

APPENDICES

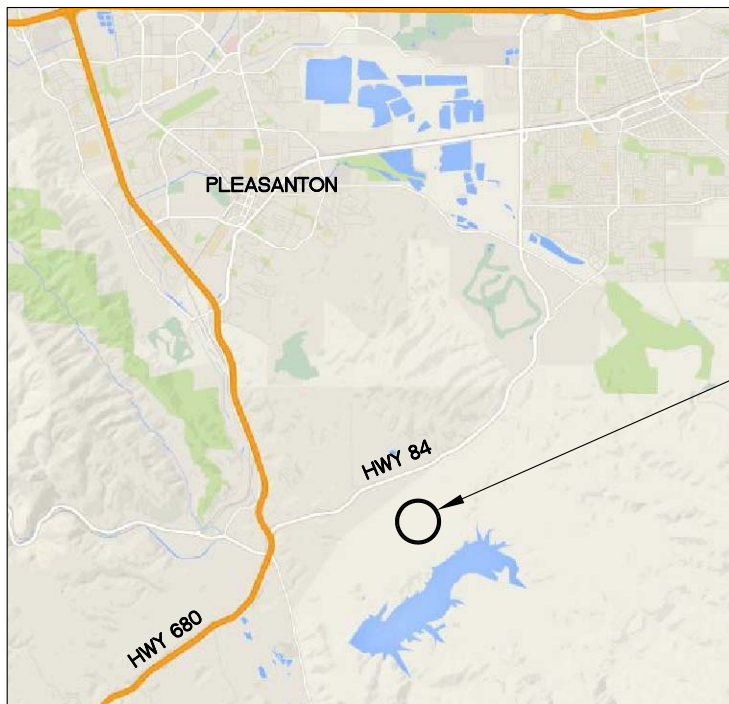
These appendices include content that is not accessible using an assistive device. For accessibility assistance please contact ACWD.

Appendix A.

Administrative 100% Design Plans

VALLECITOS CHANNEL PROGRAMMATIC MAINTENANCE PROJECT

100% ADMINISTRATIVE DRAFT DESIGN SUBMITTAL



VICINITY MAP
N.T.S. (GOOGLE)



REGIONAL MAP
N.T.S. (GOOGLE)

GENERAL NOTES

- TOPOGRAPHIC MAPPING WAS PERFORMED BY:
WATERWAYS CONSULTING, INC.
509 SWIFT STREET, UNIT A
SANTA CRUZ, CA 95060
SURVEY DATES: DECEMBER 2 AND 5, 2015; JANUARY 7 AND 28, 2016; OCTOBER 15 AND 19, 2018; DECEMBER 17, 2018;
OCTOBER 23, 2020
- ELEVATION DATUM: GPS TIES TO NAVD88 USING THE LEICA GEOSYSTEMS SMARTNET GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS) NETWORK.
- BASIS OF BEARINGS: GPS TIES TO NAD83 CALIFORNIA STATE PLANE, ZONE 3 USING THE LEICA GEOSYSTEMS SMARTNET GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS) NETWORK.
- LIDAR DATA SOURCE: 2006 USGS SURVEY OF ALAMEDA COUNTY
- AERIAL PHOTO SOURCE: NAIP 2016 AERIAL IMAGERY
- CONTOUR INTERVAL IN ONE FOOT. ELEVATIONS AND DISTANCES SHOWN ARE IN DECIMAL FEET.
- THIS IS NOT A BOUNDARY SURVEY. PROPERTY LINES WERE COMPILED FROM RECORD INFORMATION. THE LOCATION OF THESE LINES IS SUBJECT TO CHANGE, PENDING THE RESULTS OF A COMPLETE BOUNDARY SURVEY.
- ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE 2018 EDITION OF THE STATE OF CALIFORNIA STANDARD SPECIFICATIONS, ISSUED BY THE DEPARTMENT OF TRANSPORTATION (HEREAFTER REFERRED TO AS "STANDARD SPECIFICATIONS").
- THESE DESIGNS ARE NOT COMPLETE WITHOUT THE FINAL STAMPED TECHNICAL SPECIFICATIONS PREPARED BY WATERWAYS CONSULTING, INC. REFER TO SPECIFICATIONS FOR DETAILS NOT SHOWN HEREON.
- NOTIFY THE ENGINEER AT LEAST 48 HOURS PRIOR TO CONSTRUCTION. THE ENGINEER OR A DESIGNATED REPRESENTATIVE SHALL OBSERVE THE CONSTRUCTION PROCESS, AS NECESSARY TO ENSURE PROPER INSTALLATION PROCEDURES.

