

RESOLUTION AUTHORIZING THE PREPARATION AND
APPROVAL OF 2017 ADEQUATE PROGRESS REPORT
DELTA FARMS RECLAMATION DISTRICT NO. 2042
BISHOP TRACT
FOR URBAN LEVEL OF FLOOD PROTECTION (ULOP)

WHEREAS, State of California Senate Bill 5 has determined that a 200-year level of protection shall be the new standard for urban and urbanizing areas to achieve Urban Level of Flood Protection (ULOP); and,

WHEREAS, this Reclamation District is desirous of achieving said 200-year level of protection for Urban Level of Flood Protection (ULOP); and,

WHEREAS, the Reclamation District's Engineers have conducted an evaluation of its levee system to identify the work needed to comply with the Urban Levee Design Criteria (ULDC); and,

WHEREAS, the City of Stockton has requested the District prepare annually an Adequate Progress Report for Urban Level of Protection (ULOP) to demonstrate the steps RD 2042 is taking to secure adequate funding to implement the levee improvements necessary to achieve 200 Year Urban Levee of Flood Protection; and,

WHEREAS, the Reclamation District's Engineers, under the direction of the Board of Trustees, have prepared a 2017 Adequate Progress Report indicating work to be performed and the funding sources for said work through 2024.

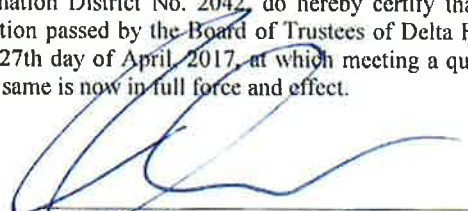
NOW, THEREFORE, BE IT RESOLVED AND ORDERED by the Board of Trustees of Delta Farms Reclamation District No. 2042 – Bishop Tract, as follows:

1. That that certain 2017 Adequate Progress Report prepared by the District Engineers on behalf of this Reclamation District is hereby approved.
2. That the officers of the District, the Chairman, and/or the Secretary, be, and either of them individually are, hereby authorized and directed to approve on behalf of this Reclamation District, the said 2017 Adequate Progress Report and any and all other agreements, addenda or other documents associated with the said 2017 Adequate Progress Report.

CERTIFICATE

I, MARC HARDY, Chairman of Delta Farms Reclamation District No. 2042, do hereby certify that the foregoing Resolution is a full, true and correct copy of a Resolution passed by the Board of Trustees of Delta Farms Reclamation District No. 2042 at a meeting thereof held on the 27th day of April, 2017, at which meeting a quorum was present; that said Resolution has never been revoked, and the same is now in full force and effect.

DATED: May 15, 2017


CHAIRMAN OF THE BOARD OF
TRUSTEES OF DELTA FARMS
RECLAMATION DISTRICT NO. 2042

Reclamation District No. 2042
Bishop Tract
2017 Adequate Progress Report
For Urban Level of Protection

May 4, 2017

Prepared for:

Reclamation District No. 2042 and the City of Stockton

Prepared by:

Kjeldsen, Sinnock & Neudeck, Inc.

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- Appendix 3 – Financial Report (as of 5/4/2017)
- Appendix 4 – 2017/2018 Budget

Overview

Kjeldsen, Sinnock and Neudeck, Inc. (KSN) has been engaged by Reclamation District No. 2042 – Bishop Tract (RD 2042) to prepare this document to support the demonstration of “adequate progress” toward the achievement of an Urban Level of Flood Protection (ULOP) within the RD 2042 basin. This document describes the steps that RD 2042 is taking to generate the local funding needed to advance and implement 200-Year levee improvements in accordance with the requirements of Senate Bill 5 (SB5).

RD 2042 is responsible for operating and maintaining the levee system and drainage facilities that provides flood protection for primarily agricultural land, infrastructure, and urban development (comprised of residential and commercial). RD 2042 was formed in 1909, and currently encompasses an area of approximately 3,100 acres, surrounded by 8.0 miles of levee, all located within San Joaquin County. At the time of formation, RD 2042 originally consisted of nearly 2,200 acres. An annexation occurred in 1989 that extended the District’s eastern limits to Interstate 5 thereby adding just over 900 acres to RD 2042. Figure 1 shows the RD 2042 levees and boundary.

The levee system of RD 2042 currently provides a 100-year level of protection and is fully accredited by the U.S. Department of Homeland Security, Federal Emergency Management Agency (FEMA) as meeting the minimum certification criteria as outlined in Title 44, CFR, Section 65.10. FEMA maintains Flood Insurance Rate Maps (FIRMs) that delineate special flood hazard areas and assist lending institutions and federal agencies to determine whether flood insurance is required. RD 2042 is currently located on FIRM panel numbers 06077C0285F, 06077C0295F, 06077C0305F, and 06077C0315F

With the passage of SB5, the State of California has determined that a 200-year level of protection shall be the new standard for urban and urbanizing areas. The existing RD 2042 levees currently do not meet the updated Urban Levee Design Criteria (ULDC) standards adopted by the Department of Water Resources, and the existing levees are not currently certified to provide 200-year protection. Accordingly, the City of Stockton as the local land use agency, in coordination with RD 2042, are jointly pursuing efforts to achieve ULOP within the RD 2042 boundary.

On behalf of RD 2042, a team of Professional Engineers consisting of Peterson Brustad Inc. (PBI), KSN, and Kleinfelder has conducted an evaluation of the RD 2042 levee system in accordance with ULDC. The goal of the evaluation was to identify any deficiencies and countermeasures needed to comply with the State’s 200-year standards and to meet the requirements of making a ULOP finding for the City of Stockton. The purpose of this Adequate Progress Report is to address the ULOP requirements for adequate requirements:

1. Identify the geographic area which will have a ULOP once the improvements are completed
2. Describe the scope, schedule, and cost of completing the flood protection improvements described the Engineer’s Report
3. Identify critical features of the system which are under construction
4. Provide evidence that there are revenues sufficient to fund each year of the project improvements.

