	I O				1.3
1230	2.0	3.9	0.095	I O				1.3
1231	2.0	3.9	0.092	I O				1.3
1232	2.0	3.8	0.090	I O				1.2
1233	2.0	3.8	0.087	I O				1.2
1234	2.0	3.7	0.085	I O				1.2
1235	2.0	3.6	0.083	I O				1.2
1236	2.0	3.6	0.080	IO				1.2
1237	2.0	3.5	0.078	IO				1.2
1238	2.0	3.5	0.076	IO				1.2
1239	2.0	3.4	0.074	IO				1.1
1240	2.0	3.4	0.072	IO				1.1
1241	2.0	3.3	0.070	IO				1.1
1242	2.0	3.3	0.069	IO				1.1
1243	2.0	3.3	0.067	IO				1.1
1244	2.0	3.2	0.065	IO				1.1
1245	2.0	3.2	0.063	IO				1.1
1246	2.0	3.1	0.062	IO				1.1
1247	2.0	3.1	0.060	IO				1.1
1248	2.0	3.1	0.059	IO				1.1
1249	2.0	3.0	0.057	IO				1.0
1250	2.0	3.0	0.056	IO				1.0
1251	2.0	3.0	0.055	IO				1.0
1252	2.0	2.9	0.053	IO				1.0
1253	2.0	2.9	0.052	IO				1.0
1254	2.0	2.9	0.051	IO				1.0
1255	2.0	2.8	0.050	IO				1.0
1256	2.0	2.8	0.049	IO				1.0
1257	2.0	2.7	0.048	O				1.0
1258	2.0	2.7	0.047	O				0.9
1259	2.0	2.6	0.046	O				0.9
1260	2.0	2.6	0.045	O				0.9

1261	2.0	2.5	0.044	O				0.9
1262	2.0	2.5	0.044	O				0.9
1263	2.0	2.4	0.043	O				0.9
1264	2.0	2.4	0.042	O				0.8
1265	2.0	2.4	0.042	O				0.8
1266	2.0	2.3	0.041	O				0.8
1267	2.0	2.3	0.041	O				0.8
1268	2.0	2.3	0.040	O				0.8
1269	2.0	2.3	0.040	O				0.8
1270	2.0	2.3	0.040	O				0.8
1271	2.0	2.2	0.039	O				0.8
1272	2.0	2.2	0.039	O				0.8
1273	2.0	2.2	0.039	O				0.8
1274	2.0	2.2	0.038	O				0.8
1275	2.0	2.2	0.038	O				0.8
1276	2.0	2.2	0.038	O				0.8
1277	2.0	2.1	0.038	O				0.8
1278	2.0	2.1	0.038	O				0.8
1279	2.0	2.1	0.037	O				0.7
1280	2.0	2.1	0.037	O				0.7
1281	2.0	2.1	0.037	O				0.7
1282	2.0	2.1	0.037	O				0.7
1283	2.0	2.1	0.037	O				0.7
1284	2.0	2.1	0.037	O				0.7
1285	2.0	2.1	0.037	O				0.7
1286	2.0	2.1	0.036	O				0.7
1287	2.0	2.1	0.036	O				0.7
1288	2.0	2.1	0.036	O				0.7
1289	2.0	2.1	0.036	O				0.7
1290	2.0	2.1	0.036	O				0.7
1291	2.0	2.0	0.036	O				0.7
1292	2.0	2.0	0.036	O				0.7
1293	2.0	2.0	0.036	O				0.7
1294	2.0	2.0	0.036	O				0.7
1295	2.0	2.0	0.036	O				0.7
1296	2.0	2.0	0.036	O				0.7
1297	2.0	2.0	0.036	O				0.7
1298	2.0	2.0	0.036	O				0.7

1299	2.0	2.0	0.036	| O	|	|	|	|	0.7
1300	2.0	2.0	0.036	| O	|	|	|	|	0.7
1310	2.0	2.0	0.035	| O	|	|	|	|	0.7
1320	2.0	2.0	0.035	| O	|	|	|	|	0.7
1330	2.0	2.0	0.035	| O	|	|	|	|	0.7
1340	2.0	2.0	0.035	| O	|	|	|	|	0.7
1350	1.0	1.7	0.029	|O	|	|	|	|	0.6
1360	1.0	1.3	0.023	|O	|	|	|	|	0.5
1370	1.0	1.1	0.020	|O	|	|	|	|	0.4
1380	1.0	1.1	0.019	|O	|	|	|	|	0.4
1390	1.0	1.0	0.018	|O	|	|	|	|	0.4
1400	1.0	1.0	0.018	|O	|	|	|	|	0.4
1420	1.0	1.0	0.018	|O	|	|	|	|	0.4
1440	1.0	1.0	0.018	|O	|	|	|	|	0.4
1460	1.0	1.0	0.018	|O	|	|	|	|	0.4
1500	1.0	0.9	0.016	|O	|	|	|	|	0.3

```
Remaining water in basin =    0.02 (Ac.Ft)
Peak flow out of basin =    10.65(CFS)
Peak flow time = 1160 Min., time interval # = 46
Maximum depth in basin =    2.77(Ft.)
```

50-YEAR NORTH PAD

Program Package Serial Number: 2090
08/09/11 FILE: DsnyPo INPUT DATA: English Units RAINFALL SOIL FILE: English (In) OUTPUT DATA: English Units PAGE 1
LOS ANGELES COUNTY FLOOD CONTROL DISTRICT PROG F0601M

MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 50 SOIL DATA FILE: C:\civild\lasoilx.dat
Disney/ABC Studio North Area 10.12 Acres STORM DAY 4

LOCATION	SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	RAIN ZONE	PCT IMPV
6601 1A	10.1	33.34	10.1	33.34	3	100.	.02000	.00	.00	0.	97	7	A37	.91
6601 2A	.0	.00	10.1	33.28	0	0.	.00000	.00	.00	0.	97	99	A37	.00

```
  CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1997-2004 Version 6.4
-------------------------------------------------------------------
Study Date : 08/09/11 Input hydrograph file name : dsnypo.hyd
Output hydrograph file name: DisBasNorth.hin
Disney/ABC Studio Northerly Basin 50-year



-------------------------------------------------------------------


User entry of depth-outflow-storage data
-------------------------------------------------------------------
Hydrograph time unit varies
Initial depth in storage basin =   0.00(Ft.)
-------------------------------------------------------------------
-------------------------------------------------------------------
Initial basin depth =   0.00 (Ft.)
Initial basin storage =      0.00 (Ac.Ft)
Initial basin outflow =   0.00 (CFS)
--------------------------------------------------------------------
-------------------------------------------------------------------
Depth vs. Storage and Depth vs. Discharge data @ 1 Min. Intervals:
 Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
     (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
--------------------------------------------------------------------
    0.000      0.000      0.000      0.000        0.000
    1.000      0.050      2.840      0.048        0.052
    2.000      0.213      6.850      0.208        0.218
    3.000      0.511     11.760      0.503        0.519
    4.000      0.975     17.430      0.963        0.987
    5.000      1.642     56.120      1.603        1.681
-------------------------------------------------------------------
            Hydrograph Detention Basin Routing
Hydrograph at 6601 2 A Storm Day: 4 Drainage Area =   10.10
Total flood hydrograph volume this storm day =    5.07 Ac. Ft.
```

```
    ---------------------------------------------------------------------

    Graph values: 'I'= unit inflow; 'O'=outflow at time shown
    ---------------------------------------------------------------------
Time   Inflow  Outflow    Storage                                          Depth
(Min)  (CFS)   (CFS)     (Ac.Ft) .0       8.3    16.5    24.8    33.0 (Ft.)
    0     0.0     0.0      0.000  O       |       |       |       |      0.0
  100     1.0     0.9      0.015  O       |       |       |       |      0.3
  200     1.0     1.0      0.018  O       |       |       |       |      0.4
  300     2.0     1.9      0.033  |O      |       |       |       |      0.7
  400     2.0     2.0      0.035  |O      |       |       |       |      0.7
  500     2.0     2.0      0.035  |O      |       |       |       |      0.7
  600     2.0     2.0      0.035  |O      |       |       |       |      0.7
  700     2.0     2.0      0.035  |O      |       |       |       |      0.7
  800     2.0     2.0      0.035  |O      |       |       |       |      0.7
  900     3.0     2.9      0.051  | O     |       |       |       |      1.0
 1000     3.0     3.0      0.056  | O     |       |       |       |      1.0
 1050     4.0     3.5      0.078  |  O    |       |       |       |      1.2
 1100     5.0     4.4      0.115  |   O   |       |       |       |      1.4
 1110     6.0     4.8      0.128  |   OI  |       |       |       |      1.5
 1120     7.0     5.3      0.149  |    OI |       |       |       |      1.6
 1130     8.0     5.9      0.176  |    O I|       |       |       |      1.8
 1131     8.0     6.0      0.179  |    O I|       |       |       |      1.8
 1132     9.0     6.1      0.183  |    O  I       |       |       |      1.8
 1133     9.0     6.2      0.187  |     O I       |       |       |      1.8
 1134     9.0     6.3      0.191  |     O I       |       |       |      1.9
 1135     9.0     6.4      0.194  |     O I       |       |       |      1.9
 1136     9.0     6.5      0.198  |     O I       |       |       |      1.9
 1137    10.0     6.6      0.203  |     O |I      |       |       |      1.9
 1138    10.0     6.7      0.207  |     O |I      |       |       |      2.0
 1139    11.0     6.9      0.213  |     O | I     |       |       |      2.0
 1140    11.0     6.9      0.219  |     O | I     |       |       |      2.0
 1141    11.0     7.0      0.224  |     O | I     |       |       |      2.0
 1142    12.0     7.1      0.231  |     O |  I    |       |       |      2.1
 1143    12.0     7.3      0.238  |      O|  I    |       |       |      2.1
 1144    12.0     7.4      0.244  |      O|  I    |       |       |      2.1
 1145    13.0     7.5      0.252  |      O|   I   |       |       |      2.1
 1146    14.0     7.6      0.261  |      O|    I  |       |       |      2.2
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1147    15.0     7.8      0.271  |      O|     I |       |       |      2.2
1148    15.0     8.0      0.281  |      O|     I |       |       |      2.2
1149    18.0     8.2      0.294  |      O|       |I      |       |      2.3
1150    21.0     8.5      0.312  |       O       |   I   |       |      2.3
1151    25.0     8.8      0.334  |       O       |       I       |      2.4
1152    29.0     9.3      0.362  |       |O      |       |   I   |      2.5
1153    32.0     9.8      0.393  |       |O      |       |      I|      2.6
1154    33.0    10.3      0.424  |       | O     |       |       I      2.7
1155    33.0    10.8      0.455  |       | O     |       |       I      2.8
1156    30.0    11.3      0.481  |       | O     |       |    I  |      2.9
1157    26.0    11.6      0.501  |       |  O    |       |I      |      3.0
1158    22.0    11.8      0.515  |       |  O    |    I  |       |      3.0
1159    18.0    11.9      0.524  |       |  O    |I      |       |      3.0
1160    13.0    11.9      0.525  |       |  OI   |       |       |      3.0
1161    11.0    11.9      0.524  |       | IO    |       |       |      3.0
1162     9.0    11.9      0.520  |       I  O    |       |       |      3.0
1163     9.0    11.8      0.516  |       I  O    |       |       |      3.0
1164     8.0    11.8      0.511  |      I|  O    |       |       |      3.0
1165     7.0    11.7      0.504  |     I |  O    |       |       |      3.0
1166     7.0    11.5      0.498  |     I |  O    |       |       |      3.0
1167     7.0    11.4      0.492  |     I |  O    |       |       |      2.9
1168     6.0    11.3      0.484  |    I  | O     |       |       |      2.9
1169     6.0    11.2      0.477  |    I  | O     |       |       |      2.9
1170     6.0    11.1      0.470  |    I  | O     |       |       |      2.9
1171     6.0    11.0      0.463  |    I  | O     |       |       |      2.8
1172     6.0    10.9      0.456  |    I  | O     |       |       |      2.8
1173     5.0    10.7      0.448  |   I   | O     |       |       |      2.8
1174     5.0    10.6      0.441  |   I   | O     |       |       |      2.8
1175     5.0    10.5      0.433  |   I   | O     |       |       |      2.7
1176     5.0    10.4      0.426  |   I   | O     |       |       |      2.7
1177     5.0    10.2      0.418  |   I   |O      |       |       |      2.7
1178     5.0    10.1      0.411  |   I   |O      |       |       |      2.7
1179     5.0    10.0      0.404  |   I   |O      |       |       |      2.6
1180     5.0     9.9      0.397  |   I   |O      |       |       |      2.6
1181     4.0     9.8      0.389  |  I    |O      |       |       |      2.6
1182     4.0     9.6      0.381  |  I    |O      |       |       |      2.6
1183     4.0     9.5      0.374  |  I    |O      |       |       |      2.5
1184     4.0     9.4      0.366  |  I    |O      |       |       |      2.5
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1185     4.0     9.3      0.359  |  I    O       |        |        |      2.5
1186     4.0     9.1      0.352  |  I    O       |        |        |      2.5
1187     4.0     9.0      0.345  |  I    O       |        |        |      2.4
1188     4.0     8.9      0.338  |  I    O       |        |        |      2.4
1189     4.0     8.8      0.331  |  I    O       |        |        |      2.4
1190     4.0     8.7      0.325  |  I    O       |        |        |      2.4
1191     4.0     8.6      0.318  |  I    O       |        |        |      2.4
1192     4.0     8.5      0.312  |  I    O       |        |        |      2.3
1193     4.0     8.4      0.306  |  I    O       |        |        |      2.3
1194     4.0     8.3      0.300  |  I    O       |        |        |      2.3
1195     4.0     8.2      0.294  |  I   O|       |        |        |      2.3
1196     3.0     8.1      0.287  | I    O|       |        |        |      2.2
1197     3.0     8.0      0.280  | I    O|       |        |        |      2.2
1198     3.0     7.8      0.274  | I    O|       |        |        |      2.2
1199     3.0     7.7      0.267  | I    O|       |        |        |      2.2
1200     3.0     7.6      0.260  | I    O|       |        |        |      2.2
1201     3.0     7.5      0.254  | I    O|       |        |        |      2.1
1202     3.0     7.4      0.248  | I    O|       |        |        |      2.1
1203     3.0     7.3      0.242  | I    O|       |        |        |      2.1
1204     3.0     7.2      0.236  | I    O|       |        |        |      2.1
1205     3.0     7.1      0.230  | I   O |       |        |        |      2.1
1206     3.0     7.0      0.225  | I   O |       |        |        |      2.0
1207     3.0     7.0      0.219  | I   O |       |        |        |      2.0
1208     3.0     6.9      0.214  | I   O |       |        |        |      2.0
1209     3.0     6.7      0.209  | I   O |       |        |        |      2.0
1210     3.0     6.6      0.203  | I   O |       |        |        |      1.9
1211     3.0     6.5      0.199  | I   O |       |        |        |      1.9
1212     3.0     6.4      0.194  | I   O |       |        |        |      1.9
1213     3.0     6.3      0.189  | I   O |       |        |        |      1.9
1214     3.0     6.2      0.185  | I  O  |       |        |        |      1.8
1215     3.0     6.1      0.181  | I  O  |       |        |        |      1.8
1216     3.0     6.0      0.176  | I  O  |       |        |        |      1.8
1217     3.0     5.9      0.172  | I  O  |       |        |        |      1.8
1218     3.0     5.8      0.169  | I  O  |       |        |        |      1.7
1219     3.0     5.7      0.165  | I  O  |       |        |        |      1.7
1220     3.0     5.6      0.161  | I  O  |       |        |        |      1.7
1221     3.0     5.5      0.158  | I  O  |       |        |        |      1.7
1222     3.0     5.4      0.154  | I  O  |       |        |        |      1.6
```

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1223     3.0     5.3      0.151  | I  O  |        |        |        |      1.6
1224     3.0     5.2      0.148  | I  O  |        |        |        |      1.6
1225     3.0     5.2      0.145  | I  O  |        |        |        |      1.6
1226     3.0     5.1      0.142  | I O   |        |        |        |      1.6
1227     3.0     5.0      0.139  | I O   |        |        |        |      1.5
1228     3.0     5.0      0.136  | I O   |        |        |        |      1.5
1229     3.0     4.9      0.134  | I O   |        |        |        |      1.5
1230     3.0     4.8      0.131  | I O   |        |        |        |      1.5
1231     3.0     4.8      0.129  | I O   |        |        |        |      1.5
1232     3.0     4.7      0.126  | I O   |        |        |        |      1.5
1233     3.0     4.7      0.124  | I O   |        |        |        |      1.5
1234     3.0     4.6      0.122  | I O   |        |        |        |      1.4
1235     3.0     4.5      0.119  | I O   |        |        |        |      1.4
1236     2.0     4.5      0.116  |I  O   |        |        |        |      1.4
1237     2.0     4.4      0.113  |I  O   |        |        |        |      1.4
1238     2.0     4.3      0.109  |I  O   |        |        |        |      1.4
1239     2.0     4.2      0.106  |I  O   |        |        |        |      1.3
1240     2.0     4.2      0.103  |I  O   |        |        |        |      1.3
1241     2.0     4.1      0.100  |I O    |        |        |        |      1.3
1242     2.0     4.0      0.098  |I O    |        |        |        |      1.3
1243     2.0     3.9      0.095  |I O    |        |        |        |      1.3
1244     2.0     3.9      0.092  |I O    |        |        |        |      1.3
1245     2.0     3.8      0.090  |I O    |        |        |        |      1.2
1246     2.0     3.8      0.087  |I O    |        |        |        |      1.2
1247     2.0     3.7      0.085  |I O    |        |        |        |      1.2
1248     2.0     3.6      0.083  |I O    |        |        |        |      1.2
1249     2.0     3.6      0.080  |I O    |        |        |        |      1.2
1250     2.0     3.5      0.078  |I O    |        |        |        |      1.2
1251     2.0     3.5      0.076  |I O    |        |        |        |      1.2
1252     2.0     3.4      0.074  |I O    |        |        |        |      1.1
1253     2.0     3.4      0.072  |I O    |        |        |        |      1.1
1254     2.0     3.3      0.070  |I O    |        |        |        |      1.1
1255     2.0     3.3      0.068  |I O    |        |        |        |      1.1
1256     2.0     3.3      0.067  |I O    |        |        |        |      1.1
1257     2.0     3.2      0.065  |I O    |        |        |        |      1.1
1258     2.0     3.2      0.063  |I O    |        |        |        |      1.1
1259     2.0     3.1      0.062  |I O    |        |        |        |      1.1
1260     2.0     3.1      0.060  |IO     |        |        |        |      1.1
```

1261	2.0	3.1	0.059	IO				1.1
1262	2.0	3.0	0.057	IO				1.0
1263	2.0	3.0	0.056	IO				1.0
1264	2.0	3.0	0.055	IO				1.0
1265	2.0	2.9	0.053	IO				1.0
1266	2.0	2.9	0.052	IO				1.0
1267	2.0	2.9	0.051	IO				1.0
1268	2.0	2.8	0.050	IO				1.0
1269	2.0	2.8	0.049	IO				1.0
1270	2.0	2.7	0.048	IO				1.0
1271	2.0	2.7	0.047	IO				0.9
1272	2.0	2.6	0.046	IO				0.9
1273	2.0	2.6	0.045	IO				0.9
1274	2.0	2.5	0.044	IO				0.9
1275	2.0	2.5	0.044	IO				0.9
1276	2.0	2.4	0.043	IO				0.9
1277	2.0	2.4	0.042	IO				0.8
1278	2.0	2.4	0.042	IO				0.8
1279	2.0	2.3	0.041	IO				0.8
1280	2.0	2.3	0.041	IO				0.8
1281	2.0	2.3	0.040	IO				0.8
1282	2.0	2.3	0.040	IO				0.8
1283	2.0	2.3	0.040	IO				0.8
1284	2.0	2.2	0.039	IO				0.8
1285	2.0	2.2	0.039	IO				0.8
1286	2.0	2.2	0.039	IO				0.8
1287	2.0	2.2	0.038	IO				0.8
1288	2.0	2.2	0.038	IO				0.8
1289	2.0	2.2	0.038	IO				0.8
1290	2.0	2.1	0.038	IO				0.8
1291	2.0	2.1	0.038	IO				0.8
1292	2.0	2.1	0.037	IO				0.7
1293	2.0	2.1	0.037	IO				0.7
1294	2.0	2.1	0.037	IO				0.7
1295	2.0	2.1	0.037	IO				0.7
1296	2.0	2.1	0.037	IO				0.7
1297	2.0	2.1	0.037	IO				0.7
1298	2.0	2.1	0.037	IO				0.7

1299	2.0	2.1	0.036	|IO	|	|	|	|	0.7
1300	2.0	2.1	0.036	|IO	|	|	|	|	0.7
1310	2.0	2.0	0.036	|O	|	|	|	|	0.7
1320	2.0	2.0	0.035	|O	|	|	|	|	0.7
1330	2.0	2.0	0.035	|O	|	|	|	|	0.7
1340	2.0	2.0	0.035	|O	|	|	|	|	0.7
1350	2.0	2.0	0.035	|O	|	|	|	|	0.7
1360	2.0	2.0	0.035	|O	|	|	|	|	0.7
1370	2.0	2.0	0.035	|O	|	|	|	|	0.7
1380	2.0	2.0	0.035	|O	|	|	|	|	0.7
1390	2.0	2.0	0.035	|O	|	|	|	|	0.7
1400	1.0	1.7	0.029	IO	|	|	|	|	0.6
1420	1.0	1.1	0.020	IO	|	|	|	|	0.4
1440	1.0	1.0	0.018	O	|	|	|	|	0.4
1460	1.0	1.0	0.018	O	|	|	|	|	0.4
1500	1.0	0.9	0.016	O	|	|	|	|	0.3

```
Remaining water in basin =    0.02 (Ac.Ft)
Peak flow out of basin =    11.93(CFS)
Peak flow time = 1160 Min., time interval # = 46
Maximum depth in basin =    3.03(Ft.)
```

2-YEAR SOUTH PAD

Program Package Serial Number: 2090

08/10/11 FILE: Dsnypo INPUT DATA: English Units RAINFALL SOIL FILE: English (In) OUTPUT DATA: English Units PAGE 1

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT PROG F0601M

MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 2 SOIL DATA FILE: C:\civild\lasoilx.dat

Disney/ABC Studios South Area 25.6 Acres STORM DAY 4

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	RAIN ZONE	PCT IMPV
6601	1A	25.6	17.32	25.6	17.32	3	300.	.02000	.00	.00	0.	97	26	A37	.91
6601	2A	.0	.00	25.6	17.31	0	0.	.00000	.00	.00	0.	97	99	A37	.00

```
  CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1997-2004 Version 6.4
-------------------------------------------------------------------
Study Date : 08/10/11 Input hydrograph file name : DsnyPo.hyd
Output hydrograph file name: DisBasS.hin
Disney Basin South - Above Ground Basin 2-year
Drainage Area 25.6


-------------------------------------------------------------------


User entry of depth-outflow-storage data
-------------------------------------------------------------------
Hydrograph time unit varies
Initial depth in storage basin =   0.00(Ft.)
-------------------------------------------------------------------
-------------------------------------------------------------------
Initial basin depth =   0.00 (Ft.)
Initial basin storage =      0.00 (Ac.Ft)
Initial basin outflow =   0.00 (CFS)
-----------------------------------------------------------------
-------------------------------------------------------------------
Depth vs. Storage and Depth vs. Discharge data @ 1 Min. Intervals:
 Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
     (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
-----------------------------------------------------------------
    0.000      0.000      0.000      0.000        0.000
    1.000      0.146      2.840      0.144        0.148
    2.000      0.598      6.850      0.593        0.603
    3.000      1.389     11.760      1.381        1.397
    4.000      2.552     17.400      2.540        2.564
    5.000      4.122     56.120      4.083        4.161
-------------------------------------------------------------------
            Hydrograph Detention Basin Routing
Hydrograph at 6601 2 A Storm Day: 4 Drainage Area =   25.60
Total flood hydrograph volume this storm day =    5.07 Ac. Ft.
```

```
    ---------------------------------------------------------------------

    Graph values: 'I'= unit inflow; 'O'=outflow at time shown
    ---------------------------------------------------------------------
Time   Inflow  Outflow    Storage                                          Depth
(Min)  (CFS)   (CFS)     (Ac.Ft) .0       4.3     8.5    12.8    17.0 (Ft.)
    0     0.0     0.0      0.000  O       |       |       |       |      0.0
  100     1.0     0.7      0.034  |O      |       |       |       |      0.2
  200     1.0     1.0      0.050  |O      |       |       |       |      0.3
  300     2.0     1.7      0.085  |  O    |       |       |       |      0.6
  400     2.0     2.0      0.102  |  O    |       |       |       |      0.7
  500     2.0     2.0      0.103  |  O    |       |       |       |      0.7
  600     2.0     2.0      0.103  |  O    |       |       |       |      0.7
  700     2.0     2.0      0.103  |  O    |       |       |       |      0.7
  800     2.0     2.0      0.103  |  O    |       |       |       |      0.7
  900     3.0     2.7      0.137  |    O  |       |       |       |      0.9
 1000     3.0     2.9      0.157  |    O  |       |       |       |      1.0
 1050     4.0     3.2      0.189  |     OI|       |       |       |      1.1
 1100     5.0     3.8      0.258  |      O|I      |       |       |      1.2
 1110     5.0     4.0      0.273  |      O|I      |       |       |      1.3
 1120     6.0     4.2      0.294  |      O|  I    |       |       |      1.3
 1130     7.0     4.4      0.325  |       O    I  |       |       |      1.4
 1131     7.0     4.5      0.328  |       O    I  |       |       |      1.4
 1132     7.0     4.5      0.332  |       O    I  |       |       |      1.4
 1133     7.0     4.5      0.335  |       O    I  |       |       |      1.4
 1134     7.0     4.6      0.339  |       O    I  |       |       |      1.4
 1135     7.0     4.6      0.342  |       O    I  |       |       |      1.4
 1136     8.0     4.6      0.347  |       O      I|       |       |      1.4
 1137     8.0     4.7      0.351  |       O      I|       |       |      1.5
 1138     8.0     4.7      0.356  |       O      I|       |       |      1.5
 1139     8.0     4.7      0.361  |       O      I|       |       |      1.5
 1140     8.0     4.8      0.365  |       |O     I|       |       |      1.5
 1141     8.0     4.8      0.369  |       |O     I|       |       |      1.5
 1142     9.0     4.9      0.375  |       |O      I       |       |      1.5
 1143     9.0     4.9      0.381  |       |O      I       |       |      1.5
 1144     9.0     5.0      0.386  |       |O      I       |       |      1.5
 1145     9.0     5.0      0.392  |       |O      I       |       |      1.5
 1146    10.0     5.1      0.399  |       |O      | I     |       |      1.6
```

```
1147    10.0     5.1      0.405  |        |O      | I     |       |      1.6
1148    10.0     5.2      0.412  |        |O      | I     |       |      1.6
1149    11.0     5.3      0.420  |        |O      |   I   |       |      1.6
1150    11.0     5.3      0.428  |        | O     |   I   |       |      1.6
1151    12.0     5.4      0.437  |        | O     |     I |       |      1.6
1152    14.0     5.5      0.449  |        | O     |       | I     |      1.7
1153    15.0     5.6      0.462  |        | O     |       |   I   |      1.7
1154    16.0     5.8      0.476  |        | O     |       |     I |      1.7
1155    17.0     5.9      0.491  |        |  O    |       |       I      1.8
1156    17.0     6.0      0.506  |        |  O    |       |       I      1.8
1157    17.0     6.2      0.521  |        |  O    |       |       I      1.8
1158    17.0     6.3      0.536  |        |  O    |       |       I      1.9
1159    17.0     6.4      0.551  |        |   O   |       |       I      1.9
1160    17.0     6.6      0.565  |        |   O   |       |       I      1.9
1161    17.0     6.7      0.580  |        |   O   |       |       I      2.0
1162    17.0     6.8      0.594  |        |   O   |       |       I      2.0
1163    17.0     6.9      0.608  |        |    O  |       |       I      2.0
1164    17.0     7.0      0.622  |        |    O  |       |       I      2.0
1165    17.0     7.1      0.635  |        |    O  |       |       I      2.0
1166    16.0     7.2      0.648  |        |    O  |       |     I |      2.1
1167    16.0     7.2      0.660  |        |    O  |       |     I |      2.1
1168    16.0     7.3      0.672  |        |    O  |       |     I |      2.1
1169    16.0     7.4      0.684  |        |    O  |       |     I |      2.1
1170    15.0     7.4      0.694  |        |     O |       |   I   |      2.1
1171    15.0     7.5      0.704  |        |     O |       |   I   |      2.1
1172    15.0     7.6      0.715  |        |     O |       |   I   |      2.1
1173    14.0     7.6      0.724  |        |     O |       | I     |      2.2
1174    14.0     7.7      0.732  |        |     O |       | I     |      2.2
1175    13.0     7.7      0.740  |        |     O |       I       |      2.2
1176    12.0     7.8      0.745  |        |     O |     I |       |      2.2
1177    11.0     7.8      0.750  |        |     O |   I   |       |      2.2
1178    10.0     7.8      0.753  |        |     O | I     |       |      2.2
1179     9.0     7.8      0.754  |        |     O I       |       |      2.2
1180     8.0     7.8      0.755  |        |     OI|       |       |      2.2
1181     7.0     7.8      0.754  |        |    IO |       |       |      2.2
1182     6.0     7.8      0.751  |        |  I  O |       |       |      2.2
1183     6.0     7.8      0.749  |        |  I  O |       |       |      2.2
1184     6.0     7.8      0.746  |        |  I  O |       |       |      2.2
```

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1185     5.0     7.7      0.742  |        |I    O |        |        |      2.2
1186     5.0     7.7      0.739  |        |I    O |        |        |      2.2
1187     5.0     7.7      0.735  |        |I    O |        |        |      2.2
1188     5.0     7.7      0.731  |        |I    O |        |        |      2.2
1189     5.0     7.7      0.728  |        |I    O |        |        |      2.2
1190     5.0     7.6      0.724  |        |I    O |        |        |      2.2
1191     5.0     7.6      0.720  |        |I    O |        |        |      2.2
1192     4.0     7.6      0.715  |      I|     O |        |        |      2.1
1193     4.0     7.5      0.710  |      I|     O |        |        |      2.1
1194     4.0     7.5      0.706  |      I|     O |        |        |      2.1
1195     4.0     7.5      0.701  |      I|     O |        |        |      2.1
1196     4.0     7.5      0.696  |      I|     O |        |        |      2.1
1197     4.0     7.4      0.691  |      I|    O  |        |        |      2.1
1198     4.0     7.4      0.687  |      I|    O  |        |        |      2.1
1199     4.0     7.4      0.682  |      I|    O  |        |        |      2.1
1200     4.0     7.3      0.677  |      I|    O  |        |        |      2.1
1201     4.0     7.3      0.673  |      I|    O  |        |        |      2.1
1202     4.0     7.3      0.668  |      I|    O  |        |        |      2.1
1203     4.0     7.3      0.664  |      I|    O  |        |        |      2.1
1204     4.0     7.2      0.659  |      I|    O  |        |        |      2.1
1205     4.0     7.2      0.655  |      I|    O  |        |        |      2.1
1206     3.0     7.2      0.649  |    I  |    O  |        |        |      2.1
1207     3.0     7.1      0.643  |    I  |    O  |        |        |      2.1
1208     3.0     7.1      0.638  |    I  |    O  |        |        |      2.0
1209     3.0     7.1      0.632  |    I  |    O  |        |        |      2.0
1210     3.0     7.0      0.626  |    I  |    O  |        |        |      2.0
1211     3.0     7.0      0.621  |    I  |    O  |        |        |      2.0
1212     3.0     7.0      0.615  |    I  |    O  |        |        |      2.0
1213     3.0     6.9      0.610  |    I  |    O  |        |        |      2.0
1214     3.0     6.9      0.605  |    I  |   O   |        |        |      2.0
1215     3.0     6.9      0.599  |    I  |   O   |        |        |      2.0
1216     3.0     6.8      0.594  |    I  |   O   |        |        |      2.0
1217     3.0     6.8      0.589  |    I  |   O   |        |        |      2.0
1218     3.0     6.7      0.584  |    I  |   O   |        |        |      2.0
1219     3.0     6.7      0.578  |    I  |   O   |        |        |      2.0
1220     3.0     6.6      0.573  |    I  |   O   |        |        |      1.9
1221     3.0     6.6      0.568  |    I  |   O   |        |        |      1.9
1222     3.0     6.5      0.564  |    I  |   O   |        |        |      1.9
```

1223	3.0	6.5	0.559		I	O			1.9
1224	3.0	6.5	0.554		I	O			1.9
1225	3.0	6.4	0.549		I	O			1.9
1226	3.0	6.4	0.544		I	O			1.9
1227	3.0	6.3	0.540		I	O			1.9
1228	3.0	6.3	0.535		I	O			1.9
1229	3.0	6.3	0.531		I	O			1.9
1230	3.0	6.2	0.526		I	O			1.8
1231	3.0	6.2	0.522		I	O			1.8
1232	3.0	6.1	0.518		I	O			1.8
1233	3.0	6.1	0.513		I	O			1.8
1234	3.0	6.1	0.509		I	O			1.8
1235	3.0	6.0	0.505		I	O			1.8
1236	3.0	6.0	0.501		I	O			1.8
1237	3.0	6.0	0.497		I	O			1.8
1238	3.0	5.9	0.493		I	O			1.8
1239	3.0	5.9	0.489		I	O			1.8
1240	3.0	5.8	0.485		I	O			1.7
1241	3.0	5.8	0.481		I	O			1.7
1242	3.0	5.8	0.477		I	O			1.7
1243	3.0	5.7	0.473		I	O			1.7
1244	3.0	5.7	0.469		I	O			1.7
1245	2.0	5.7	0.464	I		O			1.7
1246	2.0	5.6	0.459	I		O			1.7
1247	2.0	5.6	0.454	I		O			1.7
1248	2.0	5.5	0.449	I		O			1.7
1249	2.0	5.5	0.445	I		O			1.7
1250	2.0	5.4	0.440	I		O			1.7
1251	2.0	5.4	0.435	I		O			1.6
1252	2.0	5.4	0.430	I		O			1.6
1253	2.0	5.3	0.426	I		O			1.6
1254	2.0	5.3	0.421	I		O			1.6
1255	2.0	5.2	0.417	I		O			1.6
1256	2.0	5.2	0.412	I		O			1.6
1257	2.0	5.2	0.408	I		O			1.6
1258	2.0	5.1	0.404	I		O			1.6
1259	2.0	5.1	0.399	I		O			1.6
1260	2.0	5.1	0.395	I		O			1.6

1261	2.0	5.0	0.391	I	O				1.5
1262	2.0	5.0	0.387	I	O				1.5
1263	2.0	4.9	0.383	I	O				1.5
1264	2.0	4.9	0.379	I	O				1.5
1265	2.0	4.9	0.375	I	O				1.5
1266	2.0	4.8	0.371	I	O				1.5
1267	2.0	4.8	0.367	I	O				1.5
1268	2.0	4.8	0.363	I	O				1.5
1269	2.0	4.7	0.359	I	O				1.5
1270	2.0	4.7	0.356	I	O				1.5
1271	2.0	4.7	0.352	I	O				1.5
1272	2.0	4.6	0.348	I	O				1.4
1273	2.0	4.6	0.345	I	O				1.4
1274	2.0	4.6	0.341	I	O				1.4
1275	2.0	4.5	0.338	I	O				1.4
1276	2.0	4.5	0.334	I	O				1.4
1277	2.0	4.5	0.331	I	O				1.4
1278	2.0	4.4	0.327	I	O				1.4
1279	2.0	4.4	0.324	I	O				1.4
1280	2.0	4.4	0.321	I	O				1.4
1281	2.0	4.4	0.317	I	O				1.4
1282	2.0	4.3	0.314	I	O				1.4
1283	2.0	4.3	0.311	I	O				1.4
1284	2.0	4.3	0.308	I	O				1.4
1285	2.0	4.2	0.305	I	O				1.4
1286	2.0	4.2	0.302	I	O				1.3
1287	2.0	4.2	0.298	I	O				1.3
1288	2.0	4.2	0.295	I	O				1.3
1289	2.0	4.1	0.293	I	O				1.3
1290	2.0	4.1	0.290	I	O				1.3
1291	2.0	4.1	0.287	I	O				1.3
1292	2.0	4.1	0.284	I	O				1.3
1293	2.0	4.0	0.281	I	O				1.3
1294	2.0	4.0	0.278	I	O				1.3
1295	2.0	4.0	0.275	I	O				1.3
1296	2.0	4.0	0.273	I	O				1.3
1297	2.0	3.9	0.270	I	O				1.3
1298	2.0	3.9	0.267	I	O				1.3

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1299     2.0     3.9      0.265  |  I   O|       |       |       |      1.3
1300     2.0     3.9      0.262  |  I   O|       |       |       |      1.3
1310     2.0     3.7      0.238  |  I  O |       |       |       |      1.2
1320     2.0     3.5      0.216  |  I  O |       |       |       |      1.2
1330     2.0     3.3      0.197  |  I  O |       |       |       |      1.1
1340     2.0     3.1      0.181  |  I O  |       |       |       |      1.1
1350     2.0     3.0      0.166  |  I O  |       |       |       |      1.0
1360     2.0     2.9      0.153  |  I O  |       |       |       |      1.0
1370     2.0     2.7      0.141  |  I O  |       |       |       |      1.0
1380     2.0     2.6      0.132  |  IO   |       |       |       |      0.9
1390     2.0     2.4      0.125  |  IO   |       |       |       |      0.9
1400     1.0     2.2      0.113  |I  O   |       |       |       |      0.8
1420     1.0     1.7      0.087  |I O    |       |       |       |      0.6
1440     1.0     1.4      0.073  |IO     |       |       |       |      0.5
1460     1.0     1.2      0.064  |IO     |       |       |       |      0.4
1500     1.0     1.1      0.054  |O      |       |       |       |      0.4

   Remaining water in basin =    0.05 (Ac.Ft)
   Peak flow out of basin =     7.82(CFS)
   Peak flow time = 1180 Min., time interval # = 66
   Maximum depth in basin =    2.20(Ft.)
```

5-YEAR SOUTH PAD

Program Package Serial Number: 2090

08/10/11 FILE: DsnyPo INPUT DATA: English Units RAINFALL SOIL FILE: English (In) OUTPUT DATA: English Units PAGE 1

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT PROG F0601M

MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 5 SOIL DATA FILE: C:\civild\lasoilx.dat

Disney/ABC Studios South Area 25.6 Acres STORM DAY 4

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	RAIN ZONE	PCT IMPV
6601	1A	25.6	30.73	25.6	30.73	3	300.	.02000	.00	.00	0.	97	19	A37	.91
6601	2A	.0	.00	25.6	30.67	0	0.	.00000	.00	.00	0.	97	99	A37	.00

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1997-2004 Version 6.4

Study Date : 08/10/11 Input hydrograph file name : DsnyPo.hyd
Output hydrograph file name: DisBasS.hin
Disney Basin South - Above Ground Basin 5-year
Drainage Area 25.6

User entry of depth-outflow-storage data

Hydrograph time unit varies
Initial depth in storage basin = 0.00(Ft.)

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

Depth vs. Storage and Depth vs. Discharge data @ 1 Min. Intervals:

Basin Depth (Ft.)	Storage (Ac.Ft)	Outflow (CFS)	(S-O*dt/2) (Ac.Ft)	(S+O*dt/2) (Ac.Ft)
0.000	0.000	0.000	0.000	0.000
1.000	0.146	2.840	0.144	0.148
2.000	0.598	6.850	0.593	0.603
3.000	1.389	11.760	1.381	1.397
4.000	2.552	17.400	2.540	2.564
5.000	4.122	56.120	4.083	4.161

Hydrograph Detention Basin Routing
Hydrograph at 6601 2 A Storm Day: 4 Drainage Area = 25.60
Total flood hydrograph volume this storm day = 7.45 Ac. Ft.