ABBREVIATIONS

AVG.	AVERAGE
CC	CONCRETE
CLSM	CONTROLLED LOW STRENGTH MATERIAL
CY	CUBIC YARDS
DIA.	DIAMETER
E	EXISTING
EG	EXISTING GROUND
ELEV.	ELEVATION
DI	DRAINAGE INLET
FG	FINISHED GRADE
FT	FEET
INV	INVERT
N	NEW
NIC	NOT IN CONTRACT
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
RC	RELATIVE COMPACTION
RSP	ROCK SLOPE PROTECTION
SED.	SEDIMENT
SPK	SPIKE
SQ.FT.	SQUARE FOOT
T	TREE
T.B.D.	TO BE DETERMINED
TYP	TYPICAL
UNK	UNKNOWN
VEG.	VEGETATION
WSE	WATER SURFACE ELEVATION
YR	YEAR

SHEET INDEX

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PROJECT DESCRIPTION

THESE DRAWINGS PROVIDE 100% DESIGN LEVEL DETAILS FOR BANK STABILIZATION REPAIRS, CHANNEL MAINTENANCE, AND HABITAT ENHANCEMENTS ON THE VALLECITOS CHANNEL IN ALAMEDA COUNTY, CALIFORNIA.

WORK SHALL CONSIST OF BIOMECHANICAL BANK STABILIZATION, SEDIMENT REMOVAL, VEGETATION MANAGEMENT, ROAD DRAINAGE IMPROVEMENTS, AND REVEGETATION WITH NATIVE PLANTS.

SECTION AND DETAIL CONVENTION

SECTION OR DETAIL IDENTIFICATION (NUMBER OR LETTER)

REFERENCE SHEET ON WHICH SECTION OR DETAIL IS SHOWN.

TREATMENT ID AND LOCATION SYMBOL
SEE TABLE 1 ON SHEETS C6 AND C7 FOR DETAILED DESCRIPTIONS

*** CALL BEFORE YOU DIG ***

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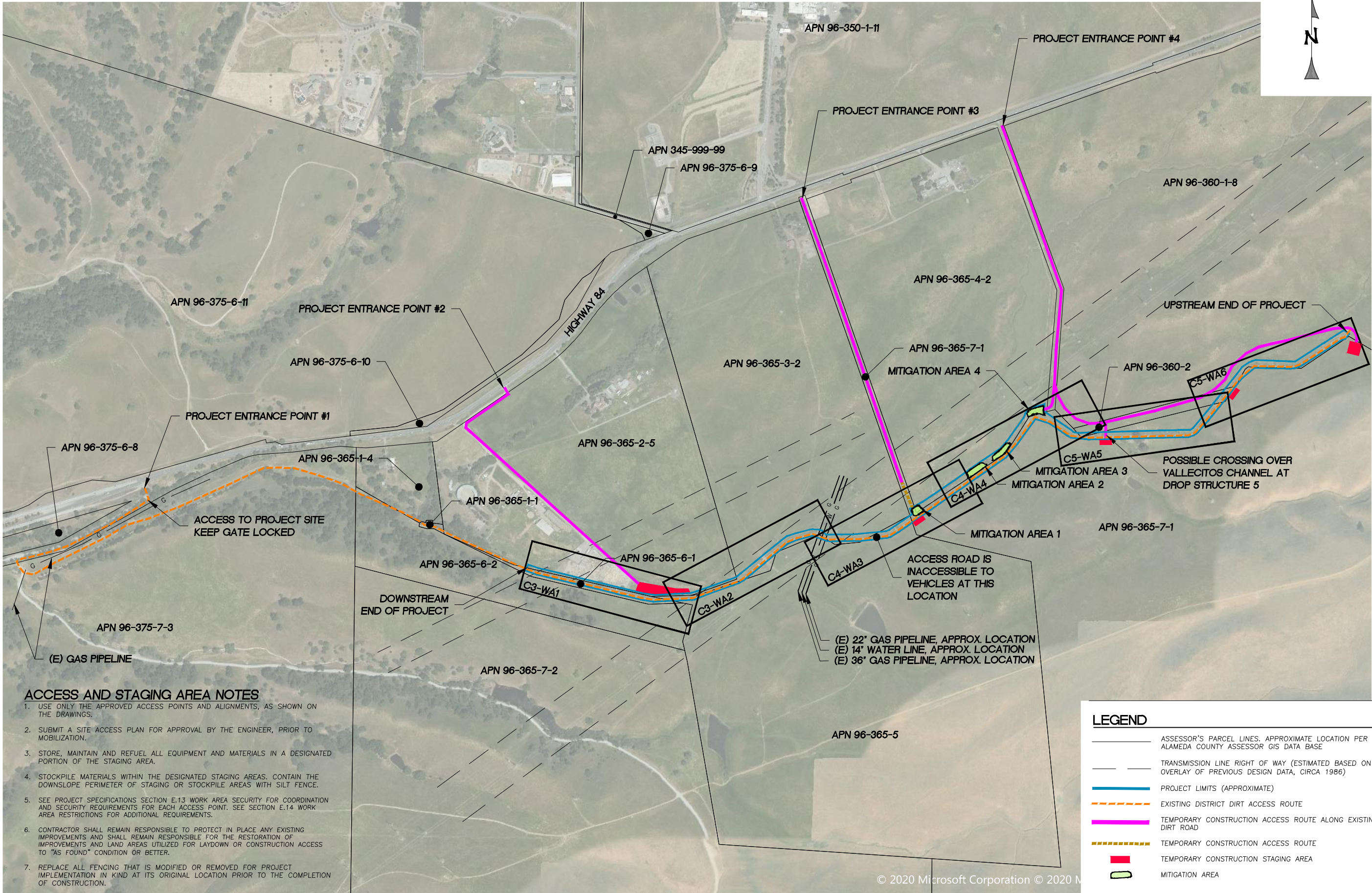
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DESIGNED DRAWN CHECKED REVIEWED BY OPS PROJ. ENGR. ENGR. SUPERVISOR	WWW KB/BZ WWW	FACILITY ID: G05 FILE: G05-21D-01-C1 DATE: 02/09/21 SCALE: AS NOTED	WATERWAYS JOB NO. 15-007	E. NUMBER XXXXX	REV A	ENGINEER'S STAMP HERE