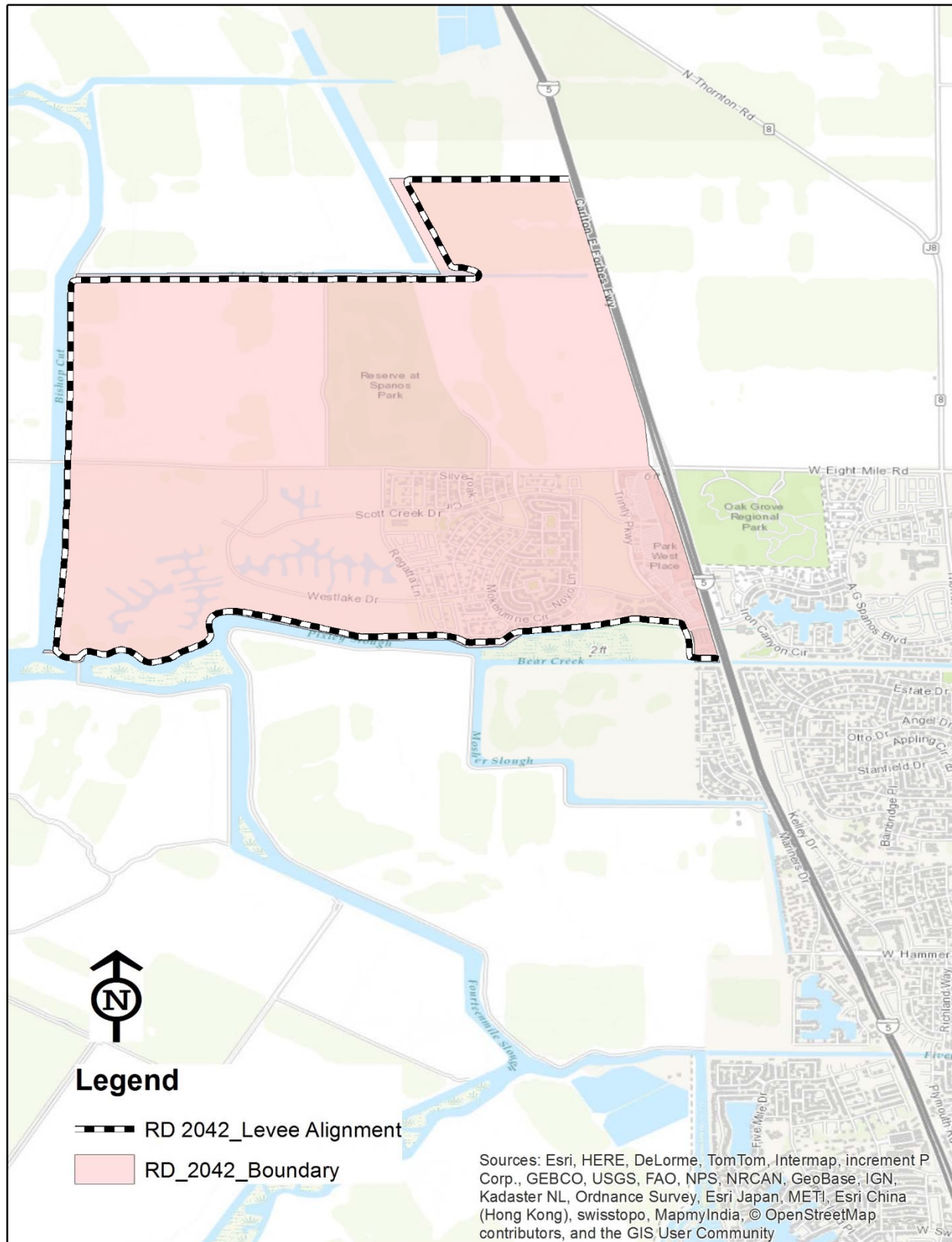


Figure 1 - RD 2042 Levee and Boundary

Project Improvements

In order for the RD 2042 levee system to meet ULDC, improvements are needed to pipe penetrations. Pipe penetration rehabilitation is necessary at various locations, primarily due to deteriorated conditions. The improvements consist of reconstructing pipe penetrations that cross the levee by removing and replacing the portion of pipe through the levee prism and installing a positive closure device (i.e. gate valve). The new pipes will be installed above the Design Water Surface Elevation (DWSE). Conceptual improvement plans are included in Appendix 1. Locations of the pipe penetrations to be rehabilitated are shown on Figure 2 and listed in Table 1.

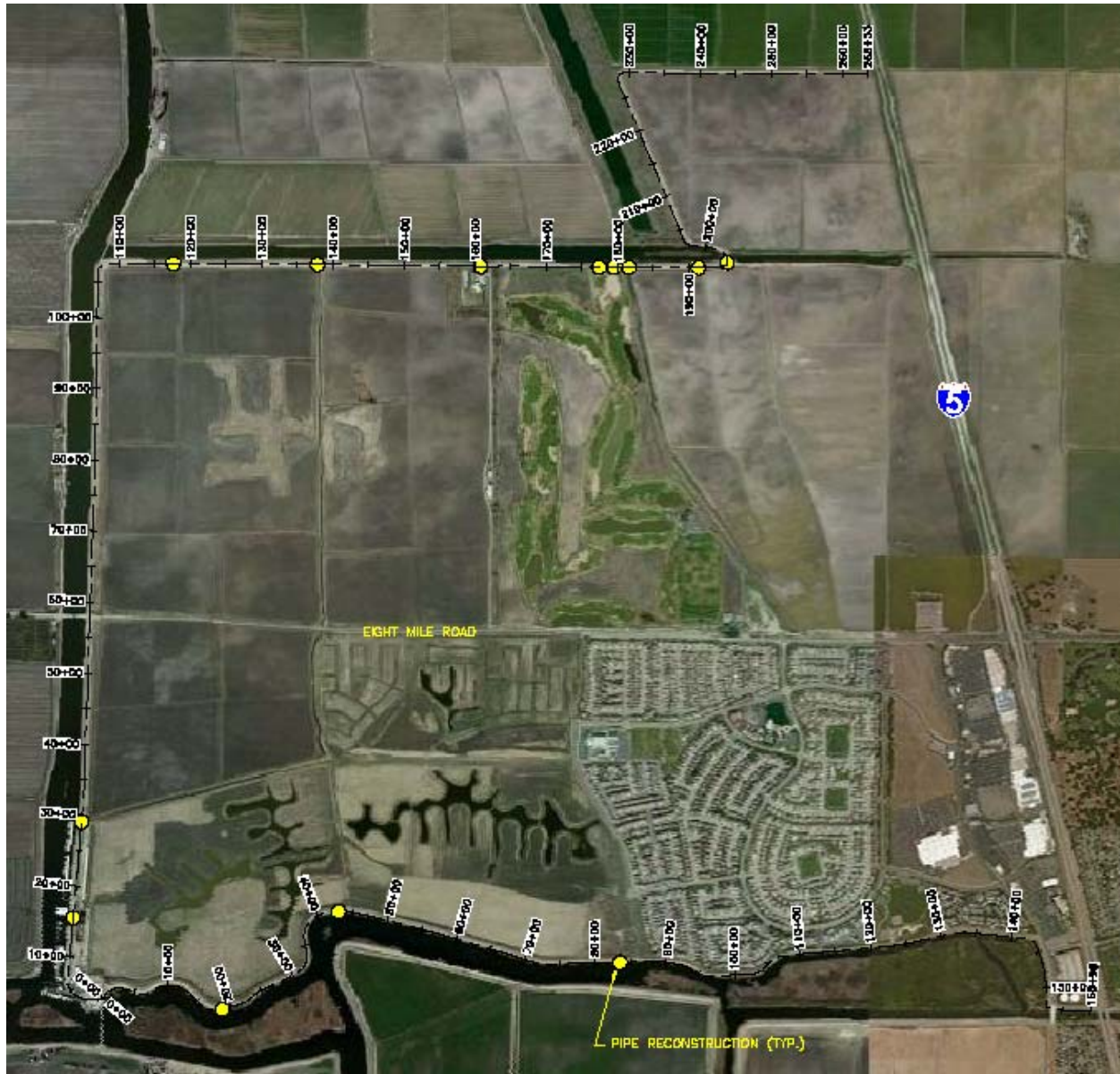


Figure 2 - Pipe Penetration Rehabilitation Locations

Table 1 - Pipe Penetration Rehabilitations

Station	Pipe Diameter (inches)
N 15+50	16
N 29+02	24
N 29+07	24
N 117+57 (underway)	12
N 137+81 (underway)	16
N 160+73	16
N 177+38	16
N 179+51	24
N 181+58	16
N 191+34	16
N 195+72	48
S 18+82	12
S 43+01	16
S 83+49	16

Project Cost

The total cost associated with the pipe penetration rehabilitations amounts to \$2,907,000 in 2017 dollars. This cost represents the total cost to obtain full ULDC compliance for the RD 2042 levee system. A summary of this cost is shown below in Table 2. A more detailed breakdown of the project costs is included in Appendix 2.

Table 2 - Summary of Project Costs

Description	Total Cost (2017\$)
Construction	\$1,730,000
Soft Costs	\$692,000
20% Contingency	\$484,400
Total:	\$2,907,000

Project Schedule

It is anticipated that two to three pipes will be rehabilitated each year for the next seven years. An estimated schedule of rehabilitation work is shown below in Table 3. An annual escalator of 3% was used to determine the total cost in any given year as shown in Table 3. Work on the 2017 penetrations is currently underway.