```
    ----------------------------------------------------------------------

    Graph values: 'I'= unit inflow; 'O'=outflow at time shown
    ----------------------------------------------------------------------
Time   Inflow  Outflow    Storage                                          Depth
(Min)  (CFS)   (CFS)     (Ac.Ft) .0       7.8    15.5    23.3    31.0 (Ft.)
    0     0.0     0.0      0.000  O       |       |       |       |       0.0
  100     2.0     1.3      0.068  |OI     |       |       |       |       0.5
  200     2.0     2.0      0.100  | O     |       |       |       |       0.7
  300     2.0     2.0      0.103  | O     |       |       |       |       0.7
  400     2.0     2.0      0.103  | O     |       |       |       |       0.7
  500     3.0     2.7      0.137  | OI    |       |       |       |       0.9
  600     3.0     2.9      0.157  |  O    |       |       |       |       1.0
  700     3.0     3.0      0.162  |  O    |       |       |       |       1.0
  800     3.0     3.0      0.163  |  O    |       |       |       |       1.0
  900     4.0     3.4      0.212  |  OI   |       |       |       |       1.1
 1000     5.0     4.3      0.306  |   OI  |       |       |       |       1.4
 1050     6.0     4.9      0.373  |    OI |       |       |       |       1.5
 1100     7.0     5.6      0.461  |    O I|       |       |       |       1.7
 1110     8.0     5.9      0.486  |     O I       |       |       |       1.8
 1120    10.0     6.2      0.528  |     O | I     |       |       |       1.8
 1130    11.0     6.7      0.584  |     O |  I    |       |       |       2.0
 1131    11.0     6.8      0.590  |     O |  I    |       |       |       2.0
 1132    11.0     6.8      0.596  |      O|  I    |       |       |       2.0
 1133    12.0     6.9      0.603  |      O|   I   |       |       |       2.0
 1134    12.0     6.9      0.610  |      O|   I   |       |       |       2.0
 1135    12.0     7.0      0.617  |      O|   I   |       |       |       2.0
 1136    12.0     7.0      0.624  |      O|   I   |       |       |       2.0
 1137    12.0     7.1      0.631  |      O|   I   |       |       |       2.0
 1138    13.0     7.1      0.639  |      O|    I  |       |       |       2.1
 1139    13.0     7.2      0.647  |      O|    I  |       |       |       2.1
 1140    13.0     7.2      0.655  |      O|    I  |       |       |       2.1
 1141    14.0     7.3      0.664  |      O|     I |       |       |       2.1
 1142    14.0     7.3      0.674  |      O|     I |       |       |       2.1
 1143    14.0     7.4      0.683  |      O|     I |       |       |       2.1
 1144    15.0     7.4      0.693  |      O|      I|       |       |       2.1
 1145    15.0     7.5      0.704  |      O|      I|       |       |       2.1
 1146    16.0     7.6      0.715  |      O|       I       |       |       2.1
```

1147	16.0	7.6	0.727	O		I			2.2
1148	17.0	7.7	0.740	O		I			2.2
1149	18.0	7.8	0.754	O		I			2.2
1150	20.0	7.9	0.770	O		I			2.2
1151	22.0	8.0	0.790	O		I			2.2
1152	24.0	8.2	0.812	O		I			2.3
1153	27.0	8.3	0.837	O		I			2.3
1154	29.0	8.5	0.866	O		I			2.3
1155	30.0	8.7	0.895	O		I			2.4
1156	31.0	8.9	0.926	O		I			2.4
1157	31.0	9.1	0.956	O		I			2.5
1158	31.0	9.3	0.986	O		I			2.5
1159	30.0	9.4	1.015	O		I			2.5
1160	30.0	9.6	1.043	O		I			2.6
1161	30.0	9.8	1.071	O		I			2.6
1162	29.0	9.9	1.097	O		I			2.6
1163	29.0	10.1	1.123	O		I			2.7
1164	28.0	10.3	1.148	O		I			2.7
1165	28.0	10.4	1.172	O		I			2.7
1166	27.0	10.6	1.195	O		I			2.8
1167	26.0	10.7	1.216	O		I			2.8
1168	25.0	10.8	1.236	O		I			2.8
1169	23.0	10.9	1.252	O		I			2.8
1170	20.0	11.0	1.265	O		I			2.8
1171	18.0	11.0	1.275	O		I			2.9
1172	15.0	11.1	1.280	O	I				2.9
1173	13.0	11.1	1.283	O	I				2.9
1174	11.0	11.1	1.282	O					2.9
1175	10.0	11.1	1.281	IO					2.9
1176	10.0	11.1	1.279	IO					2.9
1177	9.0	11.1	1.277	I O					2.9
1178	9.0	11.0	1.274	I O					2.9
1179	8.0	11.0	1.270	I O					2.8
1180	8.0	11.0	1.265	I O					2.8
1181	8.0	11.0	1.261	I O					2.8
1182	8.0	10.9	1.257	I O					2.8
1183	7.0	10.9	1.252	I O					2.8
1184	7.0	10.9	1.247	I O					2.8

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1185     7.0    10.8      1.241  |       I|  O     |        |        |      2.8
1186     7.0    10.8      1.236  |       I|  O     |        |        |      2.8
1187     7.0    10.8      1.231  |       I|  O     |        |        |      2.8
1188     7.0    10.7      1.226  |       I|  O     |        |        |      2.8
1189     6.0    10.7      1.219  |      I |  O     |        |        |      2.8
1190     6.0    10.7      1.213  |      I |  O     |        |        |      2.8
1191     6.0    10.6      1.206  |      I | O      |        |        |      2.8
1192     6.0    10.6      1.200  |      I | O      |        |        |      2.8
1193     6.0    10.5      1.194  |      I | O      |        |        |      2.8
1194     6.0    10.5      1.187  |      I | O      |        |        |      2.7
1195     6.0    10.5      1.181  |      I | O      |        |        |      2.7
1196     6.0    10.4      1.175  |      I | O      |        |        |      2.7
1197     6.0    10.4      1.169  |      I | O      |        |        |      2.7
1198     6.0    10.4      1.163  |      I | O      |        |        |      2.7
1199     5.0    10.3      1.156  |    I   | O      |        |        |      2.7
1200     5.0    10.3      1.148  |    I   | O      |        |        |      2.7
1201     5.0    10.2      1.141  |    I   | O      |        |        |      2.7
1202     5.0    10.2      1.134  |    I   | O      |        |        |      2.7
1203     5.0    10.1      1.127  |    I   | O      |        |        |      2.7
1204     5.0    10.1      1.120  |    I   | O      |        |        |      2.7
1205     5.0    10.0      1.113  |    I   | O      |        |        |      2.7
1206     5.0    10.0      1.106  |    I   | O      |        |        |      2.6
1207     5.0    10.0      1.099  |    I   | O      |        |        |      2.6
1208     5.0     9.9      1.092  |    I   | O      |        |        |      2.6
1209     5.0     9.9      1.085  |    I   | O      |        |        |      2.6
1210     5.0     9.8      1.079  |    I   | O      |        |        |      2.6
1211     5.0     9.8      1.072  |    I   | O      |        |        |      2.6
1212     5.0     9.8      1.066  |    I   | O      |        |        |      2.6
1213     5.0     9.7      1.059  |    I   | O      |        |        |      2.6
1214     5.0     9.7      1.053  |    I   |O       |        |        |      2.6
1215     5.0     9.6      1.046  |    I   |O       |        |        |      2.6
1216     5.0     9.6      1.040  |    I   |O       |        |        |      2.6
1217     4.0     9.5      1.032  |   I    |O       |        |        |      2.5
1218     4.0     9.5      1.025  |   I    |O       |        |        |      2.5
1219     4.0     9.5      1.017  |   I    |O       |        |        |      2.5
1220     4.0     9.4      1.010  |   I    |O       |        |        |      2.5
1221     4.0     9.4      1.002  |   I    |O       |        |        |      2.5
1222     4.0     9.3      0.995  |   I    |O       |        |        |      2.5
```

1223	4.0	9.3	0.987	I	O				2.5
1224	4.0	9.2	0.980	I	O				2.5
1225	4.0	9.2	0.973	I	O				2.5
1226	4.0	9.1	0.966	I	O				2.5
1227	4.0	9.1	0.959	I	O				2.5
1228	4.0	9.0	0.952	I	O				2.4
1229	4.0	9.0	0.945	I	O				2.4
1230	4.0	9.0	0.938	I	O				2.4
1231	4.0	8.9	0.931	I	O				2.4
1232	4.0	8.9	0.925	I	O				2.4
1233	4.0	8.8	0.918	I	O				2.4
1234	4.0	8.8	0.911	I	O				2.4
1235	4.0	8.8	0.905	I	O				2.4
1236	4.0	8.7	0.898	I	O				2.4
1237	4.0	8.7	0.892	I	O				2.4
1238	4.0	8.6	0.885	I	O				2.4
1239	4.0	8.6	0.879	I	O				2.4
1240	4.0	8.6	0.873	I	O				2.3
1241	4.0	8.5	0.866	I	O				2.3
1242	4.0	8.5	0.860	I	O				2.3
1243	4.0	8.4	0.854	I	O				2.3
1244	4.0	8.4	0.848	I	O				2.3
1245	4.0	8.4	0.842	I	O				2.3
1246	4.0	8.3	0.836	I	O				2.3
1247	4.0	8.3	0.830	I	O				2.3
1248	4.0	8.3	0.824	I	O				2.3
1249	4.0	8.2	0.818	I	O				2.3
1250	4.0	8.2	0.813	I	O				2.3
1251	4.0	8.1	0.807	I	O				2.3
1252	4.0	8.1	0.801	I	O				2.3
1253	3.0	8.1	0.794	I	O				2.2
1254	3.0	8.0	0.787	I	O				2.2
1255	3.0	8.0	0.780	I	O				2.2
1256	3.0	7.9	0.773	I	O				2.2
1257	3.0	7.9	0.767	I	O				2.2
1258	3.0	7.9	0.760	I	O				2.2
1259	3.0	7.8	0.753	I	O				2.2
1260	3.0	7.8	0.747	I	O				2.2

1261	3.0	7.7	0.740	I	O					2.2
1262	3.0	7.7	0.734	I	O					2.2
1263	3.0	7.7	0.727	I	O					2.2
1264	3.0	7.6	0.721	I	O					2.2
1265	3.0	7.6	0.714	I	O					2.1
1266	3.0	7.5	0.708	I	O					2.1
1267	3.0	7.5	0.702	I	O					2.1
1268	3.0	7.5	0.696	I	O					2.1
1269	3.0	7.4	0.690	I	O					2.1
1270	3.0	7.4	0.684	I	O					2.1
1271	3.0	7.3	0.678	I	O					2.1
1272	3.0	7.3	0.672	I	O					2.1
1273	3.0	7.3	0.666	I	O					2.1
1274	3.0	7.2	0.660	I	O					2.1
1275	3.0	7.2	0.654	I	O					2.1
1276	3.0	7.2	0.648	I	O					2.1
1277	3.0	7.1	0.643	I	O					2.1
1278	3.0	7.1	0.637	I	O					2.0
1279	3.0	7.1	0.631	I	O					2.0
1280	3.0	7.0	0.626	I	O					2.0
1281	3.0	7.0	0.620	I	O					2.0
1282	3.0	7.0	0.615	I	O					2.0
1283	3.0	6.9	0.609	I	O					2.0
1284	3.0	6.9	0.604	I	O					2.0
1285	3.0	6.9	0.599	I	O					2.0
1286	3.0	6.8	0.593	I	O					2.0
1287	3.0	6.8	0.588	I	O					2.0
1288	3.0	6.7	0.583	I	O					2.0
1289	3.0	6.7	0.578	I	O					2.0
1290	3.0	6.6	0.573	I	O					1.9
1291	3.0	6.6	0.568	I	O					1.9
1292	3.0	6.5	0.563	I	O					1.9
1293	3.0	6.5	0.558	I	O					1.9
1294	3.0	6.5	0.553	I	O					1.9
1295	3.0	6.4	0.549	I	O					1.9
1296	3.0	6.4	0.544	I	O					1.9
1297	3.0	6.3	0.539	I	O					1.9
1298	3.0	6.3	0.535	I	O					1.9

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1299     3.0     6.2      0.530  |  I  O |       |       |       |      1.9
1300     3.0     6.2      0.526  |  I  O |       |       |       |      1.8
1310     3.0     5.8      0.484  |  I  O |       |       |       |      1.7
1320     3.0     5.5      0.447  |  I O  |       |       |       |      1.7
1330     3.0     5.2      0.415  |  I O  |       |       |       |      1.6
1340     3.0     5.0      0.386  |  I O  |       |       |       |      1.5
1350     2.0     4.7      0.353  | I O   |       |       |       |      1.5
1360     2.0     4.4      0.318  | I O   |       |       |       |      1.4
1370     2.0     4.1      0.288  | I O   |       |       |       |      1.3
1380     2.0     3.9      0.261  | IO    |       |       |       |      1.3
1390     2.0     3.6      0.236  | IO    |       |       |       |      1.2
1400     2.0     3.5      0.215  | IO    |       |       |       |      1.2
1420     2.0     3.1      0.180  | IO    |       |       |       |      1.1
1440     2.0     2.9      0.152  | O     |       |       |       |      1.0
1460     2.0     2.6      0.132  | O     |       |       |       |      0.9
1500     2.0     2.1      0.110  | O     |       |       |       |      0.8

   Remaining water in basin =    0.11 (Ac.Ft)
   Peak flow out of basin =    11.10(CFS)
   Peak flow time = 1173 Min., time interval # = 59
   Maximum depth in basin =    2.87(Ft.)
```

10-YEAR SOUTH PAD

Program Package Serial Number: 2090

08/10/11 FILE: DsnyPo INPUT DATA: English Units RAINFALL SOIL FILE: English (In) OUTPUT DATA: English Units PAGE 1

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT PROG F0601M

MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 10 SOIL DATA FILE: C:\civild\lasoilx.dat

Disney/ABC Studios South Area 25.6 Acres STORM DAY 4

LOCATION	SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	RAIN ZONE	PCT IMPV
6601 1A	25.6	39.73	25.6	39.73	3	300.	.02000	.00	.00	0.	97	17	A37	.91
6601 2A	.0	.00	25.6	39.69	0	0.	.00000	.00	.00	0.	97	99	A37	.00

```
  CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1997-2004 Version 6.4
-------------------------------------------------------------------
Study Date : 08/10/11 Input hydrograph file name : DsnyPo.hyd
Output hydrograph file name: DisBasS.hin
Disney Basin South - Above Ground Basin 10-year
Drainage Area 25.6


-------------------------------------------------------------------


User entry of depth-outflow-storage data
-------------------------------------------------------------------
Hydrograph time unit varies
Initial depth in storage basin =   0.00(Ft.)
-------------------------------------------------------------------
-------------------------------------------------------------------
Initial basin depth =   0.00 (Ft.)
Initial basin storage =      0.00 (Ac.Ft)
Initial basin outflow =   0.00 (CFS)
-------------------------------------------------------------------
-------------------------------------------------------------------
Depth vs. Storage and Depth vs. Discharge data @ 1 Min. Intervals:
 Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
     (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
-------------------------------------------------------------------
    0.000      0.000      0.000      0.000        0.000
    1.000      0.146      2.840      0.144        0.148
    2.000      0.598      6.850      0.593        0.603
    3.000      1.389     11.760      1.381        1.397
    4.000      2.552     17.400      2.540        2.564
    5.000      4.122     56.120      4.083        4.161
-------------------------------------------------------------------
            Hydrograph Detention Basin Routing
Hydrograph at 6601 2 A Storm Day: 4 Drainage Area =   25.60
Total flood hydrograph volume this storm day =    9.42 Ac. Ft.
```

```
    ---------------------------------------------------------------------

    Graph values: 'I'= unit inflow; 'O'=outflow at time shown
    ---------------------------------------------------------------------
Time   Inflow  Outflow    Storage                                        Depth
(Min)  (CFS)   (CFS)     (Ac.Ft) .0      10.0    20.0    30.0    40.0 (Ft.)
    0     0.0     0.0      0.000  O       |       |       |       |      0.0
  100     3.0     2.0      0.101  |OI     |       |       |       |      0.7
  200     3.0     2.9      0.152  | O     |       |       |       |      1.0
  300     3.0     3.0      0.160  | O     |       |       |       |      1.0
  400     3.0     3.0      0.163  | O     |       |       |       |      1.0
  500     3.0     3.0      0.164  | O     |       |       |       |      1.0
  600     3.0     3.0      0.164  | O     |       |       |       |      1.0
  700     4.0     3.4      0.212  | OI    |       |       |       |      1.1
  800     4.0     3.8      0.258  |  O    |       |       |       |      1.2
  900     5.0     4.4      0.319  |  OI   |       |       |       |      1.4
 1000     6.0     5.2      0.417  |   O   |       |       |       |      1.6
 1050     7.0     5.8      0.485  |   OI  |       |       |       |      1.7
 1100     9.0     6.9      0.602  |    O I|       |       |       |      2.0
 1110    10.0     7.1      0.637  |    O  I       |       |       |      2.0
 1120    12.0     7.4      0.691  |    O  |I      |       |       |      2.1
 1130    14.0     7.9      0.766  |     O |  I    |       |       |      2.2
 1131    14.0     7.9      0.774  |     O |  I    |       |       |      2.2
 1132    14.0     8.0      0.782  |     O |  I    |       |       |      2.2
 1133    14.0     8.0      0.791  |     O |  I    |       |       |      2.2
 1134    15.0     8.1      0.800  |     O |   I   |       |       |      2.3
 1135    15.0     8.2      0.810  |     O |   I   |       |       |      2.3
 1136    15.0     8.2      0.819  |     O |   I   |       |       |      2.3
 1137    16.0     8.3      0.830  |     O |   I   |       |       |      2.3
 1138    16.0     8.4      0.840  |     O |   I   |       |       |      2.3
 1139    16.0     8.4      0.851  |     O |   I   |       |       |      2.3
 1140    17.0     8.5      0.862  |     O |    I  |       |       |      2.3
 1141    17.0     8.6      0.874  |     O |    I  |       |       |      2.3
 1142    18.0     8.6      0.887  |     O |     I |       |       |      2.4
 1143    18.0     8.7      0.900  |     O |     I |       |       |      2.4
 1144    19.0     8.8      0.914  |      O|      I|       |       |      2.4
 1145    19.0     8.9      0.928  |      O|      I|       |       |      2.4
 1146    20.0     9.0      0.943  |      O|       I       |       |      2.4
```

1147	21.0	9.1	0.960	|	O|	I	|	|	|	2.5
1148	22.0	9.2	0.977	|	O|	|I	|	|	|	2.5
1149	23.0	9.3	0.996	|	O|	| I	|	|	|	2.5
1150	25.0	9.5	1.018	|	O|	| I	|	|	|	2.5
1151	29.0	9.6	1.045	|	O|	| I	|	|	|	2.6
1152	32.0	9.8	1.075	|	O|	|	|I	|	|	2.6
1153	35.0	10.0	1.110	|	O	|	|	I	|	2.6
1154	38.0	10.3	1.148	|	O	|	|	I	|	2.7
1155	39.0	10.5	1.188	|	O	|	|	I	|	2.7
1156	40.0	10.8	1.228	|	O	|	|	I	|	2.8
1157	40.0	11.0	1.268	|	O	|	|	I	|	2.8
1158	40.0	11.3	1.308	|	|O	|	|	I	|	2.9
1159	39.0	11.5	1.346	|	|O	|	|	I	|	2.9
1160	39.0	11.7	1.384	|	|O	|	|	I	|	3.0
1161	38.0	11.9	1.420	|	|O	|	|	I	|	3.0
1162	37.0	12.1	1.454	|	|O	|	|	I	|	3.1
1163	36.0	12.2	1.487	|	|O	|	|	I	|	3.1
1164	35.0	12.4	1.518	|	|O	|	|	I	|	3.1
1165	34.0	12.5	1.548	|	| O	|	|	I	|	3.1
1166	33.0	12.7	1.576	|	| O	|	| I	|	3.2
1167	30.0	12.8	1.600	|	| O	|	I	|	3.2
1168	27.0	12.9	1.619	|	| O	|	I	|	3.2
1169	23.0	12.9	1.633	|	| O	| I	|	|	3.2
1170	20.0	13.0	1.643	|	| O	I	|	|	3.2
1171	17.0	13.0	1.648	|	| O I	|	|	|	3.2
1172	14.0	13.0	1.650	|	| OI	|	|	|	3.2
1173	13.0	13.0	1.650	|	| O	|	|	|	3.2
1174	12.0	13.0	1.648	|	|IO	|	|	|	3.2
1175	12.0	13.0	1.647	|	|IO	|	|	|	3.2
1176	11.0	13.0	1.644	|	I O	|	|	|	3.2
1177	11.0	13.0	1.641	|	I O	|	|	|	3.2
1178	10.0	13.0	1.637	|	I O	|	|	|	3.2
1179	10.0	12.9	1.633	|	I O	|	|	|	3.2
1180	10.0	12.9	1.629	|	I O	|	|	|	3.2
1181	9.0	12.9	1.624	|	I| O	|	|	|	3.2
1182	9.0	12.9	1.619	|	I| O	|	|	|	3.2
1183	9.0	12.8	1.613	|	I| O	|	|	|	3.2
1184	9.0	12.8	1.608	|	I| O	|	|	|	3.2

```
1185     8.0    12.8      1.601  |      I | O      |        |        |      3.2
1186     8.0    12.8      1.595  |      I | O      |        |        |      3.2
1187     8.0    12.7      1.588  |      I | O      |        |        |      3.2
1188     8.0    12.7      1.582  |      I | O      |        |        |      3.2
1189     8.0    12.7      1.575  |      I | O      |        |        |      3.2
1190     8.0    12.6      1.569  |      I | O      |        |        |      3.2
1191     7.0    12.6      1.561  |    I   | O      |        |        |      3.1
1192     7.0    12.6      1.553  |    I   | O      |        |        |      3.1
1193     7.0    12.5      1.546  |    I   | O      |        |        |      3.1
1194     7.0    12.5      1.538  |    I   |O       |        |        |      3.1
1195     7.0    12.4      1.531  |    I   |O       |        |        |      3.1
1196     7.0    12.4      1.523  |    I   |O       |        |        |      3.1
1197     7.0    12.4      1.516  |    I   |O       |        |        |      3.1
1198     7.0    12.3      1.508  |    I   |O       |        |        |      3.1
1199     7.0    12.3      1.501  |    I   |O       |        |        |      3.1
1200     6.0    12.3      1.492  |   I    |O       |        |        |      3.1
1201     6.0    12.2      1.484  |   I    |O       |        |        |      3.1
1202     6.0    12.2      1.475  |   I    |O       |        |        |      3.1
1203     6.0    12.1      1.467  |   I    |O       |        |        |      3.1
1204     6.0    12.1      1.458  |   I    |O       |        |        |      3.1
1205     6.0    12.1      1.450  |   I    |O       |        |        |      3.1
1206     6.0    12.0      1.442  |   I    |O       |        |        |      3.0
1207     6.0    12.0      1.433  |   I    |O       |        |        |      3.0
1208     6.0    11.9      1.425  |   I    |O       |        |        |      3.0
1209     6.0    11.9      1.417  |   I    |O       |        |        |      3.0
1210     6.0    11.9      1.409  |   I    |O       |        |        |      3.0
1211     6.0    11.8      1.401  |   I    |O       |        |        |      3.0
1212     6.0    11.8      1.393  |   I    |O       |        |        |      3.0
1213     6.0    11.7      1.385  |   I    |O       |        |        |      3.0
1214     6.0    11.7      1.377  |   I    |O       |        |        |      3.0
1215     6.0    11.6      1.369  |   I    |O       |        |        |      3.0
1216     5.0    11.6      1.360  |   I    |O       |        |        |      3.0
1217     5.0    11.5      1.351  |   I    |O       |        |        |      3.0
1218     5.0    11.5      1.342  |   I    |O       |        |        |      2.9
1219     5.0    11.4      1.333  |   I    |O       |        |        |      2.9
1220     5.0    11.4      1.325  |   I    |O       |        |        |      2.9
1221     5.0    11.3      1.316  |   I    |O       |        |        |      2.9
1222     5.0    11.3      1.307  |   I    |O       |        |        |      2.9
```

1223	5.0	11.2	1.299	|	I	O	|	|	| 2.9
1224	5.0	11.1	1.290	|	I	O	|	|	| 2.9
1225	5.0	11.1	1.282	|	I	O	|	|	| 2.9
1226	5.0	11.0	1.273	|	I	O	|	|	| 2.9
1227	5.0	11.0	1.265	|	I	O	|	|	| 2.8
1228	5.0	10.9	1.257	|	I	O	|	|	| 2.8
1229	5.0	10.9	1.249	|	I	O	|	|	| 2.8
1230	5.0	10.8	1.241	|	I	O	|	|	| 2.8
1231	5.0	10.8	1.233	|	I	O	|	|	| 2.8
1232	5.0	10.7	1.225	|	I	O	|	|	| 2.8
1233	5.0	10.7	1.217	|	I	O	|	|	| 2.8
1234	5.0	10.6	1.209	|	I	O	|	|	| 2.8
1235	5.0	10.6	1.201	|	I	O	|	|	| 2.8
1236	5.0	10.5	1.194	|	I	O	|	|	| 2.8
1237	5.0	10.5	1.186	|	I	O	|	|	| 2.7
1238	5.0	10.5	1.178	|	I	O	|	|	| 2.7
1239	5.0	10.4	1.171	|	I	O	|	|	| 2.7
1240	5.0	10.4	1.164	|	I	O	|	|	| 2.7
1241	5.0	10.3	1.156	|	I	O	|	|	| 2.7
1242	5.0	10.3	1.149	|	I	O	|	|	| 2.7
1243	5.0	10.2	1.142	|	I	O	|	|	| 2.7
1244	4.0	10.2	1.133	|	I	O	|	|	| 2.7
1245	4.0	10.1	1.125	|	I	O	|	|	| 2.7
1246	4.0	10.1	1.116	|	I	O	|	|	| 2.7
1247	4.0	10.0	1.108	|	I	O	|	|	| 2.6
1248	4.0	10.0	1.100	|	I	O|	|	|	| 2.6
1249	4.0	9.9	1.092	|	I	O|	|	|	| 2.6
1250	4.0	9.9	1.083	|	I	O|	|	|	| 2.6
1251	4.0	9.8	1.075	|	I	O|	|	|	| 2.6
1252	4.0	9.8	1.067	|	I	O|	|	|	| 2.6
1253	4.0	9.7	1.060	|	I	O|	|	|	| 2.6
1254	4.0	9.7	1.052	|	I	O|	|	|	| 2.6
1255	4.0	9.6	1.044	|	I	O|	|	|	| 2.6
1256	4.0	9.6	1.036	|	I	O|	|	|	| 2.6
1257	4.0	9.5	1.029	|	I	O|	|	|	| 2.5
1258	4.0	9.5	1.021	|	I	O|	|	|	| 2.5
1259	4.0	9.4	1.013	|	I	O|	|	|	| 2.5
1260	4.0	9.4	1.006	|	I	O|	|	|	| 2.5

1261	4.0	9.3	0.999	I	O					2.5
1262	4.0	9.3	0.991	I	O					2.5
1263	4.0	9.2	0.984	I	O					2.5
1264	4.0	9.2	0.977	I	O					2.5
1265	4.0	9.2	0.970	I	O					2.5
1266	4.0	9.1	0.963	I	O					2.5
1267	4.0	9.1	0.956	I	O					2.5
1268	4.0	9.0	0.949	I	O					2.4
1269	4.0	9.0	0.942	I	O					2.4
1270	4.0	8.9	0.935	I	O					2.4
1271	4.0	8.9	0.928	I	O					2.4
1272	4.0	8.9	0.921	I	O					2.4
1273	4.0	8.8	0.915	I	O					2.4
1274	4.0	8.8	0.908	I	O					2.4
1275	4.0	8.7	0.902	I	O					2.4
1276	4.0	8.7	0.895	I	O					2.4
1277	4.0	8.7	0.889	I	O					2.4
1278	4.0	8.6	0.882	I	O					2.4
1279	4.0	8.6	0.876	I	O					2.4
1280	4.0	8.5	0.870	I	O					2.3
1281	4.0	8.5	0.864	I	O					2.3
1282	4.0	8.5	0.857	I	O					2.3
1283	4.0	8.4	0.851	I	O					2.3
1284	4.0	8.4	0.845	I	O					2.3
1285	4.0	8.3	0.839	I	O					2.3
1286	4.0	8.3	0.833	I	O					2.3
1287	4.0	8.3	0.827	I	O					2.3
1288	4.0	8.2	0.821	I	O					2.3
1289	4.0	8.2	0.816	I	O					2.3
1290	4.0	8.2	0.810	I	O					2.3
1291	4.0	8.1	0.804	I	O					2.3
1292	4.0	8.1	0.798	I	O					2.3
1293	4.0	8.1	0.793	I	O					2.2
1294	4.0	8.0	0.787	I	O					2.2
1295	4.0	8.0	0.782	I	O					2.2
1296	4.0	8.0	0.776	I	O					2.2
1297	4.0	7.9	0.771	I	O					2.2
1298	4.0	7.9	0.765	I	O					2.2

```
1299     4.0     7.9      0.760  |  I  O |       |       |       |      2.2
1300     4.0     7.8      0.755  |  I  O |       |       |       |      2.2
1310     3.0     7.5      0.697  | I  O  |       |       |       |      2.1
1320     3.0     7.1      0.638  | I  O  |       |       |       |      2.1
1330     3.0     6.7      0.584  | I  O  |       |       |       |      2.0
1340     3.0     6.3      0.536  | I  O  |       |       |       |      1.9
1350     3.0     5.9      0.493  | I O   |       |       |       |      1.8
1360     3.0     5.6      0.455  | I O   |       |       |       |      1.7
1370     3.0     5.3      0.422  | I O   |       |       |       |      1.6
1380     3.0     5.0      0.392  | I O   |       |       |       |      1.5
1390     3.0     4.8      0.366  | IO    |       |       |       |      1.5
1400     3.0     4.6      0.343  | IO    |       |       |       |      1.4
1420     3.0     4.2      0.304  | IO    |       |       |       |      1.3
1440     3.0     4.0      0.274  | IO    |       |       |       |      1.3
1460     3.0     3.8      0.250  | IO    |       |       |       |      1.2
1500     3.0     3.4      0.213  | O     |       |       |       |      1.1

   Remaining water in basin =    0.21 (Ac.Ft)
   Peak flow out of basin =    13.02(CFS)
   Peak flow time = 1172 Min., time interval # = 58
   Maximum depth in basin =    3.22(Ft.)
```

25-YEAR SOUTH PAD

Program Package Serial Number: 2090

08/10/11 FILE: DsnyPo INPUT DATA: English Units RAINFALL SOIL FILE: English (In) OUTPUT DATA: English Units PAGE 1

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT PROG F0601M

MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 25 SOIL DATA FILE: C:\civild\lasoilx.dat

Disney/ABC Studios South Area 25.6 Acres STORM DAY 4

LOCATION		SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	RAIN ZONE	PCT IMPV
6601	1A	25.6	53.77	25.6	53.77	3	300.	.02000	.00	.00	0.	97	14	A37	.91
6601	2A	.0	.00	25.6	53.67	0	0.	.00000	.00	.00	0.	97	99	A37	.00

```
  CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1997-2004 Version 6.4
-------------------------------------------------------------------
Study Date : 08/10/11 Input hydrograph file name : DsnyPo.hyd
Output hydrograph file name: DisBasS.hin
Disney Basin South - Above Ground Basin 25-year
Drainage Area 25.6


-------------------------------------------------------------------


User entry of depth-outflow-storage data
-------------------------------------------------------------------
Hydrograph time unit varies
Initial depth in storage basin =   0.00(Ft.)
-------------------------------------------------------------------
-------------------------------------------------------------------
Initial basin depth =   0.00 (Ft.)
Initial basin storage =      0.00 (Ac.Ft)
Initial basin outflow =   0.00 (CFS)
-------------------------------------------------------------------
-------------------------------------------------------------------
Depth vs. Storage and Depth vs. Discharge data @ 1 Min. Intervals:
 Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
     (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
-------------------------------------------------------------------
    0.000      0.000      0.000      0.000        0.000
    1.000      0.146      2.840      0.144        0.148
    2.000      0.598      6.850      0.593        0.603
    3.000      1.389     11.760      1.381        1.397
    4.000      2.552     17.400      2.540        2.564
    5.000      4.122     56.120      4.083        4.161
-------------------------------------------------------------------
            Hydrograph Detention Basin Routing
Hydrograph at 6601 2 A Storm Day: 4 Drainage Area =   25.60
Total flood hydrograph volume this storm day =   11.17 Ac. Ft.
```

```
    ----------------------------------------------------------------------

    Graph values: 'I'= unit inflow; 'O'=outflow at time shown
    ----------------------------------------------------------------------
Time   Inflow  Outflow    Storage                                          Depth
(Min)  (CFS)   (CFS)     (Ac.Ft) .0      13.5    27.0    40.5    54.0 (Ft.)
    0     0.0     0.0      0.000  O       |       |       |       |      0.0
  100     3.0     2.0      0.101  |O      |       |       |       |      0.7
  200     3.0     2.9      0.152  |O      |       |       |       |      1.0
  300     3.0     3.0      0.160  |O      |       |       |       |      1.0
  400     4.0     3.4      0.211  | O     |       |       |       |      1.1
  500     4.0     3.8      0.257  | O     |       |       |       |      1.2
  600     4.0     3.9      0.271  | O     |       |       |       |      1.3
  700     4.0     4.0      0.275  | O     |       |       |       |      1.3
  800     5.0     4.4      0.324  | O     |       |       |       |      1.4
  900     6.0     5.3      0.418  |  O    |       |       |       |      1.6
 1000     7.0     6.2      0.526  |  OI   |       |       |       |      1.8
 1050     9.0     7.0      0.625  |   OI  |       |       |       |      2.0
 1100    11.0     8.1      0.797  |   O I |       |       |       |      2.3
 1110    13.0     8.4      0.850  |   O  I|       |       |       |      2.3
 1120    15.0     8.9      0.925  |    O  I       |       |       |      2.4
 1130    17.0     9.5      1.021  |    O  | I     |       |       |      2.5
 1131    18.0     9.5      1.033  |    O  | I     |       |       |      2.5
 1132    18.0     9.6      1.044  |    O  | I     |       |       |      2.6
 1133    18.0     9.7      1.056  |    O  | I     |       |       |      2.6
 1134    19.0     9.8      1.068  |    O  |  I    |       |       |      2.6
 1135    19.0     9.8      1.081  |    O  |  I    |       |       |      2.6
 1136    20.0     9.9      1.095  |    O  |  I    |       |       |      2.6
 1137    20.0    10.0      1.109  |    O  |  I    |       |       |      2.6
 1138    20.0    10.1      1.123  |    O  |  I    |       |       |      2.7
 1139    21.0    10.2      1.137  |     O |   I   |       |       |      2.7
 1140    21.0    10.3      1.152  |     O |   I   |       |       |      2.7
 1141    22.0    10.4      1.168  |     O |    I  |       |       |      2.7
 1142    22.0    10.5      1.184  |     O |    I  |       |       |      2.7
 1143    23.0    10.6      1.201  |     O |    I  |       |       |      2.8
 1144    24.0    10.7      1.220  |     O |     I |       |       |      2.8
 1145    25.0    10.8      1.239  |     O |     I |       |       |      2.8
 1146    26.0    11.0      1.260  |     O |      I|       |       |      2.8
```

1147	27.0	11.1	1.282	O	I			2.9
1148	29.0	11.2	1.307	O	I			2.9
1149	30.0	11.4	1.332	O	I			2.9
1150	34.0	11.6	1.363	O	I			3.0
1151	38.0	11.8	1.400	O	I			3.0
1152	43.0	12.0	1.442	O	I			3.0
1153	48.0	12.3	1.492	O	I			3.1
1154	52.0	12.5	1.546	O	I			3.1
1155	53.0	12.8	1.602	O	I			3.2
1156	54.0	13.1	1.659	O	I			3.2
1157	53.0	13.3	1.713	O	I			3.3
1158	53.0	13.6	1.768	O	I			3.3
1159	52.0	13.9	1.821	O	I			3.4
1160	51.0	14.1	1.872	O	I			3.4
1161	49.0	14.3	1.919	O	I			3.5
1162	48.0	14.6	1.966	O	I			3.5
1163	46.0	14.8	2.009	O	I			3.5
1164	42.0	14.9	2.046	O	I			3.6
1165	37.0	15.1	2.077	O	I			3.6
1166	32.0	15.2	2.100	O	I			3.6
1167	27.0	15.3	2.116	O	I			3.6
1168	22.0	15.3	2.125	O	I			3.6
1169	19.0	15.4	2.130	O	I			3.6
1170	17.0	15.4	2.132	O	I			3.6
1171	16.0	15.4	2.133	O				3.6
1172	15.0	15.4	2.133	O				3.6
1173	14.0	15.4	2.131	O				3.6
1174	14.0	15.3	2.129	O				3.6
1175	13.0	15.3	2.126	I	O			3.6
1176	13.0	15.3	2.123	I	O			3.6
1177	12.0	15.3	2.118	I	O			3.6
1178	12.0	15.3	2.114	I	O			3.6
1179	12.0	15.3	2.109	I	O			3.6
1180	11.0	15.2	2.103	I	O			3.6
1181	11.0	15.2	2.097	I	O			3.6
1182	11.0	15.2	2.092	I	O			3.6
1183	10.0	15.1	2.085	I	O			3.6
1184	10.0	15.1	2.078	I	O			3.6

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1185    10.0    15.1      2.071  |    I  O       |       |       |      3.6
1186    10.0    15.0      2.064  |    I  O       |       |       |      3.6
1187    10.0    15.0      2.057  |    I  O       |       |       |      3.6
1188     9.0    15.0      2.048  |    I  O       |       |       |      3.6
1189     9.0    14.9      2.040  |    I  O       |       |       |      3.6
1190     9.0    14.9      2.032  |    I  O       |       |       |      3.6
1191     9.0    14.8      2.024  |    I  O       |       |       |      3.5
1192     9.0    14.8      2.016  |    I  O       |       |       |      3.5
1193     9.0    14.8      2.008  |    I  O       |       |       |      3.5
1194     9.0    14.7      2.000  |    I  O       |       |       |      3.5
1195     8.0    14.7      1.991  |   I   O       |       |       |      3.5
1196     8.0    14.6      1.982  |   I   O       |       |       |      3.5
1197     8.0    14.6      1.973  |   I   O       |       |       |      3.5
1198     8.0    14.5      1.964  |   I   O       |       |       |      3.5
1199     8.0    14.5      1.955  |   I   O       |       |       |      3.5
1200     8.0    14.5      1.946  |   I   O       |       |       |      3.5
1201     8.0    14.4      1.937  |   I   O       |       |       |      3.5
1202     8.0    14.4      1.928  |   I   O       |       |       |      3.5
1203     8.0    14.3      1.919  |   I   O       |       |       |      3.5
1204     7.0    14.3      1.909  |   I   O       |       |       |      3.4
1205     7.0    14.2      1.899  |   I   O       |       |       |      3.4
1206     7.0    14.2      1.889  |   I   O       |       |       |      3.4
1207     7.0    14.1      1.879  |   I   O       |       |       |      3.4
1208     7.0    14.1      1.870  |   I   O       |       |       |      3.4
1209     7.0    14.0      1.860  |   I   O       |       |       |      3.4
1210     7.0    14.0      1.850  |   I   O       |       |       |      3.4
1211     7.0    14.0      1.841  |   I   O       |       |       |      3.4
1212     7.0    13.9      1.831  |   I   O       |       |       |      3.4
1213     7.0    13.9      1.822  |   I   O       |       |       |      3.4
1214     7.0    13.8      1.812  |   I   O       |       |       |      3.4
1215     7.0    13.8      1.803  |   I   O       |       |       |      3.4
1216     7.0    13.7      1.794  |   I   O       |       |       |      3.3
1217     7.0    13.7      1.784  |   I   O       |       |       |      3.3
1218     7.0    13.6      1.775  |   I   O       |       |       |      3.3
1219     6.0    13.6      1.765  |  I    O       |       |       |      3.3
1220     6.0    13.5      1.754  |  I    O       |       |       |      3.3
1221     6.0    13.5      1.744  |  I   O|       |       |       |      3.3
1222     6.0    13.4      1.734  |  I   O|       |       |       |      3.3
```