WATERWAYS CONSULTING INC. 509A SWIFT ST. SANTA CRUZ, CA 95060 PH: (831) 447-7744 WWW.WATWAYS.COM	ALAMEDA COUNTY WATER DISTRICT 43885 SOUTH GRIMMER BOULEVARD P.O. BOX 5110 FREMONT, CA 94537-5110 (510) 668-4200

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SHEET NO
C1



- ACCESS AND STAGING AREA NOTES**
1. USE ONLY THE APPROVED ACCESS POINTS AND ALIGNMENTS, AS SHOWN ON THE DRAWINGS.
 2. SUBMIT A SITE ACCESS PLAN FOR APPROVAL BY THE ENGINEER, PRIOR TO MOBILIZATION.
 3. STORE, MAINTAIN AND REFUEL ALL EQUIPMENT AND MATERIALS IN A DESIGNATED PORTION OF THE STAGING AREA.
 4. STOCKPILE MATERIALS WITHIN THE DESIGNATED STAGING AREAS. CONTAIN THE DOWNSLOPE PERIMETER OF STAGING OR STOCKPILE AREAS WITH SILT FENCE.
 5. SEE PROJECT SPECIFICATIONS SECTION E.13 WORK AREA SECURITY FOR COORDINATION AND SECURITY REQUIREMENTS FOR EACH ACCESS POINT. SEE SECTION E.14 WORK AREA RESTRICTIONS FOR ADDITIONAL REQUIREMENTS.
 6. CONTRACTOR SHALL REMAIN RESPONSIBLE TO PROTECT IN PLACE ANY EXISTING IMPROVEMENTS AND SHALL REMAIN RESPONSIBLE FOR THE RESTORATION OF IMPROVEMENTS AND LAND AREAS UTILIZED FOR LAYDOWN OR CONSTRUCTION ACCESS TO "AS FOUND" CONDITION OR BETTER.
 7. REPLACE ALL FENCING THAT IS MODIFIED OR REMOVED FOR PROJECT IMPLEMENTATION IN KIND AT ITS ORIGINAL LOCATION PRIOR TO THE COMPLETION OF CONSTRUCTION.

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WORK AREA OVERVIEW AND ACCESS PLAN
SCALE: 1" = 400'

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DRAWN

CHECKED

REVIEWED BY OPS

PROJ ENGR

ENGR SUPERVISOR

WWW

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ALAMEDA COUNTY WATER DISTRICT