Table 3 - Estimated Project Schedule

Year	Pipe Penetration	Total Cost
2017	N 117+57, N 137+81	\$278,800
2018	N 160+73, N 177+38	\$332,100
2019	N 179+51, N 181+58	\$458,400
2020	N 195+72	\$622,800
2021	N 191+34, N 15+50	\$362,900
2022	N 29+02	\$314,100
2023	N 29+07, S 18+82	\$463,700
2024	S 43+01, S 83+49	\$396,600

Project Funding

RD 2042 is the sole funding entity for the ULDC improvements. A current financial report that indicates balances for all RD 2042 funds is included in Appendix 3. There is currently a balance of \$1,222,100 in the contingency fund and \$500,000 in the ULDC fund.

As the sole funding entity, RD 2042 will be responsible for funding the improvements. The primary source of revenue for RD 2042 is from the existing assessment district which generates approximately \$550,000 per year. Other sources of income generate another \$107,000 per year. A copy of this year's RD 2042 budget is included in Appendix 4. In order to fund the improvements, RD 2042 has created a new ULDC fund and will reallocate excess budget funds previously directed to the contingency fund. For the fiscal year 2017/2018, this translates to approximately \$340,000 being available to fund the first year of ULDC improvements.

A cash flow analysis that demonstrates a feasible solution for implementation of the needed 200-year ULDC improvements is shown below in Table 4. Table 4 conservatively assumes that the ULDC fund will be funded at \$340,000 per year. It is expected that this table will be refined over time as the planning and development of the project progress over time.

Table 4 - Cash Flow Analysis

Description	2017	2018	2019	2020	2021	2022	2023	2024
Beginning Balance	\$0	\$101,200	\$149,100	\$70,700	\$20,000	\$37,100	\$103,000	\$19,300
Revenues:								
ULDC Fund	\$340,000	\$340,000	\$340,000	\$340,000	\$340,000	\$340,000	\$340,000	\$340,000
Transfer from Contingency Fund	\$40,000	\$40,000	\$40,000	\$232,100	\$40,000	\$40,000	\$40,000	\$40,000
Total Revenues	\$380,000	\$380,000	\$380,000	\$572,100	\$380,000	\$380,000	\$380,000	\$380,000
Expenditures:								
ULDC Improvements	\$278,800	\$332,100	\$458,400	\$622,800	\$362,900	\$314,100	\$463,700	\$396,600
Total Expenditures	\$278,800	\$332,100	\$458,400	\$622,800	\$362,900	\$314,100	\$463,700	\$396,600
Ending Balance	\$101,200	\$149,100	\$70,700	\$20,000	\$37,100	\$103,000	\$19,300	\$2,700

Exhibit 1

Reclamation District No. 2042

Adequate Progress Report

Appendix 1

Conceptual Improvement Plans

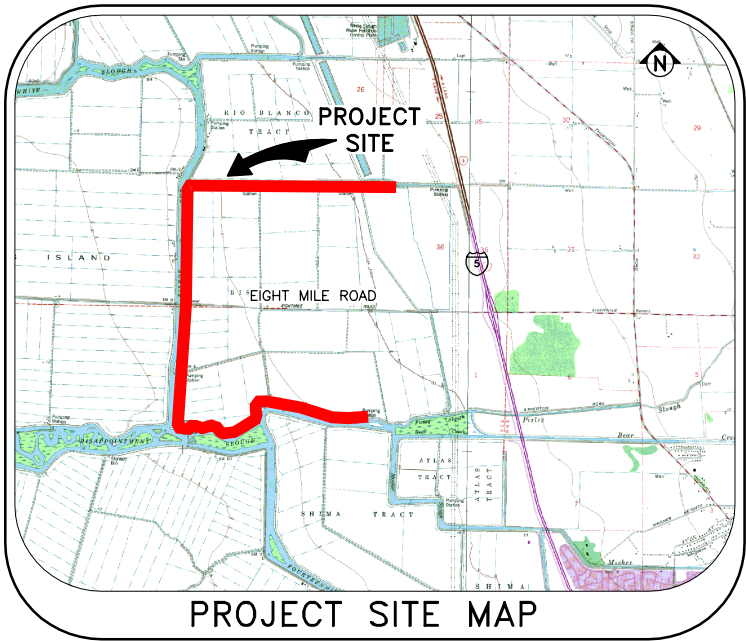
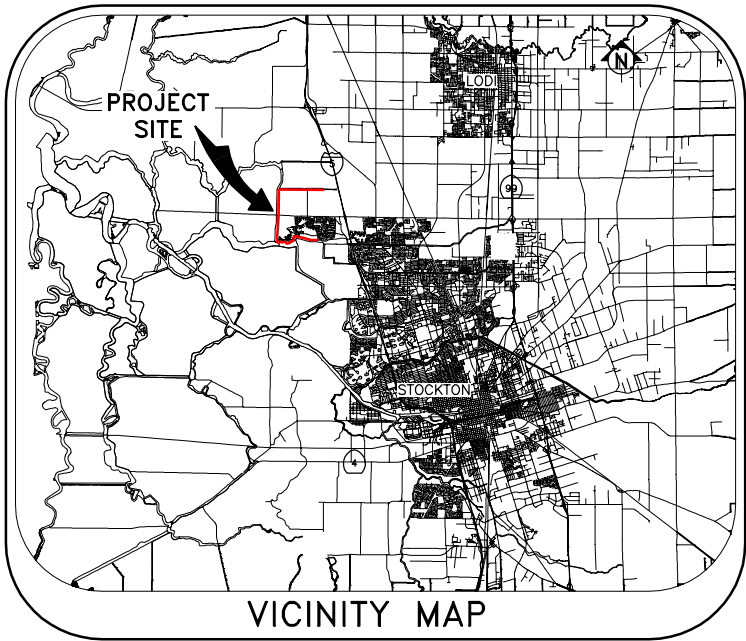
RECLAMATION DISTRICT NO. 2042

BISHOP TRACT

STOCKTON, CALIFORNIA

URBAN LEVEE DESIGN CRITERIA, PROJECT NO. 13.1
PENETRATION REHABILITATION

AT
VARIOUS LOCATIONS



SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	BASE MAP
3-4	DETAILS

SHEET INDEX



Submittal	
%	Date
10%	9/23/2016

K S N INC.	KJELDEN SINNOCK NEUDECK	711 N. Pershing Avenue Stockton, CA 95203 (209) 946-0268
		1355 Halyard Drive, Suite 180 West Sacramento, CA 95691 (916) 403-5900
	Civil Engineers and Land Surveyors	www.ksninc.com