1223	6.0	13.4	1.723	I	O				3.3
1224	6.0	13.3	1.713	I	O				3.3
1225	6.0	13.3	1.703	I	O				3.3
1226	6.0	13.2	1.693	I	O				3.3
1227	6.0	13.2	1.683	I	O				3.3
1228	6.0	13.1	1.673	I	O				3.2
1229	6.0	13.1	1.664	I	O				3.2
1230	6.0	13.0	1.654	I	O				3.2
1231	6.0	13.0	1.644	I	O				3.2
1232	6.0	13.0	1.635	I	O				3.2
1233	6.0	12.9	1.625	I	O				3.2
1234	6.0	12.9	1.616	I	O				3.2
1235	6.0	12.8	1.606	I	O				3.2
1236	6.0	12.8	1.597	I	O				3.2
1237	6.0	12.7	1.588	I	O				3.2
1238	6.0	12.7	1.578	I	O				3.2
1239	6.0	12.6	1.569	I	O				3.2
1240	6.0	12.6	1.560	I	O				3.1
1241	6.0	12.5	1.551	I	O				3.1
1242	6.0	12.5	1.542	I	O				3.1
1243	6.0	12.5	1.533	I	O				3.1
1244	5.0	12.4	1.523	I	O				3.1
1245	5.0	12.4	1.513	I	O				3.1
1246	5.0	12.3	1.503	I	O				3.1
1247	5.0	12.3	1.493	I	O				3.1
1248	5.0	12.2	1.483	I	O				3.1
1249	5.0	12.2	1.473	I	O				3.1
1250	5.0	12.1	1.463	I	O				3.1
1251	5.0	12.1	1.453	I	O				3.1
1252	5.0	12.0	1.443	I	O				3.0
1253	5.0	12.0	1.434	I	O				3.0
1254	5.0	11.9	1.424	I	O				3.0
1255	5.0	11.9	1.415	I	O				3.0
1256	5.0	11.8	1.405	I	O				3.0
1257	5.0	11.8	1.396	I	O				3.0
1258	5.0	11.7	1.386	I	O				3.0
1259	5.0	11.7	1.377	I	O				3.0
1260	5.0	11.6	1.368	I	O				3.0

1261	5.0	11.6	1.359	I	O				3.0
1262	5.0	11.5	1.350	I	O				3.0
1263	5.0	11.5	1.341	I	O				2.9
1264	5.0	11.4	1.332	I	O				2.9
1265	5.0	11.4	1.323	I	O				2.9
1266	5.0	11.3	1.315	I	O				2.9
1267	5.0	11.2	1.306	I	O				2.9
1268	5.0	11.2	1.297	I	O				2.9
1269	5.0	11.1	1.289	I	O				2.9
1270	5.0	11.1	1.280	I	O				2.9
1271	5.0	11.0	1.272	I	O				2.9
1272	5.0	11.0	1.264	I	O				2.8
1273	5.0	10.9	1.256	I	O				2.8
1274	5.0	10.9	1.248	I	O				2.8
1275	5.0	10.8	1.239	I	O				2.8
1276	5.0	10.8	1.231	I	O				2.8
1277	5.0	10.7	1.224	I	O				2.8
1278	5.0	10.7	1.216	I	O				2.8
1279	5.0	10.6	1.208	I	O				2.8
1280	5.0	10.6	1.200	I	O				2.8
1281	5.0	10.5	1.192	I	O				2.8
1282	5.0	10.5	1.185	I	O				2.7
1283	5.0	10.4	1.177	I	O				2.7
1284	5.0	10.4	1.170	I	O				2.7
1285	5.0	10.4	1.162	I	O				2.7
1286	5.0	10.3	1.155	I	O				2.7
1287	5.0	10.3	1.148	I	O				2.7
1288	4.0	10.2	1.139	I	O				2.7
1289	4.0	10.2	1.131	I	O				2.7
1290	4.0	10.1	1.122	I	O				2.7
1291	4.0	10.1	1.114	I	O				2.7
1292	4.0	10.0	1.106	I	O				2.6
1293	4.0	9.9	1.097	I	O				2.6
1294	4.0	9.9	1.089	I	O				2.6
1295	4.0	9.8	1.081	I	O				2.6
1296	4.0	9.8	1.073	I	O				2.6
1297	4.0	9.7	1.065	I	O				2.6
1298	4.0	9.7	1.057	I	O				2.6

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1299     4.0     9.7      1.049  | I  O  |       |       |       |      2.6
1300     4.0     9.6      1.042  | I  O  |       |       |       |      2.6
1310     4.0     9.1      0.968  | I  O  |       |       |       |      2.5
1320     4.0     8.7      0.900  | I  O  |       |       |       |      2.4
1330     4.0     8.3      0.837  | I O   |       |       |       |      2.3
1340     4.0     8.0      0.780  | I O   |       |       |       |      2.2
1350     4.0     7.7      0.728  | I O   |       |       |       |      2.2
1360     4.0     7.4      0.679  | I O   |       |       |       |      2.1
1370     4.0     7.1      0.635  | I O   |       |       |       |      2.0
1380     3.0     6.8      0.587  |I  O   |       |       |       |      2.0
1390     3.0     6.3      0.538  |I O    |       |       |       |      1.9
1400     3.0     5.9      0.495  |I O    |       |       |       |      1.8
1420     3.0     5.3      0.424  |I O    |       |       |       |      1.6
1440     3.0     4.8      0.367  |IO     |       |       |       |      1.5
1460     3.0     4.4      0.323  |IO     |       |       |       |      1.4
1500     3.0     3.8      0.258  |IO     |       |       |       |      1.2

   Remaining water in basin =    0.26 (Ac.Ft)
   Peak flow out of basin =    15.37(CFS)
   Peak flow time = 1171 Min., time interval # = 57
   Maximum depth in basin =    3.64(Ft.)
```

50-YEAR SOUTH PAD

Program Package Serial Number: 2090

08/09/11 FILE: DsnyPo INPUT DATA: English Units RAINFALL SOIL FILE: English (In) OUTPUT DATA: English Units PAGE 1

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT PROG F0601M

MODIFIED RATIONAL METHOD HYDROLOGY - STORM YEAR = 50 SOIL DATA FILE: C:\civild\lasoilx.dat

Disney/ABC Studios South Area 25.6 Acres STORM DAY 4

LOCATION	SUBAREA AREA(Ac)	SUBAREA Q(CFS)	TOTAL AREA(Ac)	TOTAL Q(CFS)	CONV TYPE	CONV LNGTH(Ft)	CONV SLOPE	CONV SIZE(Ft)	CONV Z	CONTROL Q(CFS)	SOIL NAME	TC	RAIN ZONE	PCT IMPV
6601 1A	25.6	63.52	25.6	63.52	3	300.	.02000	.00	.00	0.	97	13	A37	.91
6601 2A	.0	.00	25.6	63.35	0	0.	.00000	.00	.00	0.	97	99	A37	.00

```
  CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1997-2004 Version 6.4
-------------------------------------------------------------------
Study Date : 08/09/11 Input hydrograph file name : DsnyPo.hyd
Output hydrograph file name: DisBasS.hin
Disney Basin South - Above Ground Basin 50-year
Drainage Area 25.6


-------------------------------------------------------------------


User entry of depth-outflow-storage data
-------------------------------------------------------------------
Hydrograph time unit varies
Initial depth in storage basin =   0.00(Ft.)
-------------------------------------------------------------------
-------------------------------------------------------------------
Initial basin depth =   0.00 (Ft.)
Initial basin storage =      0.00 (Ac.Ft)
Initial basin outflow =   0.00 (CFS)
-------------------------------------------------------------------
-------------------------------------------------------------------
Depth vs. Storage and Depth vs. Discharge data @ 1 Min. Intervals:
 Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
     (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
-------------------------------------------------------------------
    0.000      0.000      0.000      0.000        0.000
    1.000      0.146      2.840      0.144        0.148
    2.000      0.598      6.850      0.593        0.603
    3.000      1.389     11.760      1.381        1.397
    4.000      2.552     17.400      2.540        2.564
    5.000      4.122     56.120      4.083        4.161
-------------------------------------------------------------------
            Hydrograph Detention Basin Routing
Hydrograph at 6601 2 A Storm Day: 4 Drainage Area =   25.60
Total flood hydrograph volume this storm day =   13.08 Ac. Ft.
```

```
    ---------------------------------------------------------------------

    Graph values: 'I'= unit inflow; 'O'=outflow at time shown
    ---------------------------------------------------------------------
Time   Inflow  Outflow    Storage                                        Depth
(Min)  (CFS)   (CFS)     (Ac.Ft) .0      15.8    31.5    47.3    63.0 (Ft.)
    0     0.0     0.0      0.000  O       |       |       |       |      0.0
  100     4.0     2.6      0.135  |OI     |       |       |       |      0.9
  200     4.0     3.6      0.235  |OI     |       |       |       |      1.2
  300     4.0     3.9      0.264  |OI     |       |       |       |      1.3
  400     4.0     4.0      0.273  | O     |       |       |       |      1.3
  500     4.0     4.0      0.276  | O     |       |       |       |      1.3
  600     5.0     4.4      0.324  | O     |       |       |       |      1.4
  700     5.0     4.8      0.370  | O     |       |       |       |      1.5
  800     6.0     5.4      0.432  | OI    |       |       |       |      1.6
  900     7.0     6.2      0.530  |  O    |       |       |       |      1.8
 1000     8.0     7.1      0.640  |  OI   |       |       |       |      2.1
 1050    10.0     7.8      0.751  |  O I  |       |       |       |      2.2
 1100    13.0     9.1      0.966  |   O I |       |       |       |      2.5
 1110    15.0     9.5      1.032  |   O  I|       |       |       |      2.5
 1120    17.0    10.1      1.119  |    O  I       |       |       |      2.7
 1130    20.0    10.8      1.232  |    O  | I     |       |       |      2.8
 1131    20.0    10.9      1.245  |    O  | I     |       |       |      2.8
 1132    21.0    11.0      1.259  |    O  | I     |       |       |      2.8
 1133    21.0    11.0      1.272  |    O  | I     |       |       |      2.9
 1134    22.0    11.1      1.287  |    O  |  I    |       |       |      2.9
 1135    22.0    11.2      1.302  |    O  |  I    |       |       |      2.9
 1136    22.0    11.3      1.317  |    O  |  I    |       |       |      2.9
 1137    23.0    11.4      1.333  |    O  |  I    |       |       |      2.9
 1138    23.0    11.5      1.349  |    O  |  I    |       |       |      2.9
 1139    24.0    11.6      1.366  |    O  |   I   |       |       |      3.0
 1140    25.0    11.7      1.384  |    O  |   I   |       |       |      3.0
 1141    25.0    11.8      1.403  |     O |   I   |       |       |      3.0
 1142    26.0    11.9      1.422  |     O |    I  |       |       |      3.0
 1143    27.0    12.0      1.443  |     O |    I  |       |       |      3.0
 1144    28.0    12.1      1.465  |     O |     I |       |       |      3.1
 1145    29.0    12.2      1.488  |     O |     I |       |       |      3.1
 1146    30.0    12.4      1.512  |     O |      I|       |       |      3.1
```

1147	32.0	12.5	1.539		O	I			3.1
1148	33.0	12.6	1.567		O	I			3.2
1149	35.0	12.8	1.598		O	I			3.2
1150	40.0	13.0	1.636		O	I			3.2
1151	45.0	13.2	1.679		O	I			3.2
1152	51.0	13.4	1.731		O	I			3.3
1153	57.0	13.7	1.791		O	I			3.3
1154	61.0	14.0	1.856		O	I			3.4
1155	63.0	14.4	1.923		O	I			3.5
1156	63.0	14.7	1.990		O	I			3.5
1157	63.0	15.0	2.057		O	I			3.6
1158	62.0	15.3	2.121		O	I			3.6
1159	61.0	15.6	2.184		O	I			3.7
1160	59.0	15.9	2.243		O	I			3.7
1161	57.0	16.2	2.300		O	I			3.8
1162	54.0	16.4	2.352		O	I			3.8
1163	50.0	16.7	2.398		O	I			3.9
1164	43.0	16.8	2.434		O	I			3.9
1165	37.0	17.0	2.462		O	I			3.9
1166	31.0	17.1	2.481		O	I			3.9
1167	26.0	17.1	2.493		O	I			3.9
1168	22.0	17.1	2.500		O	I			4.0
1169	20.0	17.2	2.504		O	I			4.0
1170	19.0	17.2	2.506		O	I			4.0
1171	18.0	17.2	2.507		O	I			4.0
1172	17.0	17.2	2.507		O				4.0
1173	16.0	17.2	2.506		O				4.0
1174	15.0	17.2	2.503		I	O			4.0
1175	15.0	17.1	2.500		I	O			4.0
1176	14.0	17.1	2.495		I	O			4.0
1177	14.0	17.1	2.491		I	O			3.9
1178	13.0	17.1	2.485		I	O			3.9
1179	13.0	17.0	2.480		I	O			3.9
1180	13.0	17.0	2.474		I	O			3.9
1181	12.0	17.0	2.467		I	O			3.9
1182	12.0	17.0	2.460		I	O			3.9
1183	12.0	16.9	2.454		I	O			3.9
1184	12.0	16.9	2.447		I	O			3.9

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1185    11.0    16.9      2.439  |    I  O       |        |        |      3.9
1186    11.0    16.8      2.431  |    I  O       |        |        |      3.9
1187    11.0    16.8      2.423  |    I  O       |        |        |      3.9
1188    11.0    16.7      2.415  |    I  O       |        |        |      3.9
1189    10.0    16.7      2.406  |    I  O       |        |        |      3.9
1190    10.0    16.6      2.396  |    I  O       |        |        |      3.9
1191    10.0    16.6      2.387  |    I  O       |        |        |      3.9
1192    10.0    16.6      2.378  |    I  O       |        |        |      3.9
1193    10.0    16.5      2.369  |    I  O       |        |        |      3.8
1194    10.0    16.5      2.360  |    I  O       |        |        |      3.8
1195    10.0    16.4      2.351  |    I  O       |        |        |      3.8
1196     9.0    16.4      2.341  |   I   O       |        |        |      3.8
1197     9.0    16.3      2.331  |   I   O       |        |        |      3.8
1198     9.0    16.3      2.321  |   I   O       |        |        |      3.8
1199     9.0    16.2      2.311  |   I   O       |        |        |      3.8
1200     9.0    16.2      2.301  |   I   O       |        |        |      3.8
1201     9.0    16.1      2.291  |   I   O       |        |        |      3.8
1202     9.0    16.1      2.281  |   I   O       |        |        |      3.8
1203     9.0    16.0      2.272  |   I   O       |        |        |      3.8
1204     8.0    16.0      2.261  |   I   O       |        |        |      3.7
1205     8.0    15.9      2.250  |   I   O       |        |        |      3.7
1206     8.0    15.9      2.239  |   I   O       |        |        |      3.7
1207     8.0    15.8      2.228  |   I   O       |        |        |      3.7
1208     8.0    15.8      2.217  |   I   O       |        |        |      3.7
1209     8.0    15.7      2.207  |   I  O|       |        |        |      3.7
1210     8.0    15.7      2.196  |   I  O|       |        |        |      3.7
1211     8.0    15.6      2.185  |   I  O|       |        |        |      3.7
1212     8.0    15.6      2.175  |   I  O|       |        |        |      3.7
1213     8.0    15.5      2.165  |   I  O|       |        |        |      3.7
1214     8.0    15.5      2.154  |   I  O|       |        |        |      3.7
1215     8.0    15.4      2.144  |   I  O|       |        |        |      3.6
1216     8.0    15.4      2.134  |   I  O|       |        |        |      3.6
1217     7.0    15.3      2.122  |  I   O|       |        |        |      3.6
1218     7.0    15.3      2.111  |  I   O|       |        |        |      3.6
1219     7.0    15.2      2.100  |  I   O|       |        |        |      3.6
1220     7.0    15.2      2.088  |  I   O|       |        |        |      3.6
1221     7.0    15.1      2.077  |  I   O|       |        |        |      3.6
1222     7.0    15.0      2.066  |  I   O|       |        |        |      3.6
```

1223	7.0	15.0	2.055	I	O				3.6
1224	7.0	14.9	2.044	I	O				3.6
1225	7.0	14.9	2.033	I	O				3.6
1226	7.0	14.8	2.022	I	O				3.5
1227	7.0	14.8	2.012	I	O				3.5
1228	7.0	14.7	2.001	I	O				3.5
1229	7.0	14.7	1.990	I	O				3.5
1230	7.0	14.6	1.980	I	O				3.5
1231	7.0	14.6	1.969	I	O				3.5
1232	7.0	14.5	1.959	I	O				3.5
1233	7.0	14.5	1.949	I	O				3.5
1234	7.0	14.4	1.938	I	O				3.5
1235	7.0	14.4	1.928	I	O				3.5
1236	7.0	14.3	1.918	I	O				3.5
1237	6.0	14.3	1.907	I	O				3.4
1238	6.0	14.2	1.895	I	O				3.4
1239	6.0	14.2	1.884	I	O				3.4
1240	6.0	14.1	1.873	I	O				3.4
1241	6.0	14.1	1.862	I	O				3.4
1242	6.0	14.0	1.851	I	O				3.4
1243	6.0	13.9	1.840	I	O				3.4
1244	6.0	13.9	1.829	I	O				3.4
1245	6.0	13.8	1.818	I	O				3.4
1246	6.0	13.8	1.807	I	O				3.4
1247	6.0	13.7	1.796	I	O				3.4
1248	6.0	13.7	1.786	I	O				3.3
1249	6.0	13.6	1.775	I	O				3.3
1250	6.0	13.6	1.765	I	O				3.3
1251	6.0	13.5	1.754	I	O				3.3
1252	6.0	13.5	1.744	I	O				3.3
1253	6.0	13.4	1.734	I	O				3.3
1254	6.0	13.4	1.723	I	O				3.3
1255	6.0	13.3	1.713	I	O				3.3
1256	6.0	13.3	1.703	I	O				3.3
1257	6.0	13.2	1.693	I	O				3.3
1258	6.0	13.2	1.683	I	O				3.3
1259	6.0	13.1	1.673	I	O				3.2
1260	6.0	13.1	1.664	I	O				3.2

1261	6.0	13.0	1.654	I	O			3.2
1262	6.0	13.0	1.644	I	O			3.2
1263	6.0	13.0	1.635	I	O			3.2
1264	6.0	12.9	1.625	I	O			3.2
1265	6.0	12.9	1.616	I	O			3.2
1266	6.0	12.8	1.606	I	O			3.2
1267	6.0	12.8	1.597	I	O			3.2
1268	6.0	12.7	1.588	I	O			3.2
1269	5.0	12.7	1.577	I	O			3.2
1270	5.0	12.6	1.566	I	O			3.2
1271	5.0	12.6	1.556	I	O			3.1
1272	5.0	12.5	1.546	I	O			3.1
1273	5.0	12.5	1.535	I	O			3.1
1274	5.0	12.4	1.525	I	O			3.1
1275	5.0	12.4	1.515	I	O			3.1
1276	5.0	12.3	1.505	I	O			3.1
1277	5.0	12.3	1.495	I	O			3.1
1278	5.0	12.2	1.485	I	O			3.1
1279	5.0	12.2	1.475	I	O			3.1
1280	5.0	12.1	1.465	I	O			3.1
1281	5.0	12.1	1.455	I	O			3.1
1282	5.0	12.0	1.445	I	O			3.0
1283	5.0	12.0	1.436	I	O			3.0
1284	5.0	11.9	1.426	I	O			3.0
1285	5.0	11.9	1.417	I	O			3.0
1286	5.0	11.8	1.407	I	O			3.0
1287	5.0	11.8	1.398	I	O			3.0
1288	5.0	11.8	1.388	I	O			3.0
1289	5.0	11.7	1.379	I	O			3.0
1290	5.0	11.6	1.370	I	O			3.0
1291	5.0	11.6	1.361	I	O			3.0
1292	5.0	11.5	1.352	I	O			3.0
1293	5.0	11.5	1.343	I	O			2.9
1294	5.0	11.4	1.334	I	O			2.9
1295	5.0	11.4	1.325	I	O			2.9
1296	5.0	11.3	1.316	I	O			2.9
1297	5.0	11.3	1.308	I	O			2.9
1298	5.0	11.2	1.299	I	O			2.9

1299	5.0	11.1	1.291	I O				2.9
1300	5.0	11.1	1.282	I O				2.9
1310	5.0	10.6	1.202	I O				2.8
1320	5.0	10.1	1.128	I O				2.7
1330	4.0	9.7	1.053	I O				2.6
1340	4.0	9.2	0.978	I O				2.5
1350	4.0	8.8	0.909	I O				2.4
1360	4.0	8.4	0.846	I O				2.3
1370	4.0	8.0	0.788	I O				2.2
1380	4.0	7.7	0.735	IO				2.2
1390	4.0	7.4	0.686	IO				2.1
1400	4.0	7.1	0.641	IO				2.1
1420	4.0	6.5	0.563	IO				1.9
1440	4.0	6.0	0.501	IO				1.8
1460	4.0	5.6	0.452	O				1.7
1500	4.0	4.9	0.379	O				1.5

Remaining water in basin = 0.38 (Ac.Ft)
Peak flow out of basin = 17.18(CFS)
Peak flow time = 1171 Min., time interval # = 57
Maximum depth in basin = 3.96(Ft.)

SUB-APPENDIX 1-H.

SEDIMENT TRANSPORT ANALYSIS

Sediment Transport Analysis

The sediment transport analysis for Placerita Creek has indicated there would be no adverse impact downstream with implementation of the Proposed Project. There would be minimal sediment build up within the Proposed Project site, and the proposed slope protection would protect against future scour that might occur.

Please see Drainage Report, volume 2 of 2 for details and results.

Bank elevation calculations

The embankment protection height is calculated in accordance with the parameters established in Chapter 5 of the LACDPW Sedimentation Manual. The results show the embankment proposed elevations would be higher than LACDPW 50-year water surface elevations. Please see following table for calculations.

APPENDIX 2 – STANDARD URBAN STORMWATER MITIGATION PLAN - SUSMP

I. Project Description

A. Project Background

The northern portion of the Development Area would contain an electrical substation, four soundstages, production offices, and two mills (or studio offices instead of the four soundstages, production offices, and two mills). The southern portion of the Development Area would contain eight soundstages, production offices, four mills, six writer/producer bungalows, an administration building, a commissary, a warehouse, and a central utility plant, as well as a surface parking lot to the east of the soundstages.

The Proposed Project also would include the construction of an approximately 2,000,000-gallon water tank and associated water line to be located on the Ranch south of Placerita Canyon Road. The construction of the water tank and associated water line would include improvements to an existing dirt road leading from Placerita Canyon Road to the water tank, including paving of the road for all-weather access at the request of the Newhall County Water District, the water provider for the Development Area.

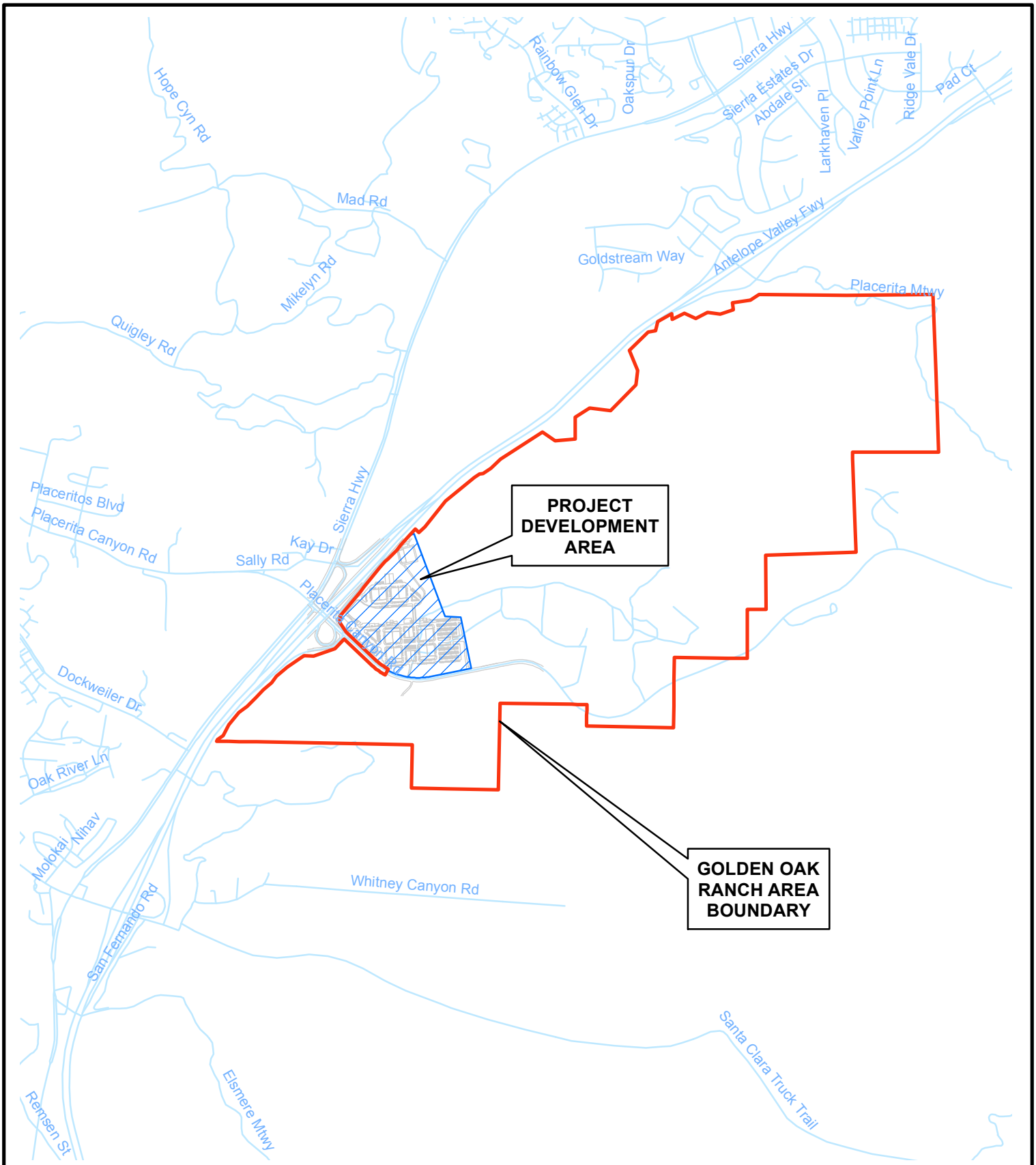
B. Purpose and Scope

The project is located in the unincorporated area of the Los Angeles County, and therefore is under the jurisdiction of the Los Angeles County Department of Public Works (LACDPW).

The purpose of this report is:

- To meet Los Angeles County Standard Urban Stormwater Mitigation Plan (SUSMP) requirements;
- To determine and mitigate the Proposed Project's impact (increase in peak flow rates) on existing hydrologic conditions;
- To provide sufficient detailed information to support detailed hydraulic design of Best Management Practices (BMP).

For detailed information on sizing of storm drain facilities, please refer to the Hydrology and Water Quality Study.



2,000 0 Feet

FIGURE 1

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AT THE RANCH

VICINITY AND LOCATION

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II. Site Characterization

The site is located in Newhall, California between State Route 14 and Placerita Canyon Road. Current land use on the Proposed Project site consists of outdoor filming, agriculture and parking.

The proposed land use is a motion picture and television studio, which would include soundstages, parking lots, bioretention areas and surrounding landscaping.

The following table shows the receiving waters for the Proposed Project site.

Table 1
Receiving Waters for Urban Runoff

Receiving Water	303 (d) List Impairments[1]	Designated Beneficial Uses[2]
Eastern Santa Clara	Chloride, Chlorpyrifos, Coliform, Diazinon, and Toxicity	Existing: MUN, IND, PROC, AGR

[1] State Water Resources Control Board, Proposed 2006 303 (d) List of Water Quality Limited Segments.

[2] California Regional Water Quality Control Board, Los Angeles Region.

III. Pollutants of Concern

The pollutants of concern are discussed and identified in Appendix 1, Surface Water Quality on page 1-15 and include:

- Pathogens (viruses and bacteria);
- Heavy Metals;
- Nutrients;
- Pesticides;
- Organic Compounds;
- Sediments;
- Trash and Debris;
- Oxygen Demanding Substances; and
- Oil and Grease.

The receiving waters for the Proposed Project have been identified as Placerita Creek and the South Fork of the Santa Clara River which flow into Reach 6 of the Santa Clara River. The Santa Clara River (Reach 6) is listed as impaired for Chloride, Chlorpyrifos, Coliform, Diazinon, and Toxicity on the most recent State Clean Water Act Section CWA 303(d) list of impaired water bodies.

The following are pollutants the SUSMP would strive to mitigate with implementation of BMPs:

- Nutrients;
- Sediments;
- Oil and Grease; and
- Trash and Debris.

The 2002 CWA Section 303(d) List identifies the Total Maximum Daily Limit (TMDL) of Nutrients, Sediments, Oil, Grease, and Trash and Debris as medium to high priority, with Pesticide and Organic Compounds as very low priority. Therefore, the SUSMP would concentrate on mitigation of the impact of pollutants with a TMDL priority of medium to high.

Below are TMDL records for the Santa Clara River watershed.

Last update: Feb 23, 2009

TMDL record(s) for **Santa Clara River** watershed

No.	Resolution No.	Watershed	Pollutant	Resolution Name	Staff Contact	Status	New Posting (last 30 days)
1	2008-012	Santa Clara River	Chloride	Reconsideration of the Upper Santa Clara River Chloride TMDL Implementation Plan & Revise Chloride WQ Objectives	Yanjie Chu (213) 576-6681	Approved by OAL on Jan 26, 2010	
2	2007-009	Santa Clara River	Trash	Lake Elizabeth, Munz Lake, Lake Hughes Trash TMDL	Eric Wu (213) 576-6683	TMDL In Effect on Mar 6, 2008	
3	2006-016	Santa Clara River	Salts	Upper Santa Clara River Chloride TMDL Implementation Plan Re-Consideration	Yanjie Chu (213) 576-6681	TMDL In Effect on Jun 12, 2008	
4	2004-004	Santa Clara River	Salts	Upper Santa Clara River Chloride TMDL	Yanjie Chu (213) 576-6681	TMDL In Effect on May 4, 2005	
5	2003-011	Santa Clara River	Nutrients	Santa Clara River Nutrients TMDL	Yanjie Chu (213) 576-6681	TMDL In Effect on Mar 23, 2004	

IV. Hydrology

A. General Approach

The watershed was identified and characterized for both existing and proposed conditions. A computer spreadsheet was used to estimate the runoff flowrate for the 50-year storm event.

The storm drain system was designed to intercept the runoff at proposed grate inlets strategically located to maximize interception of the 50-year storm event.

An underground storage system was designed so the proposed peak discharge rates are below or equal to the existing peak discharges.

B. Data Sources

The primary source of data are the LACDPW Hydrology Manual (2006) and the LA County Standard Urban Stormwater Mitigation Plan (September 2002).

Soil type is classified as 97, as shown in the Mint Canyon quadrant of the Hydrologic Map figure LACDPW 1-H1.45.

Average 50-year storm event rain fall is 7.5 inches.

Methodology used to compute the flow rates is the Modified Rational Method, described in the LACDPW Hydrology Manual.

The modified rational method (MODRAT) uses a runoff coefficient that is a function of the rainfall intensity. The runoff coefficient reflects the fraction of rainfall that does not infiltrate and is based on the rainfall intensity for a given time period.

MODRAT uses the following equation at each time step:

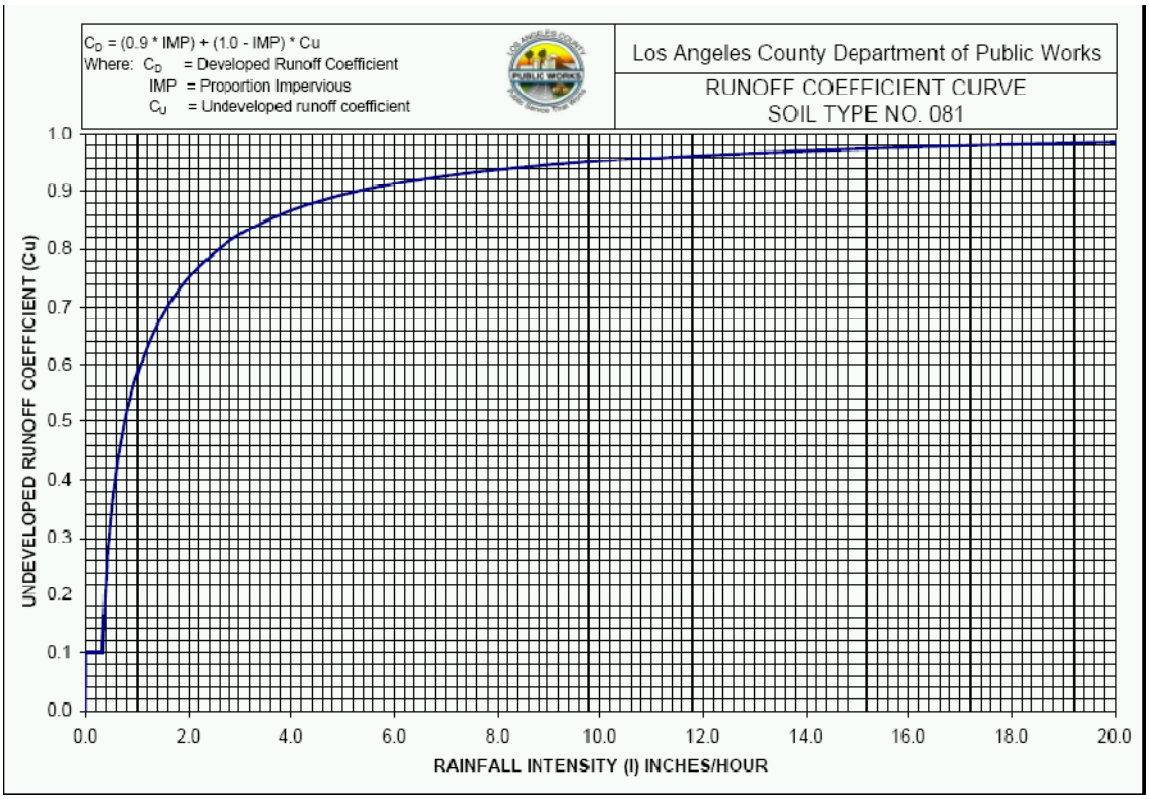
$Q = C*I*A$

Where: Q = Volumetric flow rate in cfs

C = Runoff coefficient, dimensionless
I = Rainfall intensity at a given point in time in in/hr
A = Watershed area in acres

Undeveloped Runoff Coefficient (Cu)

MODRAT uses runoff coefficient curves to model the runoff response of the soil to changing intensity. The 179 undeveloped runoff coefficient curves, plotted in Sub-Appendix 2-A, correspond to different soil types within the County of Los Angeles. The following Figure shows the shape of a typical runoff coefficient curve.



Developed Soil Runoff Coefficient Curves (CD)

Each undeveloped runoff coefficient curve represents natural soil conditions. When precipitation occurs over a developed watershed, the rain falls on directly connected impervious areas and pervious areas. Runoff from pervious areas only occurs during heavy rainfall. Directly connected impervious areas always produce direct runoff. As impervious area increases, the amount of direct runoff increases. The runoff coefficient curve must be modified to match the developed condition. The following equation accounts for the effects of development based on the undeveloped runoff coefficient and the amount of impervious area.

$$Cd = (0.9 * IMP) + (1 - IMP) * Cu$$

Where:

Cd = Developed area runoff coefficient
IMP = Percent impervious
Cu = Undeveloped area runoff coefficient

C. Existing Conditions Results

The existing condition hydrologic analysis was based on current natural site conditions and vegetation coverage. For the purposes of calculations the site was divided into northern and southern areas.

D. Proposed Conditions Results

The proposed conditions hydrologic analysis was based on the development of the Proposed Project, including the proposed water tank and water tank access road. The water tank pad area and access road would be paved with an all-weather surface at the request of the Newhall County Water District and the area of impervious surface would be less than 1 (one) acre. The runoff generated by the increased impervious area would drain to detention/infiltration basin DB-01, DB-02, DB-03 & DB-04. Underground storage systems are provided with these basins to store runoff on site so there would be no impact to peak flows, volumes and water quality associated with the addition of impervious surface.

E. Baseline Hydrology Comparison

A comparison of existing and proposed peak flows rates is provided in Table 2 below.

Table 2
Existing vs. Proposed 50-yr Peak Flows Comparison

Project	Subarea	Area (acres)	Flow rate clear cfs)
North	Existing	10.12	29.53
	Proposed	10.12	34.59

Project	Subarea	Area (acres)	Flow rate clear (cfs)
South	Existing	25.60	48.71
	Proposed	25.40	64.66

All tributary areas will ultimately drain to Placerita Creek. The difference between existing and developed conditions peak flow rates would be stored in underground storage systems located on both the north and south sites.

V. Best Management Practices

The Proposed Project would be designed to minimize, to the maximum extent practicable, the introduction of pollutants of concern to site runoff that may result in significant impacts to water quality. The following proposed Site Design, Source Control, and Treatment Control Best Management Practices (BMPs) are designed to reduce the amount of pollution potentially produced by the Proposed Project site. The site is divided into two main drainage areas, northern and southern areas. Refer to the BMP Exhibit for a complete overview of the Proposed Project site's proposed BMPs.

Drainage Area North

This drainage area would direct flows from roof tops and the proposed parking lots to the detention/retention areas located on the southwest and southeast corners of the northern area, where they would flow into underground storage systems. The estimated volume generated would be 0.4 acre-ft.

Drainage Area South

This area would direct flows from the parking lots into vegetated swales. The runoff then would be collected at inlets at the end of the swales and conveyed in a storm drain system and discharged to a detention basin before it would be released into Placerita Creek. The rest of the southern area would drain to a detention/retention area located on the northwest corner, before runoff would be collected into the underground storage system. The estimated volume generated on this southern area would be 1.3 acre-ft.

Flow rates for both areas are shown in Table 3. Detention basins have been designed and sized to accommodate volumes above and beyond those shown in Table 3.