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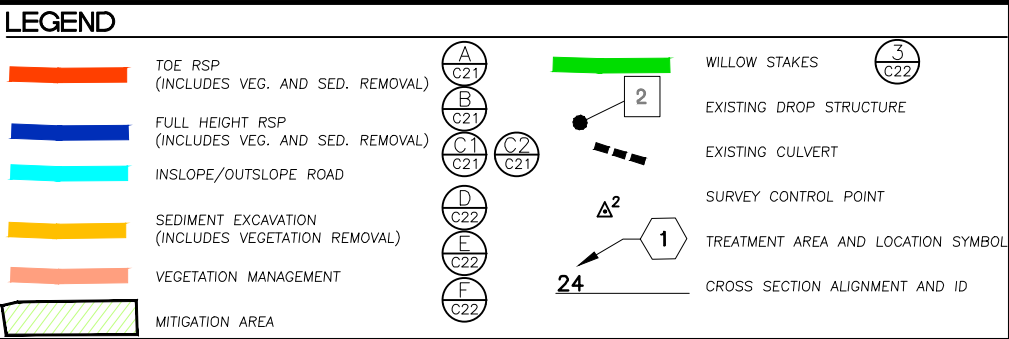
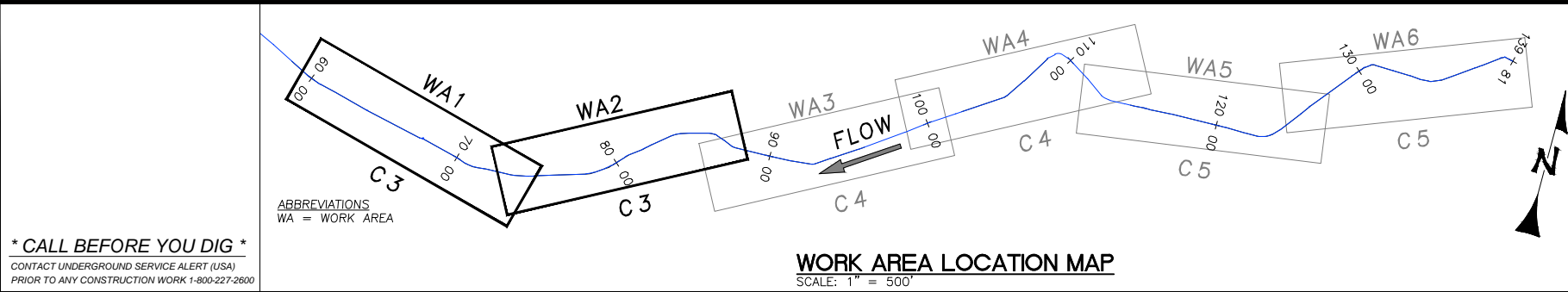
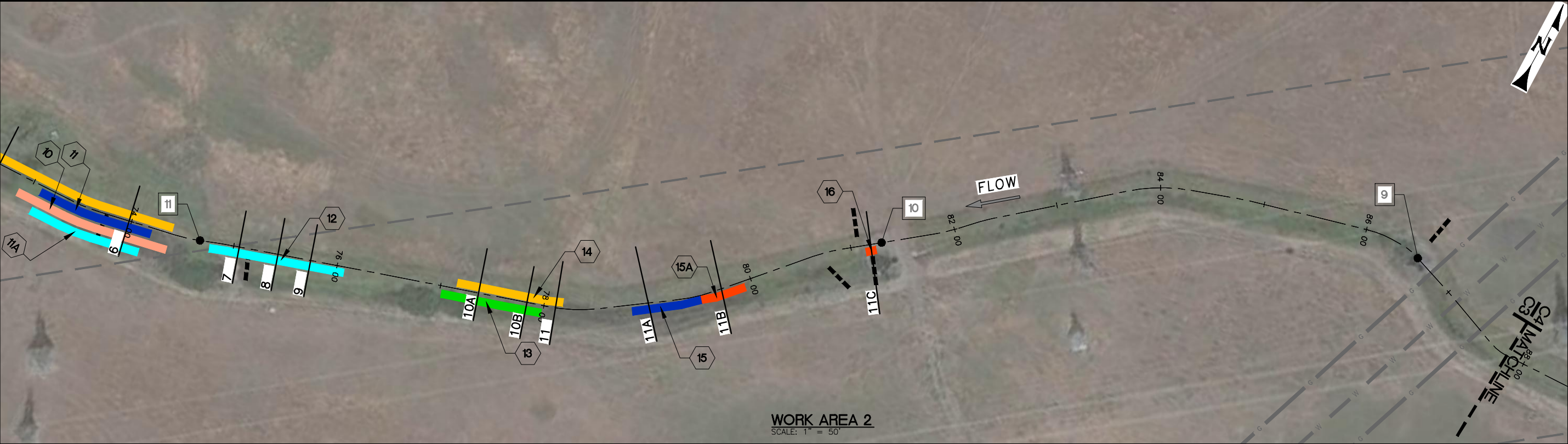
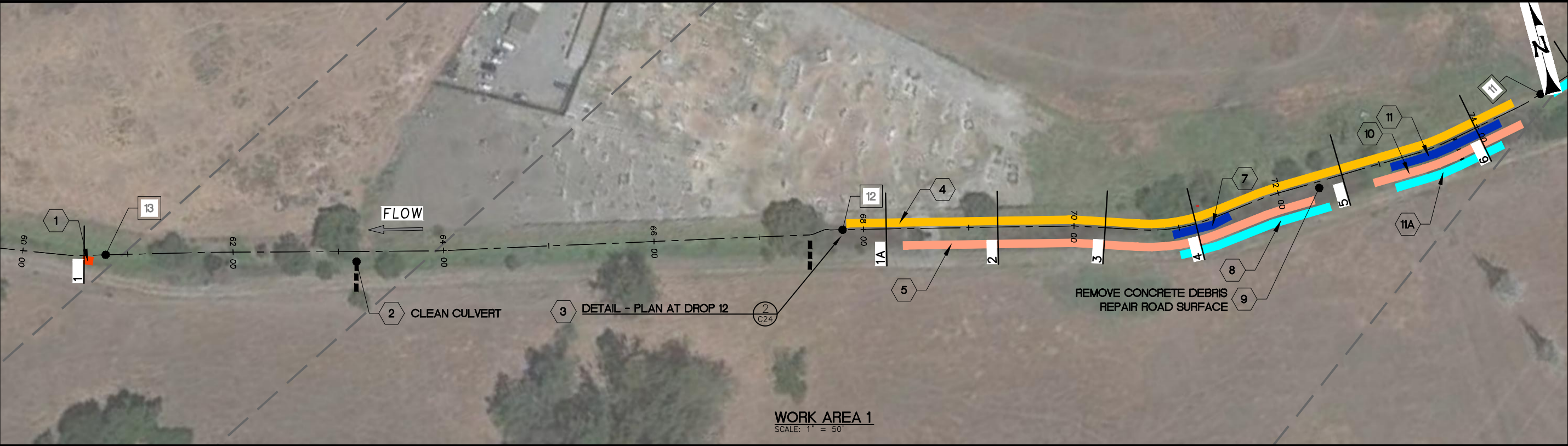
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SHEET NO
C2