RECLAMATION DISTRICT NO. 2042 ULDC PROJECT 13.1 – PENETRATION REHABILITATION STOCKTON, CALIFORNIA	
TITLE SHEET	

Revisions				Design EEA Drawn EEA Check CHN
No.	Description	Date	By	

Scale	Date SEPTEMBER 2016
	Sheet Number 1 Of 4
	Project File No. 0752-0680

C-001

FILE SPEC: P:\0752_Bishop\0680_ULDC_Evaluation\08_Civil\400_Plans\020_CAD\Improvements\13.1_Sht 02_Base Map.dwg
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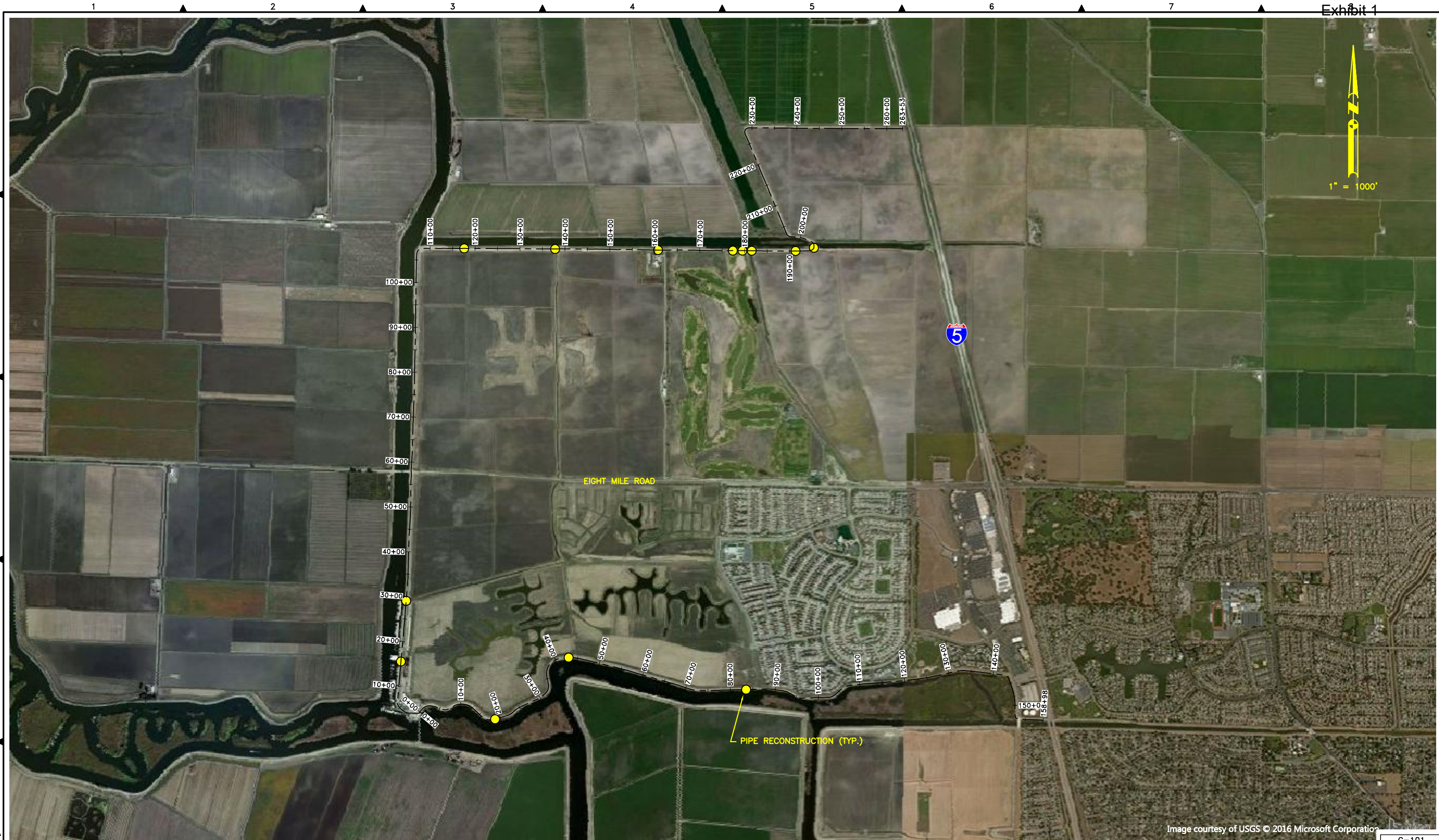


Image courtesy of USGS © 2016 Microsoft Corporation

C-101



Submittal	
%	Date
10%	9/23/2016

**K
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N**
INC.

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NEUDECK**
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RECLAMATION DISTRICT NO. 2042
ULDC PROJECT 13.1 – PENETRATION REHABILITATION
STOCKTON, CALIFORNIA

BASE MAP

Revisions					Design EEA
No.	Description	Date	By	Appr'd. By	
					Drawn EEA
					Check CHN

Scale

1" = 500'

Original Drawing Scale

0 1/4" 1"

Date
SEPTEMBER 2016

Sheet Number
2 Of 4

Project File No.
0752-0680

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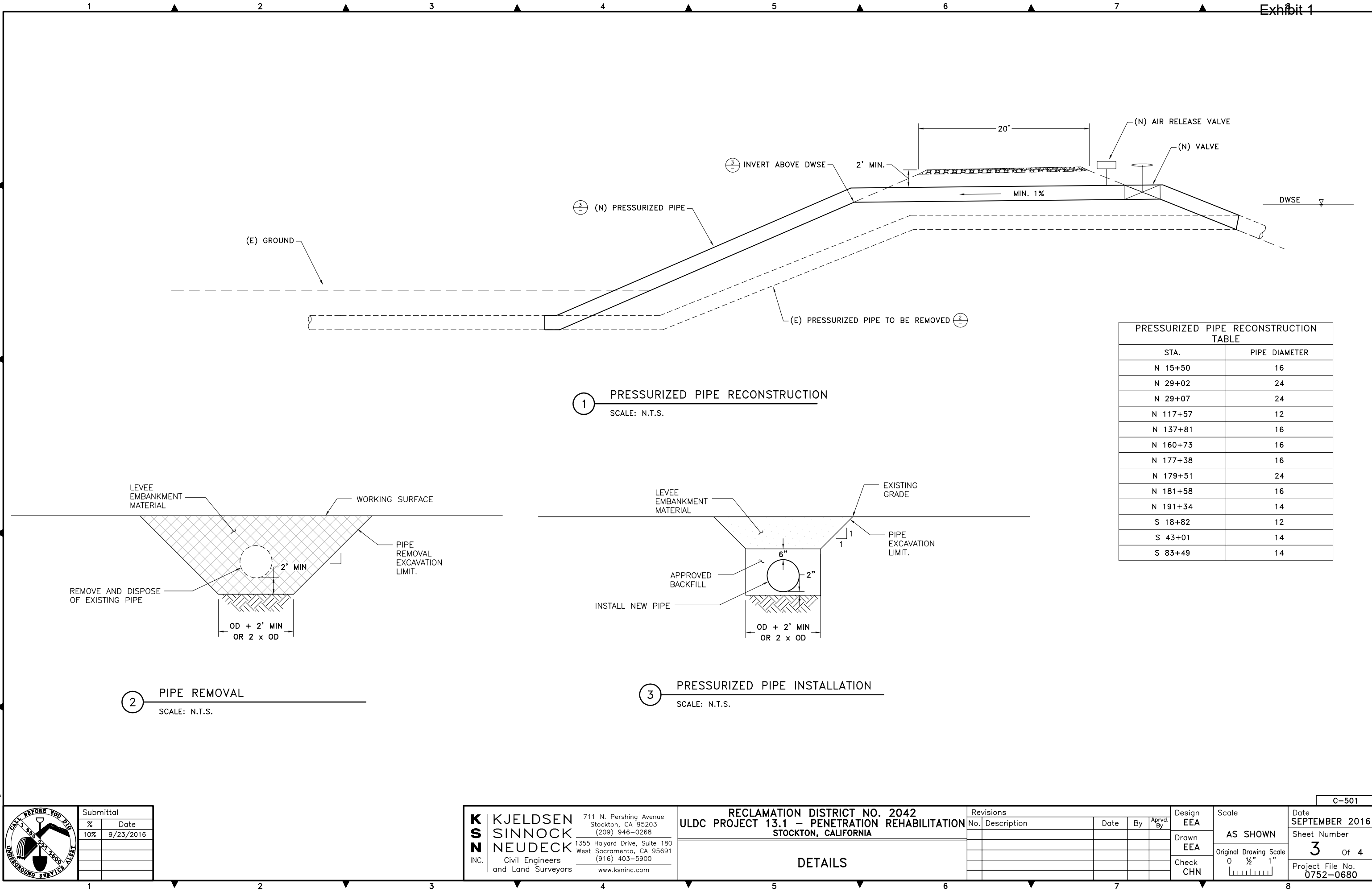


Exhibit 1

C-501



Submittal	
%	Date
10%	9/23/2016

**K
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INC.

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RECLAMATION DISTRICT NO. 2042
ULDC PROJECT 13.1 – PENETRATION REHABILITATION
STOCKTON, CALIFORNIA