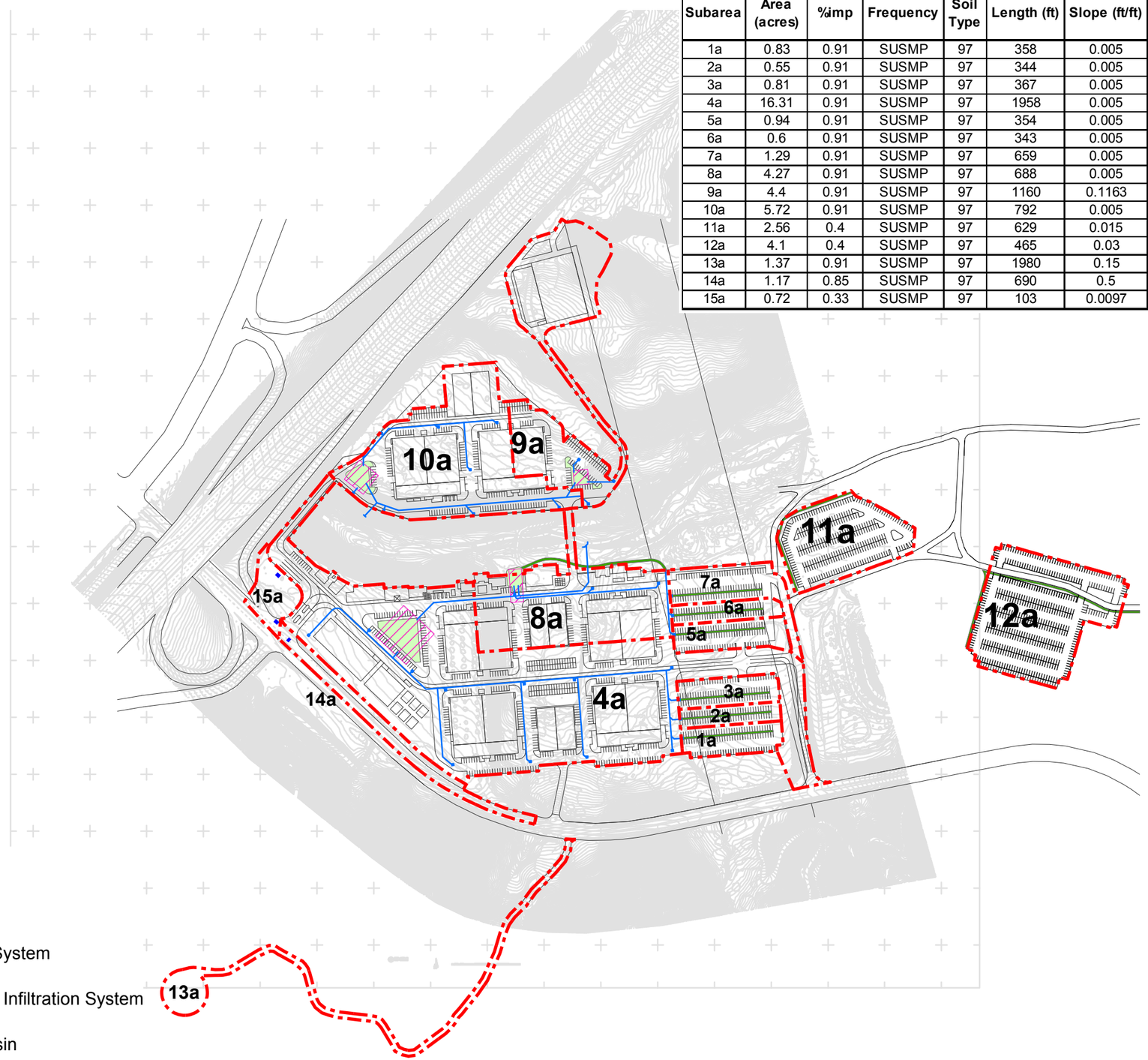
Table 3
BMP Flow Rates and Volumes

Site	Area (acres)	%imp	Isohyet (in.)	Tc-calc (min.)	Intens (in./hr)	Cu	Cd	Flow rate (cfs)	Volume (acre-ft)
North	10.12	0.91	0.75	30	0.19	0.10	0.83	1.59	0.52
South	25.60	0.91	0.75	30	0.19	0.10	0.83	4.06	1.32

SUSMP PEAK MITIGATION FLOW RATES

Subarea	Area (acres)	%imp	Frequency	Soil Type	Length (ft)	Slope (ft/ft)	Isohyet (in.)	Tc-calculated (min.)	Intensity (in./hr)	Cu	Cd	Flow rate (cfs)	Volume (acre-ft)
1a	0.83	0.91	SUSMP	97	358	0.005	0.75	27	0.2	0.1	0.83	0.14	0.04
2a	0.55	0.91	SUSMP	97	344	0.005	0.75	27	0.2	0.1	0.83	0.09	0.03
3a	0.81	0.91	SUSMP	97	367	0.005	0.75	28	0.2	0.1	0.83	0.13	0.04
4a	16.31	0.91	SUSMP	97	1958	0.005	0.75	30	0.19	0.1	0.83	2.57	0.84
5a	0.94	0.91	SUSMP	97	354	0.005	0.75	27	0.2	0.1	0.83	0.16	0.05
6a	0.6	0.91	SUSMP	97	343	0.005	0.75	27	0.2	0.1	0.83	0.1	0.03
7a	1.29	0.91	SUSMP	97	659	0.005	0.75	30	0.19	0.1	0.83	0.2	0.07
8a	4.27	0.91	SUSMP	97	688	0.005	0.75	30	0.19	0.1	0.83	0.67	0.22
9a	4.4	0.91	SUSMP	97	1160	0.1163	0.75	30	0.19	0.1	0.83	0.69	0.23
10a	5.72	0.91	SUSMP	97	792	0.005	0.75	30	0.19	0.1	0.83	0.9	0.29
11a	2.56	0.4	SUSMP	97	629	0.015	0.75	30	0.19	0.1	0.42	0.2	0.07
12a	4.1	0.4	SUSMP	97	465	0.03	0.75	30	0.19	0.1	0.42	0.33	0.11
13a	1.37	0.91	SUSMP	97	1980	0.15	0.75	30	0.19	0.1	0.83	0.22	0.07
14a	1.17	0.85	SUSMP	97	690	0.5	0.75	19	0.24	0.1	0.78	0.22	0.06
15a	0.72	0.33	SUSMP	97	103	0.0097	0.75	19	0.24	0.1	0.36	0.06	0.02

NOTE: BOTH ALTERNATE PARKING LOT WILL BE PAVED WITH PERVIOUS SURFACE, SO THE SUSMP DISCHARGE WILL INFILTRATE.



0 200 400 800 Feet

Legend

- Tributary Boundary
- Proposed Storm Drain System
- Underground Storage & Infiltration System
- Detention/Retention Basin
- Vegetated Swales

FIGURE 12

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AT THE RANCH

BMP EXHIBIT
SUSMP HYDROLOGY

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A. Site Design BMPs

1. Minimize Urban Runoff and Pollutants of Concern

   The project would minimize urban runoff through the use of infiltration devices such as infiltration basins. Pollutants of concern would be treated in vegetated swales and underground storage systems before reaching Placerita Creek.

2. Minimize Impervious Footprint

   Landscaping would be established throughout the Proposed Project site to minimize the impervious footprint. Planters would be located throughout the Proposed Project for additional onsite vegetation. Bioretention areas also would be used to reduce the impervious footprint of the parking areas.

3. Conserve Natural Areas

   The Proposed Project would include natural (or undisturbed areas) or native vegetation whenever possible.

B. Source Control BMPs

1. Protect Slopes and Channels

   The proposed grading would stabilize the slopes along Placerita Creek within the Development Area. Once stabilized, these slopes would be planted with native vegetation.

2. Provide Storm Drain System Stenciling and signage

   Storm drain inlets and catch basins would be labeled with stenciling and signs and prohibitive language and/or graphical icons would be posted.

3. Properly Design Outdoor Material Storage Areas

   The development would include soundstages, mills and parking lots. If materials with the potential to contaminate storm water were placed outdoors, they would be: 1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that would prevent contact with runoff or spillage to the storm water conveyance system; or 2) protected by curbs. Designated storage areas would be paved (sufficiently impervious) and covered to

contain leaks and spills, as well as include a roof or awning to minimize collection of storm water.

4. Properly Design Trash Storage Areas

The Proposed Project would have one trash enclosure within each of the drainage areas. The trash enclosure would be securely covered to contain waste. Drainage from adjoining roofs and pavement would not enter the trash storage area.

C. Treatment Control BMPs

Mitigation Design (Volumetric or Flow Based)

Structural or Treatment Control Best Management Practices (BMPs) would be required for this Proposed Project under the Los Angeles County Standard Urban Stormwater Mitigation Plan (SUSMP).

The SUSMP calculation methodology was used to calculate the required treatment flows and volumes for each of the discharge points from the site. The runoff coefficient curve for soil type 97 and the LACDPW intensity-duration data for the quadrangle Mint Canyon 1-H1.45 were used. Table 4 shows Peak Mitigated Flow Rates and Volumes.

Table 4
Peak Mitigated Flow Rates and Volumes

Project	Subarea	Area (acres)	Flow rate (cfs)	Volume (acre-ft)
Golden Oak	North	10.12	1.59	0.52
Golden Oak	South	25.6	4.06	1.32

Table 5 below shows the types of pollutants the BMPs are effective in treating. In addition to those noted, bioretention has been selected as a principal BMP. As described in Appendix 2-E – BMP Description, bioretention is highly effective in removing all pollutants of concern.

D. Mitigation of SUSMP Volume and LID ΔVolume.

The project has been designed to infiltrate both the SUSMP Volumes (Figure 12) and the ΔV LID Volumes (Figure 13). SUSMP Volumes were larger than LID Volumes. Therefore Infiltration Basins will be sized to handle the SUSMP Volumes (See calculations in Appendix 1-G, pages 2-16, 2-17)

Table 5
Treatment Control BMP Selection Matrix[5]

Pollutant of Concern	Treatment Control BMP Categories (1) (2)							
	Veg. Swale & Veg. Filter Strips (3)	Detention Basins (4)	Infiltration Basins, Infiltration Trenches, & Porous Pavement (5)	Wet Ponds or Wetlands (6)	Sand Filter or Media Filters	Water Quality Inlets	Hydrodynamic Separator Systems (7)	Manufactured / Proprietary Devices (8)
Sediment/Turbidity Y ☑ N ☐	H/M ☑	M ☐	H/M ☐	H/M ☐	H/M ☐	L ☐	H/M (L for turbidity) ☐	U ☐
Nutrients Y ☑ N ☐	L ☐	M ☐	H/M ☑	H/M ☐	L/M ☐	L ☐	L ☐	U ☐
Organic Compounds Y ☑ N ☐	U ☐	U ☑	U ☐	U ☐	H/M ☐	L ☐	L ☐	U ☐
Trash & Debris Y ☑ N ☐	L ☐	M ☑	U ☐	U ☐	H/M ☐	M ☐	H/M ☐	U ☐
Oxygen Demanding Substances Y ☑ N ☐	L ☐	M ☐	H/M ☑	H/M ☐	H/M ☐	L ☐	L ☐	U ☐
Bacteria & Viruses Y ☑ N ☐	U ☐	U ☐	H/M ☑	U ☐	H/M ☐	L ☐	L ☐	U ☐
Oils & Grease Y ☑ N ☐	H/M ☑	M ☐	U ☐	U ☐	H/M ☐	M ☐	L/M ☐	U ☐
Pesticides (non-soil bound) Y ☑ N ☐	U ☐	U ☑	U ☐	U ☐	U ☐	L ☐	L ☐	U ☐
Metals Y ☑ N ☐	H/M ☑	M ☐	H ☐	H ☐	H ☐	L ☐	L ☐	U ☐

Abbreviations: L: Low removal efficiency H/M: High or medium removal efficiency U: Unknown removal efficiency

Notes:

(1) Includes bioretention which has been found to be H/M removal efficiency. See Appendix N, BMP Descriptions, for information on the effectiveness of bioretention

(2) Includes planter boxes and grass-crete.

[5] Excerpt from the Riverside County Water Quality Management Plan for Urban Runoff, January 2009.

VI. References

Los Angeles County Department of Public Works, LACDPW Hydrology and Sedimentation Manual 2006.

Los Angeles County Department of Public Works, LACDPW
A Manual for the Standard Urban Storm Water Mitigation Plan (SUSMP), September 2002.

Los Angeles County Department of Public Works, LACDPW
Tc_Calc_Vol.xls, July 2004.

Riverside County Flood Control and Water Conservation District, RCFCWCD.

Riverside County Water Quality Management Plan for Urban Runoff, January 2009.

VII. Sub-Appendices

2-A: LACDPW Hydrology Data

Isohyet Map
Hydrological Soil Classification Map

2-B: SUSMP Project site

Location and Vicinity Map

2-C: SUSMP Calculations

2-D: Supplemental Information

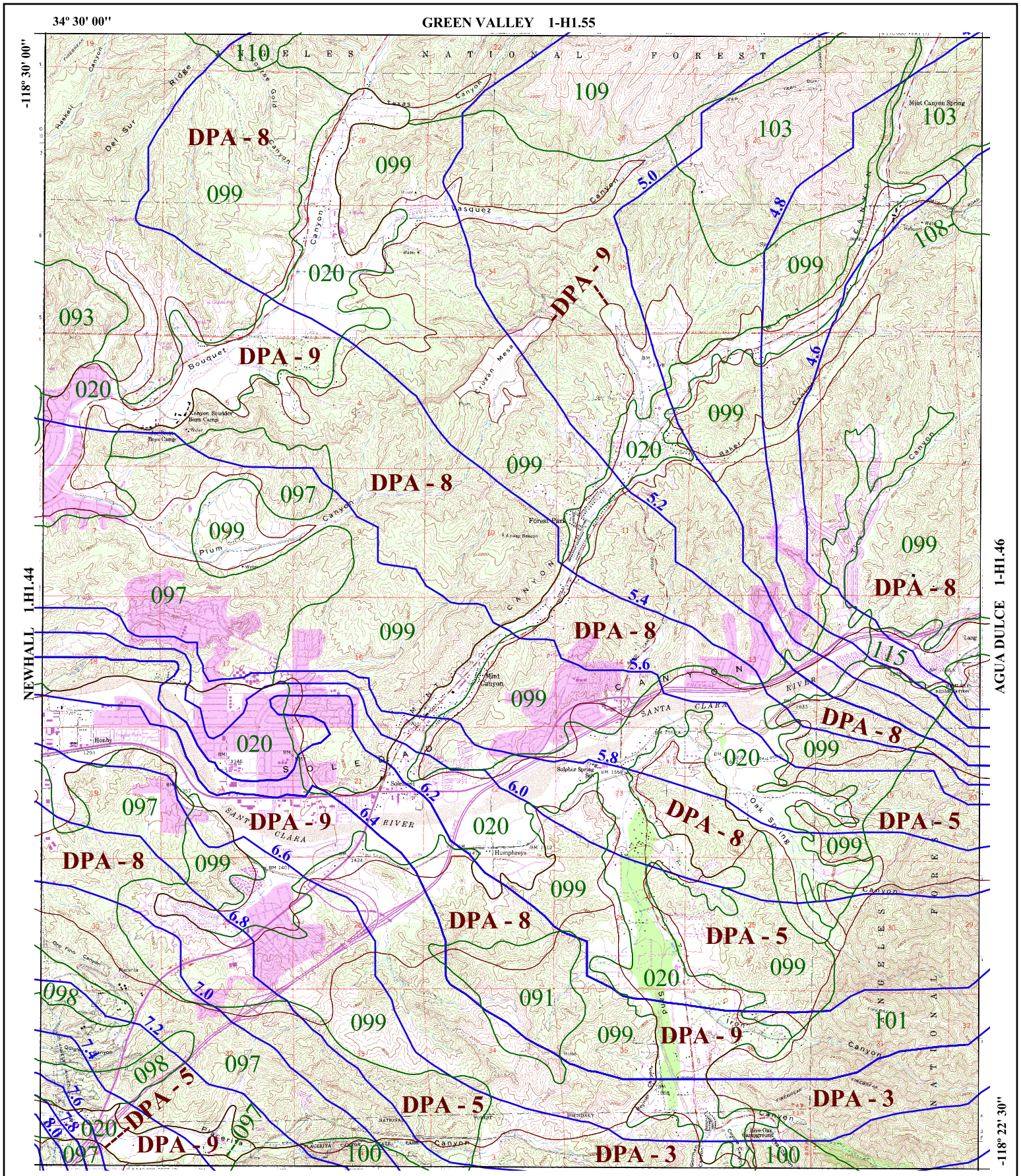
BMP Descriptions

SUB-APPENDIX 2-A

LACDPW Hydrology Data

Isohyet Map

Hydrological Soil Classification Map



N
W E
S

016 SOIL CLASSIFICATION AREA

7.2 INCHES OF RAINFALL

DPA - 6 DEBRIS POTENTIAL AREA

1 0 1 2 Miles

25-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.878
10-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.714

MINT CANYON
50-YEAR 24-HOUR ISOHYET

1-H1.45

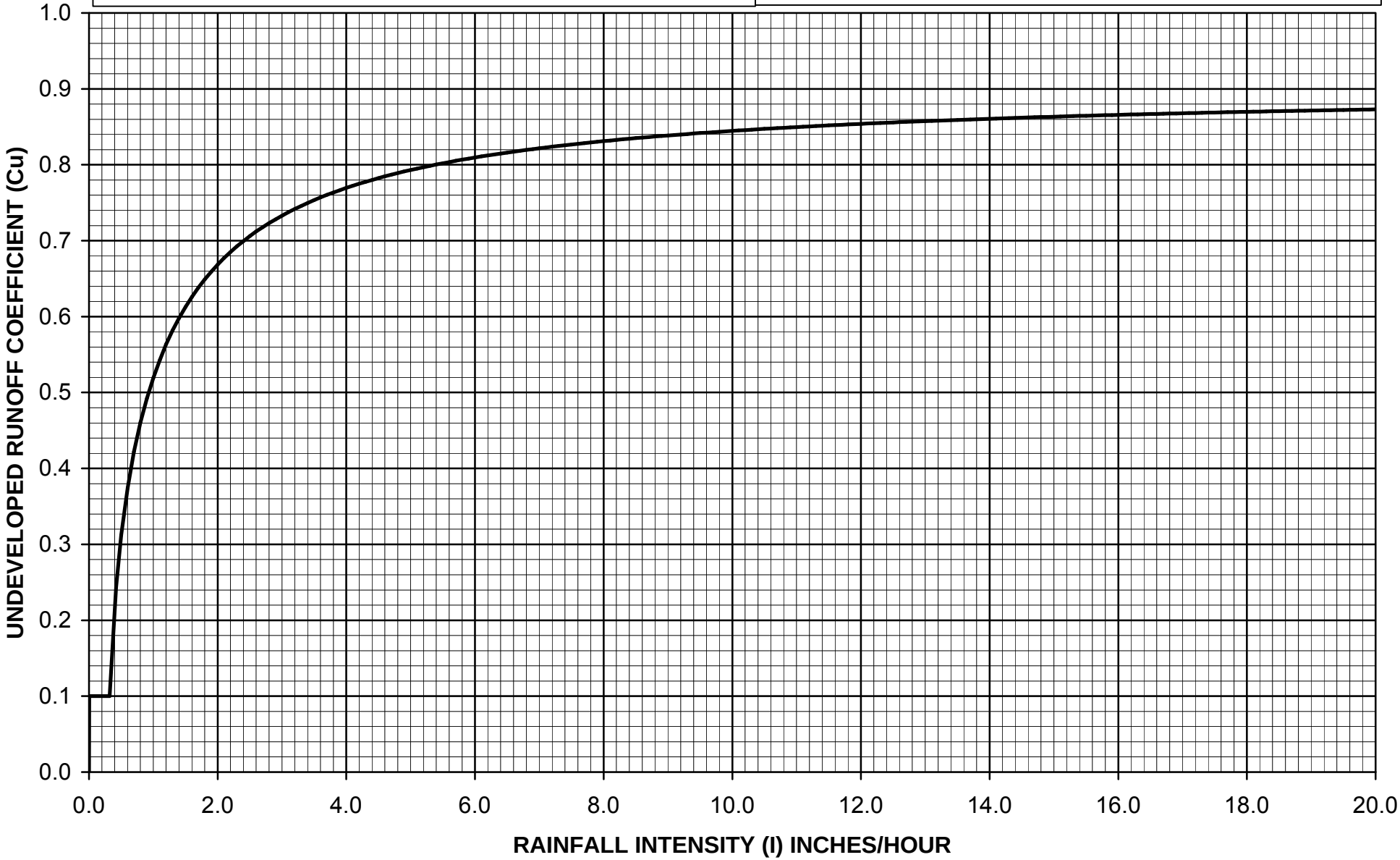
LOS ANGELES COUNTY PUBLIC WORKS Public Service That Works

$C_D = (0.9 * IMP) + (1.0 - IMP) * C_U$

Where: C_D = Developed Runoff Coefficient
IMP = Proportion Impervious
C_U = Undeveloped runoff coefficient

Los Angeles County Department of Public Works

RUNOFF COEFFICIENT CURVE
SOIL TYPE NO. 097



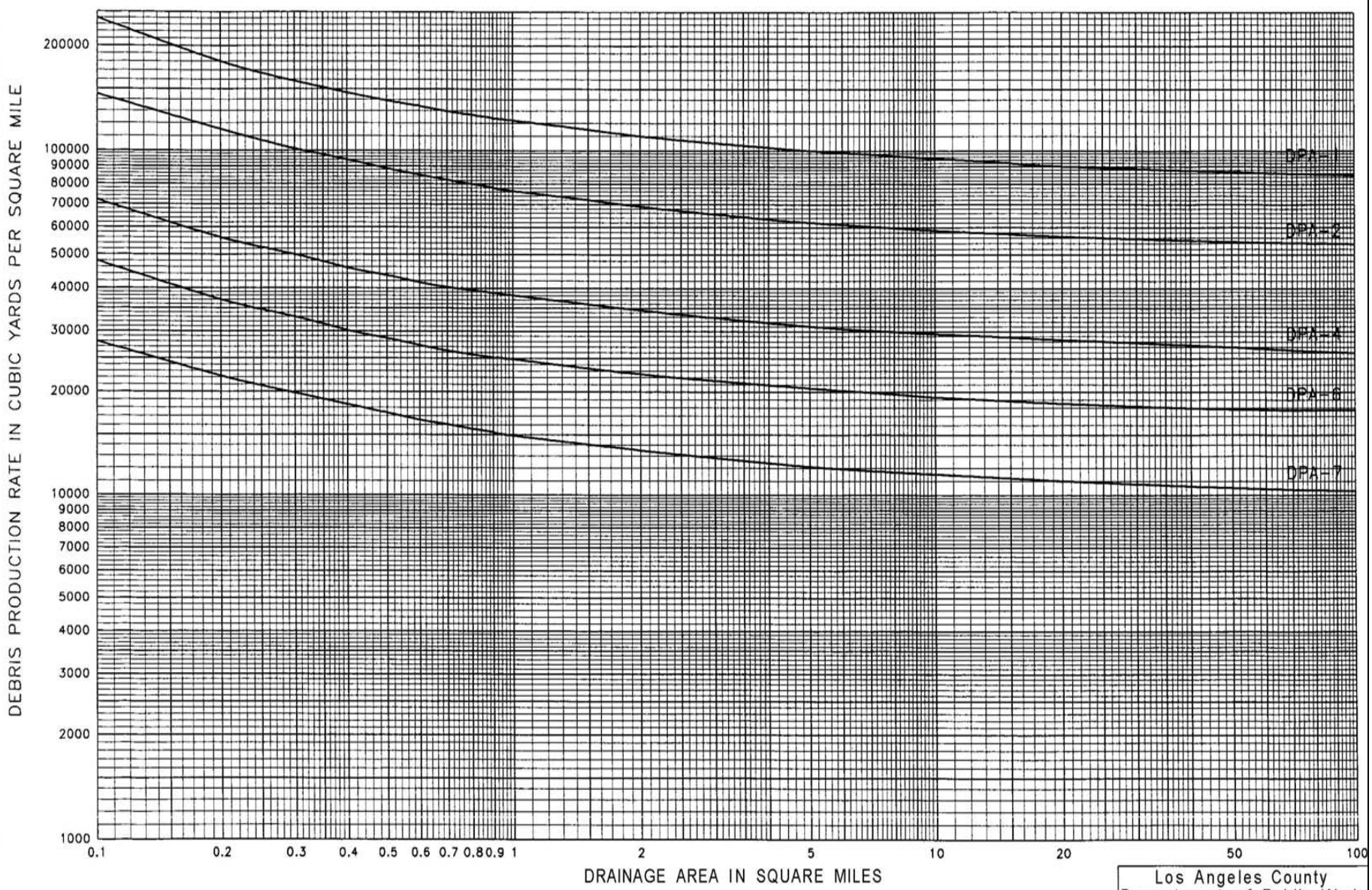
APPENDIX B

Debris Production Rate Curves

Los Angeles Basin	B-1
Santa Clara Basin	B-2
Antelope Valley	B-3

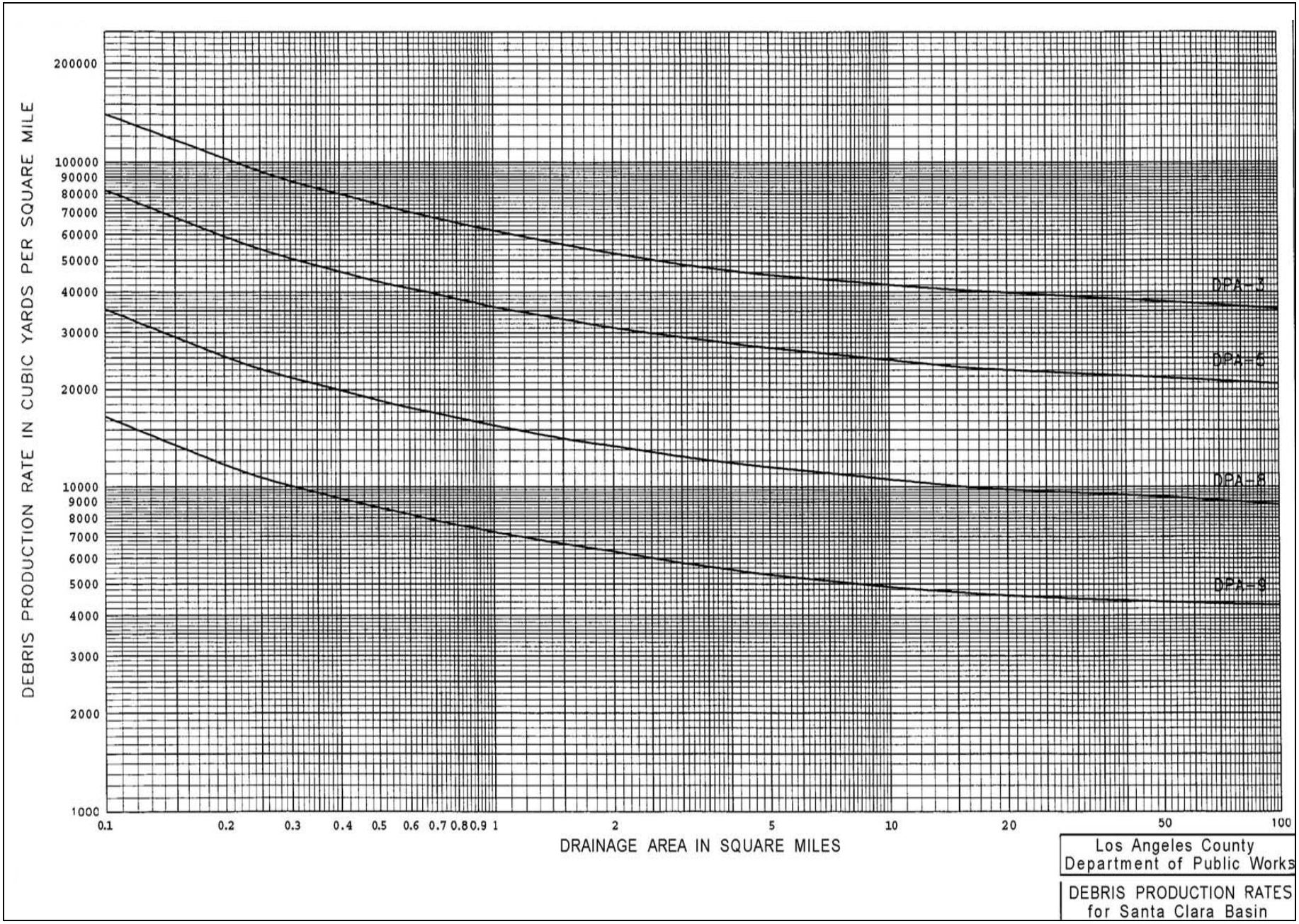
Peak Bulking Factor Curves

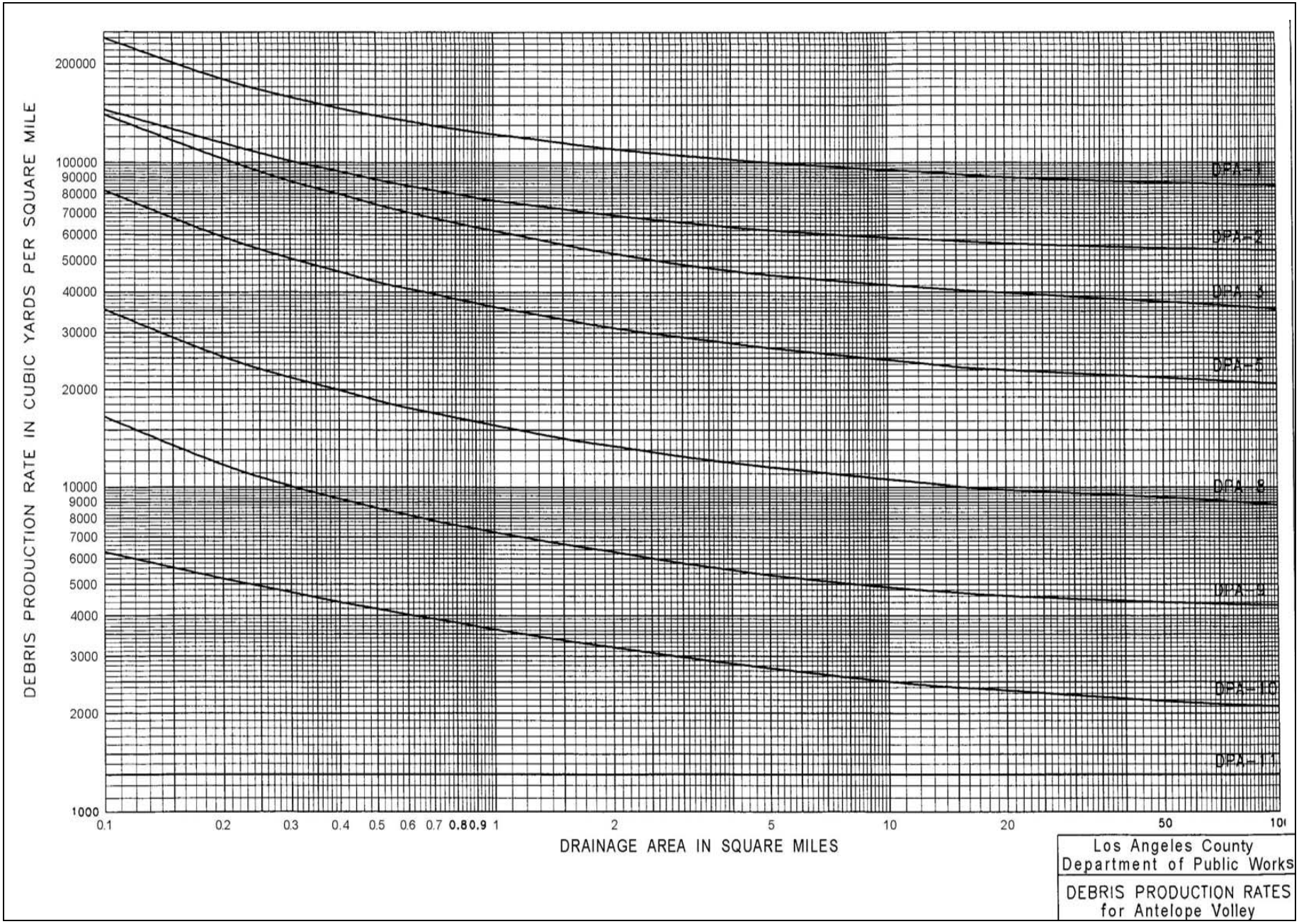
Los Angeles Basin	B-4
Santa Clara Basin	B-5
Antelope Valley	B-6



Los Angeles County
Department of Public Works

DEBRIS PRODUCTION RATES
for Los Angeles Basin


DEBRIS PRODUCTION RATE IN CUBIC YARDS PER SQUARE MILE
200000
100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
2
5
10
20
50
100
DRAINAGE AREA IN SQUARE MILES
DPA-3
DPA-5
DPA-8
DPA-9
Los Angeles County
Department of Public Works
DEBRIS PRODUCTION RATES
for Santa Clara Basin



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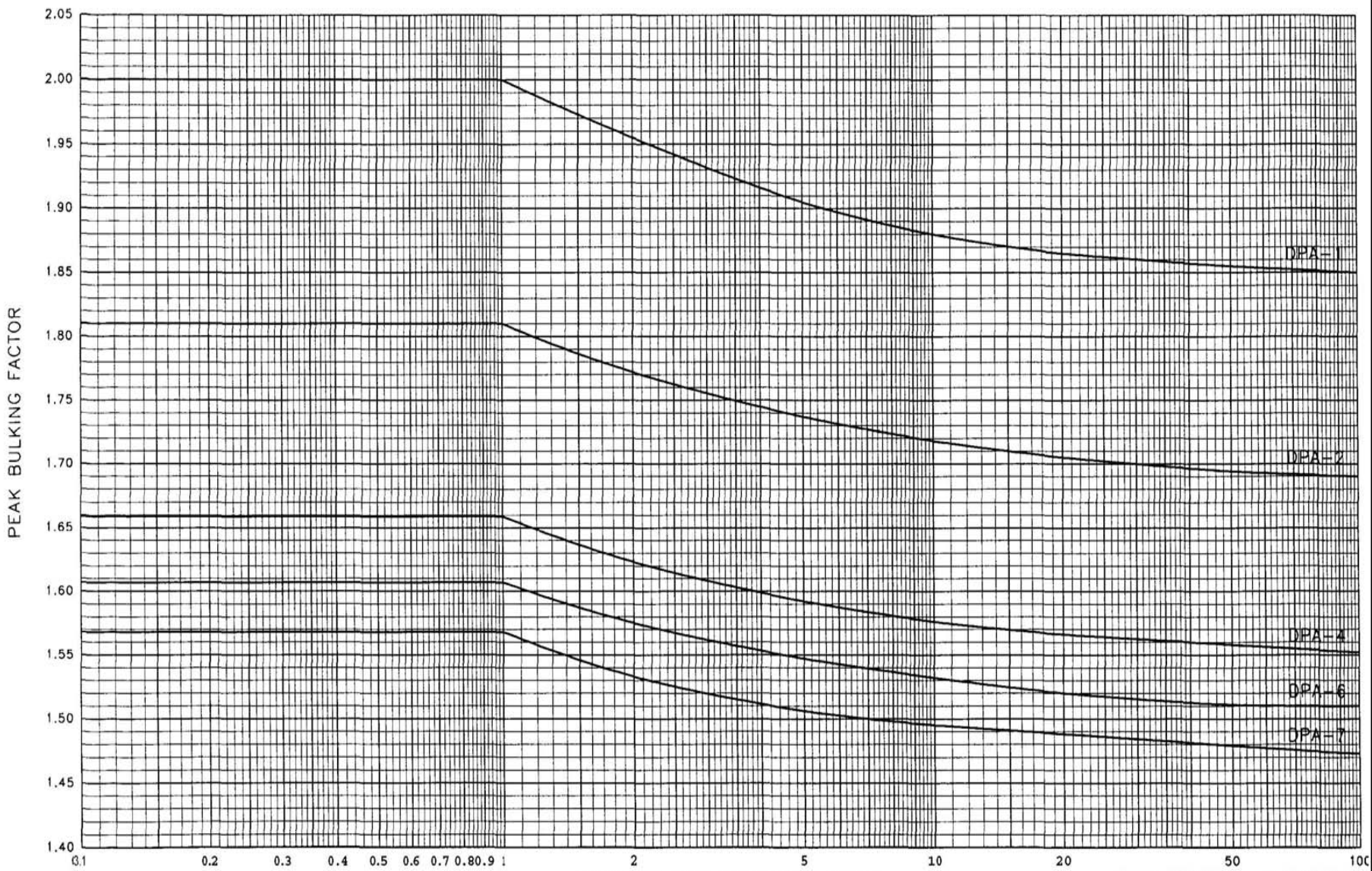
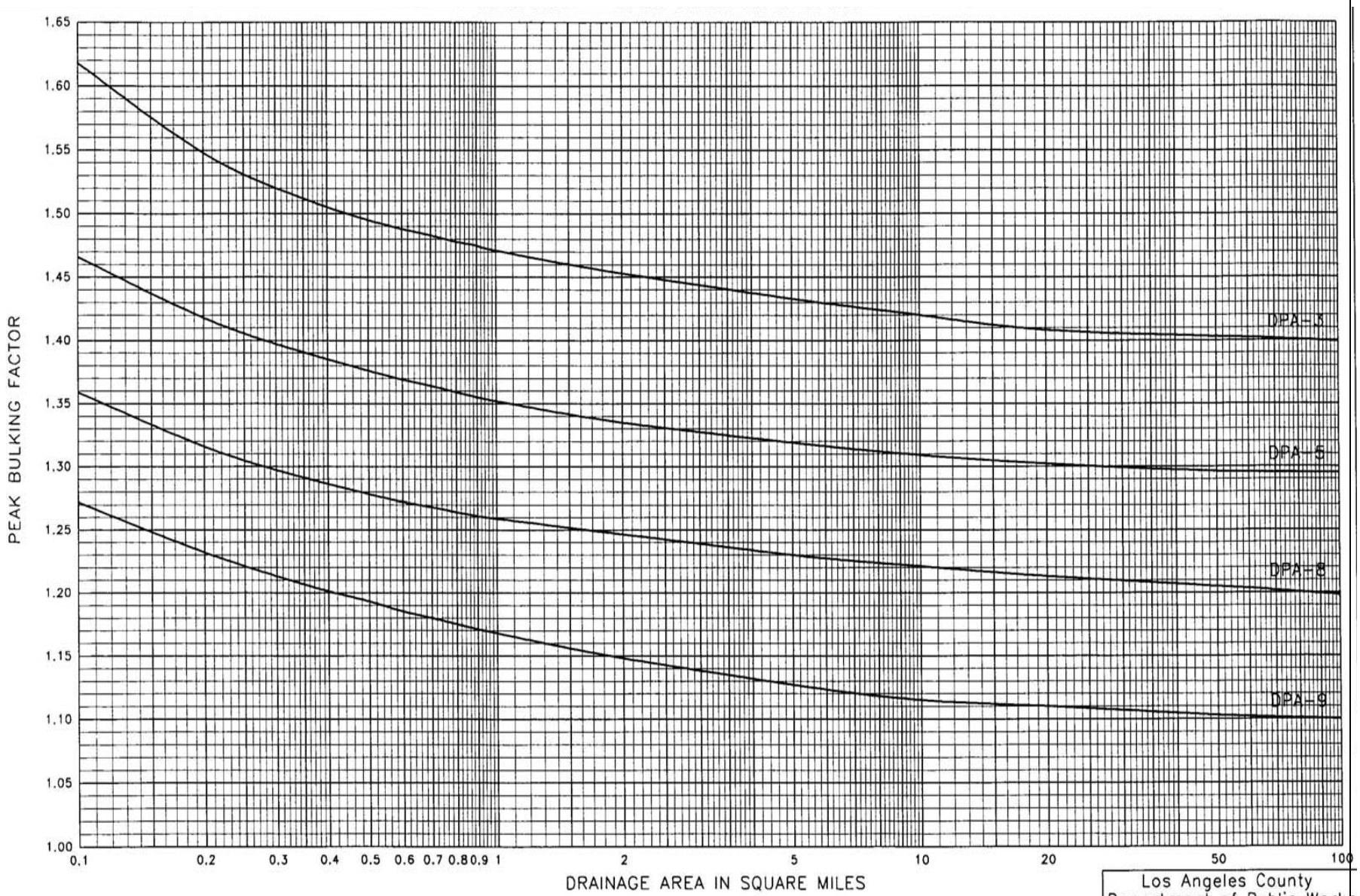
Department of Public Works