VALLECITOS CHANNEL PROGRAMMATIC MAINTENANCE PROJECT
100% ADMN. DRAFT SUBMITTAL
SITE OVERVIEW AND ACCESS

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REVISIONS
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E. NUMBER XXXXX
ACWD JOB NO. 21003



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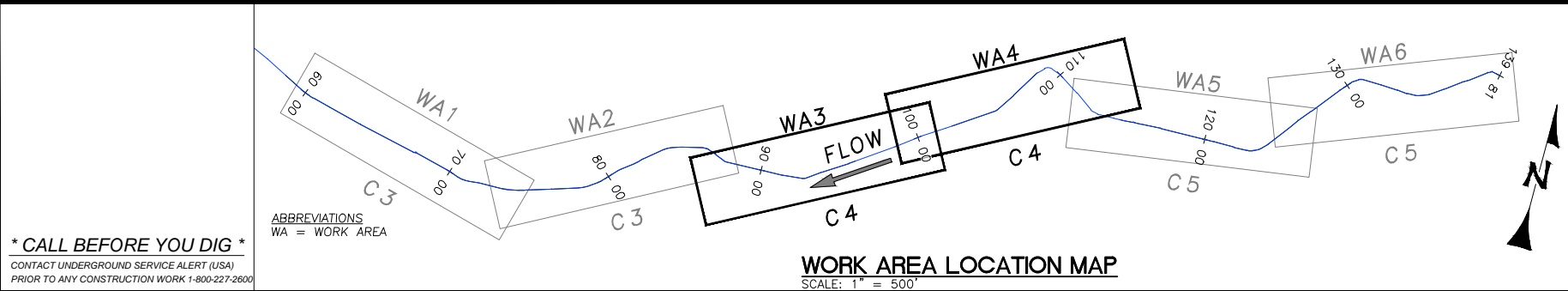
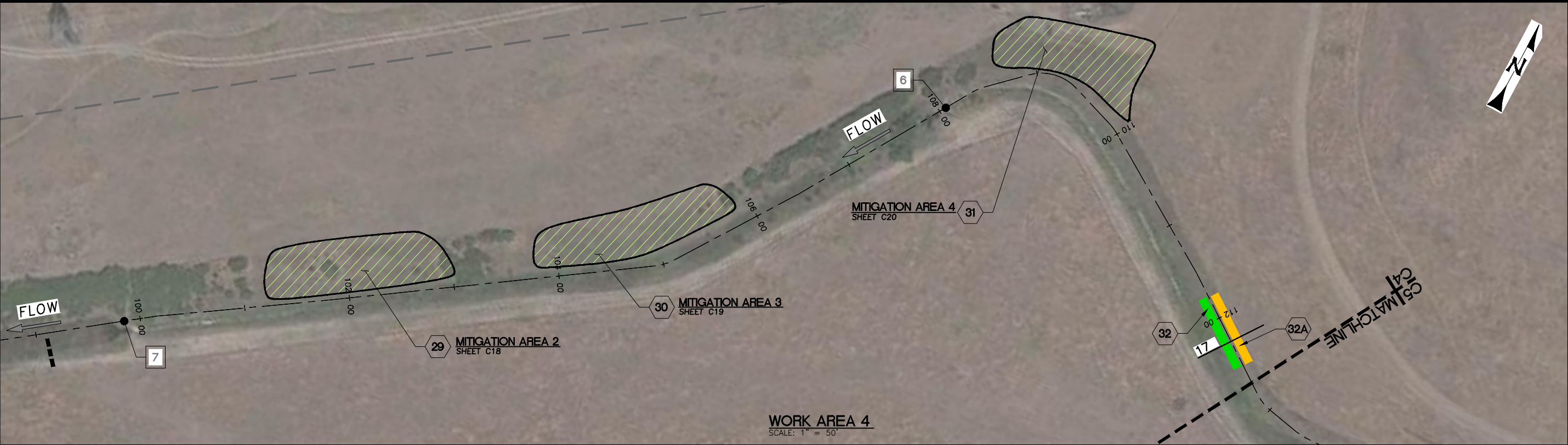
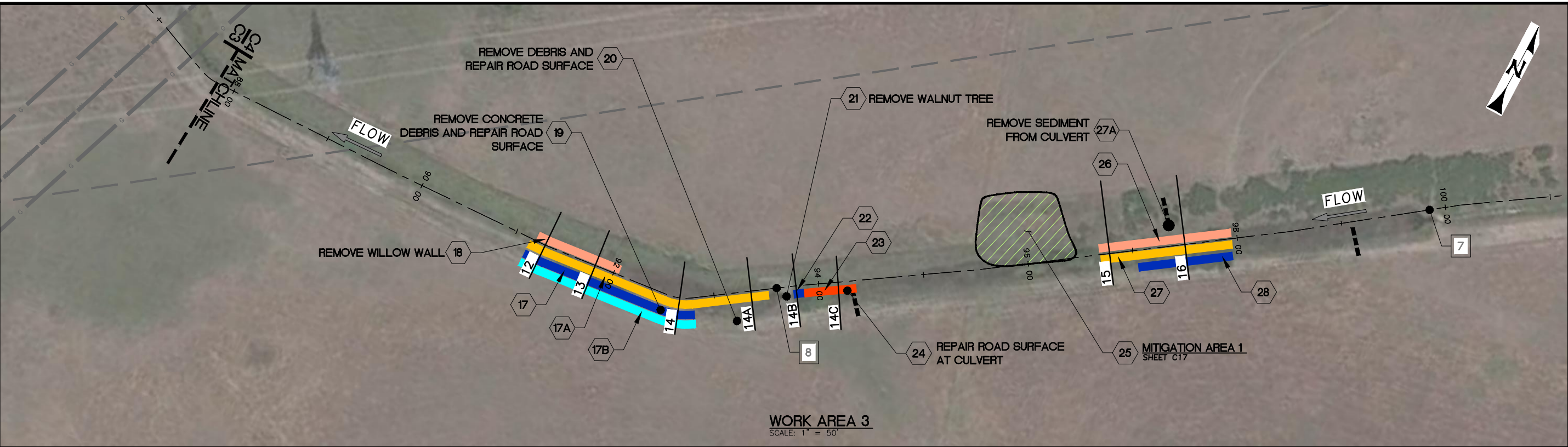
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REVIEWED BY OPS	
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ENGR SUPERVISOR	