DETAILS

Revisions				
No.	Description	Date	By	Appd. By

Design
EEA

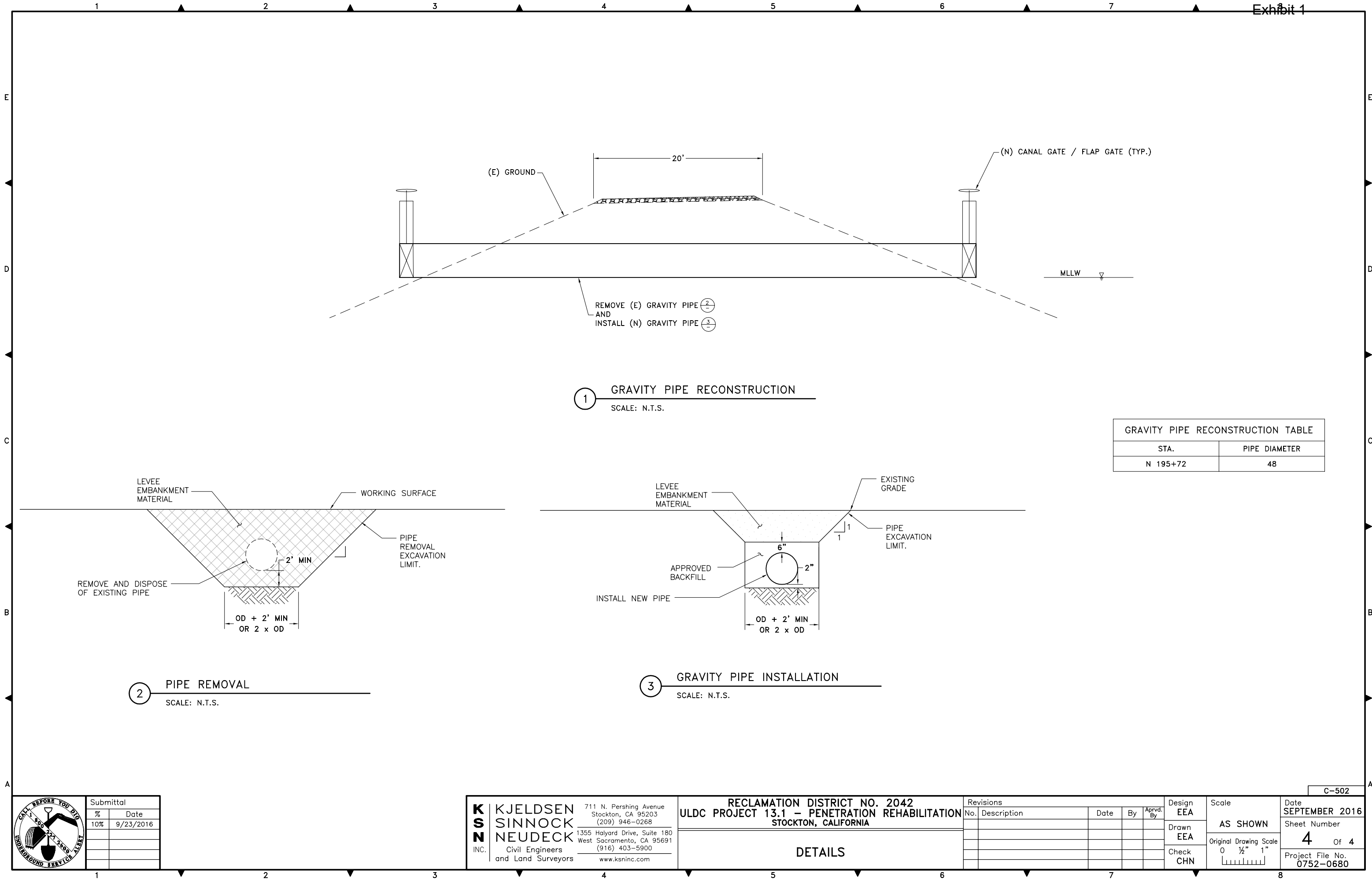
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Scale
AS SHOWN
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0 1/4" 1"

Date
SEPTEMBER 2016
Sheet Number
3 Of 4
Project File No.
0752-0680

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PLOT DATE: Feb 02, 2017 - 8:27am



Submittal	
%	Date
10%	9/23/2016

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RECLAMATION DISTRICT NO. 2042
ULDC PROJECT 13.1 – PENETRATION REHABILITATION
STOCKTON, CALIFORNIA

DETAILS

Revisions				Design EEA	Scale	Date SEPTEMBER 2016
No.	Description	Date	By	Aprvd. By		
					AS SHOWN Original Drawing Scale 0 1/4" 1"	Sheet Number 4 Of 4
						Project File No. 0752-0680

Check
CHN

Drawn
EEA

Exhibit 1

Reclamation District No. 2042

Adequate Progress Report

Appendix 2

Detailed Cost Estimate

RECLAMATION DISTRICT NO. 2042 - BISHOP TRACT
 ULDC EVALUATION
 STOCKTON, CALIFORNIA

OPINION OF PROBABLE COSTS
 DETAILS OF PROPOSED IMPROVEMENTS

Item	Description	Quantity	Unit	Unit Cost	Total Cost
------	-------------	----------	------	-----------	------------

PROJECT NO. 13.1

PENETRATION REHABILITATION

Construction

1.	Mobilization			3%	\$49,000
2.	Erosion Control			3%	\$49,000
3.	Reconstruct Existing 12" Pipe	2	EA	\$60,000	\$120,000
4.	Reconstruct Existing 16" Pipe	8	EA	\$80,000	\$640,000
5.	Reconstruct Existing 24" Pipe	3	EA	\$125,000	\$375,000
6.	Reconstruct Existing 48" Pipe	1	EA	\$200,000	\$200,000
7.	Air Release Valve	13	EA	\$2,000	\$26,000
8.	12" Valve	2	EA	\$4,000	\$8,000
9.	16" Valve	8	EA	\$8,500	\$68,000
10.	24" Valve	3	EA	\$25,000	\$75,000
11.	48" Valve	2	EA	\$60,000	\$120,000
Subtotal:					\$1,730,000

Management / Environmental / Engineering

1.	Administration			5%	\$86,500
2.	Planning			3%	\$51,900
3.	Environmental and Permitting			5%	\$86,500
4.	Geotechnical Engineering			2%	\$34,600
5.	Surveying and Civil Engineering			10%	\$173,000
6.	Construction Management and Inspection			12%	\$207,600
7.	Mitigation			3%	\$51,900
Subtotal:					\$640,100

				SUBTOTAL:	\$2,422,000
				CONTINGENCY (20%):	\$484,400
				PROJECT TOTAL:	\$2,907,000

Exhibit 1

Reclamation District No. 2042

Adequate Progress Report

Appendix 3

**Financial Report
(as of 5/4/2017)**

As of
05/04/2017 9:05:19 AM

Reclamation District 2042

GENERAL LEDGER

DATES: 4/1/2017 - 5/5/2017

101 - General Fund 53501

Date	Description	Debits	Credits	Ref	Doc #	Trans Title
4/1/17	Balance Forward	3824.82	0.00		0	
	Totals:	3,824.82	0.00		Net:	3,824.82

106 - Fund 53511 Contingency

Date	Description	Debits	Credits	Ref	Doc #	Trans Title
4/1/17	Balance Forward	1722100.00	0.00		0	
5/1/17	to fund 53596	0.00	500000.00	Fund transfe	937	Fund Transfer
	Totals:	1,722,100.00	500,000.00		Net:	1,222,100.00

107 - Fund 53594 Maint & Op

Date	Description	Debits	Credits	Ref	Doc #	Trans Title
4/1/17	Balance Forward	166089.11	0.00		0	
	Totals:	166,089.11	0.00		Net:	166,089.11