DEBRIS PRODUCTION RATES
for Antelope Volley



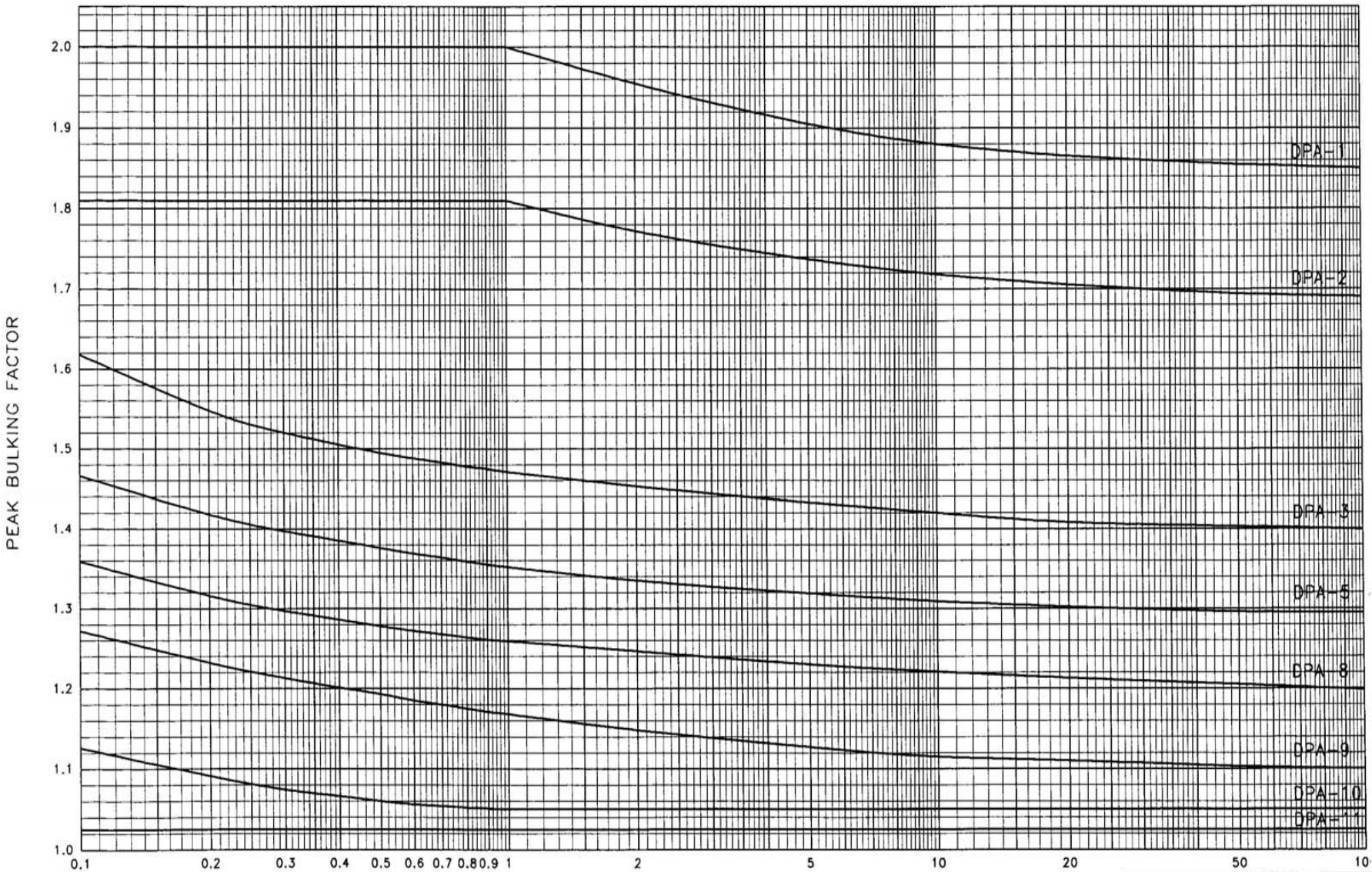
Los Angeles County
Department of Public Works

PEAK BULKING FACTORS
for Los Angeles Basin



Los Angeles County
Department of Public Works

PEAK BULKING FACTORS
for Santa Clara Basin



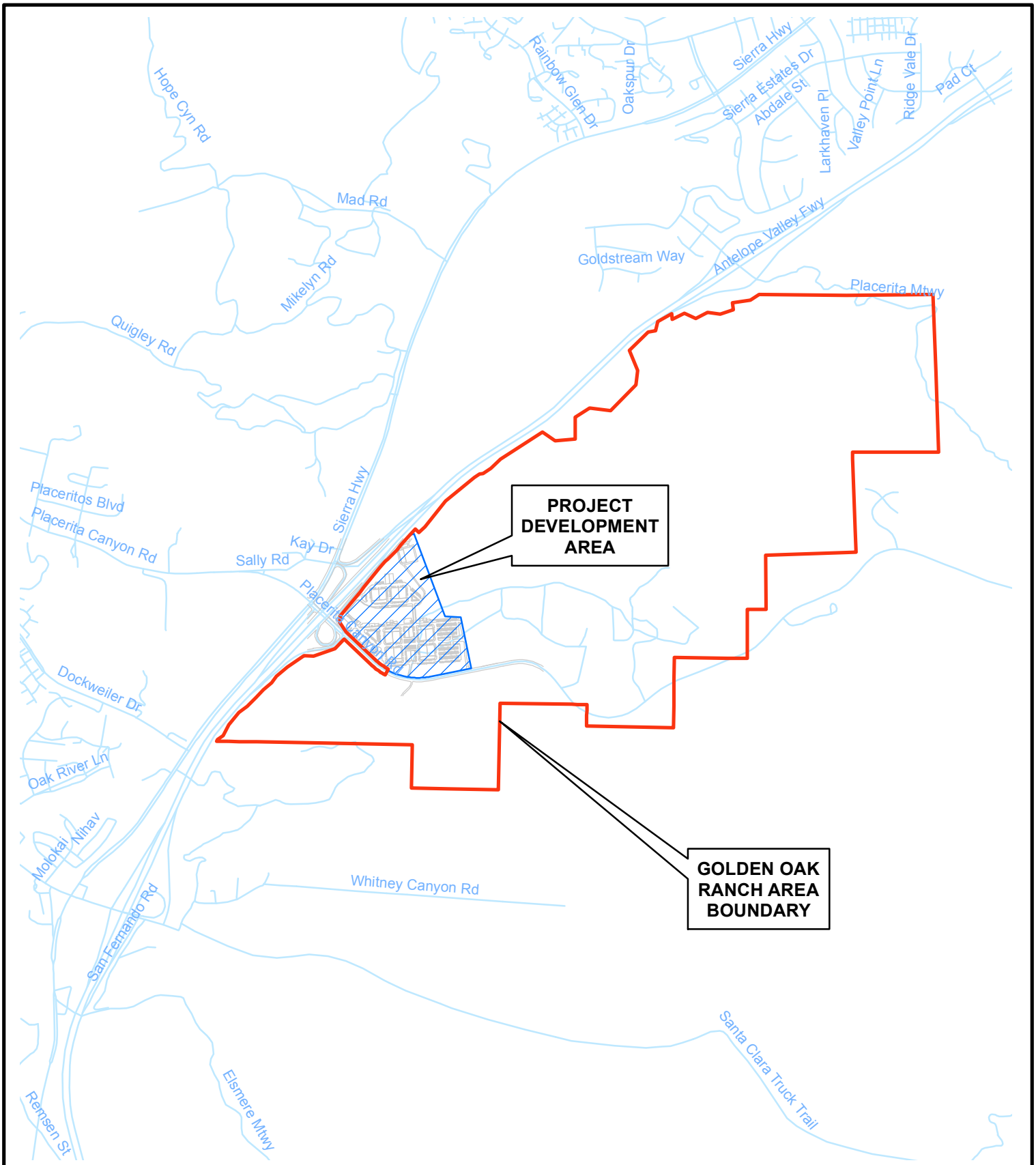
Los Angeles County
Department of Public Works

PEAK BULKING FACTORS
for Antelope Valley

SUB-APPENDIX 2-B

SUSMP Project Site

Location and Vicinity Map



2,000 0 Feet

FIGURE 1

DISNEY | ABC STUDIOS

AT THE RANCH

VICINITY AND LOCATION

DAVID EVANS AND ASSOCIATES INC.
4200 Concours Suite 200
Ontario, California 91764
TELEPHONE: 909.481.5750
WEBSITE: www.deainc.com

SUB-APPENDIX 2-C

SUSMP Calculations

DISNEY/ ABC STUDIOS AT THE RANCH
SUSMP CALCULATION
0.75" STORM EVENT

Subarea	Area (acres)	%imp	Frequency	Soil Type	Length (ft)	Slope (ft/ft)	Isohyet (in.)	Tc-calculated (min.)	Intensity (in./hr)	Cu	Cd	Flow rate (cfs)	Volume (acre-ft)
1a	0.83	0.91	SUSMP	97	358	0.005	0.75	27	0.2	0.1	0.83	0.14	0.04
2a	0.55	0.91	SUSMP	97	344	0.005	0.75	27	0.2	0.1	0.83	0.09	0.03
3a	0.81	0.91	SUSMP	97	367	0.005	0.75	28	0.2	0.1	0.83	0.13	0.04
4a	16.31	0.91	SUSMP	97	1958	0.005	0.75	30	0.19	0.1	0.83	2.57	0.84
5a	0.94	0.91	SUSMP	97	354	0.005	0.75	27	0.2	0.1	0.83	0.16	0.05
6a	0.6	0.91	SUSMP	97	343	0.005	0.75	27	0.2	0.1	0.83	0.1	0.03
7a	1.29	0.91	SUSMP	97	659	0.005	0.75	30	0.19	0.1	0.83	0.2	0.07
8a	4.27	0.91	SUSMP	97	688	0.005	0.75	30	0.19	0.1	0.83	0.67	0.22
9a	4.4	0.91	SUSMP	97	1160	0.1163	0.75	30	0.19	0.1	0.83	0.69	0.23
10a	5.72	0.91	SUSMP	97	792	0.005	0.75	30	0.19	0.1	0.83	0.9	0.29
11a	2.56	0.4	SUSMP	97	629	0.015	0.75	30	0.19	0.1	0.42	0.2	0.07
12a	4.1	0.4	SUSMP	97	465	0.03	0.75	30	0.19	0.1	0.42	0.33	0.11
13a	1.37	0.91	SUSMP	97	1980	0.15	0.75	30	0.19	0.1	0.83	0.22	0.07
14a	1.17	0.85	SUSMP	97	690	0.5	0.75	19	0.24	0.1	0.78	0.22	0.06
15a	0.72	0.33	SUSMP	97	103	0.0097	0.75	19	0.24	0.1	0.36	0.06	0.02

SUB-APPENDIX 2-D

Supplemental Information

BMP Descriptions

APPENDIX B BMP DESIGN CRITERIA

B.1 BIORETENTION FACILITY

DESCRIPTION

Bioretention is a best management practice (BMP) developed in the early 1990's by the Prince George's County, MD, Department of Environmental Resources (PGDER). Bioretention utilizes soils and both woody and herbaceous plants to remove pollutants from stormwater runoff. As shown in Figure 1, runoff is conveyed as sheet flow to the treatment area, which consists of a grass buffer strip, sand bed, ponding area, organic layer or mulch layer, planting soil, and plants. Runoff passes first over or through a sand bed, which slows the runoff's velocity, distributes it evenly along the length of the ponding area, which consists of a surface organic layer and/or ground cover and the underlying planting soil. The ponding area is graded; its center depressed. Water is ponded to a depth of 6 inches and gradually infiltrates the bioretention area and/or is evapotranspired. Bioretention areas are applicable as on-lot retention facilities that are designed to mimic forested systems that naturally control hydrology. The bioretention area is graded to drain excess runoff over a weir and into the storm drain system. Stored water in the bioretention area planting soil infiltrates over a period of days into the underlying soils.

The basic bioretention design shown in Figure 1 can be modified to accommodate more specific needs. The bioretention BMP design can be modified to include an underdrain within the sand bed to collect the infiltrated water and discharge it to a downstream storm drain system. This modification may be required when impervious subsoils and marine clays prevent complete infiltration in the soil system. This modified design makes the bioretention area act more as a filter that discharges treated water than as an infiltration device.

There are six basic components of a bioretention facility:

(1) Grass Buffer Strip	-	Designed to filter out particulates and reduce runoff velocity.
(2) Sand Bed	-	Further reduces velocity by capturing a portion of the runoff and distributes it evenly along the length of the ponding area. Also provides aeration to the plant bed and enhances infiltration.
(3) Ponding Area	-	Collects and stores runoff prior to infiltration.
(4) Organic/Mulch Layer	-	Provides some filtering of runoff, encourages development of beneficial microorganisms, and protects the soil surface from erosion.
(5) Planting Soil	-	Provides nourishment for the plant life. Clay particles within the soil also remove certain pollutants through

		adsorption.
(6) Plants	-	Provides uptake of harmful pollutants.

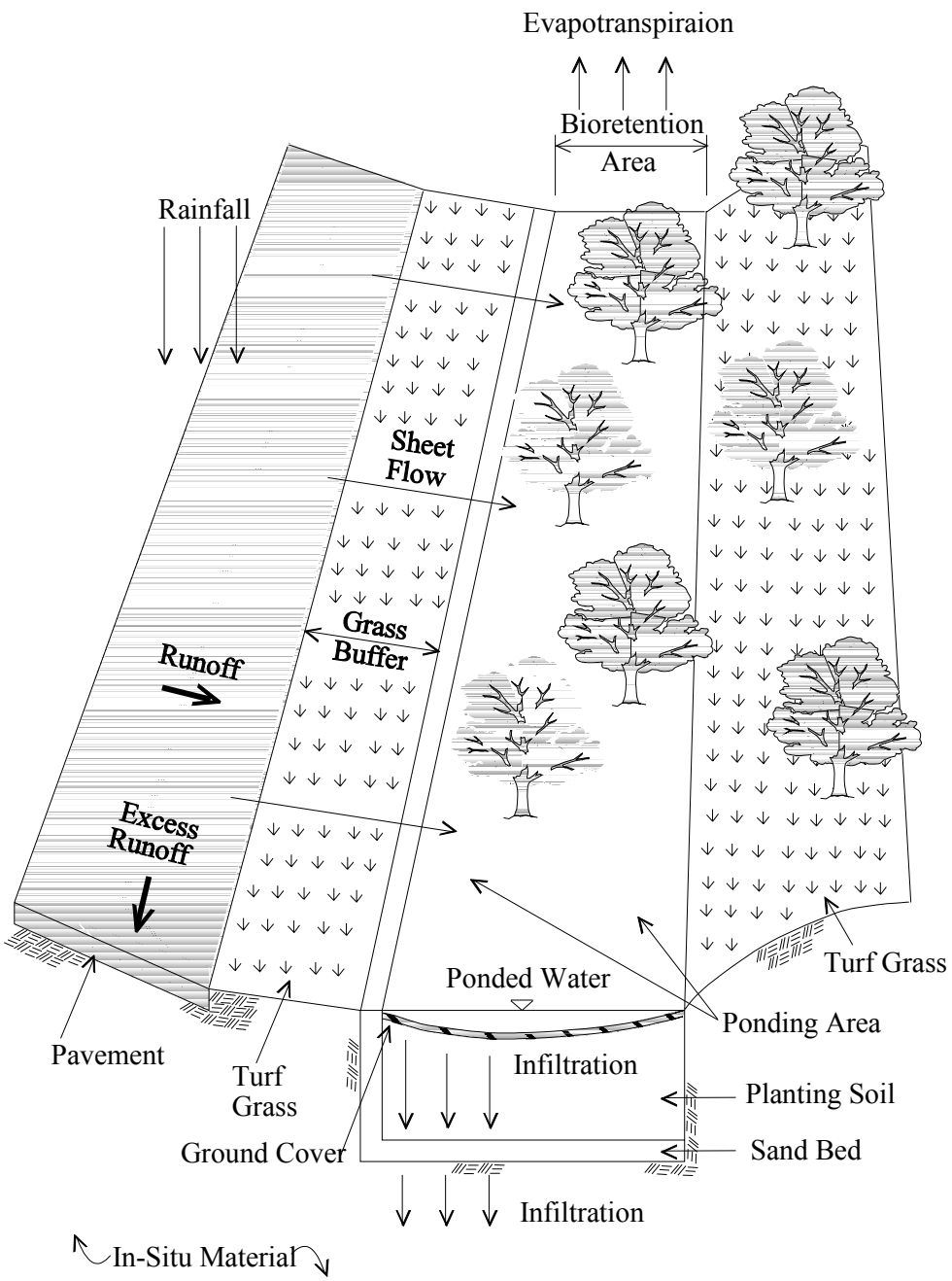


Figure 1. Schematic of a typical bioretention area BMP (adapted from Prince George's County, 1993)

ADVANTAGES

1. If designed properly, has shown ability to remove significant amounts of dissolved heavy metals, phosphorous, TSS, and fine sediments.
2. Requires relatively little engineering design in comparison to other stormwater management facilities (e.g. sand filters).
3. Provides groundwater recharge when the runoff is allowed to infiltrate into the subsurface.
4. Enhances the appearance of parking lots and provides shade and wind breaks, absorbs noise, and improves an area's landscape.
5. Maintenance on a bioretention facility is limited to the removal of leaves from the bioretention area each fall.
6. The vegetation recommended for use in bioretention facilities is generally hardier than the species typically used in parking lot landscapes. This is a particular advantage in urban areas where plants often fare poorly due to poor soils and air pollution.

LIMITATIONS

1. Low removal of nitrates.
2. Not applicable on steep, unstable slopes or landslide areas (slopes greater than 20 percent).
3. Requires relatively large areas.
4. Not appropriate at locations where the water table is within 6 feet of the ground surface and where the surrounding soil stratum is unstable.
5. Clogging may be a problem, particularly if the BMP receives runoff with high sediment loads.

DESIGN CRITERIA

1. Calculate the volume of stormwater to be mitigated by the bioretention facility using the Los Angeles County Department of Public Works *Method for Calculating Standard Urban Stormwater Mitigation Plan (SUSMP) Flow Rates and Volumes Based on 0.75-inches of Rainfall*.
2. The soil should have infiltration rates greater than 0.5 inches per hour, otherwise an underdrain system should be included (see # 11).
3. Drainage to the bioretention facility must be graded to create sheet flow, not a concentrated stream. Level spreaders (i.e. slotted curbs) can be used to facilitate sheet flow. The maximum sheet flow velocity should be 1 ft/s for the planted ground cover and 3 ft/s for mulched cover.
4. Soil shall be a uniform mix, free of stones, stumps, roots or other similar objects

larger than 1-inch in diameter. No other materials or substances shall be mixed or dumped within the bioretention area that may be harmful to plant growth, or prove a hindrance to the planting or maintenance operations. The planting soil shall be free of Bermuda grass, Quackgrass, Johnson grass, Mugwort, Nutsedge, Poison Ivy, Canadian Thistle, Tearthumb, or other noxious weeds.

5. Planting soil shall be tested and meet the following criteria:

pH range	5.2-7.0
Organic matter	1.5-4.0%
Magnesium	35 lbs. per acre, minimum
Phosphorus P_2O_5	75 lbs. per acre, minimum
Potassium K_2O	85 lbs. per acre, minimum
Soluble salts	not to exceed 500 ppm
Clay	0-25% by volume
Silt	30-55% by volume
Sand	35-60% by volume

6. It is very important to minimize compaction of both the base of the bioretention area and the required backfill. When possible, use excavation hoes to remove original soil. If excavated using a loader, the excavator should use a wide track or marsh track equipment, or light equipment with turf type tires. Use of equipment with narrow tracks or narrow tires, rubber tires with large lugs, or high pressure tires will cause excessive compaction resulting in reduced infiltration rates and storage volumes and is not acceptable. Compaction will significantly contribute to design failure.
7. Compaction can be alleviated at the base of the bioretention facility by using a primary tilling operation such as a chisel plow, ripper, or subsoiler. These tilling operations are to refracture the soil profile through the 12 inch compaction zone. Substitute methods must be approved by the engineer. Rototillers typically do not till deep enough to reduce the effects of compaction from heavy equipment. Rototill 2 to 3 inches of sand into the base of the bioretention facility before back filing the required sand layer. Pump any ponded water before preparing (rototilling) base.
8. When back filling topsoil over the sand layer, first place 3 to 4 inches of topsoil over the sand, then rototill the sand/topsoil to create a gradation zone. Backfill the remainder of the topsoil to final grade.
9. Mulch around individual plants only. Shredded hardwood mulch is the only accepted mulch. Shredded hardwood mulch must be well aged (stockpiled or stored for at least 12 months) for acceptance. The mulch should be applied to a maximum depth of 3-inches.
10. The plant root ball should be planted so $1/8^{th}$ of the ball is above final grade surface.
11. If used, place underdrains on a 3 feet wide section of filter cloth followed by a gravel bedding. Pipe is placed next, followed by the gravel bedding. The ends of underdrain pipes not terminating in an observation well shall be capped.

12. The main collector pipe for underdrain systems shall be constructed at a minimum slope of 0.5%. Observation wells and/or clean-out pipes must be provided (one minimum per every 1,000 square feet of surface area).
13. Size an emergency overflow weir with 6-inches of head, using the Weir equation:

    $Q=CLH^{3/2}$

    Where C= 2.65 (smooth crested grass weir)
    Q= flow rate
    H = 6-inches of head
    L = length of weir
14. Bioretention areas should be at least 15 feet wide with a 25 foot width preferable, and a minimum length of 40 feet long. Generally, the length-to-width ratio should be around 2 to 1 to improve surface flow characteristics.
15. The plant soil depth should be 4 feet or more to provide beneficial root zone, both in terms of space and moisture content.
16. The depth of the ponding area should be limited to no more than 6 inches to limit the duration of standing water to no more than 4 days. If an underdrain system is used, the depth of the ponding area should be limited to no more than 1 foot. Longer ponding times can lead to anaerobic conditions that are not conductive to plant growth. Longer periods of standing water can also lead to the breeding of mosquitoes and other pests.
17. The bioretention area should be vegetated to resemble a terrestrial forest community ecosystem, which is dominated by understory trees, a shrub layer, and herbaceous ground covers. Three species each of both trees and shrubs are recommended to be planted at a rate of 1000 trees and shrubs per acre. The shrub-to-tree ratio should be 2:1 to 3:1. Trees should be spread 12 feet apart and the shrubs should be spaced 8 feet apart.

REFERENCES

1. S. Bitter and J. Keith Bowers, 1994. Bioretention as a Water Quality Best Management Practice. *Watershed Protection Techniques*, Vol. 1, No. 3. Silver Spring, MD.

2. The Center for Watershed Protection, Environmental Quality Resources and Loiederman Associates. 1997. *Maryland Stormwater Design Manual*. Prepared for: Maryland Department of the Environment. Baltimore, MD.

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4. DEQ Storm Water Management Guidelines, Department of Environmental Quality,

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5. *Design Manual for Use of Bioretention in Stormwater Management*, 1993. Department of Environmental Resources, Division of Environmental Management, Watershed Protection Branch, Prince George's County, MD.

6. GKY and Associates, Inc. June 1996. *Evaluation and Management of Highway Runoff Water Quality*, Publication No. FHWA-PD-96-032. Prepared for: US Department of Transportation, Federal Highway Administration. Washington, DC.

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8. *Low-Impact Development Design Manual*, November 1997. Department of Environmental Resources, Prince George's County, MD.

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10. T.R. Schueler, 1987. *Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban Best Management Practices*. Metropolitan Washington Council of Governments.

11. T.R. Schueler, 1992. *A Current Assessment of Urban Best Management Practices*. Metropolitan Washington Council of Governments.

B.6 EXTENDED/DRY DETENTION BASINS OR UNDERGROUND DETENTION TANKS

DESCRIPTION

Extended/dry detention basins are depressed basins that temporarily store a portion of stormwater runoff following a storm event. Underground detention tanks function similar to detention basins. However, since underground detention tanks are located below ground, the surface above these systems can be utilized for other more useful needs (parking lots, sidewalks, landscaping adjacent to buildings, etc). Water is controlled by means of a hydraulic control structure (orifice and/or weirs) to restrict outlet discharge. The extended/dry detention basins and underground detention tanks normally do not have a permanent water pool between storm events. The objectives of both systems are to remove particulate pollutants and to reduce maximum runoff values associated with development to their pre-development levels. Detention basin facilities may be berm-encased areas or excavated basins. Detention tank facilities may be corrugated metal pipe, concrete pipe, or vaults.

ADVANTAGES

1. Modest removal efficiencies for the larger particulate fraction of pollutants.
2. Removal of sediment and buoyant materials. Nutrients, heavy metals, toxic materials, and oxygen-demanding particles are also removed with sediment substances associated with the particles.
3. Can be designed for combined flood control and stormwater quality control.
4. Requires less capital cost and land area when compared to wet pond BMP.
5. Downstream channel protection when properly designed and maintained.

LIMITATIONS

1. Require sufficient area and hydraulic head to function properly.
2. Generally not effective in removing dissolved and finer particulate size pollutants from stormwater.
3. Some constraints other than the existing topography include, but are not limited to, the location of existing and proposed utilities, depth to bedrock, location and number of existing trees, and wetlands.
4. Extended/dry detention basins have moderate to high maintenance requirements.
5. Sediments can be resuspended if allowed to accumulate over time and escape through the hydraulic control to downstream channels and streams.
6. Some environmental concerns with using extended/dry detention basins, include potential impact on wetlands, wildlife habitat, aquatic biota, and downstream water quality.
7. May create mosquito breeding conditions and other nuisances.

DESIGN CRITERIA

EXTENDED/DRY DETENTION BASINS:

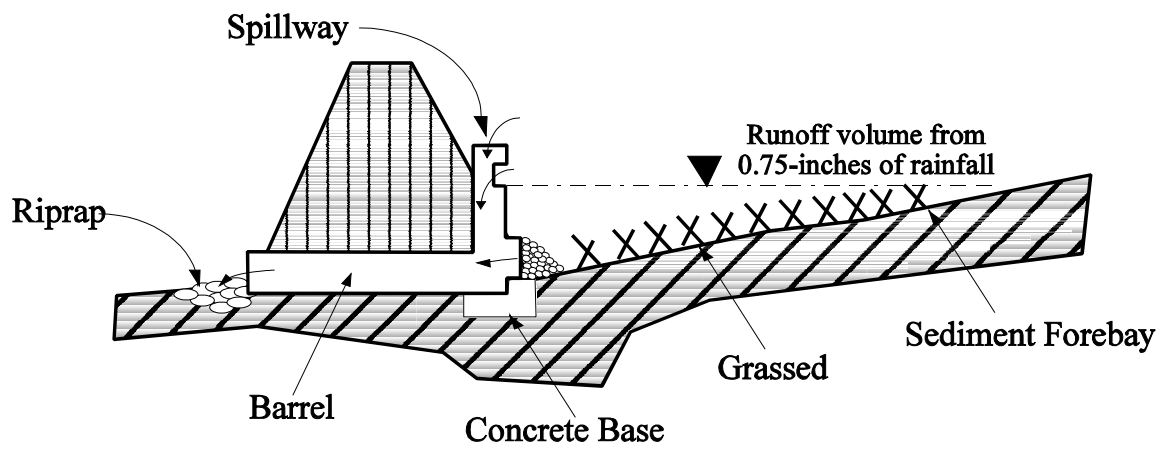


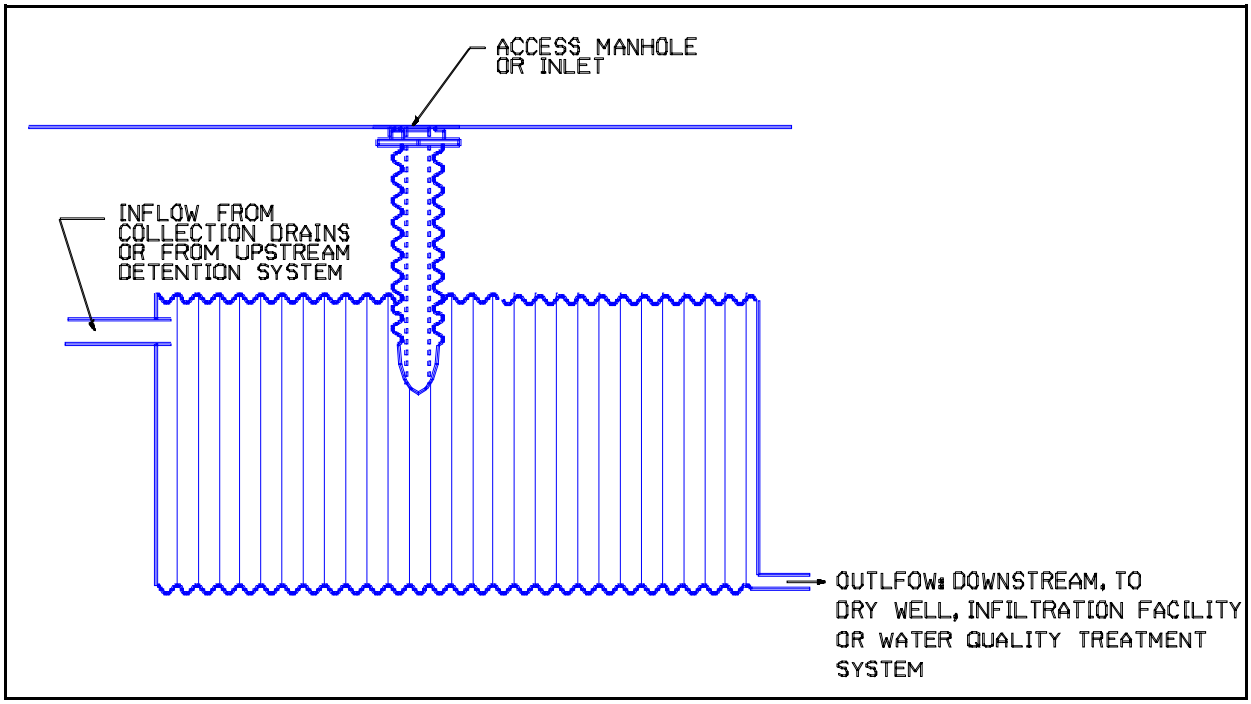
Figure 1. Conceptual elements of typical extended/dry detention structures.

Criteria	*Design Considerations*
Storage volume	Calculate the volume of stormwater to be mitigated by the extended/dry detention basin using the Los Angeles County Department of Public Works *Method for Calculating Standard Urban Stormwater Mitigation Plan (SUSMP) Flow Rates and Volumes Based on 0.75-inches of Rainfall*. Provide a storage volume for 120 percent of the runoff volume generated from 0.75-inches of rainfall above the lowest outlet in the basin. The additional 20 percent of storage volume provides for sediment accumulation and the resultant loss in storage volume.
Emptying time	A 24- to 48-hour emptying time should be used for the runoff volume generated from 0.75-inches of rainfall, with no more than 50 percent of the 0.75-inches of rainfall being released in 12 hours.
Basin geometry	Shape the pond with a gradual expansion from the inlet and a gradual contraction toward the outlet, thereby limiting short circuiting. The basin length to width ratio should be not less than 4.
Two-stage design	A two-stage design with a lower frequency pool that fills often with frequently occurring runoff minimizes standing water and sediment deposition in the remainder of the basin can enhance water quality benefits. The bottom stage should store 10 to 25 percent of the runoff volume generated from 0.75-inches of rainfall.
Low-flow channel	Conveys low base flows from the forebay to the outlet. Erosion protection should be provided for the low-flow channel.

Basin side slopes	Slopes should be stable and gentle enough to limit rill erosion and facilitate maintenance access and needs. Side slopes should be no steeper than 4:1 (H:V), preferably flatter.
Inlet	Dissipate flow energy at basin's inflow point(s) to limit erosion and promote particle sedimentation.
Forebay design	Provide the opportunity for larger particles to settle out in an area that has, as a useful refinement, a solid surface bottom to facilitate mechanical sediment removal. The forebay volume should be 5 to 10 percent of the runoff volume generated from 0.75-inches of rainfall.
Outlet design	Use a water quality outlet that is capable of slowly releasing the runoff volume generated from 0.75-inches of rainfall over a 24- to 48-hour period. A perforated riser can be used in conjunction with orifices and a weir box opening above it to control larger storm outflows. A cutoff collar should be considered for the outlet pipe to control seepage.
Perforation protection	Provide a crushed rock blanket of sufficient size to prevent clogging of the primary water quality outlet while not interfering significantly with its hydraulic capacity.
Dam embankment	The embankment should be designed not to fail during a 100-yr and larger storm. Embankment slopes should be no steeper than 3:1 (H:V), preferably 4:1, and flatter, and planted with turf-forming grasses. Poorly compacted native soils should be excavated and replaced. Embankment soils should be compacted to at least 95 percent of their maximum density. Spillway structures and overflows should be designed in accordance with local drainage criteria.
Vegetation	Bottom vegetation provides erosion control and sediment entrapment. Basin bottom, berms, and side-sloping areas may be planted with native grasses or with irrigated turf, depending on the local setting.
Maintenance access	Access to the forebay and outlet area shall be provided to maintenance vehicles. Maximum grades should be eight percent, and a solid driving surface of gravel, rock, concrete, or gravel-stabilized turf should be provided.

UNDERGROUND DETENTION TANKS:

Figure 2. Conceptual elements of typical underground detention structures.



CRITERIA	***DESIGN CONSIDERATIONS***
Storage volume	Calculate the volume of stormwater to be mitigated by the underground detention tank using the Los Angeles County Department of Public Works Method for Calculating Standard Urban Stormwater Mitigation Plan (SUSMP) Flow Rates and Volumes Based on 0. 75-inches of Rainfall Provide a storage volume for 120 percent of the runoff volume generated from 0.75-inches of rainfall above the lowest outlet in the tank. The additional 20 percent of storage volume provides for sediment accumulation and the resultant loss in storage volume.
Emptying time	A 24- to 48-hour emptying time should be used for the runoff volume generated from 0.75-inches of rainfall, with no more than 50 percent of the 0.75-inches of rainfall being released in 12 hours.
Tank geometry	Tank should be constructed to fit within the site layout.
Low-flow outlet	Conveys low base flows from the tank to the outlet.
Outlet design	Use a water quality outlet that is capable of slowly releasing the runoff volume generated from 0.75-inches of rainfall over a 24- to 48-hour period.
Over flow design	Runoff volume generated from a storm greater than a 0.75-inches rainfall event should be diverted via a flow splitter placed at the tank entrance or an overflow weir/orifice system designed in conjunction with the outlet of the tank.
Maintenance access	Access to the tanks shall be provided for maintenance personal.

REFERENCES

1. Camp, Dresser and McKee, Inc., Larry Walker Associates, 1993. *California Best Management Practices - Municipal*, California State Water Resources Council Board, Alameda, CA.

2. GKY and Associates, Inc. June 1996. *Evaluation and Management of Highway Runoff Water Quality*, Publication No. FHWA-PD-96-032. Prepared for: US Department of Transportation, Federal Highway Administration. Washington, DC.

3. K. H. Lichten, June 1997. *Compilation of New Development Stormwater Treatment Controls in the San Francisco Bay Area*, Bay Area Stormwater Management Agencies Association, San Francisco, CA.

4. *Low-Impact Development Design Manual*, November 1997. Department of Environmental Resources, Prince George's County, MD.

5. T. R. Schueler, 1987. *Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs*, Department of Environmental Programs, Metropolitan Washington Council of Governments, Washington, DC.

6. Ventura Countywide Stormwater Quality Management Program, *Draft BMP DD: Extended Dry Detention Basins*, June 1999. Ventura, CA.

7. G. K. Young and F. Graziano, 1989. *Outlet Hydraulics of Extended Detention Facilities*, Northern Virginia Planning District Commission, Annandale, VA.

The following is a list of known locations where an Extended Dry Detention Basin was installed. The design of the installed basin in each location may vary from what is recommended in this SUSMP due to its specific circumstances. Los Angeles County does not endorse nor warranty any design used in the locations herein. Each individual case may require that the design be tailored to perform properly.

Installed Location (City/Address)	Brand/Manufacturer	Owner/Client
I-5/I-605 Intersection	N/A	Caltrans
I-605/SR 91 Intersection	N/A	Caltrans

B.6 EXTENDED/DRY DETENTION BASINS

DESCRIPTION

Extended/dry detention basins are depressed basins that temporarily store a portion of stormwater runoff following a storm event. Water is controlled by means of a hydraulic control structure to restrict outlet discharge. The extended/dry detention basins normally do not have a permanent water pool between storm events. The objectives of extended/dry detention basins are to remove particulate pollutants and to reduce maximum runoff values associated with development to their pre-development levels. Detention facilities may be berm-encased areas, excavated basins, or tanks.

ADVANTAGES

1. Modest removal efficiencies for the larger particulate fraction of pollutants.
2. Removal of sediment and buoyant materials. Nutrients, heavy metals, toxic materials, and oxygen-demanding particles are also removed with sediment substances associated with the particles.
3. Can be designed for combined flood control and stormwater quality control.
4. Requires less capital cost and land area when compared to wet pond BMP.
5. Downstream channel protection when properly designed and maintained.

LIMITATIONS

1. Require sufficient area and hydraulic head to function properly.
2. Generally not effective in removing dissolved and finer particulate size pollutants from stormwater.
3. Some constraints other than the existing topography include, but are not limited to, the location of existing and proposed utilities, depth to bedrock, location and number of existing trees, and wetlands.
4. Extended/dry detention basins have moderate to high maintenance requirements.
5. Sediments can be resuspended if allowed to accumulate over time and escape through the hydraulic control to downstream channels and streams.
6. Some environmental concerns with using extended/dry detention basins, include potential impact on wetlands, wildlife habitat, aquatic biota, and downstream water quality.
7. May create mosquito breeding conditions and other nuisances.

DESIGN CRITERIA

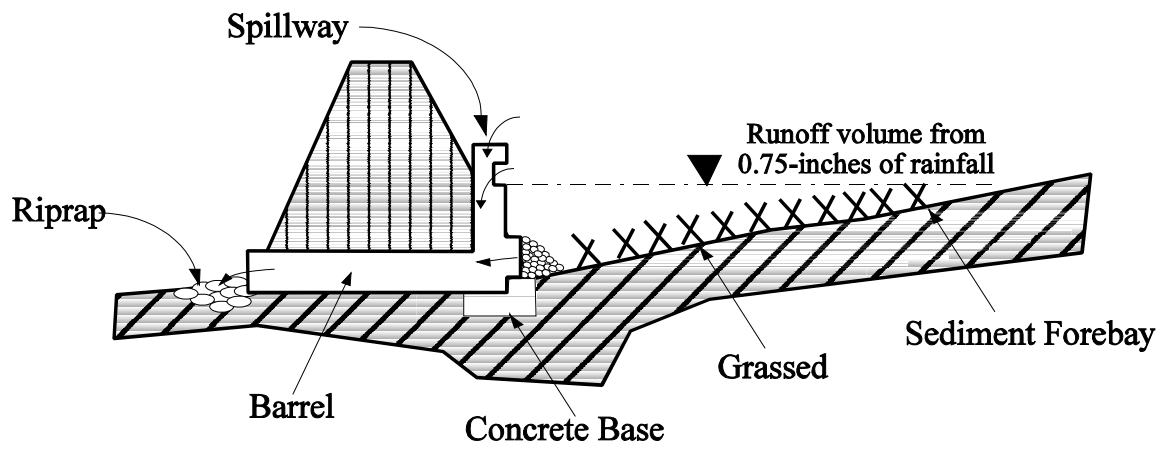


Figure 1. Conceptual elements of typical extended/dry detention structures.

Criteria	*Design Considerations*
Storage volume	Calculate the volume of stormwater to be mitigated by the extended/dry detention basin using the Los Angeles County Department of Public Works *Method for Calculating Standard Urban Stormwater Mitigation Plan (SUSMP) Flow Rates and Volumes Based on 0.75-inches of Rainfall*. Provide a storage volume for 120 percent of the runoff volume generated from 0.75-inches of rainfall above the lowest outlet in the basin. The additional 20 percent of storage volume provides for sediment accumulation and the resultant loss in storage volume.
Emptying time	A 24- to 48-hour emptying time should be used for the runoff volume generated from 0.75-inches of rainfall, with no more than 50 percent of the 0.75-inches of rainfall being released in 12 hours.
Basin geometry	Shape the pond with a gradual expansion from the inlet and a gradual contraction toward the outlet, thereby limiting short circuiting. The basin length to width ratio should be not less than 4.
Two-stage design	A two-stage design with a lower frequency pool that fills often with frequently occurring runoff minimizes standing water and sediment deposition in the remainder of the basin can enhance water quality benefits. The bottom stage should store 10 to 25 percent of the runoff volume generated from 0.75-inches of rainfall.
Low-flow channel	Conveys low base flows from the forebay to the outlet. Erosion protection should be provided for the low-flow channel.
Basin side slopes	Slopes should be stable and gentle enough to limit rill erosion and facilitate maintenance access and needs. Side slopes should be no steeper than 4:1 (H:V), preferably flatter.