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TREATMENT PLAN (1 OF 3)



LEGEND

- TOE RSP (INCLUDES VEG. AND SED. REMOVAL)
- FULL HEIGHT RSP (INCLUDES VEG. AND SED. REMOVAL)
- INSLOPE/OUTSLOPE ROAD
- SEDIMENT EXCAVATION (INCLUDES VEGETATION REMOVAL)
- VEGETATION MANAGEMENT
- MITIGATION AREA
- WILLOW STAKES
- EXISTING DROP STRUCTURE
- EXISTING CULVERT
- SURVEY CONTROL POINT
- TREATMENT AREA AND LOCATION SYMBOL
- CROSS SECTION ALIGNMENT AND ID

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VALLECITOS CHANNEL PROGRAMMATIC MAINTENANCE PROJECT
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TREATMENT PLAN (2 OF 3)

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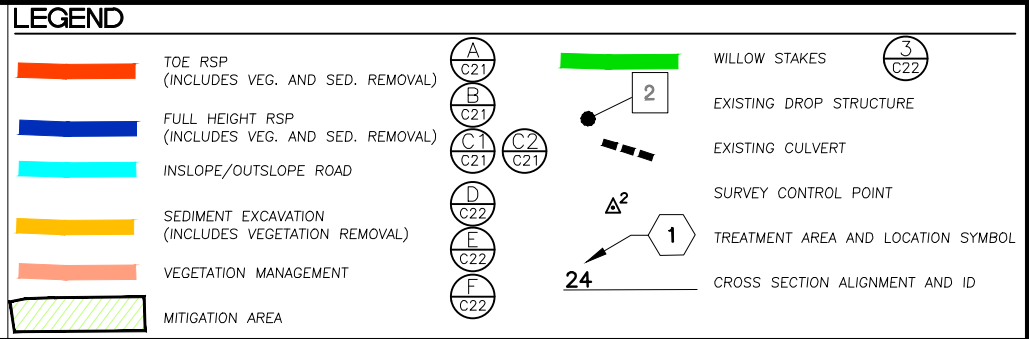
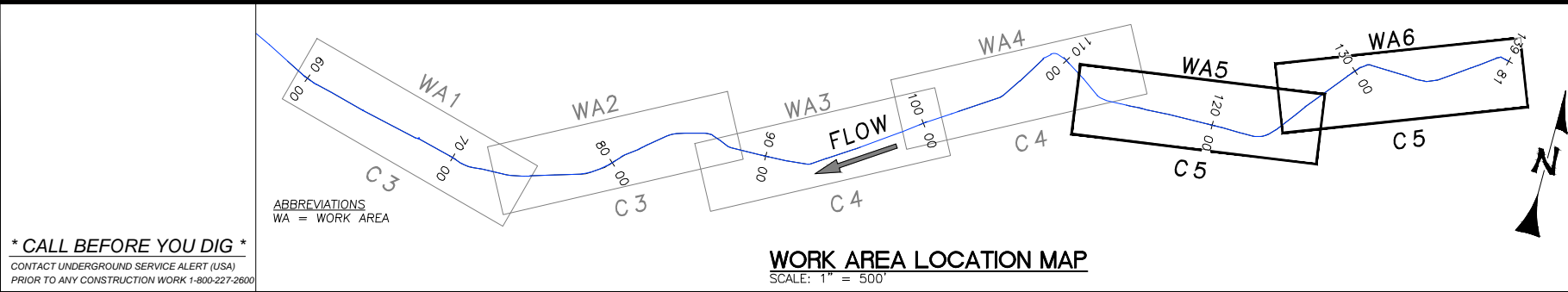
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TREATMENT PLAN (3 OF 3)