112 - Fund 53596 ULDC

Date	Description	Debits	Credits	Ref	Doc #	Trans Title
5/1/17	from fund 53511	500000.00	0.00	Fund transfe	937	Fund Transfer
	Totals:	500,000.00	0.00		Net:	500,000.00

Grand Totals: 2,392,013.93 500,000.00 Net: 1,892,013.93

Exhibit 1

Reclamation District No. 2042

Adequate Progress Report

Appendix 4

2017/2018 Budget

Draft

REVENUE		Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	TOTAL
(to be revised after formal assessment levied)														
Regular Assessment - County roll							\$250,000						\$250,000	\$500,000
Regular Assessment - Invoiced							25,000						25,000	50,000
Checking & Savings		1,000												1,000
County Operating Funds		50,000												50,000
Subventions Reimbursement													23,100	23,100
ULDC fund		500,000												500,000
Total Revenues		\$551,000	\$0	\$0	\$0	\$0	\$275,000	\$0	\$0	\$0	\$0	\$0	\$298,100	\$1,124,100

General Operations		Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	TOTAL
PG & E		\$700	700	700	700	700	700	700	700	700	700	700	700	\$8,400
Engineering		450	450	450	450	450	450	450	450	450	450	450	450	5,400
Canal Maintenance		100	100	100	6,000	100	100	100	100	100	5,000	100	100	11,000
Office Supplies, Dues, Fees, & Misc		750	750	750	750	700	7,000	750	750	750	750	750	750	12,000
Accounting Services		500	500	500	500	500	500	500	500	500	500	500	500	15,200
Legal Services		750	750	750	750	750	750	750	750	750	750	750	750	6,000
Professional Services		1,200	300	300			300			300				9,000
Worker's Compensation								15,000	6,000				300	21,000
Insurance, E&O & Liability								7,000		1,000				8,000
Agency Fees - County														0
SJ Flood Control														
Property Taxes		100	100	100	100	100	2,200	100	100	100	300	100	100	2,500
Pump Maintenance - labor		150	150	150	150	150	150	150	150	150	150	150	150	1,200
R/M Pumps & Pump Station				85,000	85,000	85,000	85,000	15,000	150	150	150	150	150	16,650
ULDC Expenses														340,000
Total General Operations Expense - se		(\$4,700)	(\$3,500)	(\$88,800)	(\$94,500)	(\$88,450)	(\$97,250)	(\$40,350)	(\$9,500)	(\$4,800)	(\$8,800)	(\$3,500)	(\$3,800)	(\$447,950)

Routine Maintenance		Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	TOTAL
Engineering		1,000	2,000	2,000	10,000	500	1,000	1,000	1,000	1,000	1,000	1,000	1,000	22,500
Labor		120	120	120	120	120	120	120	120	120	120	120	120	1,440
Rodent Control			500											1,500
Vegetation Control				6,000		7,000				5,000				18,000
Levee Patrol		170	170	170	170	170	170	170	170	170	170	170	170	2,040
Levee Maintenance				2,000		2,000			2,000			2,000		8,000
Toe Ditch Maintenance						6,000					1,000			7,000
Professional Services		500	500	500	500	500	500	500	500	500	500	500	500	6,000
Backslope m=Maintenance			10,000											10,000
Erosion repairs - rip rap							20,000							20,000
Road Maintenance					20,000						5,000			25,000
Total Routine Maint. Expenses		(\$1,790)	(\$13,290)	(\$10,790)	(\$30,790)	(\$16,290)	(\$21,790)	(\$1,790)	(\$4,790)	(\$6,790)	(\$7,790)	(\$13,790)	(\$1,790)	(\$131,480)

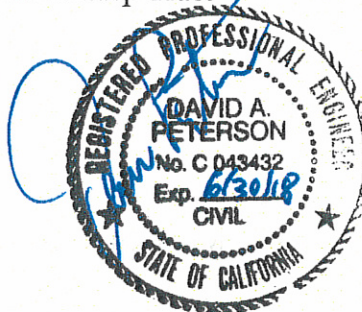
Cumulative Expense Total		(\$6,490)	(\$23,280)	(\$122,870)	(\$248,160)	(\$352,900)	(\$471,940)	(\$514,080)	(\$528,370)	(\$539,960)	(\$556,550)	(\$573,840)	(\$579,430)	
Cumulative Revenue Total		\$551,000	\$551,000	\$551,000	\$551,000	\$551,000	\$826,000	\$826,000	\$826,000	\$826,000	\$826,000	\$826,000	\$1,124,100	
Net Cumulative Total		\$544,510	\$527,720	\$428,130	\$302,840	\$198,100	\$354,060	\$311,920	\$297,630	\$286,040	\$269,450	\$252,160	\$544,670	Estimated excess to contingency fund



Urban Levee Design Criteria (ULDC) Evaluation of the RD 2042 Levee System Cover Memorandum

Prepared for: Reclamation District 2042: Bishop Tract

November 7, 2016



Prepared by: Ryan Dunne, EIT and Michael Pantell, EIT

Reviewed by: Dave Peterson, PE and Mike Rossiter, PE, CFM

1.0 Introduction

Reclamation District 2042 - Bishop Tract (RD 2042) has conducted an evaluation of their levees in accordance with the State of California Urban Levee Design Criteria (ULDC). The goal of the evaluation was to identify any deficiencies and countermeasures needed to comply with the State's 200-year standards and to meet the requirements of making an Urban Level of Protection (ULOP) "finding" set forth by the State. The enclosed technical memoranda are intended to serve as the Engineer's Report which is a key element to support a ULOP finding based on the ULDC EVD-1 finding requirements.

ULOP findings made pursuant to this Engineer's Report must be supported by all 6 findings in the ULOP (FND-1 through FND-6), and also be supported by an Independent Panel of Experts (IPE) report and an Engineers Response to Comments from the IPE report, per the listed requirements of making an EVD-1 finding.

Periodic reviews under FND-3 and FND-4 must be performed at least every 5 years commencing with the initial finding, and consider changes in engineering standards and practice, changing hydrology, sea-level rise, climate change, physical changes in the system, new data, system performance, physical condition, and any other relevant factors affecting sustainable performance.

2.0 Background of the RD 2042 Levee System

RD 2042 is located in San Joaquin County, on the north end of the City of Stockton and just west of Interstate-5. The RD 2042 levees are currently accredited to 100-year FEMA standards per 44CFR 65.10. All ULDC analyses in the enclosed deliverable were performed on the levee system as it stands today.



3.0 Contents of the ULDC Binders

The engineer's report herein includes two (2) volumes of binders covering the subjects that are required for a ULDC evaluation. Table 1 identifies the author and the location of each required ULDC analysis:

Table 1. Responsible party and location of required ULDC analyses.

Required ULDC Section	Responsible Party	Memo Location
7.1 Design Water Surface Elevation	PBI	Volume 1
7.2 Minimum Top of Levee	PBI	Volume 1
7.3 Soil Sampling, Testing and Logging	KLEINFELDER	Volume 2
7.4 Slope Stability for Intermittently Loaded Levees	KLEINFELDER	Volume 2
7.5 Underseepage for Intermittently Loaded Levees	KLEINFELDER	Volume 2
7.6 Frequently Loaded Levees	PBI	Volume 1
7.7 Seismic Vulnerability	KLEINFELDER	Volume 2
7.8 Levee Geometry	KSN	Volume 1
7.9 Interfaces and Transitions	KLEINFELDER	Volume 2
7.10 Erosion	KSN	Volume 1
7.11 Right-of-Way	KSN	Volume 1
7.12 Encroachments	KSN	Volume 1
7.13 Penetrations	PBI	Volume 1
7.14 Floodwalls, Retaining Walls, and Closure Structures	KSN	Volume 1
7.15 Animal Burrows	KSN	Volume 1
7.16 Levee Vegetation	KSN	Volume 1
7.17 Wind Setup and Wave Run-up	PBI	Volume 1
7.18 Security	KSN	Volume 1
7.19 Sea Level Rise	PBI	Volume 1
7.20 Emergency Actions	KSN	Volume 1
8.0 O&M, Inspection, Monitoring, and Remediation of Poor Performance	KSN	Volume 1

All reports and appendices are also provided on a DVD that accompanies this deliverable.