Inlet	Dissipate flow energy at basin's inflow point(s) to limit erosion and promote particle sedimentation.
Forebay design	Provide the opportunity for larger particles to settle out in an area that has, as a useful refinement, a solid surface bottom to facilitate mechanical sediment removal. The forebay volume should be 5 to 10 percent of the runoff volume generated from 0.75-inches of rainfall.
Outlet design	Use a water quality outlet that is capable of slowly releasing the runoff volume generated from 0.75-inches of rainfall over a 24- to 48-hour period. A perforated riser can be used in conjunction with orifices and a weir box opening above it to control larger storm outflows. A cutoff collar should be considered for the outlet pipe to control seepage.
Perforation protection	Provide a crushed rock blanket of sufficient size to prevent clogging of the primary water quality outlet while not interfering significantly with its hydraulic capacity.
Dam embankment	The embankment should be designed not to fail during a 100-yr and larger storm. Embankment slopes should be no steeper than 3:1 (H:V), preferably 4:1, and flatter, and planted with turf-forming grasses. Poorly compacted native soils should be excavated and replaced. Embankment soils should be compacted to at least 95 percent of their maximum density. Spillway structures and overflows should be designed in accordance with local drainage criteria.
Vegetation	Bottom vegetation provides erosion control and sediment entrapment. Basin bottom, berms, and side-sloping areas may be planted with native grasses or with irrigated turf, depending on the local setting.
Maintenance access	Access to the forebay and outlet area shall be provided to maintenance vehicles. Maximum grades should be eight percent, and a solid driving surface of gravel, rock, concrete, or gravel-stabilized turf should be provided.

REFERENCES

1. Camp, Dresser and McKee, Inc., Larry Walker Associates, 1993. *California Best Management Practices - Municipal*, California State Water Resources Council Board, Alameda, CA.

2. GKY and Associates, Inc. June 1996. *Evaluation and Management of Highway Runoff Water Quality*, Publication No. FHWA-PD-96-032. Prepared for: US Department of Transportation, Federal Highway Administration. Washington, DC.

3. K. H. Lichten, June 1997. *Compilation of New Development Stormwater Treatment Controls in the San Francisco Bay Area*, Bay Area Stormwater Management Agencies Association, San Francisco, CA.

4. *Low-Impact Development Design Manual*, November 1997. Department of Environmental Resources, Prince George's County, MD.

5. T. R. Schueler, 1987. *Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs*, Department of Environmental Programs, Metropolitan Washington Council of Governments, Washington, DC.

6. Ventura Countywide Stormwater Quality Management Program, *Draft BMP DD: Extended Dry Detention Basins*, June 1999. Ventura, CA.

7. G. K. Young and F. Graziano, 1989. *Outlet Hydraulics of Extended Detention Facilities*, Northern Virginia Planning District Commission, Annandale, VA.

The following is a list of known locations where an Extended Dry Detention Basin was installed. The design of the installed basin in each location may vary from what is recommended in this SUSMP due to its specific circumstances. Los Angeles County does not endorse nor warranty any design used in the locations herein. Each individual case may require that the design be tailored to perform properly.

Installed Location (City/Address)	Brand/Manufacturer	Owner/Client
I-5/I-605 Intersection	N/A	Caltrans
I-605/SR 91 Intersection	N/A	Caltrans

B.7 INFILTRATION BASINS

DESCRIPTION

An infiltration basin is a surface pond which captures first-flush stormwater and treats it by allowing it to percolate into the ground and through permeable soils. As the stormwater percolates into the ground, physical, chemical, and biological processes occur which remove both sediments and soluble pollutants. Pollutants are trapped in the upper layers of the soil, and the water is then released to groundwater. Infiltration basins are generally used for drainage areas between 5 and 50 acres (Boutiette and Duerring, 1994). For drainage areas less than 5 acres, an infiltration trench or other BMP may be more appropriate. For drainage areas greater than 50 acres, maintenance of an infiltration basin would be burdensome, and an extended/dry detention basin or wet pond may be more appropriate. Infiltration basins are generally dry except immediately following storms, but a low-flow channel may be necessary if a constant base flow is present.

Infiltration basins create visible surface ponds that dissipate because water is infiltrated through the pond bottom; infiltration trenches hide surface drainage in underground void regions and the water is infiltrated below the rocks. Infiltration basins effectively remove soluble pollutants because processes such as adsorption and biological processes remove these soluble pollutants from stormwater. This kind of treatment is not always available in other kinds of BMPs.

Several types of infiltration basins exist. They can be either in-line or off-line, and may treat different volumes of water, such as the water quality volume or the 2-year or 10-year storm. A full infiltration basin is built to hold the entire water quality volume, and the only outlet from the pond is an emergency spillway. More commonly used is the combined infiltration/detention basin, where the outflow is controlled by a vertical riser. Excess flow volume spills over the drop inlet at the top of the riser, and very large storms will exit through the emergency spillway. Other types of basins include the side-by-side basin, and the off-line infiltration basin. The side by side basin consists of a basin with an elevated channel to carry base flows running along one of its sides. Storm flows also flow through the elevated channel, but overflow the channel and enter the basin when they become deep enough. An off-line infiltration basin is used to treat the first flush runoff, while higher flows remain in the main channel.

ADVANTAGES

1. High removal capability for particulate pollutants and moderate removal for soluble pollutants.
2. Groundwater recharge helps to maintain dry-weather flows in streams.
3. Can minimize increases in runoff volume.

4. When properly designed and maintained, it can replicate pre-development hydrology more closely than other BMP options.
5. Basins provide more habitat value than other infiltration systems.

LIMITATIONS

1. High failure rate due to clogging and high maintenance burden.
2. Low removal of dissolved pollutants in very coarse soils.
3. Not suitable on fill slopes or steep slopes.
4. Risk of groundwater contamination in very coarse soils, may require groundwater monitoring.
5. Should not be used if significant upstream sediment load exists.
6. Slope of contributing watershed needs to be less than 20 percent.
7. Not recommended for discharge to a sole source aquifer.
8. Cannot be located within 100 feet of drinking water wells.
9. Metal and petroleum hydrocarbons could accumulate in soils to potentially toxic levels.
10. Relatively large land requirement.
11. Only feasible where soil is permeable and there is sufficient depth to bedrock and water table.
12. Need to be located a minimum of 10 feet down gradient and 100 feet up gradient from building foundations because of seepage problems.
13. Infiltration facilities could fall under Chapter 15, Title 23, of California Code of Regulations regarding waste disposal to land.

DESIGN CRITERIA

Designing an infiltration basin is a process in which several factors are examined. The soil type and the drainage area are important factors in infiltration basin design. If either one of these two is inappropriate, the infiltration basin will not function properly. The steps in the design of an infiltration basin are listed below.

1. *Drainage Area.* Drainage areas between 5 and 50 acres are good candidates for infiltration basins. Infiltration trenches might be more appropriate for smaller drainage areas, while retention ponds are more appropriate for larger drainage areas (Schueler, 1987).
2. *Soils.* The site must have the appropriate soil, or the basin will not function properly. It is important that the soil be able to accept water at a minimum infiltration rate. Soils with an infiltration rate of less than 0.3 inches per hour, are not suitable sites for infiltration basins. Soils with a high percentage of clay are also undesirable, and should not be used if the percentage of clay is greater than 30. Generally, areas with fine to moderately fine soils are prevalent should not be

considered as sites, because these soils do not have a high infiltration rate. Soils with greater than 40 percent combined silt/clay also should not be used. A series of soil cores should be taken to a depth of at least 5 feet below the proposed basin floor elevation to determine which kinds of soils are prevalent at the potential site.

3. *Volume.* Calculate the volume of stormwater to be mitigated by the infiltration basin using the Los Angeles County Department of Public Works *Method for Calculating Standard Urban Stormwater Mitigation Plan (SUSMP) Flow Rates and Volumes Based on 0.75-inches of Rainfall*.
4. *Slope.* The basin floor should be as flat as possible to ensure an even infiltration surface and should not be or greater than 5 percent slope. Also, side slopes should have a maximum slope of 3 horizontal to 1 vertical (Schueler, 1987).
5. *Vegetation.* Vegetation should be established as soon as possible. Water-tolerant reed canary grass or tall fescue should be planted on the floor and side slopes of the basin (Schueler, 1987). Root penetration and thatch formation maintains and sometimes improves infiltration capacity of the basin floor. Also, the vegetation helps to trap the pollutants by growing through the accumulated sediment and preventing resuspension. The vegetation also helps reduce pollution levels by taking up soluble nutrients for growth and converting them into less available pollutant forms.
6. *Inlet.* Sediment forebays or riprap aprons should be installed to reduce flow velocities and trap sediments upon entrance to the basin. Flow should be evenly distributed over the basin floor by a riprap apron. The inlet pile or channel should enter the basin at floor level to prevent erosion (Schueler, 1987).
7. *Drainage Time.* The basin should completely drain within 24 hours to avoid the risk of it not being empty before the next storm. Overestimation of the future infiltration capacity can result in a standing water problem. Ponds with detention times of less than six hours are not effectively removing pollutants from the storm flows (Schueler, 1987). The most common problem is setting the elevation and size of the low-flow orifice. If the orifice is too large, runoff events pass through the basin too quickly. If the low-flow orifice diameter is too narrow, there is a risk of creating an undesirable quasi-permanent pool.
8. *Buffer Zone.* A 25 foot buffer should be placed between the edge of the basin floor, and the nearest adjacent lot (Schueler, 1987). The buffer should consist of water tolerant, native plant species that provide food and cover for wildlife. This buffer zone may also act as a screen if necessary.
9. *Access.* Access to the basin floor should be provided for light equipment (Schueler, 1987).
10. *Water Table.* The basin floor should be a minimum of 10 feet above the water table.
11. *Maximum Depth.* The maximum allowable depth is equal to the infiltration rate multiplied by the maximum allowable dewatering time (24 hours).
12. *Freeboard.* A minimum of 2 feet of freeboard should be available between the

spillway crest and the top of the dam (Dormann, et al., 1988).

13. *Emergency Spillway.* The emergency spillway should be able to safely pass the 100-year flood.
14. *Surface Area of the Basin Floor.* If the surface area of the basin floor is increased, the infiltration rate and quantity of runoff which can be infiltrated will be increased. Larger surface areas can also help compensate for clogging on the surface.

REFERENCES

1. L. N. Boutiette and C. L. Duerring, 1994. *Massachusetts Nonpoint Source Management Manual, The Megamanual: A Guidance Document for Municipal Officials*, Massachusetts Department of Environmental Protection, Office of Watershed Management, Nonpoint Source Program, Boston, MA.

2. Camp, Dresser and McKee, Inc., Larry Walker Associates, 1993. *California Best Management Practices - Municipal*, California State Water Resources Council Board, Alameda, CA.

3. M. E. Dormann, J. Hartigan, and B. Maestri, 1988. *Retention, Detention, and Overland Flow for Pollutant Removal from Highway Stormwater Runoff: Interim Guidelines for Management Measures*, FHWA/RD-87/056, Federal Highway Administration, Versar, Inc., Springfield, VA.

4. GKY and Associates, Inc. June 1996. *Evaluation and Management of Highway Runoff Water Quality*, Publication No. FHWA-PD-96-032. Prepared for: US Department of Transportation, Federal Highway Administration. Washington, DC.

5. T. R. Schueler, 1987. *Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs*, Department of Environmental Programs, Metropolitan Washington Council of Governments, Washington, DC.

6. Ventura Countywide Stormwater Quality Management Program, *Draft BMP IN: Infiltration Facilities*, June 1999. Ventura, CA.

The following is a known location where an Infiltration Basin was installed. The design of the installed basin in the location may vary from what is recommended in this SUSMP due to its specific circumstances. Los Angeles County does not endorse nor warranty any design used in the location herein. Each individual case may require that the design be tailored to perform properly.

Installed Location (City/Address)	Brand/Manufacturer	Owner/Client
I 605/SR 91	N/A	Caltrans

B.8 INFILTRATION TRENCHES

DESCRIPTION

An infiltration trench is basically an excavated trench that has been lined with filter fabric and backfilled with stone to form an underground basin. Runoff is diverted into the trench and either infiltrates into the soil, or enters a perforated pipe underdrain and is routed to an outflow facility. The depths of an infiltration trench generally range between 3 and 8 feet (Schueler, 1987) and may change when site-specific factors are considered. Smaller trenches are used for water quality, while larger trenches can be constructed if stormwater quantity control is required (Schueler, 1987). Trenches are not usually feasible in ultra-urban or retrofit situations where the soils have low permeability or low voids (Schueler, 1992). They should be installed only after the contributing area has stabilized to minimize runoff of sediments.

Infiltration trenches and infiltration basins follow similar design logic. The differences are that the former is for small drainage areas and stores runoff out of sight, within a gravel or aggregate matrix, whereas the latter is for larger drainage areas and water is stored in a visible surface pond.

Infiltration trenches effectively remove soluble and particulate pollutants. They can provide groundwater recharge by diverting 60 to 90 percent of annual urban runoff back into the soil (Boutiette and Duerring, 1994). They are generally used for drainage areas less than 10 acres, but some references cite 5 acres as a maximum size drainage area (Schueler, 1987, 1992). Potential locations include residential lots, commercial areas, parking lots, and adjacent to road shoulders. Trenches are only feasible on permeable soils (sand and gravel), and where the water table and bedrock are situated well below the bottom of the trench (Boutiette and Duerring, 1994; Schueler, 1987). Trenches are frequently used in combination with grassed sales. Trenches should not be used to trap course sediments, because the large sediment will clog the trench. Grass buffers can be installed to capture sediment before it enters the trench.

ADVANTAGES

1. Provides groundwater recharge.
2. Trenches fit into small areas.
3. Good pollutant removal capabilities.
4. Can minimize increases in runoff volume.
5. Can fit into medians, perimeters, and other unused areas of a development site.
6. Helps replicate pre-development hydrology and increases dry weather baseflow.

LIMITATIONS

1. Slope of contributing watershed needs to be less than 20 percent.
2. Soil should have infiltration rate greater than 0.3 inches per hour and clay content less than 30 percent.
3. Drainage area should be between 1 to 10 acres.
4. The bottom of infiltration trench should be at least 4 feet above the underlying bedrock and the seasonal high water table.
5. High failure rates of conventional trenches and high maintenance burden.
6. Low removal of dissolved pollutants in very coarse soils.
7. Not suitable on fill slopes or steep slopes.
8. Risk of groundwater contamination in very coarse soils, may require groundwater monitoring.
9. Infiltration facilities could fall under Chapter 15, Title 23, of California Code of Regulations regarding waste disposal to land.
10. Cannot be located within 100 feet of drinking water wells.
11. Need to be located a minimum of 10 feet down gradient and 100 feet up gradient from building foundations because of seepage problems.
12. Should not be used if upstream sediment load cannot be controlled prior to entry into the trench.
13. Metals and petroleum hydrocarbons could accumulate in soils to potentially toxic levels.

DESIGN CRITERIA

Infiltration trenches can be categorized both by trench type, and as surface or below ground. Special inlets are required for underground trenches to prevent sediment and oil or grease from clogging the infiltration trench (Schueler, 1987). Surface trenches are commonly used where land is not limiting and underground trenches are better suited for development with minimal land availabilities.

1. *Volume.* Calculate the volume of stormwater to be mitigated by the infiltration trench using the Los Angeles County Department of Public Works *Method for Calculating Standard Urban Stormwater Mitigation Plan (SUSMP) Flow Rates and Volumes Based on 0.75-inches of Rainfall*.
2. *Dimensions.* Generally, soils with low infiltration rates require a higher ratio of bottom surface area to storage volume (Northern Virginia Planning District Commission and Engineers and Surveyors Institute, 1992). The following formulas can be used to determine the dimensions of the infiltration basin:

$$H_{Tmax} = \frac{E \times t_{max}}{P}$$

$$H_{Tmin} = \frac{E \times t_{min}}{P}$$

$$A = \frac{V}{E \times t_{max}}$$

Where:

H_{Tmax}, H_{Tmin}	=	Maximum and minimum trench depths (ft).
E	=	Infiltration rate in length per unit time (ft/hr).
t_{max}, t_{min}	=	Maximum and minimum target drain-time (hr).
P	=	Pore volume ratio of stone aggregate (% porosity/100).
V	=	Fluid storage volume requirement (ft^3).
A	=	Trench bottom surface area (ft^2).

The actual storage volume of the facility is the void ratio multiplied by the total volume of the trench. The available land and other constraints such as depth to bedrock or water table are used to determine the final dimensions of the trench.

3. *Buffer Strip/Special Inlet.* A grass filter strip a minimum of 20 feet should surround the trench on all sides over which surface flow reaches an above-ground trench. A special inlet can be used to prevent floatable material, solids, grease, and oil from entering trenches which are located below ground.
4. *Filter Fabric.* The bottom and sides of the trench should be lined with filter fabric soon after the trench is excavated. The fabric should be flush with the sides, overlap on the order of 2 feet over the seams, and not have trapped air pockets. As an alternative, 6 inches of clean, washed sand may be placed on the bottom of the trench instead of filter fabric.
5. *Grass Cover.* If the trench is grass covered, at least 1 foot of soil should be over the trench for grass substrate.
6. *Surface Area.* The surface area of the trench can be engineered to the site with the understanding that a larger surface area of the bottom of the trench increases infiltration rates and helps to reduce clogging and that depth may be limited by

seasonal groundwater.

7. *Surface Area of the Trench Bottom.* Pollutant removal in a trench can be improved by increasing the surface area of the trench bottom. This is done by adjusting the geometry to make the trench shallow and broad, rather than deep and narrow. Greater bottom surface area increases infiltration rates and provides more area and depth for soil filtering. In addition, broader trench bottoms reduce the risk of clogging at the soil/filter cloth interface by spreading infiltration over a wider area.
8. *Distance from Wells and Foundations.* The trench should be at least 100 feet of any drinking water supply well, and at least 10 feet downgradient and 100 feet upgradient from building foundations (Schueler, 1987).
9. *Drain Time.* The drain time should be between two and three days. The total volume of the trench should drain in 48 hours. The minimum drain time should be 24 hours.
10. *Backfill Material.* The backfill material in the trench should have a D_{50} sized between 1.5 and 3 inches and clay content should be limited to less than 30 percent. The porosity of the material should be between 0.3 and 0.4.
11. *Observation Well.* An observation well of 4 to 6 inches diameter PVC should be located in the center of the trench and the bottom should rest on a plate. The top should be capped. The water level should be measured after a storm event. If it has not completely drained in three days, some remedial work may need to be done.
12. *Overflow Berm.* A 2 to 3 inch emergency overflow berm on the downstream side of the trench serves a twofold purpose. First, it detains surface runoff and allows it to pond and infiltrate to the trench. The berm also promotes uniform sheet flow for runoff overflow.

V. REFERENCES

1. L. N. Boutiette and C. L. Duerring, 1994. *Massachusetts Nonpoint Source Management Manual, The Megamanual: A Guidance Document for Municipal Officials*, Massachusetts Department of Environmental Protection, Office of Watershed Management, Nonpoint Source Program, Boston, MA.

2. Camp, Dresser and McKee, Inc., Larry Walker Associates, 1993. *California Best Management Practices - Municipal*, California State Water Resources Council Board, Alameda, CA.

3. DEQ Storm Water Management Guidelines, Department of Environmental Quality, State of Oregon. http://waterquality.deq.state.or.us/wq/groundwa/swmgmtguide.htm

4. M. E. Dormann, J. Hartigan, and B. Maestri, 1988. *Retention, Detention, and Overland Flow for Pollutant Removal from Highway Stormwater Runoff: Interim Guidelines for Management Measures*, FHWA/RD-87/056, Federal Highway Administration, Versar, Inc., Springfield, VA.

5. GKY and Associates, Inc. June 1996. *Evaluation and Management of Highway Runoff Water Quality*, Publication No. FHWA-PD-96-032. Prepared for: US Department of Transportation, Federal Highway Administration. Washington, DC.

6. *Low-Impact Development Design Manual*, November 1997. Department of Environmental Resources, Prince George's County, MD.

7. Northern Virginia Planning District Commission and Engineers Surveyors Institute, 1992. *Northern Virginia BMP Handbook, A Guide to Planning and Designing Best Management Practices in Northern Virginia*, Annandale, VA.

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9. T. R. Schueler, P. Kumble, and M. Heraty, 1992. *A Current Assessment of Urban Best Management Practices: Techniques for Reducing Nonpoint Source Pollution in the Coastal Zone*, Anacostia Research Team, Metropolitan Washington Council of Governments, Washington, DC.

10. Ventura Countywide Stormwater Quality Management Program, *Draft BMP IN: Infiltration Facilities*, June 1999. Ventura, CA.

B.13 VEGETATIVE SWALE

DESCRIPTION

Vegetated swales are shallow vegetated channels to convey stormwater where pollutants are removed by filtration through grass and infiltration through soil. They look similar to, but are wider than, a ditch that is sized only to transport flow. They require shallow slopes and soils that drain well. Grassed swale designs have achieved mixed performance in pollutant removal efficiency. Moderate removal rates have been reported for suspended solids and metals associated with particulates such as lead and zinc. Runoff waters are typically not detained long enough to effectively remove very fine suspended solids, and swales are generally unable to remove significant amounts of dissolved nutrients. Pollutant removal capability is related to channel dimensions, longitudinal slope, and type of vegetation. Optimum design of these components will increase contact time of runoff through the swale and improve pollutant removal rates.

Vegetated swales are primarily stormwater conveyance systems. They can provide sufficient control under light to moderate runoff conditions, but their ability to control large storms is limited. Therefore, they are most applicable in low to moderate sloped areas as an alternative to ditches and curb and gutter drainage. Their performance diminishes sharply in highly urbanized settings. Vegetated swales are often used as a pretreatment measure for other downstream BMPs, particularly infiltration devices. Enhanced vegetative swales utilize check dams and wide depressions to increase runoff storage and promote greater settling of pollutants.

ADVANTAGES

1. Relatively easy to design, install and maintain.
2. Vegetated areas that would normally be included in the site layout, if designed for appropriate flow patterns, may be used as a vegetated swale.
3. Relatively inexpensive.
4. Vegetation is usually pleasing to residents.

LIMITATIONS

1. Irrigation may be necessary to maintain vegetative cover.
2. Potential for mosquito breeding areas.
3. Possibility of erosion and channelization over time.
4. Requires dry soils with good drainage and high infiltration rates for better pollutant removal.

5. Not appropriate for pollutants toxic to vegetation.
6. Large area requirements may make this BMP infeasible for some sites.
7. Used to serve sites less than 10 acres in size, with slopes no greater than 5 percent.
8. The seasonal high water table should be at least 2 feet below the surface.
9. Buildings should be at least 10 feet from the site.

DESIGN CRITERIA

Several criteria should be kept in mind when beginning swale design. These provisions, presented in Table 1, have been developed through a series of evaluative research conducted on swale performance.

Table 1. Criteria for optimum swale performance (Horner, 1993).

Parameter	***Optimal Criteria***	***Minimum Criteria****
Hydraulic Residence Time	9 min	≥ 5 min
Average Flow Velocity	≤ 0.9 ft/s	
Swale Width	8 ft	2 ft
Swale Length	200 ft	100 ft
Swale Slope	~ 2 - 6%	~ 1%
Side Slope Ratio (horizontal:vertical)	4 : 1	2 : 1

* Criteria at or below minimum values can be used when compensatory adjustments are made to the standard design. Specific guidance on implementing these adjustments will be discussed in the design section.

The procedures described below were set forth by Horner, and unless otherwise cited, are set forth in *Biofiltration for Stormwater Runoff Quality Control*, published in 1993. The following steps are recommended to be conducted in order to complete a swale design:

(1) Determine the flow rate to the system.
(2) Determine the slope of the system.
(3) Select a swale shape (skip if filter strip design).
(4) Determine required channel width.
(5) Calculate the cross-sectional area of flow for the channel.
(6) Calculate the velocity of channel flow.
(7) Calculate swale length.
(8) Select swale location based on the design parameters.
(9) Select a vegetation cover for the swale.
(10) Check for swale stability.

Recommended procedures for each task are discussed in detail below.

1. *Determine Flow Rate to the System.* Calculate the flow rate of stormwater to be mitigated by the vegetated swale using the Los Angeles County Department of Public Works *Method for Calculating Standard Urban Stormwater Mitigation Plan (SUSMP) Flow Rates and Volumes Based on 0.75-inches of Rainfall*. Runoff from larger events should be designed to bypass the swale, consideration must be given to the control of channel erosion and destruction of vegetation. A stability analysis for larger flows (up to the 100-yr 24-hour) must be performed. If the flow rate approaches or exceeds 1 ft^3/s, one or more of the design criteria in Table 1 may be violated, and the swale system may not function correctly (Washington State Department of Transportation, 1995). Alternative measures to lower the design flow should be investigated. Possibilities include dividing the flow among several swales, installing detention to control release rate upstream, and reducing developed surface area to reduce runoff coefficient value and gain space for biofiltration (Horner, 1993).
2. *Determine the Slope of the System.* The slope of the swale will be somewhat dependent on where the swale is placed, but should be between the stated criteria of one and six percent.
3. *Select a Swale Shape.* Normally, swales are designed and constructed in a trapezoidal shape, although alternative designs can be parabolic, rectangular, and triangular. Trapezoidal cross-sections are preferred because of relatively wider vegetative areas and ease of maintenance (Khan, 1993). They also avoid the sharp corners present in V-shaped and rectangular swales, and offer better stability than the vertical walls of rectangular swales.
4. *Determine Required Channel Width.* Estimates for channel width for the selected shape can be obtained by applying Manning's:

$$Q = \frac{1.486 A R_h^{0.667} S^{0.5}}{n} \qquad (1)$$

Where:

Q	=	Flow (ft^3/s).
A	=	Cross-sectional area of flow (ft^2).
R_h	=	Hydraulic radius of flow cross section (ft).
S	=	Longitudinal slope of biofilter (ft/ft).
n	=	Manning's roughness coefficient.

A Manning's n value of 0.02 is used for routine swales that will be mowed with some regularity. For swales that are infrequently mowed, use a Manning's n value of 0.024. A higher n value can be selected if it is known that vegetation will be very dense (Khan, 1993).

Figure 1 presents channel geometry and equations for a trapezoidal swale, the most frequently used shape.

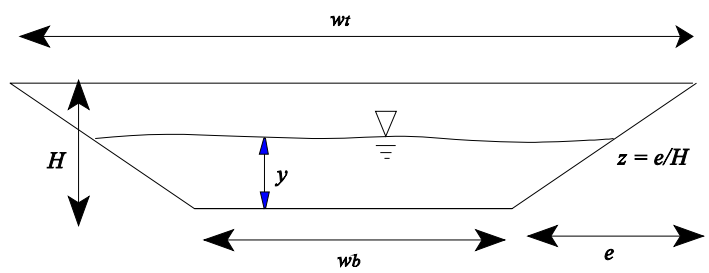

Figure 1. Channel geometry for a trapezoid swale.

$$Cross\ Sectional\ Area(A_x) = by + zy^2$$

$$Width(w) = b + 2yz$$

$$Hydraulic\ Radius(R_h) = \frac{by + zy^2}{by + 2y\sqrt{z^2 + 1}}$$

Substituting the geometric equations presented in Figure 1 into Manning's equation, the bottom width (w_b) and the top width (w_t) for the trapezoid swale can be computed using the following equations:

$$w_b \cong \frac{Qn}{y^{1.67} s^{0.5}} - zH \qquad (2)$$

$$w_t = w_b + 2zH \qquad (3)$$

Where:

Q = Flow rate in ft^3/s.

n	=	Manning's roughness coefficient.
y	=	Depth of flow.
H	=	The side slope in the form of z:1.

For trapezoidal and the limited case of V-shapes, the side slope (z) used should be at least 3:1 (horizontal:vertical). V-shaped swales should be double checked after computation of w_t to make sure that $z = 2w_t$ is at least 3. If a slope steeper than 2:1 must be used, additional stabilization measures (i.e., lining the swale with riprap) may be needed.

Typically, the depth of flow in the channel (H) is set at 3 to 4 inches. Flow depth can also be determined by subtracting 2 inches from the expected grass height, if the grass type and the height it will be maintained is known. Values lower than 3 to 4 inches can be used, but doing so will increase the computed width (w_t or w_b) of the swale (Washington State Department of Transportation, 1995).

Swale width computed should be between 2 to 8 feet. Relatively wide swales (those wider than 8 feet are more susceptible to flow channelization and are less likely to have uniform sheet flow across the swale bottom for the entire swale length. The maximum widths for swales is on the order of 10 feet, however widths greater than 8 feet should be evaluated to consider the effectiveness of the flow spreading design used and the likelihood of maintaining evenness in the swale bottom. Since length may be used to compensate for width reduction (and vice versa) so that area is maintained, the swale width can be arbitrarily set to 8 feet to continue with the analysis. If b is less than 2 feet, set b = 2 feet and continue. Narrower widths can be used if space is very constrained. Sometimes when the flow rate is very low, the equation above can generate a negative value for w_b. Since this is not possible, the bottom width should be set to 1 feet when this occurs.

5. *Calculate Cross-Sectional Area.* Compute the cross-sectional area (A) for the swale, using the following equation:

$$A_x = (w_b + 2zH)yH \tag{4}$$

6. *Calculate the Velocity of the Channel Flow.* Channel flow velocity (U) can be computed using the continuity equation:

$$U = \frac{Q}{A_x} \tag{5}$$

This velocity should be less than 0.9 ft/s, a velocity that was found to cause grasses to be flattened, reducing filtration. A velocity lower than this maximum value is recommended to achieve the 9-minute hydraulic residence time criterion, particularly in shorter swales (at U = 0.9 ft/s, a 485-ft swale is needed for a 9-min residence time and a 269-ft swale for a 5-min residence time).

If the value of U suggests that a longer swale will be needed than space permits, investigate how the design flow Q can be reduced, or increase flow depth (H) and/or swale width (w_t) up to the maximum allowable values and repeat the analysis.

7. *Calculate Swale Length.* Compute the swale length (L) using the following equation:

$$L = Ut_r \ (60 \ s/\text{min}) \tag{6}$$

Where:

t_r = Hydraulic residence time (in minutes).

Use t_r = 9 min for this calculation.

If a swale length greater than the space will permit results, investigate how the design flow Q can be reduced. Increase flow depth (H) and/or swale width (w_b) up to the maximum allowable values and repeat the analysis. If all of these possibilities are checked and space is still insufficient, t can be reduced, but to no less than 5 minutes. If the computation results in L less than 100 ft, set L = 100 ft and investigate possibilities in width reduction. This is possible through recalculating U at the 100-ft length, recomputing cross-sectional area, and ultimately adjusting the swale width w_b using the appropriate equation.

8. *Select Swale Location.* Swale geometry should be maximized by the designer, using the above equations, and given the area to be utilized. If the location has not yet been chosen, it is advantageous to compute the required swale dimensions and then select a location where the calculated width and length will fit. If locations available cannot accommodate a linear swale, a wide-radius curved path can be used to gain length. Sharp bends should be avoided to reduce erosion potential. Regardless of when and how site selection is performed, consideration should be given to the following site criteria:

Soil Type. Soil characteristics in the swale bottom should be conducive to grass growth. Soils that contain large amounts of clay cause relatively low permeability and result in standing water, and may cause grass to die. Where the potential for leaching into groundwater exists, the swale bottom may need to be sealed with clay to protect from infiltration into the resource. Compacted soils will need to be tilled before seeding

or planting. If topsoil is required to facilitate grass seeding and growth, use 6 inches of the following recommended topsoil mix: 50 to 80 percent sandy loam, 10 to 20 percent clay, and 10 to 20 percent composted organic matter (exclude animal waste).

Slope. The natural slope of the potential location will determine the nature and amount of regrading, or if additional measures to reduce erosion and/or increase pollutant removal are required. Swales should be graded carefully to attain uniform longitudinal and lateral slopes and to eliminate high and low spots. If needed, grade control checks should be provided to maintain the computed longitudinal slope and limit maximum flow velocity (Urbonas, 1992).

Natural Vegetation. The presence and composition of existing vegetation can provide valuable information on soil and hydrology. If wetland vegetation is present, inundated conditions may exist at the site. The presence of larger plants, trees and shrubs, may provide additional stabilization along the swale slopes, but also may shade any grass cover established. Most grasses grow best in full sunlight, and prolonged shading should be avoided. It is preferable that vegetation species be native to the region of application, where establishment and survival have been demonstrated.

9. *Select Vegetative Cover.* A dense planting of grass provides the filtering mechanism responsible for water quality treatment in swales. In addition, grass has the ability to grow through thin deposits of sediment and sand, stabilizing the deposited sediment and preventing it from being resuspended in runoff waters. Few other herbaceous plant species provide the same density and surface per unit area. Grass is by far the most effective choice of plant material in swales, however not all grass species provide optimum vegetative cover for use in swale systems. Dense turf grasses are best for vegetative cover. Table 2 lists several turf grasses, and their suitability in terms of cold tolerance, heat tolerance, mowing height adaptation, drought tolerance, and maintenance cost and effort.

In areas of poor drainage, wetlands species can be planted for increased vegetative cover. Use wetland species that are finely divided like grass and relatively resilient. Invasive species, such as cattails, should be avoided to eliminate proliferation in the swale and downstream.

Woody or shrubby plantings can be used for landscaping on the edge of side slopes, but not in the swale treatment area. Trees and shrubs can provide some additional stabilization, but also mature and shade the grass. In addition, leaf or needle drop can contribute unwanted nutrients, create debris jams, or interfere with waterflow through the system. If landscape plantings are to be used, selection and planting processes should be carefully planned and carried out to avoid these potential problems.

	Cold Tolerance	Heat Tolerance	Mowing Height	Drought Tolerance	Maintenance
High	Creeping bentgrass Kentucky bluegrass Red fescue Colonial bentgrass Highland bentgrass	Zoysia grass Hybrid bermuda grass Common bermuda grass St Augustine grass Kikuyu grass	Tall fescue	Hybrid bermuda grass Zoysia grass Common bermuda grass	Creeping bentgrass Dichondra
			Red fescue Kentucky bluegrass Perennial ryegrass Weeping alkali grass	St Augustine grass Kikuyu grass	Hybrid bermuda grass
		Tall fescue Dichondra Creeping bentgrass			
		Kentucky bluegrass	St. Augustinegrass Common bermudagrass		Kentucky bluegrass Colonial bentgrass Perennial ryegrass
	Tall fescue Weeping alkali grass	Highland bentgrass Perennial ryegrass Colonial bentgrass	Dichondra Kikuyugrass Colonial bentgrass Highland bentgrass Zoysiagrass	Tall fescue Red fescue	St. Augustine grass Highland bentgrass Zoysia grass
			Hybrid bermudagrass		
Low	Dichondra Zoysia grass Common bermuda grass Hybrid bermuda grass Kikuyu grass St. Augustine grass	Weeping alkaligrass Red fescue	Creeping bentgrass	Kentucky bluegrass Perennial ryegrass Highland bentgrass Creeping bentgrass Colonial bentgrass Weeping alkaligrass Dichondra	Tall fescue Common bermuda grass Kikuyu grass

Table 2. Criteria for turf grass cover
(Camp, Dresser and McKee, 1993.)

10. *Check Swale Stability.* The stability check is performed for the combination of highest expected flow and least vegetation coverage and height. Stability is normally checked for flow rate (Q) for the 100-yr, 24-h storm unless runoff from larger such events will bypass the swale. Q can be determined using the same methods mentioned for the initial design storm computation. The maximum velocity (U_{max}) in ft/s, that is permissible for the vegetation type, slope, and soil conditions should be obtained. Table 3 provides maximum velocity data for a variety of vegetative covers and slopes.

Table 3. Guide for selecting maximum permissible swale velocities for stability (adapted from Chow [1959], Livingston, et al., [1984], and Goldman, et al., [1986] from Horner [1993]).

		Maximum Velocity (ft/s)	
Cover Type	***Slope (%)***	***Erosion-resistant soils***	***Easily eroded soils***
Kentucky bluegrass Tall fescue	0 - 5	6	5
Kentucky bluegrass Ryegrasses Western wheat-grass	5 - 10	5	4
Grass-legume Mixture	0 - 5 5 - 10	5 4	4 3
Red fescue	0 - 5	3	2.5

The estimated degree of retardance for different grass coverage ("good" or "fair") should be obtained for the selected vegetation height. Estimation should be based on coverage and height will first receive flow, or whenever coverage and height are at their lowest. Table 4 provides qualitative degree of retardance for coverage and grass height.

Table 4. Grass coverage, height, and degree of retardance (Horner, 1993).

Average Grass Height (mm [inches])	***Degree of Retardance***	
Coverage = "Good"		
> 760 (30)	A.	Very high
280 - 610 (11 -24)	B.	High
150 - 270 (6 - 10)	C.	Moderate
50 - 150 (2 - 6)	D.	Low
> 50 (>2)	E.	Very low
Coverage = "Fair"		
> 760 (30)	B.	High
280 - 610 (11 -24)	C.	Moderate
150 - 270 (6 - 10)	D.	Low
50 - 150 (2 - 6)	D.	Low
> 50 (>2)	E.	Very low

Select a trial Manning's n value for poor vegetation cover and low height. A good initial choice is n = 0.04. Using the alphabetic code assigned for the degree of retardance

and the chosen n value, consult the following graph to obtain a first approximation for UR_h (velocity x hydraulic radius).

The graph in Figure 2 was derived based on English units. Compute the hydraulic radius, using the U_{max} determined for vegetation type and slope, by applying the following equation:

$$UR_h = \frac{UR_h}{U_{\max}} \tag{7}$$

Use Manning's equation to solve for the actual UR_h:

$$VR = \frac{1}{n} R^{1.67} s^{0.5} \tag{8}$$

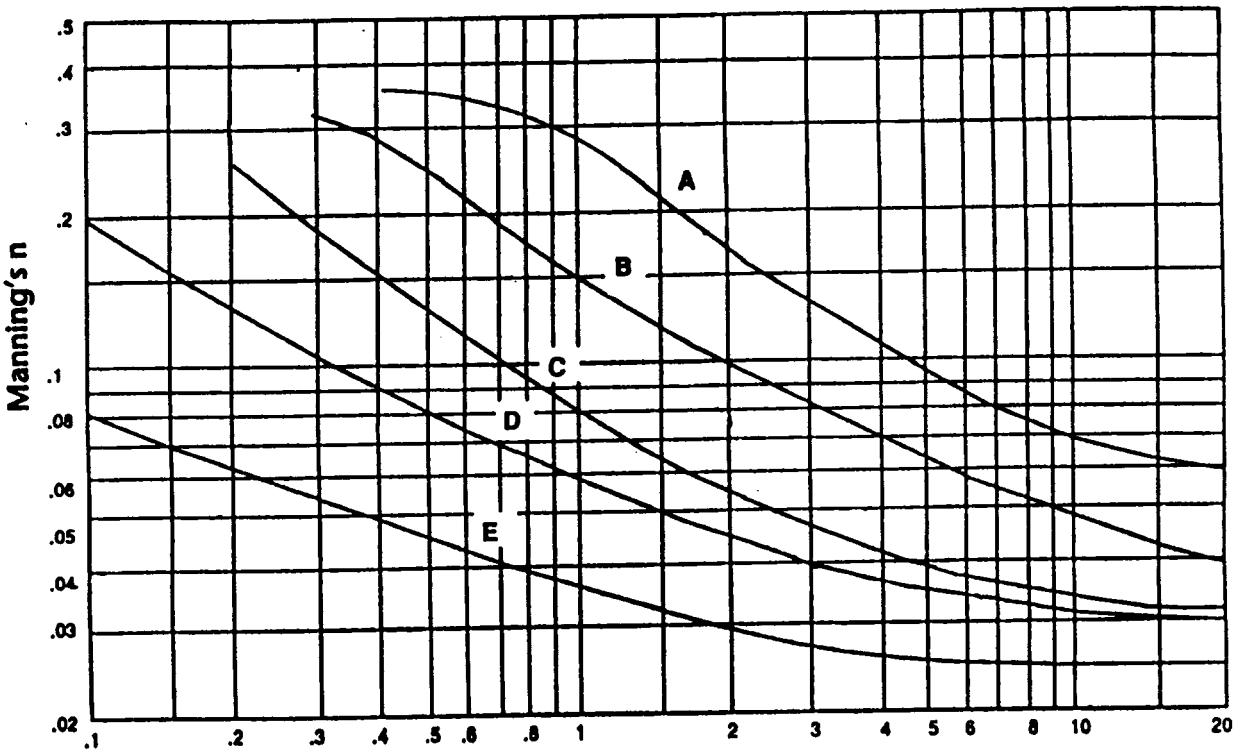

Figure 2. Relationship of Manning's n with UR_h for various degrees of flow retardance.