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TABLE 1. SCHEDULE OF WORK

				SEDIMENT EXCAVATION	RSP INSTALLATION				WILLOW STAKE INSTALLATION	VEGETATION MANAGEMENT	MITIGATION AREAS		CONCRETE DEBRIS REMOVAL	ROAD IMPROVEMENTS (INSLOPING/OUTSLOPING)	
TREATMENT AREA	DOWNSTREAM STATION (FT)	UPSTREAM STATION (FT)	LENGTH (LF)	SEDIMENT REMOVAL VOLUME (CY)	FULL HEIGHT RSP (CY)	TOE RSP (CY)	OVEREX/ CUT AT RSP (CY)	FILL AT RSP (CY)	WILLOW STAKES (EA)	PLAN AREA OF VEGETATION REMOVAL (SF)	MITIGATION EXCAVATION (CY)	MITIGATION DISTURBANCE AREA (SF)	VOLUME (CY)	LINEAR FEET (LF)	DESCRIPTION
1	6060	6070	10			11	9								INSTALL TOE RSP. DEWATERING IS REQUIRED. DEMOLISH GABION(S) NEAR TOE TO LOWEST FULLY INTACT CELL, AS DIRECTED BY THE ENGINEER. PLACE RSP IN A MANNER THAT WILL SUPPORT THE GABION(S) TO REMAIN.
DROP STRUCTURE 13	6070	6097													
2	6316														REMOVE SEDIMENT FROM CULVERT INTERIOR, OUTLET, AND INLET; EXCAVATE 1 CY.
DROP STRUCTURE 12	6770	6799													
3	6790														SEE DETAILED SITE PLAN ON SHEET C24.
4	6784	7440	656	577											REMOVE SEDIMENT FROM CHANNEL.
5	6837	7231	394							5847					REMOVE VEGETATION FROM CHANNEL.
6										NO WORK PROPOSED					N/A
7	7094	7150	56		57		47								INSTALL FULL HEIGHT RSP.
8	7097	7244	147											147	INSLOPE ROAD.
9	7238												1		EXCAVATE ROAD EDGE (5 CY), REMOVE CONCRETE DEBRIS, PLACE ENGINEERED FILL, AND REPAIR ROAD SURFACE, AS DIRECTED BY THE ENGINEER.
10	7290	7440	150							2617					REMOVE VEGETATION FROM CHANNEL.
11	7310	7421	111		221		140								INSTALL FULL HEIGHT RSP
11A	7310	7421	111											111	INSLOPE ROAD.
DROP STRUCTURE 11	7454	7483													
12	7475	7608	133											133	OUTSLOPE ROAD.
13	7701	7798	97						30						INSTALL WILLOW STAKES.
14	7715	7818	103	138											REMOVE TULE AND SEDIMENT TO ALLOW FOR WILLOW STAKING.
15	7880	7948	68		122		52	16							INSTALL FULL HEIGHT RSP.
15A	7948	7992	44			51	44								INSTALL TOE RSP.
16	8115	8125	10			15	10								INSTALL TOE RSP. DEWATERING IS REQUIRED. MAY NEED TO REMOVE AND REPLACE PIPE RAILING AND FENCE TO ACCESS WORK AREA. DEMOLISH GABION(S) NEAR TOE TO LOWEST FULLY INTACT CELL, AS DIRECTED BY THE ENGINEER. PLACE RSP IN A MANNER THAT WILL SUPPORT THE GABION(S) TO REMAIN.
DROP STRUCTURE 10	8127	8170													
															NO PROPOSED TREATMENTS BETWEEN DROP STRUCTURE 9 AND DROP STRUCTURE 10
DROP STRUCTURE 9	8661	8687													
17	9116	9280	164		264		110	65							INSTALL FULL HEIGHT RSP.
17A	9116	9352	236	288											REMOVE SEDIMENT FROM CHANNEL.
17B	9116	9280	164											164	OUTSLOPE ROAD. PLACE ENGINEERED FILL TO RECONSTRUCT THE BANK AND ROAD.
18	9120	9205	85												REMOVE 85 LF OF WILLOW WALL AND VEGETATION WITHIN THE CHANNEL. SALVAGE ALL WILLOWS OVER 4-INCHES DBH DURING WILLOW WALL REMOVAL FOR INCORPORATION INTO MITIGATION AREAS PER SECTION F AND DETAIL 7 ON SHEET C22.
19	9250												2		REMOVE CONCRETE DEBRIS, PLACE ENGINEERED FILL, AND REPAIR ROAD SURFACE.
20	9323	9327	4										2		REMOVE CONCRETE DEBRIS AND REPAIR ROAD SURFACE BY PLACING 10 CY OF ENGINEERED FILL. PLACE EROSION CONTROL FABRIC OVER DISTURBED PORTION OF CHANNEL BANK AND INSTALL 10 WILLOW STAKES AT 5 FT. ON-CENTER, AS DIRECTED BY THE ENGINEER.
DROP STRUCTURE 8	9350	9375													
21	9365														REMOVE MULTI-STEM WALNUT (8", 6", AND 3" DIAMETER STEMS).
22	9375	9385	10		15		20								INSTALL FULL HEIGHT RSP.
23	9385	9435	50			48	49								INSTALL TOE RSP. CONFORM TO TREATMENT 22, AS DIRECTED BY THE ENGINEER.
24	9428														EXCAVATE SINKHOLE OVER EXISTING CULVERT, AS DIRECTED BY ENGINEER. BACKFILL EXCAVATION WITH 1 CY ENGINEERED FILL TO RESTORE ROAD SURFACE.
25	9553	9641	88								500	5375			SEE DETAILED SITE PLAN ON SHEET C17 AND SECTION F ON SHEET C22.
26	9667	9795	128							3235					THIN WILLOWS, AS DIRECTED BY THE ENGINEER, TO FAVOR FLOW ALONG THE NORTH BANK. SALVAGE ALL WILLOW ROOTBALLS OVER 4-INCHES DBH. SALVAGED ROOTBALLS WILL BE RELOCATED TO THE MITIGATION AREAS, PER THE WILLOW TRANSPLANT DETAIL.
27	9667	9795	128	191											REMOVE SEDIMENT FROM CHANNEL.
27A	9737														REMOVE 5-10 CY OF SEDIMENT FROM (E) 48-INCH PLUGGED CULVERT. WORK WILL NEED TO OCCUR ON THE ADJACENT PARCEL TO CLEAN OUT THE INLET.
28	9703	9795	92		180		78	13							INSTALL FULL HEIGHT RSP.