4.0 Summary of ULDC Deficiencies and Proposed Improvements

Each of the required ULDC analyses that are identified in Table 2 concluded that either (a) the RD 2042 levee system met ULDC standards, (b) a long-term remediation plan is required to meet ULDC standards, or (c) levee improvements are required to meet ULDC standards.

Table 2. Levee improvements required in order to meet ULDC standards

ULDC Criteria	Long Term Plan Required	Improvements Required
7.1 Design Water Surface Elevation		
7.2 Minimum Top of Levee		
7.3 Soil Sampling, Testing, and Logging		
7.4 Slope Stability for Intermittently Loaded Levees		
7.5 Underseepage for Intermittently Loaded Levees		
7.6 Frequently Loaded Levees		
7.7 Seismic Vulnerability	x	
7.8 Levee Geometry		
7.9 Interfaces and Transitions		
7.10 Erosion		
7.11 Right-of-Way	x	x
7.12 Encroachments	x	
7.13 Penetrations	x	x
7.14 Floodwalls, Retaining Wall, and Closure Structures		
7.15 Animal Burrows ¹		
7.16 Levee Vegetation ¹		
7.17 Wind Setup and Wave Runup		
7.18 Security	x	
7.19 Sea Level Rise		
7.20 Emergency Actions	x	
8.0 Operations and Maintenance	x	

Several items require long-term plans to meet ULDC criteria. These plans were drafted and are provided in their respective memorandums for each of the ULDC sections.

Improvements to right-of-way and penetrations are required to meet ULDC standards. Table 3 describes the right-of-way deficiencies and Figure 1 summarizes the penetration deficiencies that were found

¹ 7.15 Animal Burrows and 7.16 Levee Vegetation do not require improvements but instead only require a more focused effort in identified reaches during normal operations and maintenance procedures.

through their respective ULDC analyses. This information is discussed further in the individual ULDC sections and in the *Improvements/Cost Estimate* memo, both located in Volume 1 of this deliverable.

Table 3. Existing right-of-way deficiencies

Region	Landside Zone Width	No. of Parcels	Required Acreage
Developed	10'	7	1.5
Undeveloped	20'	20	35.7

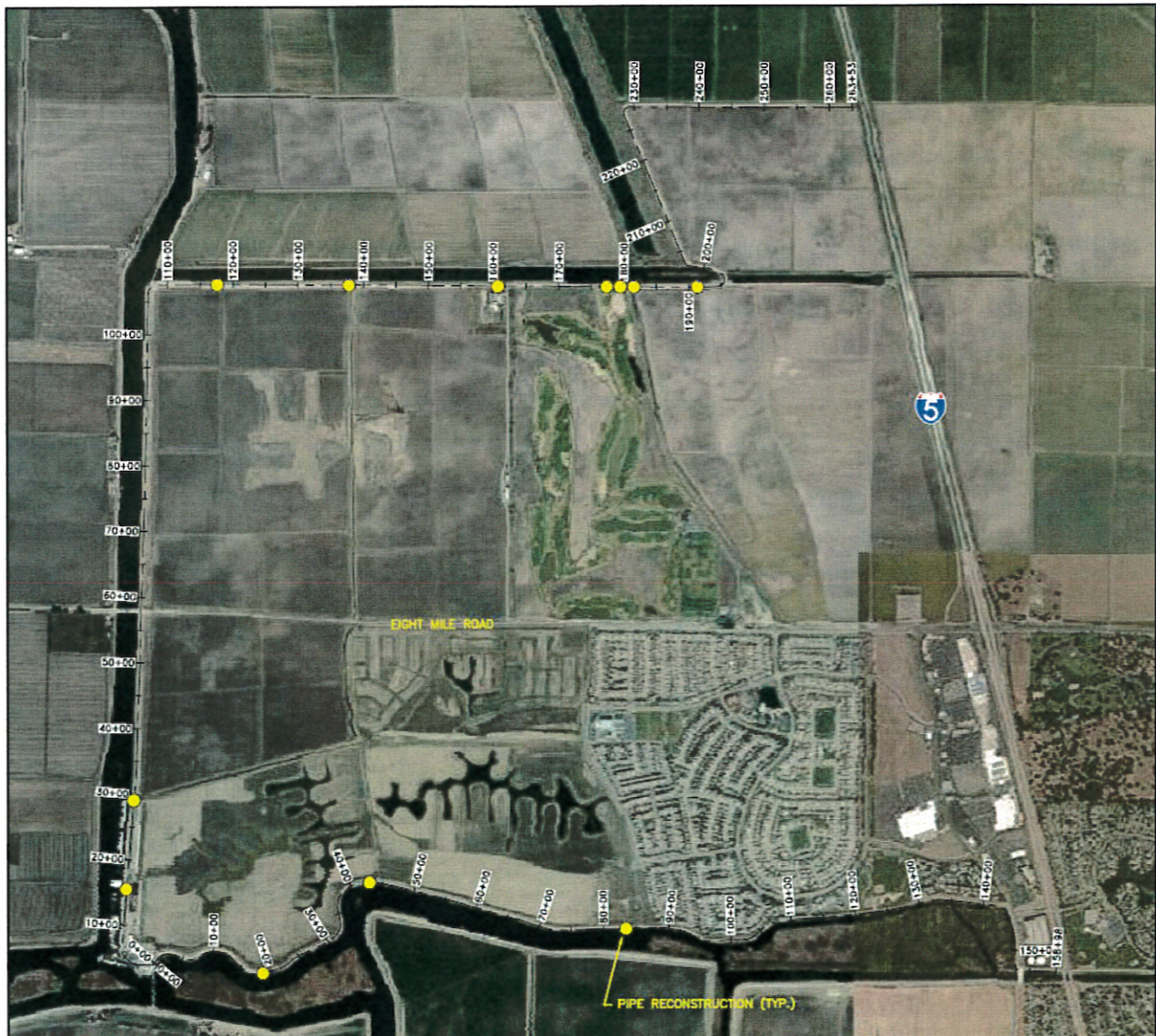


Figure 1. Location of pipe penetrations proposed for improvements.



5.0 200-year Floodplains within RD 2042

PBI completed a floodplain mapping study as part of the RD 2042 ULDC analysis. The floodplain mapping TM provided an understanding of the magnitude (depth and extent) of the 200-year floodplain within RD 2042. The PBI memorandum, *RD 2042 Bishop Tract ULDC Evaluation – Floodplain Mapping* is located in Volume 1 of this deliverable and discusses the details of the hydraulics study.

The study resulted in 200-year flood maps under two different scenarios:

- (1) RD 2042 levees do not attain ULDC/ULOP accreditation and are assumed to fail during a 200-year event (Figure 2), and
- (2) RD 2042 levees achieve ULDC/ULOP accreditation and are assumed to hold during a 200-year event (Figure 3).

Under the scenario where RD 2042 levees are ULDC/ULOP accredited, upstream levees along Bear Creek and Pixley Slough are still assumed to be unaccredited and were modeled to fail during a 200-year scenario. Some of this breach water travels through the under crossings of the Interstate-5 embankment and settles within RD 2042, however flood depths in this scenario largely remain less than 3-feet in areas outside of streets and ponds.

6.0 Conclusion

Once the proposed RD 2042 levee improvements are complete, the levee system will meet all ULDC requirements and the 200-year floodplain will be revised as shown in Figure 3.