Once the actual UR_h is determined, compare this value with the first approximation for UR_h obtained through Figure 2. If they do not agree within five percent, adjust Manning's n value and repeat the process until acceptable agreement is reached. If $n < 0.033$ is needed to get agreement, set $n = 0.033$, solve UR_h again using Manning's equation above, and proceed.

The actual velocity for the final design conditions should be computed using the following equation:

$$U = \frac{UR_h}{R_h} \tag{9}$$

The actual velocity U should be less than the U_{max} value obtained from Table 3.

The area (A_x) required for stability should be computed from the following equation:

$$A_x = \frac{Q}{U} \tag{10}$$

The area value obtained in this procedure should be compared with the area (A_x) value obtained in the capacity analysis. If less area is required for stability than is provided for capacity, the design is acceptable. If more area is required for stability, use the area (A_x) value obtained in the stability analysis to recalculate channel dimensions.

The depth of flow at the stability check design flow rate then needs to be computed for the final dimensions of the swale by solving for y in the area equations provided on Figure 2. Compare this flow depth to the depth used in the capacity design. The larger of the two values should be used, plus 1 ft of freeboard, to obtain the total depth of the swale. The top width for the full depth of the swale should than be recalculated.

As a final check for capacity should be performed based on the stability check design storm, maximum vegetation height and cover to ensure that capacity is adequate if the largest expected event coincides with the greatest retardance. Using Manning's equation, the Manning's n value used for capacity design, and the calculated channel dimension (including freeboard) to compute the flow capacity of the channel. If the flow capacity is less than the stability check design storm flow rate, increase the channel cross-sectional area as needed for this conveyance, and specify the new channel dimensions.

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The following is a list of known locations where a Vegetated Swale was installed. The design of the installed swale in each location may vary from what is recommended in this SUSMP due to its specific circumstances. Los Angeles County does not endorse nor warranty any design used in the locations

herein. Each individual case may require that the design be tailored to perform properly.

Installed Location (City/Address)	Brand/Manufacturer	Owner/Client
Cerritos Maintenance Station	N/A	Caltrans
I-605/Del Amo Ave.	N/A	Caltrans

APPENDIX 3 – LOW IMPACT DEVELOPMENT - LID

I. Introduction

The Proposed Project would implement a series of BMPs to help mitigate impacts to surface water quality. The Low Impact Development Standards Manual, January 2009, and Manual for the Standard Urban Storm Water Mitigation Plan (SUSMP), September 2002, from the LACDPW were used in developing BMPs for the Proposed Project.

To appropriately implement LID, it is important to assess its role in water quality protection. LID is one part of a toolkit that can be used to better manage natural resources and limit the pollution delivered to waterways. It is not independent of watershed planning. To gain optimal benefits, LID needs to be integrated with appropriate land use programs. LID, by itself, will not deliver the water quality outcomes desired; yet, it does provide enhanced stormwater treatment and mitigate excess volume and flow rates. However, if not integrated in a comprehensive fashion, LID techniques can end up as a series of uncoordinated innovative BMPs that have limited water quality benefit.

LID is a comprehensive development and design technique that strives to preserve or restore predevelopment hydrology and water quality through a series of small-scale, decentralized, natural and engineered controls at or near the point where the stormwater is generated. The objective is to disperse LID devices uniformly across a site to minimize runoff and to prevent storm drain systems from being overwhelmed by stormwater.

II. Effective Site Design Elements

The following site design elements are used to frame the approach in which LID deals with stormwater. These elements are addressed through a combination of BMPs.

- Conserve natural areas, soils, and vegetation – avoid mass grading in natural areas, incorporate plants to suit soil and drainage conditions, incorporate planting schemes that replicate natural sites, use vegetative plantings and bioremediation techniques to neutralize soil contaminants.

- Minimize disturbances to natural drainage patterns – minimize manicured lawns and annual beds as the dominant site elements.

- Minimize and disconnect impervious surfaces – Reduce impervious areas by maximizing landscaping and using pervious pavements. Reduce the amounts of “hydraulically” connected impervious areas by: downspouts directed towards vegetated areas, install rain barrels and cisterns below downspouts.

- Minimize soil compaction – Restrict compaction and grading to areas that will support structures as compacted soils suffer from reduced infiltration rates and limit root growth and plant survivability.

- Disconnect impervious Surfaces – Direct runoff from impervious areas to pervious areas. Grade surface toward open space with infiltration capacity, infiltrate runoff a suitable distance from foundations.

LID BMPs

The Proposed Project would implement the following LID BMPs that would complement, or be a part of, the SUSMP BMPs described previously. Figure 9, SUSMP/LID BMPs plan, shows the locations of the proposed SUSMP and LID BMPs for the Proposed Project.

The LID BMPs are listed below as follows:

- Downspout Disconnection - The proposed building downspouts would direct stormwater to the streets and storm drain system, which would discharge into the on-site detention basins that have infiltration capacity (thus reducing stormwater-loads during precipitation events).

- Vegetated Swales – As previously described in the SUSMP BMPs, these engineered densely vegetated depressions retain and filter the first flush of runoff from impervious surfaces such as parking lots or streets.

- Underground Storage /Infiltration Systems - Underground detention systems serve as the storage and flow control for the Proposed Project. They would be designed to store the increase in storm water runoff and to detain and slowly release the design volume of urban runoff. The system is also designed to mitigate and infiltrate the difference in runoff between existing and post condition which will bring no environmental impact to the Placertia Canyon Creek.

- Riparian buffers – Riparian buffers are undeveloped and vegetated lands adjacent to a stream or water body. They help to absorb stormwater runoff. They also maintain and improve water quality by protecting water resources from nonpoint pollutants such as sediment, nutrients and pesticides from both urban and agricultural activities. The existing riparian barrier adjacent to Placerita Creek would be expanded with the Proposed Project after stabilization of the fill pad slopes.

- Pervious Pavement – Pervious pavement are designed to mitigate and infiltrate the increase storm water runoff.

III. LID Hydrologic Analysis

Step 1: Determine hydrologic parameters

Determine drainage area of proposed development site (for sites larger than 40 acres use multiple subareas). Calculate slope and length of flow path and identify soil type.

Step 2: Identify design storm

There are several options for an LID design storm. This accounts for regional differences in rainfall and is consistent with existing SUSMP design criteria.

A. The 85th percentile 24-hour runoff event determined, as the maximized capture stormwater volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/SCE Manual of Practice No. 87, (1998), or

B. The volume of annual runoff, based on unit basin storage water quality volume, to achieve 80 percent or more volume treatment by the method recommended in California Stormwater Best Management Practices Handbook – Industrial/Commercial, (1993), or

C. The volume of runoff produced from a 0.75-inch storm event prior to its discharge to a stormwater conveyance system, or

D. The volume of runoff produced from a historical record based reference 24-hour rainfall criterion for treatment 0.75 inch average for the County of Los Angeles area) that achieves approximately the same reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event.

Step 3: Calculate undeveloped runoff volume

Using an approved hydrologic analysis tool consistent with the Los Angeles County Department of Public Works Hydrology Manual, determine the volume associated with the selected design storm assuming clear flows and undeveloped site conditions (0 percent impervious surfaces).

Step 4: Calculate developed runoff volume

Using the same design storm, determine the runoff volume associated with the proposed development. The impervious values shall be consistent with the hydrology manual recommendations based on land-use type.

Step 5: Calculate the excess volume (ΔV)

Subtract the undeveloped runoff volume from the developed runoff volume. This quantity is required to be infiltrated wherever possible at the site level and the BMPs used to accomplish this requirement shall be distributed throughout the project site.

Step 6: Determine water quality treatment volume or flow rate

The entire volume identified in Step 4 must be treated or infiltrated or one of the following flow rate based events can be used to determine the flow rate of runoff that must be treated:

A. The flow of runoff produced from a rain event equal to at least 0.2 inches per hour intensity; or

B. The flow of runoff produced from a rain event equal to at least 2 times the 85th percentile hourly rainfall intensity for the County of Los Angeles; or

C. The flow of runoff produced from a rain event that will result in treatment of the same portion of runoff as treated using volumetric standards above.

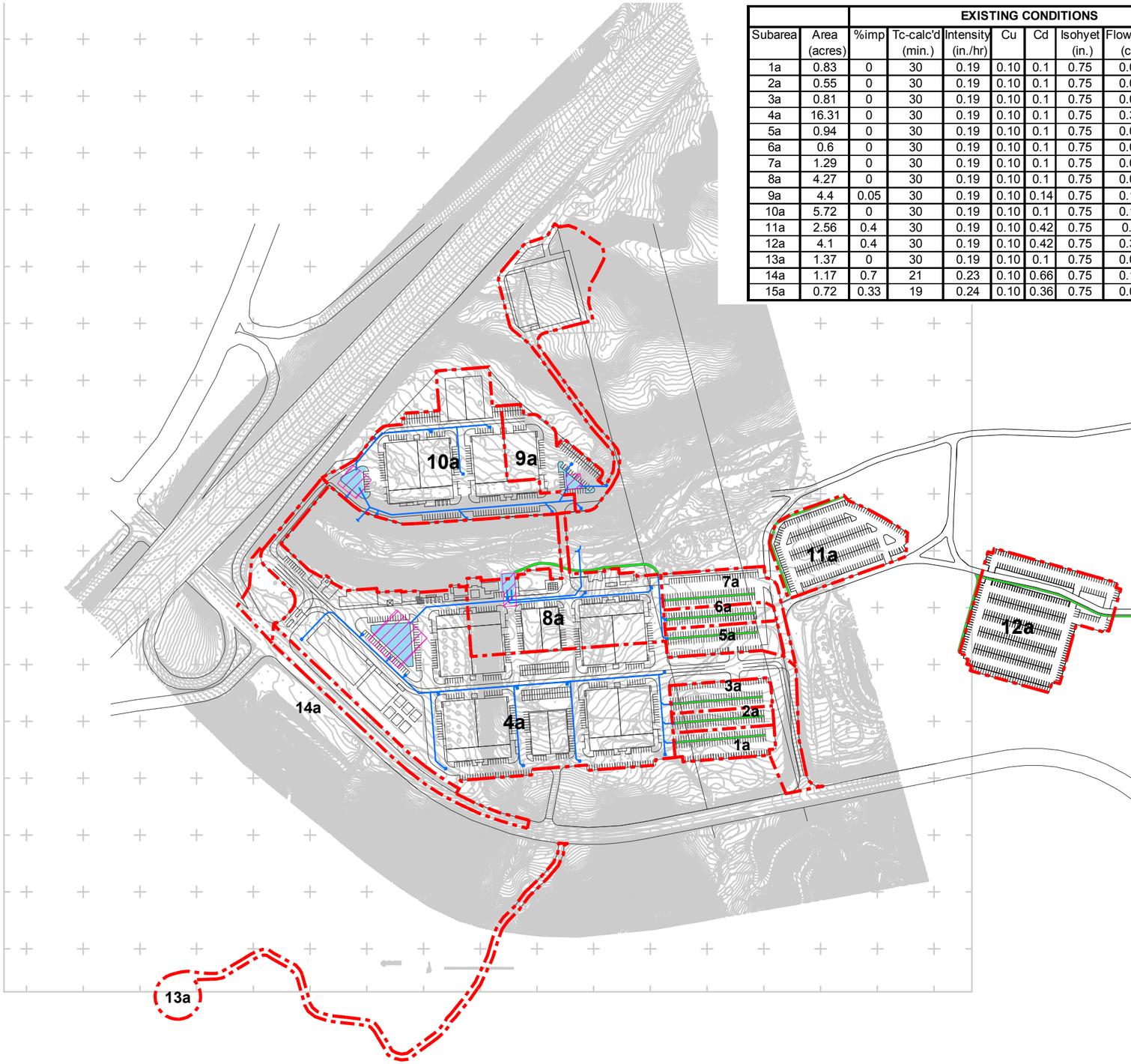
DISNEY / ABC STUDIOS AT THE RANCH
LID HYDROLOGY CALCULATIONS
DELTA VOLUME / FLOWS

		EXISTING CONDITIONS								PROPOSED CONDITIONS								
Subarea	Area (acres)	%imp	Tc-calc'd (min.)	Intensity (in./hr)	Cu	Cd	Isohyet (in.)	Flow rate (cfs)	Volume (acre-ft)	%imp	Tc-calc'd (min.)	Intensity (in./hr)	Cu	Cd	Isohyet (in.)	Flow rate (cfs)	Volume (acre-ft)	Delta V (acre-ft)
1a	0.83	0	30	0.19	0.10	0.1	0.75	0.02	0.01	0.91	27	0.2	0.10	0.83	0.75	0.14	0.04	0.03
2a	0.55	0	30	0.19	0.10	0.1	0.75	0.01	0	0.91	27	0.2	0.10	0.83	0.75	0.09	0.03	0.03
3a	0.81	0	30	0.19	0.10	0.1	0.75	0.02	0	0.91	28	0.2	0.10	0.83	0.75	0.13	0.04	0.04
4a	16.31	0	30	0.19	0.10	0.1	0.75	0.31	0.1	0.91	30	0.19	0.10	0.83	0.75	2.57	0.84	0.74
5a	0.94	0	30	0.19	0.10	0.1	0.75	0.02	0.01	0.91	27	0.2	0.10	0.83	0.75	0.16	0.05	0.04
6a	0.6	0	30	0.19	0.10	0.1	0.75	0.01	0	0.91	27	0.2	0.10	0.83	0.75	0.1	0.03	0.03
7a	1.29	0	30	0.19	0.10	0.1	0.75	0.02	0.01	0.91	30	0.19	0.10	0.83	0.75	0.2	0.07	0.06
8a	4.27	0	30	0.19	0.10	0.1	0.75	0.08	0.03	0.91	30	0.19	0.10	0.83	0.75	0.67	0.22	0.19
9a	4.4	0.05	30	0.19	0.10	0.14	0.75	0.12	0.04	0.91	30	0.19	0.10	0.83	0.75	0.69	0.23	0.19
10a	5.72	0	30	0.19	0.10	0.1	0.75	0.11	0.04	0.91	30	0.19	0.10	0.83	0.75	0.9	0.29	0.25
11a	2.56	0.4	30	0.19	0.10	0.42	0.75	0.2	0.02	0.4	30	0.19	0.10	0.42	0.75	0.2	0.07	0.05
12a	4.1	0.4	30	0.19	0.10	0.42	0.75	0.33	0.03	0.4	30	0.19	0.10	0.42	0.75	0.33	0.11	0.08
13a	1.37	0	30	0.19	0.10	0.1	0.75	0.03	0.01	0.91	30	0.19	0.10	0.83	0.75	0.22	0.07	0.06
14a	1.17	0.7	21	0.23	0.10	0.66	0.75	0.18	0.05	0.85	19	0.24	0.10	0.78	0.75	0.22	0.06	0.01
15a	0.72	0.33	19	0.24	0.10	0.36	0.75	0.06	0.02	0.33	19	0.24	0.10	0.36	0.75	0.06	0.02	0

SDV=1.80 AC-FT

		EXISTING CONDITIONS								PROPOSED CONDITIONS								
Subarea	Area (acres)	%imp	Tc-calc'd (min.)	Intensity (in./hr)	Cu	Cd	Isohyet (in.)	Flow rate (cfs)	Volume (acre-ft)	%imp	Tc-calc'd (min.)	Intensity (in./hr)	Cu	Cd	Isohyet (in.)	Flow rate (cfs)	Volume (acre-ft)	Delta V (acre-ft)
1a	0.83	0	30	0.19	0.10	0.1	0.75	0.02	0.01	0.91	27	0.2	0.10	0.83	0.75	0.14	0.04	0.03
2a	0.55	0	30	0.19	0.10	0.1	0.75	0.01	0	0.91	27	0.2	0.10	0.83	0.75	0.09	0.03	0.03
3a	0.81	0	30	0.19	0.10	0.1	0.75	0.02	0	0.91	28	0.2	0.10	0.83	0.75	0.13	0.04	0.04
4a	16.31	0	30	0.19	0.10	0.1	0.75	0.31	0.1	0.91	30	0.19	0.10	0.83	0.75	2.57	0.84	0.74
5a	0.94	0	30	0.19	0.10	0.1	0.75	0.02	0.01	0.91	27	0.2	0.10	0.83	0.75	0.16	0.05	0.04
6a	0.6	0	30	0.19	0.10	0.1	0.75	0.01	0	0.91	27	0.2	0.10	0.83	0.75	0.1	0.03	0.03
7a	1.29	0	30	0.19	0.10	0.1	0.75	0.02	0.01	0.91	30	0.19	0.10	0.83	0.75	0.2	0.07	0.06
8a	4.27	0	30	0.19	0.10	0.1	0.75	0.08	0.03	0.91	30	0.19	0.10	0.83	0.75	0.67	0.22	0.19
9a	4.4	0.05	30	0.19	0.10	0.14	0.75	0.12	0.04	0.91	30	0.19	0.10	0.83	0.75	0.69	0.23	0.19
10a	5.72	0	30	0.19	0.10	0.1	0.75	0.11	0.04	0.91	30	0.19	0.10	0.83	0.75	0.9	0.29	0.25
11a	2.56	0.4	30	0.19	0.10	0.42	0.75	0.2	0.02	0.4	30	0.19	0.10	0.42	0.75	0.2	0.07	0.05
12a	4.1	0.4	30	0.19	0.10	0.42	0.75	0.33	0.03	0.4	30	0.19	0.10	0.42	0.75	0.33	0.11	0.08
13a	1.37	0	30	0.19	0.10	0.1	0.75	0.03	0.01	0.91	30	0.19	0.10	0.83	0.75	0.22	0.07	0.06
14a	1.17	0.7	21	0.23	0.10	0.66	0.75	0.18	0.05	0.85	19	0.24	0.10	0.78	0.75	0.22	0.06	0.01
15a	0.72	0.33	19	0.24	0.10	0.36	0.75	0.06	0.02	0.33	19	0.24	0.10	0.36	0.75	0.06	0.02	0

$\Sigma\Delta V$= **1.80 Ac-Ft**



0 200 400 800 Feet

Legend

- Tributary Boundary
- Underground Storage System Alt. 1 (See Figure 10 for Alt.2)
- Proposed Storm Drain System
- Vegetated Swale
- Detention/Retention Basin

FIGURE 13

DISNEY | ABC STUDIOS

AT THE RANCH

BMP EXHIBIT
LID HYDROLOGY

DAVID EVANS AND ASSOCIATES INC.
4200 Concours Suite 200
Ontario, California 91764
TELEPHONE: 909.481.5750
WEBSITE: www.deainc.com

UNDERGROUND STORAGE CALCULATIONS:

- **NORTH AREA:**

  - Undeveloped Water Quality (Typ.) Volume:
    V=C*(P/12)*A

    C= 0.72
    P= 7.53 V=0.72*(7.53/12)*10.12
    A= 10.12 V= 4.57 Ac-ft

  - Developed Water Quality (Typ.) Volume:

    C= 0.88
    P= 7.53 V=0.88*(7.53/12)*10.12
    A= 10.12 V= 5.59 Ac-ft

    ΔV= 1.02 Ac-ft (44431 ft^3)

- **SOUTH AREA:**

  - Undeveloped Water Quality (Typ.) Volume:
    V=C*(P/12)*A

    C= 0.72
    P= 7.53 V=0.72*(7.53/12)*25.6
    A= 25.6 V= 11.57 Ac-ft

  - Developed Water Quality (Typ.) Volume:

    C= 0.88
    P= 7.53 V=0.88*(7.53/12)*25.6
    A= 25.6 V= 14.13 Ac-ft

    ΔV= 2.56 Ac-ft (111514 ft^3)

3-D. LID Best Management Practices

INFILTRATION BASIN

POLLUTANT REMOVAL	
Sediment	High
Nutrients	High
Trash	High
Metals	High
Bacteria	High
Oil and Grease	High
Organics	High

DESCRIPTION

An infiltration basin is a shallow surface pond that is designed to infiltrate stormwater through permeable soils. Infiltration basins retain runoff until it gradually infiltrates through the soil and eventually into the groundwater. Vegetation is used to avoid erosion of the basin bottom and slopes. The vegetation provides pollutant removal efficiency and can also help recharge groundwater, thus helping to maintain low flows in stream systems. Pollutant removal takes place through a combination of filtration, adsorption, and biological processes.

Infiltration basins are effective in reducing the pollutants of concern listed above; however, coarser sediments can clog and render the basin ineffective. An evaluation of the soils at the site is required to determine if an infiltration basin is an appropriate BMP to use.

As opposed to infiltration trenches, an infiltration basin creates a visible surface pond because it is not backfilled with rocks or stones. Infiltration basins are generally used for drainage areas between 5 and 50 acres. For drainage areas less than 5 acres, an infiltration trench or other BMP may be more appropriate. For drainage areas greater than 50 acres, maintenance of an infiltration basin would be burdensome and an extended/dry detention basin or wet pond may be more appropriate.

Infiltration basins are generally dry except immediately following storms. A low-flow channel may be necessary if a constant base flow is present.

ADVANTAGES	LIMITATIONS
• Avoids discharge to surface waters • Good pollutart removal capabilities • Controls runoff volume • Provides erosion and flood control • Provides groundwater recharge • Provides more habitat value than other infiltration systems • It replicates pre-development hydrology • Can fulfill an area's landscape requirement	• Dependent upon soil and subsurface conditions • High failure rates due to clogging and high maintenance burden • Sediment forebay or pretreatment required • Not recommended to treat industrial sites or sites where hazardous spills may occur • Minimum soil infiltration rate of 0.5 inches/hour • Soil infiltration rates greater than 2.4 inches/hour require full treatment of water prior to infiltration, due to risk of groundwater contamination • Not appropriate for sites with Hydrologic Soil Types C and D • In coarse soil types there is risk of groundwater contamination • Requires complete stabilization of upstream drainage areas prior to construction • Not suitable for fill areas or steep slopes • Once basin becomes clogged it is difficult to restore function • Accumulation of metals and petroleum hydrocarbons may reach toxic level

GENERAL CONSTRAINTS AND SITE CONCERNS

The use of an infiltration basin may be limited by a number of factors, including type of native soils, climate, and location of groundwater table. Site characteristics such as excessive slope of the drainage area, fine-grained soil types, and proximate location of the water table and bedrock may preclude the use of an infiltration basin. Generally, infiltration basins are not suitable for areas with relatively impermeable soils containing clay and silt or in areas with fill.

As with any infiltration BMP, the potential for groundwater contamination must be carefully considered, especially if the groundwater is used for human consumption or agricultural purposes. The infiltration basin is not suitable for sites that use or store chemicals or hazardous materials unless hazardous and toxic materials are prevented from entering the basin. In these areas, other BMPs that do not allow interaction with The groundwater should be considered. In addition, an appropriate erosion-control seed mix needs to be used for the basin.

An infiltration basin needs to be built without driving heavy equipment over the infiltration surface. Any equipment driven on the surface should have extra-wide (low pressure) tires. Prior to any construction, the infiltration area needs to be enclosed with a top to stop entrance by unwanted equipment.

It is important to note that before construction begins, the entire drainage area needs to be stabilized. This can be done by implementing a temporary diversion berm around the perimeter of the construction site to prevent drainage and sediment buildup to this area. After construction is completed, the entire contributing drainage area needs to be stabilized and clean of construction material before runoff can be allowed into the infiltration basin.

Evaluation of a particular site to determine if the use of an infiltration basin is appropriate includes:

- Determination of the soil type (ASTM D 3385-88 – Consider NRCS Soil Types A and B only) and consult USDA Soil Survey Tables to review other parameters such as the amount of silt and clay, presence of a restrictive layer or seasonal high water table, and estimated permeability. The soil should not have more than 30 percent clay or more than 40 percent of clay and silt combined. Eliminate sites that are clearly unsuitable for infiltration.
- Groundwater separation should be at least 10 feet from the basin invert to the measured groundwater elevation and 100 feet away from groundwater wells. There is concern at the State and regional levels of the impact on groundwater quality from infiltrated runoff, especially when the separation between groundwater and the surface is small.
- Placement should be away from buildings, slopes, and highway pavement (greater than 10 feet) and production wells and bridge structures (greater than 100 feet).
- Sites constructed of fill having a base flow or with a slope greater than 15 percent should not be considered.
- Ensure that adequate head is available to operate flow-splitter structures (to allow the basin to be off-line) without ponding in the splitter structure or creating backwater upstream of the splitter.
- Base flow should not be present in the tributary watershed.

VEGETATED SWALES

POLLUTANT REMOVAL	
Sediment	Medium
Nutrients	Low
Trash	Low
Metals	Medium
Bacteria	Low
Oil and Grease	Medium
Organics	Medium

DESCRIPTION

Vegetated swales are open, shallow channels with low-lying vegetation covering the side slopes and bottom that collect and slowly convey runoff flow to downstream discharge points. Vegetated swales provide pollutant removal through settling and filtration in the vegetation (usually grasses) lining the channels, provide the opportunity for volume reduction through infiltration and evapotranspiration, and reduce the flow velocity in addition to conveying stormwater runoff. An effective vegetated swale achieves uniform sheet flow over and through a densely vegetated area for a period of several minutes. The vegetation in the swale can vary depending on its location within a development project and is the choice of the designer depending on the functional criteria outlined below. Swales that are integrated within a project may use turf or other more intensive landscaping while swales that are located on the project perimeter, within a park, or close to an open space area may be planted with a more naturalistic plant palette.

ADVANTAGES	LIMITATIONS
• Potentially inexpensive • Significant collateral water quality benefits • Roadside ditches are easily converted to swales	• Can be difficult to avoid channelization • Cannot treat a large drainage area. Large areas may need to be divided and treated with several swales • Impractical in areas with steep topography • Not effective and may even erode when flow velocities are high if the grass cover is not properly maintained • In some places their use is restricted by law; many local municipalities require curb and gutter systems in residential areas • Swales are more susceptible to failure, if not properly maintained, than other treatment BMPs

GENERAL CONSTRAINTS AND SITE CONCERNS

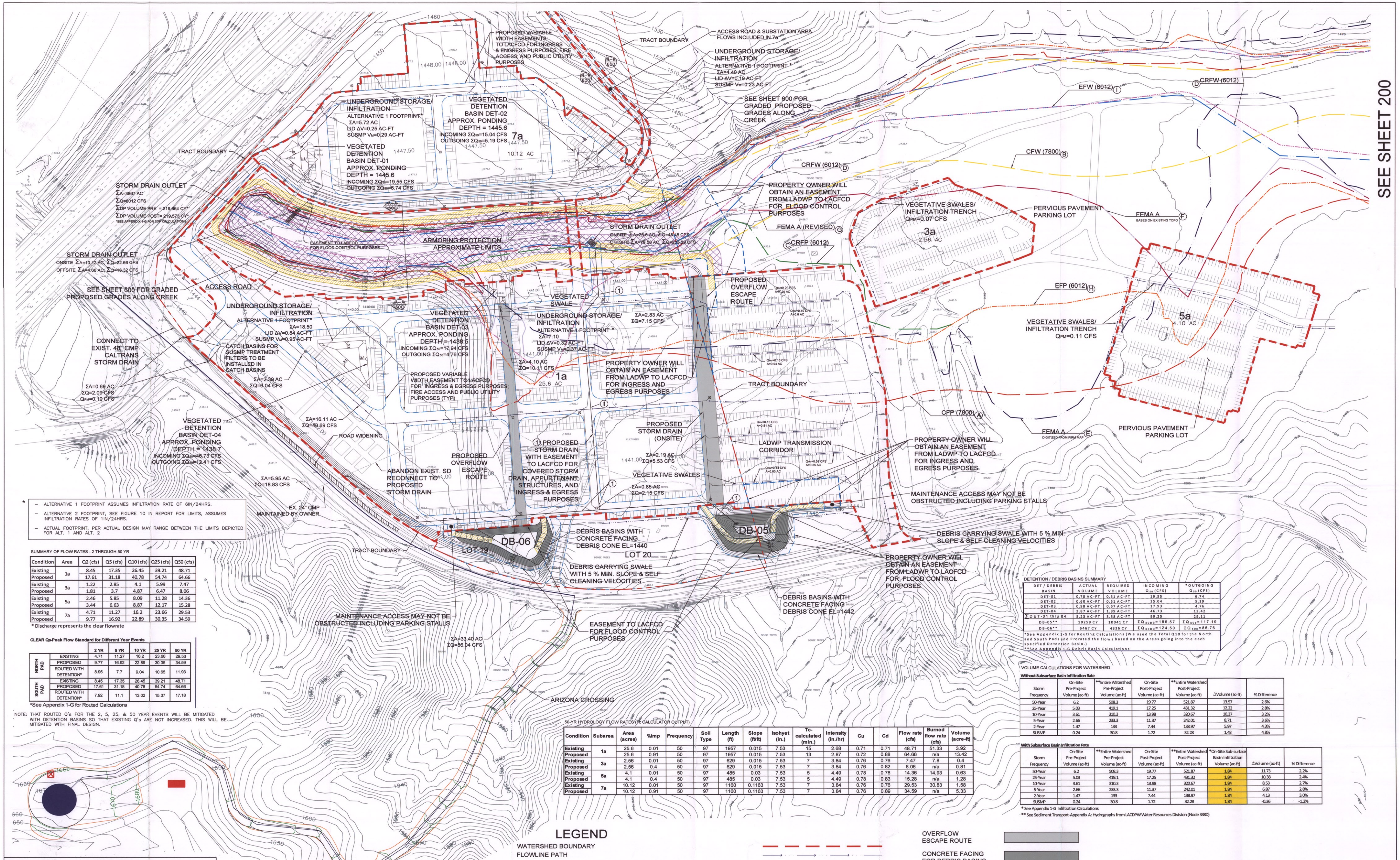
• Steep terrain and/or large tributary areas may cause erosive flows.

• Limited site slope may cause ponding.

• Swales must not interfere with flood control functions of existing conveyance and detention structures.

MULTIUSE OPPORTUNITIES

Swales can easily be converted into roadside vegetated buffers or parking lot landscaping.



* — ALTERNATIVE 1 FOOTPRINT ASSUMES INFILTRATION RATE OF 6IN/24HRS.
— ALTERNATIVE 2 FOOTPRINT, SEE FIGURE 10 IN REPORT FOR LIMITS, ASSUMES INFILTRATION RATES OF 1IN/24HRS.
— ACTUAL FOOTPRINT, PER ACTUAL DESIGN MAY RANGE BETWEEN THE LIMITS DEPICTED FOR ALT. 1 AND ALT. 2

SUMMARY OF FLOW RATES - 2 THROUGH 50 YR

Condition	Area	Q2 (cfs)	Q5 (cfs)	Q10 (cfs)	Q25 (cfs)	Q50 (cfs)
Existing	1a	8.45	17.35	26.45	39.21	48.71
Proposed		17.61	31.18	40.78	54.74	64.66
Existing	3a	1.22	2.85	4.1	5.99	7.47
Proposed		1.81	3.7	4.87	6.47	8.06
Existing	5a	2.46	5.85	8.09	11.28	14.36
Proposed		3.44	6.63	8.87	12.17	15.28
Existing	7a	4.71	11.27	16.2	23.66	29.53
Proposed		9.77	16.92	22.89	30.35	34.59

* Discharge represents the clear flowrate

CLEAR Qs-Peak Flow Standard for Different Year Events

		2 YR	5 YR	10 YR	25 YR	50 YR
NORTH PAD	EXISTING	4.71	11.27	16.2	23.66	29.53
	PROPOSED	9.77	16.92	22.89	30.35	34.59
	ROUTED WITH DETENTION*	8.95	7.7	9.04	10.65	11.93
SOUTH PAD	EXISTING	8.45	17.35	26.45	39.21	48.71
	PROPOSED	17.61	31.18	40.78	54.74	64.66
	ROUTED WITH DETENTION*	7.92	11.1	13.02	15.37	17.18

*See Appendix 1-G for Routed Calculations

NOTE: THAT ROUTED Q's FOR THE 2, 5, 25, & 50 YEAR EVENTS WILL BE MITIGATED WITH DETENTION BASINS SO THAT EXISTING Q's ARE NOT INCREASED. THIS WILL BE MITIGATED WITH FINAL DESIGN.

50-YR HYDROLOGY FLOW RATES (Tc CALCULATOR OUTPUT)

Condition	Subarea	Area (acres)	%imp	Frequency	Soil Type	Length (ft)	Slope (ft/ft)	Isohyet (in.)	Tc-calculated (min.)	Intensity (in./hr)	Cu	Cd	Flow rate (cfs)	Burned flow rate (cfs)	Volume (acre-ft)
Existing	1a	25.6	0.01	50	97	1957	0.015	7.53	15	2.68	0.71	0.71	48.71	51.33	3.92
Proposed		25.6	0.91	50	97	1957	0.015	7.53	13	2.87	0.72	0.88	64.66	n/a	13.42
Existing	3a	2.56	0.01	50	97	629	0.015	7.53	7	3.84	0.76	0.76	7.47	7.8	0.4
Proposed		2.56	0.4	50	97	629	0.015	7.53	7	3.84	0.76	0.82	8.06	n/a	0.81
Existing	5a	4.1	0.01	50	97	485	0.03	7.53	5	4.49	0.78	0.78	14.36	14.93	0.63
Proposed		4.1	0.4	50	97	485	0.03	7.53	5	4.49	0.78	0.83	15.28	n/a	1.28
Existing	7a	10.12	0.01	50	97	1160	0.1163	7.53	7	3.84	0.76	0.76	29.53	30.83	1.58
Proposed		10.12	0.91	50	97	1160	0.1163	7.53	7	3.84	0.76	0.89	34.59	n/a	5.33

DETENTION / DEBRIS BASINS SUMMARY

DET / DEBRIS BASIN	ACTUAL VOLUME	REQUIRED VOLUME	INCOMING Q_{50} (CFS)	*OUTGOING Q_{50} (CFS)
DET-01	0.78 AC-FT	0.51 AC-FT	19.55	6.74
DET-02	0.60 AC-FT	0.51 AC-FT	15.04	5.19
DET-03	0.98 AC-FT	0.67 AC-FT	17.93	4.76
DET-04	2.87 AC-FT	1.89 AC-FT	46.73	12.42
Σ DET-01 thru 04	5.23 AC-FT	3.58 AC-FT	99.25	29.11
DB-05**	10258 CY	10041 CY	ΣQ_{50BB}=186.57	ΣQ_{50b}=117.19
DB-06**	6467 CY	4336 CY	ΣQ_{50BB}=124.50	ΣQ_{50b}=85.76

*See Appendix 1-G for Routing Calculations (We used the Total Q50 for the North and South Pads and Prorated the flows based on the Areas going into the each specified Detention Basin.)
**See Appendix 1-G Debris Basin Calculations

VOLUME CALCULATIONS FOR WATERSHED

Without Subsurface Basin Infiltration Rate

Storm Frequency	On-Site Pre-Project Volume (ac-ft)	**Entire Watershed Pre-Project Volume (ac-ft)	On-Site Post-Project Volume (ac-ft)	**Entire Watershed Post-Project Volume (ac-ft)	ΔVolume (ac-ft)	% Difference
50-Year	6.2	508.3	19.77	521.87	13.57	2.6%
25-Year	5.03	419.1	17.25	431.32	12.22	2.8%
10-Year	3.61	310.3	13.98	320.67	10.37	3.2%
5-Year	2.66	233.3	11.37	242.01	8.71	3.6%
2-Year	1.47	133	7.44	138.97	5.97	4.3%
SUSMP	0.24	30.8	1.72	32.28	1.48	4.8%

With Subsurface Basin Infiltration Rate

Storm Frequency	On-Site Pre-Project Volume (ac-ft)	**Entire Watershed Pre-Project Volume (ac-ft)	On-Site Post-Project Volume (ac-ft)	**Entire Watershed Post-Project Volume (ac-ft)	*On-Site Sub-surface Basin Infiltration Volume (ac-ft)	ΔVolume (ac-ft)	% Difference
50-Year	6.2	508.3	19.77	521.87	1.84	11.73	2.2%
25-Year	5.03	419.1	17.25	431.32	1.84	10.38	2.4%
10-Year	3.61	310.3	13.98	320.67	1.84	8.53	2.7%
5-Year	2.66	233.3	11.37	242.01	1.84	6.87	2.8%
2-Year	1.47	133	7.44	138.97	1.84	4.13	3.0%
SUSMP	0.24	30.8	1.72	32.28	1.84	-0.36	-1.2%

* See Appendix 1-G Infiltration Calculations
** See Sediment Transport-Appendix A: Hydrographs from LACDPW Water Resources Division (Node 338D)

LEGEND

WATERSHED BOUNDARY
FLOWLINE PATH
Ⓐ CFP (7800) - COUNTY FLOODPLAIN ADOPTED ON 10/22/1985 (Q50= 7800 CFS)
Ⓑ CFW (7800) - COUNTY FLOODWAY ADOPTED ON 10/22/1985 (Q50= 7800 CFS)
Ⓒ CRFP (6012) - REVISED FLOODPLAIN (Q50= 6012 CFS)
Ⓓ CRFW (6012) - REVISED FLOODWAY (Q50= 6012 CFS)
Ⓔ FEMA ZONE A 09/26/2008 DIGITIZED FROM FIRM MAP (Q100=3,546CFS)
Ⓕ FEMA ZONE A BASED ON EXISTING TOPOGRAPHY (Q100=3,546CFS)
Ⓖ FEMA REVISED
Ⓗ EFP (6012) - EXISTING FLOODPLAIN (Q50= 6012 CFS)
Ⓘ EFW (6012) - EXISTING FLOOWAY (Q50= 6012 CFS)

OVERFLOW ESCAPE ROUTE
CONCRETE FACING FOR DEBRIS BASINS
15 FT ACCESS ROAD
APPROXIMATE LIMITS OF BANK ARMORING
PLACERITA CANYON ROAD IMPROVEMENTS
TRACT BOUNDARY
PROPOSED EASEMENT

MAINTENANCE RESPONSIBILITY NOTES

① MAINTENANCE OF STORM DRAIN LINES AND APPURTENANCES BY LOS ANGELES COUNTY FLOOD CONTROL DISTRICT AS SHOWN HEREON. ALL OTHER DRAINAGE LINES AND APPURTENANCES TO BE MAINTAINED BY OWNER.

All LANDSCAPED SLOPES AND OPEN SPACE AREAS TO BE MAINTAINED BY OWNER/APPLICANT.

ALL ON-SITE ACCESS ROADS AND BRIDGE TO BE MAINTAINED BY OWNER/APPLICANT.

NOTE

A FEMA APPROVED CLOMR WILL BE REQUIRED PRIOR TO APPROVAL OF GRADING PLANS.

SUSMP/ DRAINAGE CONCEPT / LID PLAN
APPROVED FOR DRAINAGE
APPROVED BY: Lizbeth Calderón RCE NO. C68328 DATE: 8/22/11
CHECKED BY: DATE: 8/23/11
LAND DEVELOPMENT DIVISION
LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

REGISTERED PROFESSIONAL ENGINEER JEFFREY KARL RUPP NO. 42868 Exp. 3/31/2012 CIVIL STATE OF CALIFORNIA

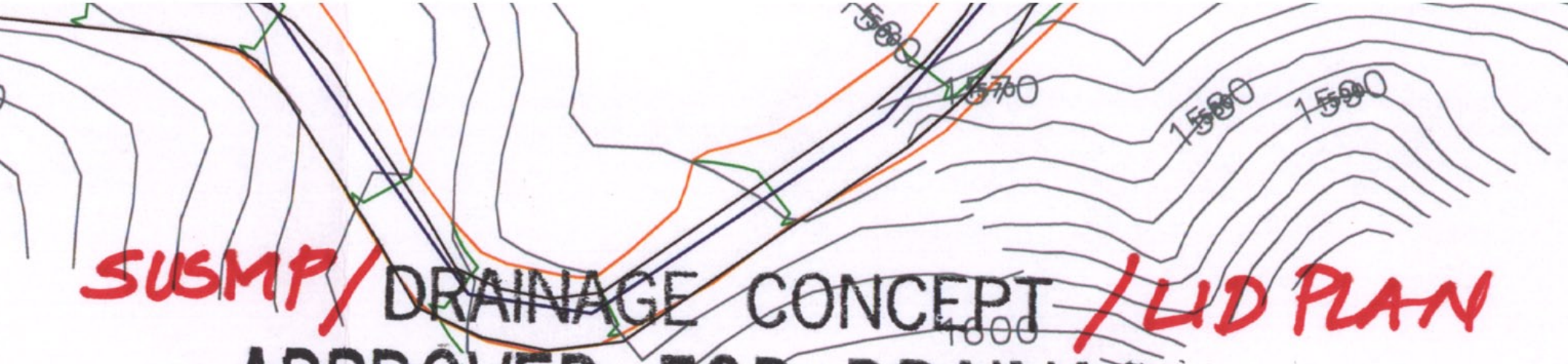
0 40 80 160
SCALE: 1"=80'

SHEET 100: HYDROLOGY MAP 1/2

DAVID EVANS AND ASSOCIATES INC.
4200 Concours, Suite 200
Ontario California 91764
Phone: 909.481.5750

DRAINAGE CONCEPT / ~~HYDROLOGY STUDY /~~ SUSMP / LID PLAN FOR TR 71216 ONSITE

RECEIVED AUG 22 2011 PROCESSING CENTER LAND DEVELOPMENT DIVISION



SUSMP / DRAINAGE CONCEPT / LID PLAN

APPROVED FOR DRAINAGE

APPROVED BY: Elizabeth Calderón RCE NO. C68328 DATE: 8/22/11

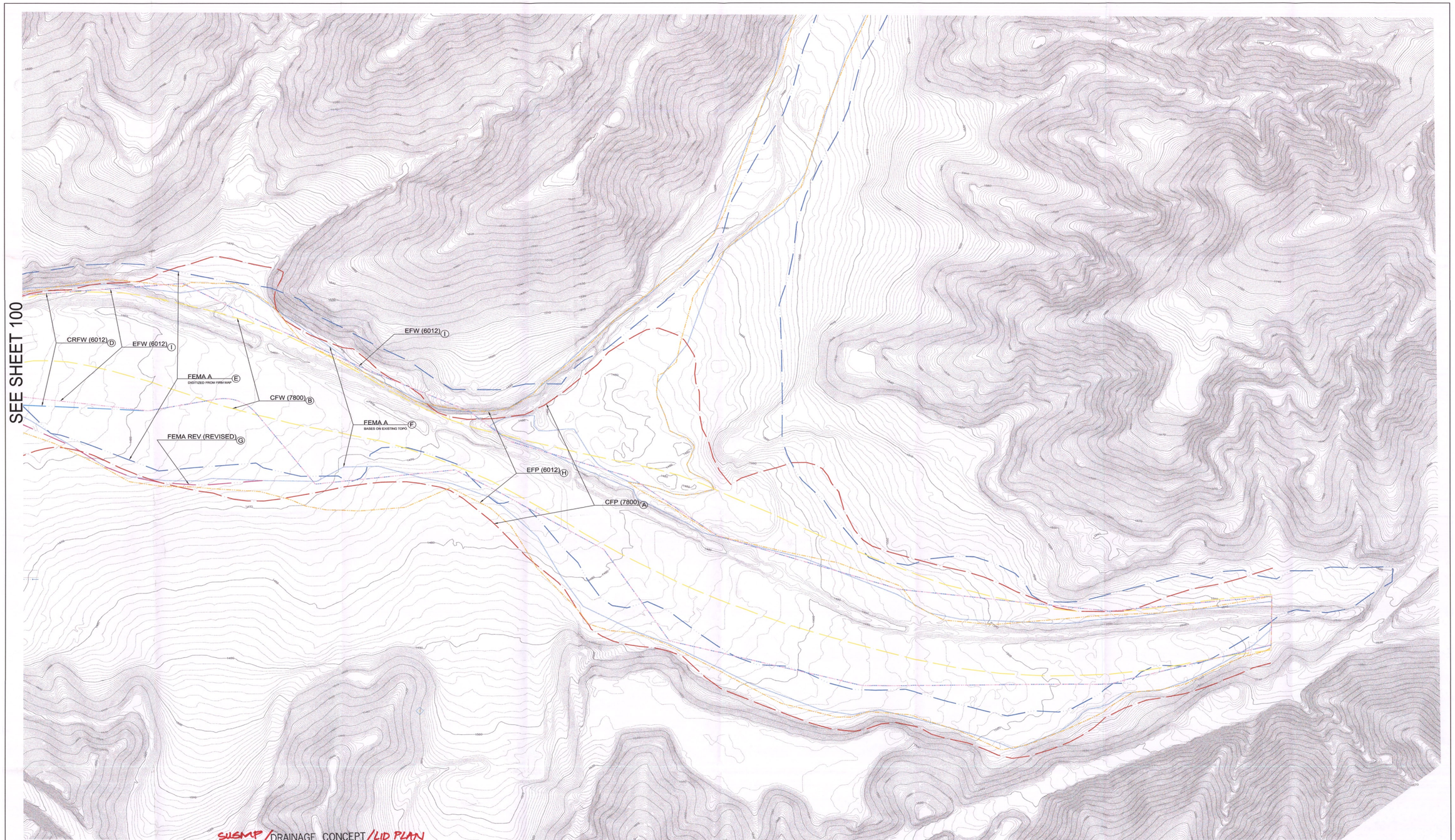
CHECKED BY: _____ DATE: 8/23/11

LAND DEVELOPMENT DIVISION
LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

MAGNETIC

0 40 80 160

SCALE: 1"=80'



SUSMP / DRAINAGE CONCEPT / LID PLAN

APPROVED FOR DRAINAGE

APPROVED BY: Yashdip Chilkowa RCE NO. C68324 DATE: 8/22/11

CHECKED BY: DATE: 8/22/11

LAND DEVELOPMENT DIVISION
LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

0 40 80 160
SCALE: 1"=80'

REGISTERED PROFESSIONAL ENGINEER
JEFFREY KARL RUPP
NO. 42868
Exp. 3/31/2012
CIVIL
STATE OF CALIFORNIA

LEGEND

WATERSHED BOUNDARY
FLOWLINE PATH

(A) CFP (7800) - COUNTY FLOODPLAIN ADOPTED ON 10/22/1985 (Q50= 7800 CFS)
(B) CFW (7800) - COUNTY FLOODWAY ADOPTED ON 10/22/1985 (Q50= 7800 CFS)

(C) CRFP (6012) - REVISED FLOODPLAIN (Q50= 6012 CFS)
(D) CRFW (6012) - REVISED FLOODWAY (Q50= 6012 CFS)

(E) FEMA ZONE A 09/26/2008 DIGITIZED FROM FIRM MAP (Q100=3,546CFS)
(F) FEMA ZONE A BASED ON EXISTING TOPOGRAPHY (Q100=3,546CFS)
(G) FEMA REVISED

(H) EFP (6012) - EXISTING FLOODPLAIN (Q50= 6012 CFS)
(I) EFW (6012) - EXISTING FLOOWAY (Q50= 6012 CFS)

NOTE
A FEMA APPROVED CLOMR WILL BE REQUIRED PRIOR TO APPROVAL OF GRADING PLANS.

SHEET 200: HYDROLOGY MAP 2/2

DAVID EVANS AND ASSOCIATES INC.
4200 Concours, Suite 200
Ontario California 91764
Phone: 909.481.5750

DRAINAGE CONCEPT /
~~HYDROLOGY STUDY~~ /
SUSMP / LID PLAN
FOR TR 71216
ONSITE

SUSMP / DRAINAGE CONCEPT / LID PLAN

APPROVED FOR DRAINAGE

APPROVED BY: Lizbeth Calderón RCE NO. C68328 DATE: 8/22/11

CHECKED BY: _____ DATE: 8/23/11

LAND DEVELOPMENT DIVISION
LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

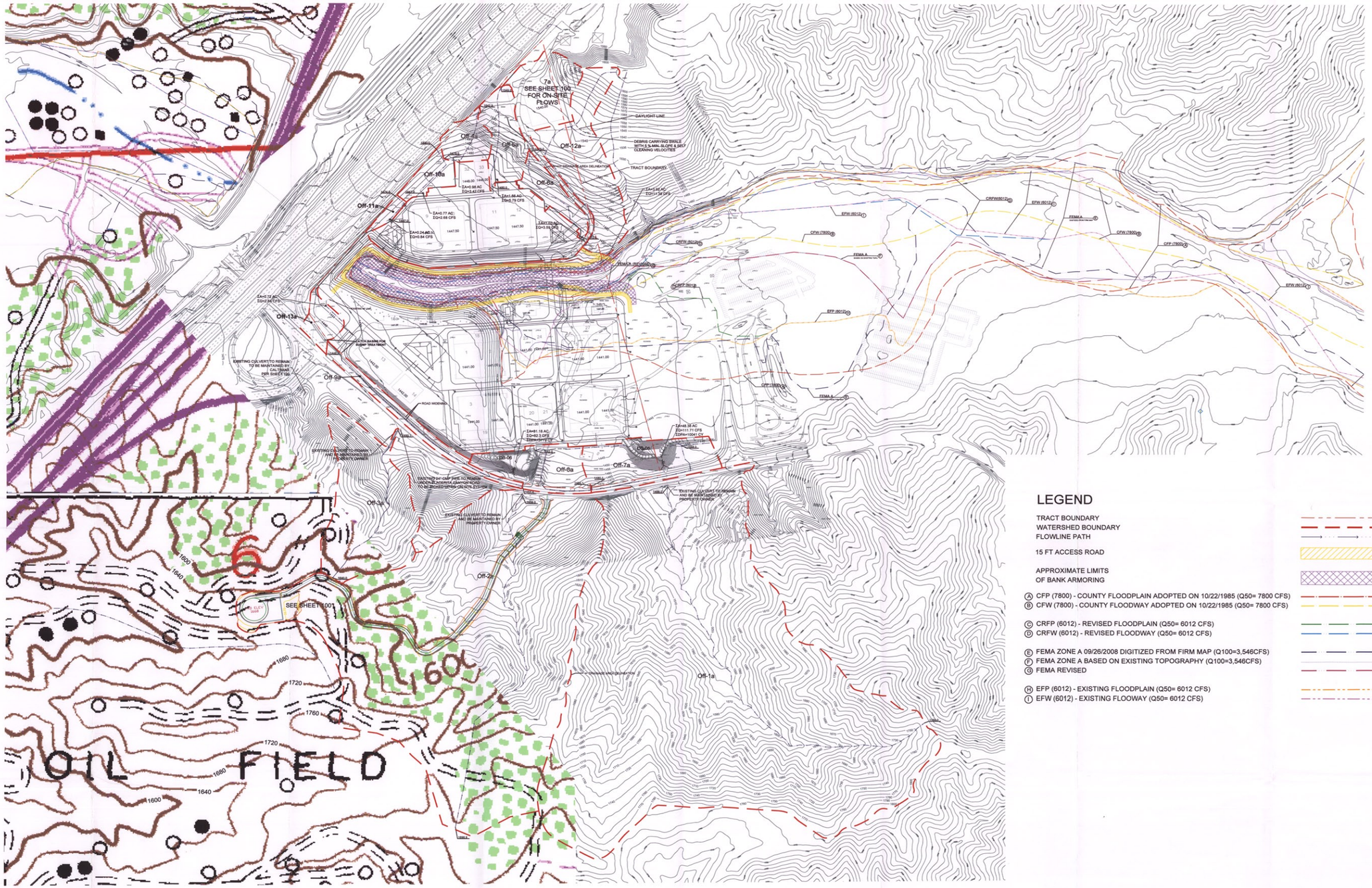
2/2

MAGNETIC

0 40 80 160

SCALE: 1"=80'

REGISTERED PROFESSIONAL ENGINEER
JEFFREY
KARL
RUPP
NO. 42868
Exp. 3/31/2012
CIVIL
STATE OF CALIFORNIA



LEGEND

TRACT BOUNDARY
WATERSHED BOUNDARY
FLOWLINE PATH

15 FT ACCESS ROAD

APPROXIMATE LIMITS OF BANK ARMORING

(A) CFP (7800) - COUNTY FLOODPLAIN ADOPTED ON 10/22/1985 (Q50= 7800 CFS)
(B) CFW (7800) - COUNTY FLOODWAY ADOPTED ON 10/22/1985 (Q50= 7800 CFS)

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(E) FEMA ZONE A 09/26/2008 DIGITIZED FROM FIRM MAP (Q100=3,546CFS)
(F) FEMA ZONE A BASED ON EXISTING TOPOGRAPHY (Q100=3,546CFS)
(G) FEMA REVISED

(H) EFP (6012) - EXISTING FLOODPLAIN (Q50= 6012 CFS)
(I) EFW (6012) - EXISTING FLOOWAY (Q50= 6012 CFS)

RECEIVED
AUG 2 2 2011
PROCESSING CENTER
LAND DEVELOPMENT DIVISION

SHEET 300: HYDROLOGY MAP 1/2

DAVID EVANS AND ASSOCIATES INC.
4200 Concours, Suite 200
Ontario California 91764
Phone: 909.481.5750

DRAINAGE CONCEPT / ~~HYDROLOGY STUDY~~ / SUSMP / LID PLAN FOR TR 71216 OFF-SITE

REGISTERED PROFESSIONAL ENGINEER
JEFFREY KARL RUPP
NO. 42868
Exp. 3/31/2012
CIVIL
STATE OF CALIFORNIA

0 75 150 300
SCALE: 1"=150'

SUSMP / DRAINAGE CONCEPT / LID PLAN
APPROVED FOR DRAINAGE

APPROVED BY: Zachary Calderon RCE NO. C68328 DATE: 8/22/11
CHECKED BY: _____ DATE: 8/23/11

LAND DEVELOPMENT DIVISION
LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

HYDROLOGY PARAMETERS

Subarea	Area (acres)	%Imp	Frequency	Soil Type	Elev UP (ft)	Elev DW (ft)	Length (ft)	Slope	Isohyet (in)	Fire Factor	DPA	Bulking Factor	DP Rate (CY/Mi²)	DP RATE (CY/AC)
Off-1a	45.54	0.01	50	97	1768.0	1458.0	2156.37	0.1437	7.5	0.34	3	1.62	140000	219
Off-2a	33.4	0.05	50	97	1698.9	1459.0	1753.8	0.1368	7.5	0.34	5	1.47	82000	128
Off-3a	5.95	0.01	50	97	1680.0	1450.1	949.42	0.2422	7.5	0.34	5	1.47	82000	128
Off-4a	0.98	0.01	50	97	1542.9	1479.0	357.25	0.1791	7.5	0.34	5	1.47	82000	128
Off-5a	1.66	0.01	50	97	1549.0	1480.0	488.98	0.1411	7.5	0.34	5	1.47	82000	128
Off-6a	1.03	0.01	50	97	1529.0	1472.0	506.41	0.1125	7.5	0.34	5	1.47	82000	128
Off-7a	2.84	0.01	50	97	1480.1	1448.0	671.10	0.0478	7.5	0.34	9	1.27	16500	26
Off-8a	2.16	0.01	50	97	1480.1	1442.0	472.96	0.0806	7.5	0.34	9	1.27	16500	26
Off-9a	1.17	0.91	50	97	1464.4	1448.8	1044.77	0.0149	7.5	0.34	9	1.27	16500	26
Off-10a	0.77	0.01	50	97	1490.0	1447.0	277.82	0.1548	7.5	0.34	5	1.47	82000	128
Off-11a	0.24	0.01	50	97	1474.0	1447.0	181.93	0.1777	7.5	0.34	5	1.47	82000	128
Off-12a	3.92	0.01	50	97	1605.0	1444.0	1217	0.1323	7.5	0.34	5	1.47	82000	128
Off-13a	0.72	0.33	50	97	1444.0	1443.0	103	0.0097	7.5	0.34	9	1.27	82000	26

50-YR HYDROLOGY FLOW RATES

Subarea	Area (acres)	%Imp	Frequency	Soil Type	Length (ft)	Slope (ft/ft)	Isohyet (in.)	Tc-calculated (min.)	Intensity (in./hr)	Cv	Cd	Flow rate (cfs)	Fire Factor	Burned flow rate (cfs)	Bulked flow rate (cfs)	Volume (acre-ft)	Debris (cy)
														Burned			
Off-1a	45.54	0.01	50	97	2156.37	0.1437	7.5	11	3.39	0.73	0.73	102.72	0.34	107.83	174.58	6.91	9968
Off-2a	33.4	0.05	50	97	1753.8	0.1368	7.5	9	3.39	0.75	0.75	86.05	0.34	89.69	131.84	5.66	4261
Off-3a	5.9	0.01	50	97	949.42	0.2422	7.5	5	4.11	0.77	0.77	18.38	0.34	19.12	28.11	0.88	740
Off-4a	0.98	0.01	50	97	357.25	0.1791	7.5	5	4.47	0.78	0.78	3.40	0.34	N/A	N/A	0.15	N/A
Off-5a	1.66	0.01	50	97	488.98	0.1411	7.5	5	4.47	0.78	0.78	5.79	0.34	N/A	N/A	0.35	N/A
Off-6a	1.03	0.01	50	97	506.41	0.1125	7.5	5	4.47	0.78	0.78	3.59	0.34	N/A	N/A	0.35	N/A
Off-7a	2.84	0.01	50	97	671.1	0.0478	7.5	6	4.11	0.77	0.77	8.99	0.34	9.36	11.89	0.43	13
Off-8a	2.16	0.01	50	97	472.96	0.0806	7.5	5	4.47	0.78	0.78	7.53	0.34	7.83	9.94	0.33	88
Off-9a	1.17	0.91	50	97	1044.77	0.0149	7.5	9	3.39	0.75	0.89	3.53	0.34	N/A	N/A	0.61	N/A
Off-10a	0.77	0.01	50	97	277.82	0.1548	7.5	5	4.47	0.78	0.78	2.68	0.34	2.79	3.54	0.12	31
Off-11a	0.24	0.01	50	97	181.93	0.1777	7.5	5	4.47	0.78	0.78	0.84	0.34	N/A	N/A	0.04	N/A
Off-12a	3.92	0.01	50	97	1217	0.1323	7.5	7	3.92	0.76	0.76	11.38	0.34	N/A	N/A	0.61	N/A
Off-13a	0.72	0.33	50	97	103	0.0097	7.5	5	4.47	0.78	0.82	2.64	0.34	N/A	N/A	0.2	N/A

SUSMP / DRAINAGE CONCEPT / LID PLAN

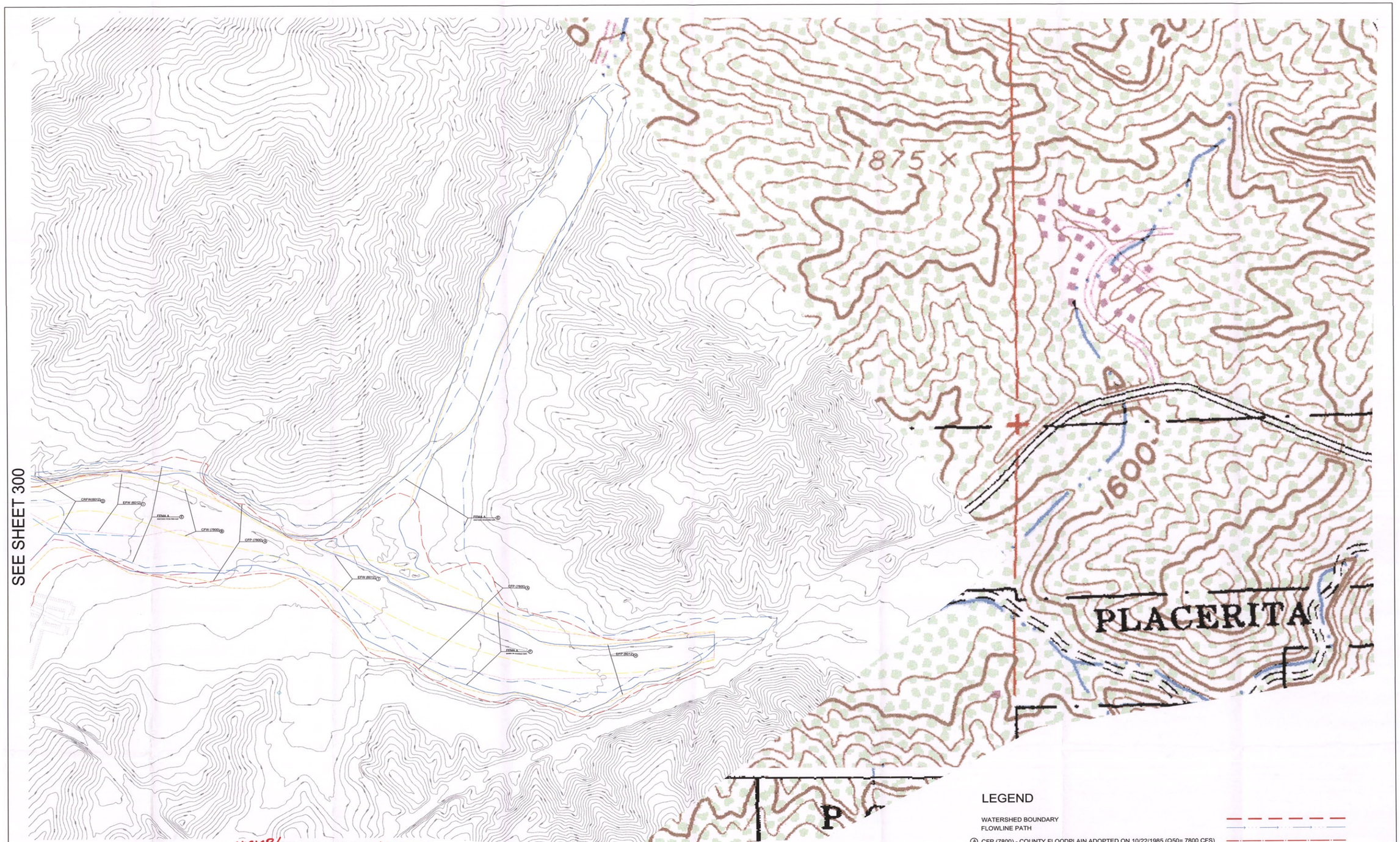
APPROVED FOR DRAINAGE

APPROVED BY: Lizbeth Calderon RCE NO. C68328 DATE: 8/22/11

CHECKED BY: DATE: 8/23/11

LAND DEVELOPMENT DIVISION

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS



LEGEND

WATERSHED BOUNDARY
FLOWLINE PATH

Ⓐ CFP (7800) - COUNTY FLOODPLAIN ADOPTED ON 10/22/1985 (Q50= 7800 CFS)
Ⓑ CFW (7800) - COUNTY FLOODWAY ADOPTED ON 10/22/1985 (Q50= 7800 CFS)

Ⓒ CRFP (6012) - REVISED FLOODPLAIN (Q50= 6012 CFS)
Ⓓ CRFW (6012) - REVISED FLOODWAY (Q50= 6012 CFS)

Ⓔ FEMA ZONE A 09/26/2008 DIGITIZED FROM FIRM MAP (Q100=3,546CFS)
Ⓕ FEMA ZONE A BASED ON EXISTING TOPOGRAPHY (Q100=3,546CFS)
Ⓖ FEMA REVISED

Ⓗ EFP (6012) - EXISTING FLOODPLAIN (Q50= 6012 CFS)
Ⓘ EFW (6012) - EXISTING FLOOWAY (Q50= 6012 CFS)

SUSMP/ DRAINAGE CONCEPT/LID PLAN
APPROVED FOR DRAINAGE
PROVED BY: Yakelly Calderon RCE NO. C68328 DAT.. 8/22/14
HECKED BY: _____ DATE: 8/22/14
LAND DEVELOPMENT DIVISION
LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

REGISTERED PROFESSIONAL ENGINEER
JEFFREY KARL RUPP
NO. 42868
Exp. 3/31/2012
CIVIL
STATE OF CALIFORNIA

0 75 150 300
SCALE: 1"=150'

SHEET 400: HYDROLOGY MAP 2/2

DAVID EVANS AND ASSOCIATES INC.
4200 Concours, Suite 200
Ontario California 91764
Phone: 909.481.5750

DRAINAGE CONCEPT /
~~HYDROLOGY STUDY~~
SUSMP / LID PLAN
FOR TR 71216
OFF-SITE

SUSMP / DRAINAGE CONCEPT / LID PLAN

APPROVED FOR DRAINAGE

APPROVED BY: Lizbeth Calderon RCE NO. C68328 DATE: 8/22/11

CHECKED BY: _____ DATE: 8/23/11

LAND DEVELOPMENT DIVISION
LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

REGISTERED PROFESSIONAL ENGINEER
JEFFREY
KARL
RUPP
NO. 42868
Exp. 3/31/2012
CIVIL
STATE OF CALIFORNIA

Table A - HEC-RAS Peak flow Rates for Placerita Creek

Pre-Project
Storm Frequency
50-Year Flow Rate Data

Node Number	HEC-RAS Section	Profile	Area (acres)	Clearwater Flow Rate (ft^3/s)	Burned Flow Rate (ft^3/s)	Bulked Flow Rate (ft^3/s)	Bulking Factor	Clearwater Flow Rate Yield (ft^3/s)/acre	Burned Flow Rate Yield (ft^3/s)/acre
326	1900	Upper	3082.8	3369.2	3702.6	5214.8	1.41	1.09	1.20
331	510	Tributary	369	616.7	639.1	874.1	1.37	1.67	1.73
335	1300	Lower	3682.3	3890.3	4269.2	5943.5	1.39	1.06	1.16
339	2527.26	Sound Stage	3867.4	3950.4	4331.2	6011.7	1.39	1.02	1.12
344	7	Sound Stage	4164.4	4122.1	4512.1	6211.8	1.38	0.99	1.08
346	3	Sound Stage	4273.8	4187.4	4558.8	6259.1	1.37	0.98	1.07

Post-Project
Storm Frequency
50-Year Flow Rate Data

Node Number	HEC-RAS Section	Profile	Area (acres)	Clearwater Flow Rate (ft^3/s)	Burned Flow Rate (ft^3/s)	Bulked Flow Rate (ft^3/s)	Bulking Factor	Clearwater Flow Rate Yield (ft^3/s)/acre	Burned Flow Rate Yield (ft^3/s)/acre
326	1900	Upper	3082.8	3369.2	3702.6	5214.8	1.41	1.09	1.20
331	510	Tributary	369	616.7	639.1	874.1	1.37	1.67	1.73
335	1300	Lower	3682.3	3890.3	4269.2	5943.5	1.39	1.06	1.16
339	2527.26	Sound Stage	3867.4	3950.4	4331.2	5993.3	1.39	1.02	1.12
344	7	Sound Stage	4164.4	4122.1	4512.1	6211.8	1.38	0.99	1.08
346	3	Sound Stage	4273.8	4187.4	4558.8	6259.1	1.37	0.98	1.07

Storm Frequency
25-Year Flow Rate Data

Node Number	HEC-RAS Section	Profile	Area (acres)	Clearwater Flow Rate (ft^3/s)	Burned Flow Rate (ft^3/s)	Bulked Flow Rate (ft^3/s)	Bulking Factor	Clearwater Flow Rate Yield (ft^3/s)/acre	Burned Flow Rate Yield (ft^3/s)/acre
326	1900	Upper	3082.8	2543.1	2852.1	5214.8	1.41	0.82	0.93
331	510	Tributary	369	481.4	501.9	874.1	1.37	1.30	1.36
335	1300	Lower	3682.3	2936.7	3286.8	5943.5	1.39	0.80	0.89
339	2527.26	Sound Stage	3867.4	2981.8	3334.1	6011.7	1.39	0.77	0.86
344 (1)	7	Sound Stage	4164.4	3210.8	3590.1	4956.6	1.38	0.77	0.86
346 (1)	3	Sound Stage	4273.8	3295.1	3684.5	5072.8	1.38	0.77	0.86

Storm Frequency
10-Year Flow Rate Data

Node Number	HEC-RAS Section	Profile	Area (acres)	Clearwater Flow Rate (ft^3/s)	Burned Flow Rate (ft^3/s)	Bulked Flow Rate (ft^3/s)	Bulking Factor	Clearwater Flow Rate Yield (ft^3/s)/acre	Burned Flow Rate Yield (ft^3/s)/acre
326	1900	Upper	3082.8	1630.6	1895	5214.8	1.41	0.53	0.61
331	510	Tributary	369	334	350.7	874.1	1.37	0.91	0.95
335	1300	Lower	3682.3	1895.7	2188.6	5943.5	1.39	0.51	0.59
339	2527.26	Sound Stage	3867.4	1923.3	2219.1	6011.7	1.39	0.50	0.57
344 (1)	7	Sound Stage	4164.4	2071.0	2389.5	3299.0	1.38	0.50	0.57
346 (1)	3	Sound Stage	4273.8	2125.4	2452.3	3376.3	1.38	0.50	0.57

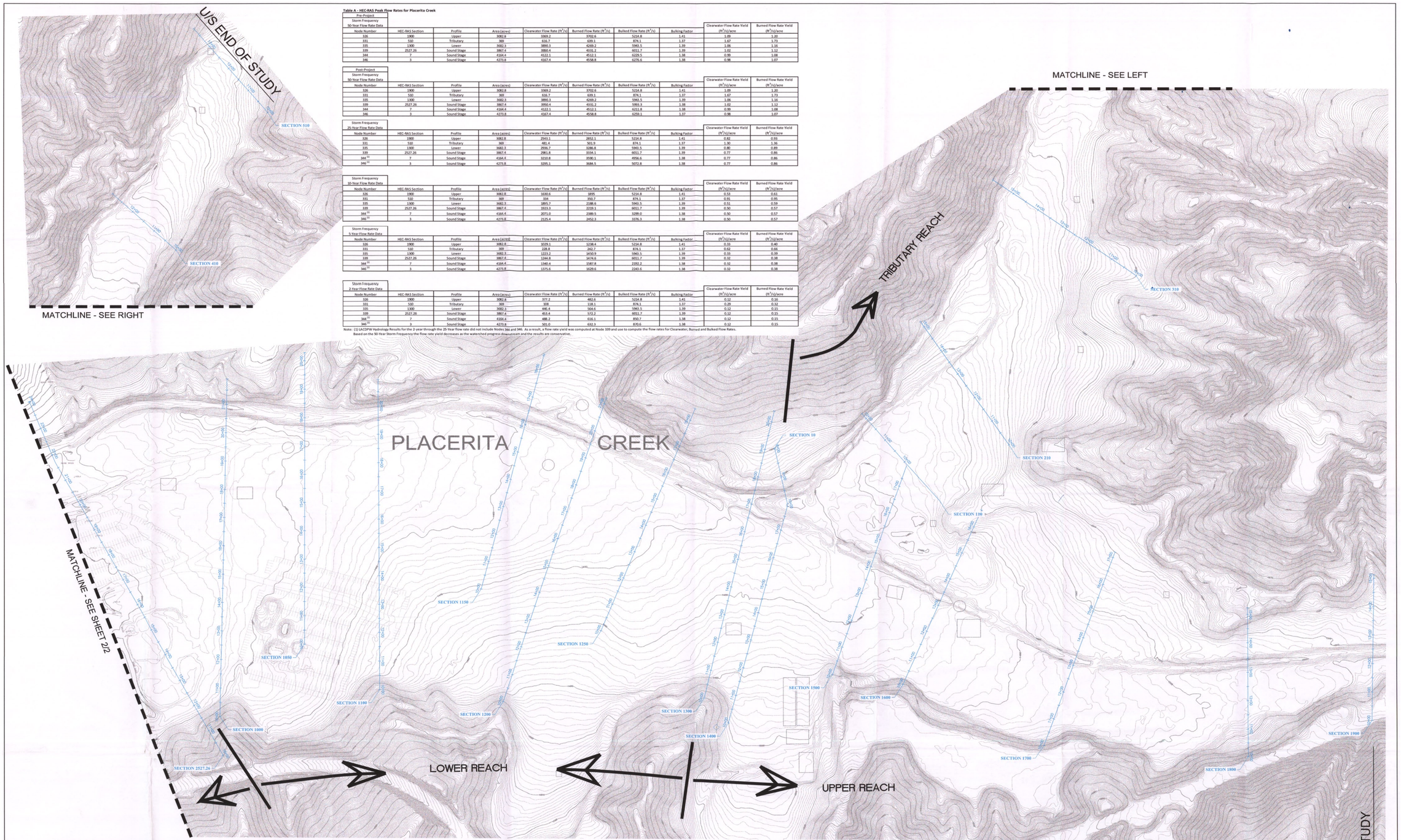
Storm Frequency
5-Year Flow Rate Data

Node Number	HEC-RAS Section	Profile	Area (acres)	Clearwater Flow Rate (ft^3/s)	Burned Flow Rate (ft^3/s)	Bulked Flow Rate (ft^3/s)	Bulking Factor	Clearwater Flow Rate Yield (ft^3/s)/acre	Burned Flow Rate Yield (ft^3/s)/acre
326	1900	Upper	3082.8	1029.1	1238.4	5214.8	1.41	0.33	0.40
331	510	Tributary	369	228.8	242.7	874.1	1.37	0.62	0.66
335	1300	Lower	3682.3	1223.2	1450.9	5943.5	1.39	0.33	0.39
339	2527.26	Sound Stage	3867.4	1244.8	1474.6	6011.7	1.39	0.32	0.38
344 (1)	7	Sound Stage	4164.4	1340.4	1587.8	2192.2	1.38	0.32	0.38
346 (1)	3	Sound Stage	4273.8	1375.6	1629.6	2243.4	1.38	0.32	0.38

Storm Frequency
2-Year Flow Rate Data

Node Number	HEC-RAS Section	Profile	Area (acres)	Clearwater Flow Rate (ft^3/s)	Burned Flow Rate (ft^3/s)	Bulked Flow Rate (ft^3/s)	Bulking Factor	Clearwater Flow Rate Yield (ft^3/s)/acre	Burned Flow Rate Yield (ft^3/s)/acre
326	1900	Upper	3082.8	377.2	482.6	5214.8	1.41	0.12	0.16
331	510	Tributary	369	108	118.1	874.1	1.37	0.29	0.32
335	1300	Lower	3682.3	446.4	564.6	5943.5	1.39	0.12	0.15
339	2527.26	Sound Stage	3867.4	453.4	572.2	6011.7	1.39	0.12	0.15
344 (1)	7	Sound Stage	4164.4	488.2	616.1	850.7	1.38	0.12	0.15
346 (1)	3	Sound Stage	4273.8	501.0	632.3	870.6	1.38	0.12	0.15

Note: (1) LACDPW Hydrology Results for the 2-year through the 25-Year flow rate did not include Nodes 344 and 346. As a result, a flow rate yield was computed at Node 339 and use to compute the flow rates for Clearwater, Burned and Bulked Flow Rates.
Based on the 50-Year Storm Frequency the flow rate yield decreases as the watershed progress downstream and the results are conservative.



SUSMP / DRAINAGE CONCEPT / LID PLAN
APPROVED FOR DRAINAGE
PROVED BY: Angelica Calderon RCE NO. C68328 DATE: 8/22/11
ECKED BY: DATE: 8/22/11
LAND DEVELOPMENT DIVISION
LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

REGISTERED PROFESSIONAL ENGINEER JEFFREY KARL RUPP NO. 42868 Exp. 3/31/2012 CIVIL STATE OF CALIFORNIA

0 50 100 200
SCALE: 1"=100'

LEGEND

HEC-RAS CROSS SECTION

Storm Frequency
ML Flow Rate Data

HEC-RAS Section	Profile	Area (acres)	Flow Rate (ft^3/s)
1900	Upper	3082.8	7050
510	Tributary	369	540
1300	Lower	3682.3	7770
2527.26	Sound Stage	3867.4	7880
700.65	Sound Stage	3867.4	7880
7	Sound Stage	4164.4	7880
3	Sound Stage	4273.8	7880

Storm Frequency
FEMA Flow Rate Data

HEC-RAS Section	Profile	Area (acres)	Flow Rate (ft^3/s)
1900	Upper	3082.8	3550
510	Tributary	369	860
1300	Lower	3682.3	3550
2527.26	Sound Stage	3867.4	3550
700.65	Sound Stage	3867.4	3550
7	Sound Stage	4164.4	3550
3	Sound Stage	4273.8	3550

SHEET 500: HYDRAULICS MAP 1/2

DAVID EVANS AND ASSOCIATES INC.
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Phone: 909.481.5750

DRAINAGE CONCEPT /
~~HYDROLOGY STUDY~~ /
SUSMP / LID PLAN
FOR TR 71216
HEC RAS MODEL

SUSMP / DRAINAGE CONCEPT / LID PLAN

APPROVED FOR DRAINAGE

PROVED BY: Lizbeth Calderón RCE NO. C68328 DATE: 8/22/11

HECKED BY: DATE: 8/23/11

LAND DEVELOPMENT DIVISION

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

MAGNETIC

REGISTERED PROFESSIONAL ENGINEER
JEFFREY KARL RUPP
NO. 42868
Exp. 3/31/2012
CIVIL
STATE OF CALIFORNIA

0 50 100 200

SCALE: 1"=100'

MATCHLINE - SEE BELOW

MATCHLINE - SEE SHEET 1/2

MATCHLINE - SEE ABOVE

SIERRA HWY

SR-14

EXIST. 20' RCP CULVERT

DAYLIGHT LIMITS

TRACT BOUNDARY

ARMORING PROTECTION APPROXIMATE LOCATION

SOUND STAGES REACH

PLACERITA CYN RD

SECTION 4

SECTION 5

SECTION 6

SECTION 7

SECTION 8

SECTION 9.07

SECTION 709.65

SECTION 865.47

SECTION 1052.52

SECTION 1258.53

SECTION 1368.32

SECTION 1526.45

SECTION 1644.9

SECTION 1941.35

SECTION 2087.81

SECTION 2368.89

SECTION 3

10+00.00

1442.5 PG

SUSMP/ DRAINAGE CONCEPT/LID PLAN

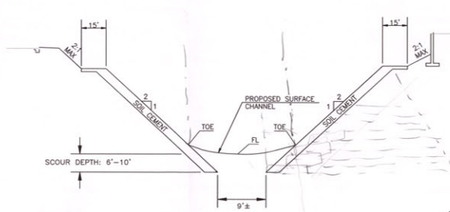
APPROVED FOR DRAINAGE

APPROVED BY: Anjali Aldwin RCE NO. 065328 DATE: 8/23/11

CHECKED BY: DATE: 8/23/11

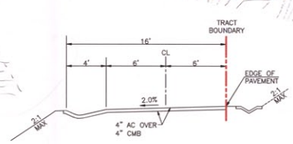
LAND DEVELOPMENT DIVISION

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS



TYPICAL PLACERITA CREEK BANK PROTECTION SECTION A-A (NARROWEST SECTION

N.T.S.



SUBSTATION ACCESS ROAD SECTION B-B

N.T.S.

LEGEND

HEC-RAS CROSS SECTION

TRACT BOUNDARY

15 FT ACCESS ROAD

APPROXIMATE LIMITS OF BANK ARMORING

0 50 100 200

SCALE: 1"=100'

SHEET 600: HYDRAULICS MAP 2/2

DAVID EVANS AND ASSOCIATES INC.

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Phone: 909.481.5750

DRAINAGE CONCEPT / ~~HYDROLOGY STUDY /~~ SUSMP / LID PLAN FOR TR 71216 HEC RAS MODEL

REGISTERED PROFESSIONAL ENGINEER JEFFREY KARL RUPP NO. 42868 Exp. 3/31/2012 CIVIL STATE OF CALIFORNIA

SUSMP / DRAINAGE CONCEPT / LID PLAN

APPROVED FOR DRAINAGE

APPROVED BY: Lizbeth Caldron RCE NO. C68328 DATE: 8/22/11

CHECKED BY: _____ DATE: 8/23/11

LAND DEVELOPMENT DIVISION

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

-1350