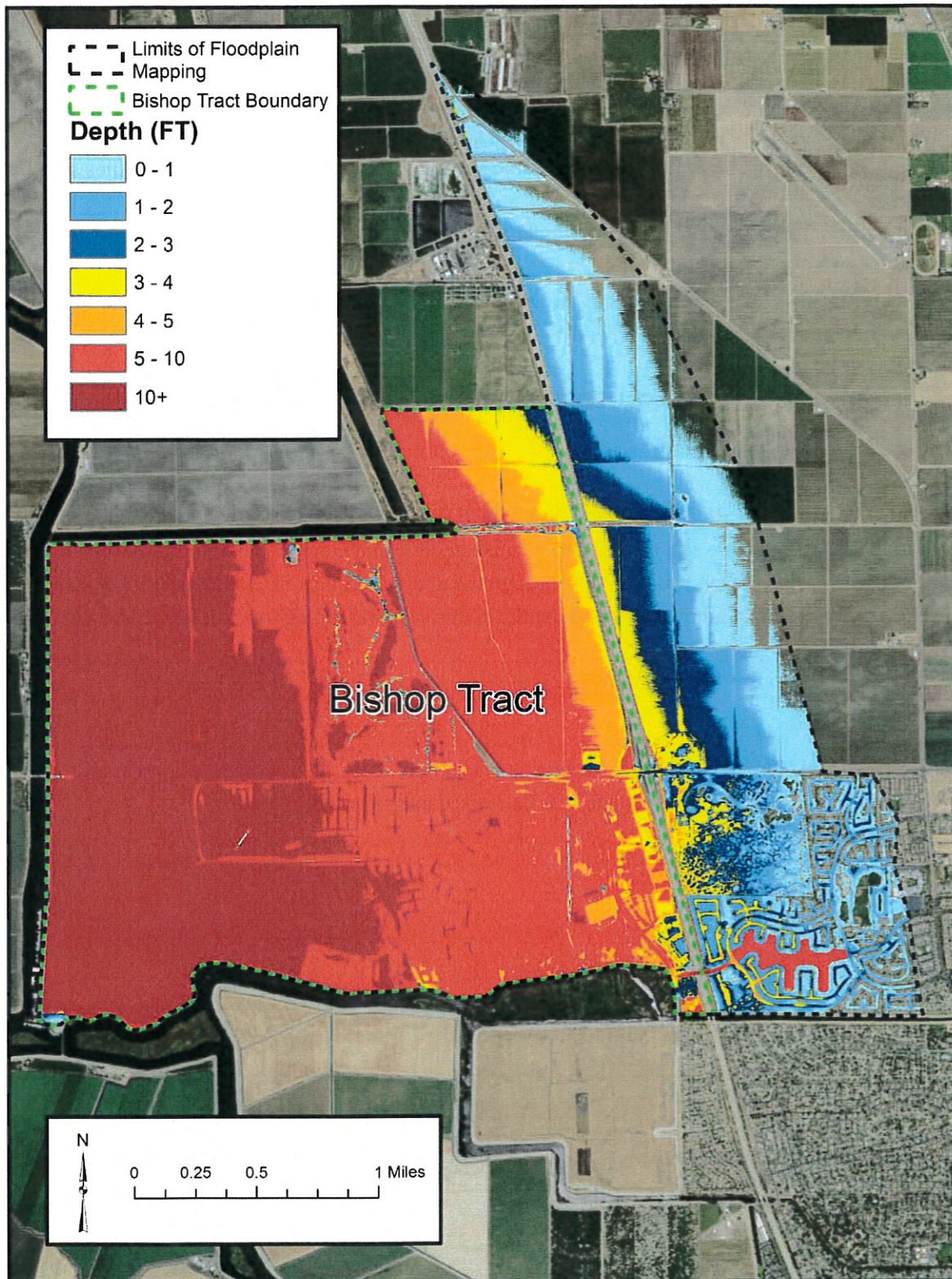


Figure 2. 200-year floodplain depths without ULDC/ULOP accreditation of RD 2042 levees.

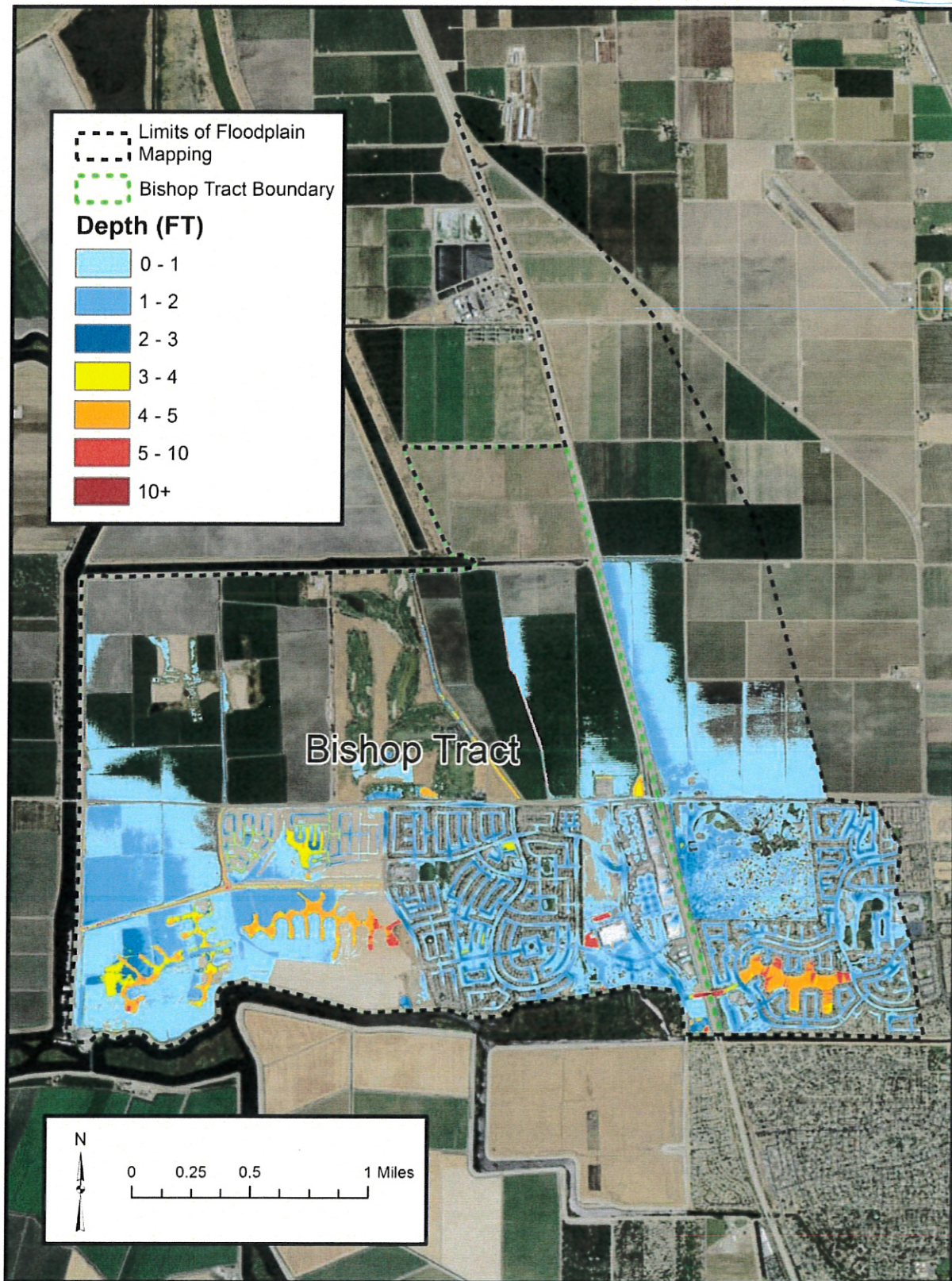


Figure 3. 200-year floodplain depths with ULDC/ULOP accreditation of RD 2042 levees.