NOTES

1. LOCATIONS OF TREATMENTS SHOWN ON SHEET C3, C4, AND C5.
2. LOCATIONS AND QUANTITIES SHOWN ARE APPROXIMATE. FINAL LAYOUT, GRADE, AND DIMENSIONS SHALL BE STAKED BY THE ENGINEER IN THE FIELD.

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JOB NO.
15-007

DATE: 02/09/21
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A

E. NUMBER
XXXXX
21003

VALLECITOS CHANNEL PROGRAMMATIC
MAINTENANCE PROJECT
100% ADMN. DRAFT SUBMITTAL

SCHEDULE OF WORK (1 OF 2)

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CHECKED
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ENGR SUPERVISOR

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CONSULTING INC.

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SHEET NO
C6

TABLE 1. SCHEDULE OF WORK (CONTINUED)

				SEDIMENT EXCAVATION	RSP INSTALLATION				WILLOW STAKE INSTALLATION	VEGETATION MANAGEMENT	MITIGATION AREAS		CONCRETE DEBRIS REMOVAL	ROAD IMPROVEMENTS (INSLOPING/OUTSLOPING)	
TREATMENT AREA	DOWNSTREAM STATION (FT)	UPSTREAM STATION (FT)	LENGTH (LF)	SEDIMENT REMOVAL VOLUME (CY)	FULL HEIGHT RSP (CY)	TOE RSP (CY)	OVEREX/ CUT AT RSP (CY)	FILL AT RSP (CY)	WILLOW STAKES (EA)	PLAN AREA OF VEGETATION REMOVAL (SF)	MITIGATION EXCAVATION (CY)	MITIGATION REVEGETATION (SF)	VOLUME (CY)	LINEAR FEET (LF)	DESCRIPTION
DROP STRUCTURE 7	9979	10007													
29	10121	10295	174								1035	8425			SEE DETAILED SITE PLAN ON SHEET C18 AND SECTION F ON SHEET C22.
30	10379	10588	209								1170	7700			SEE DETAILED SITE PLAN ON SHEET C19 AND SECTION F ON SHEET C22.
DROP STRUCTURE 6	10805	10833													
31	10864	10994	130								1050	7750			SEE DETAILED SITE PLAN ON SHEET C20 AND SECTION F ON SHEET C22.
32	11177	11249	72						25						INSTALL WILLOW STAKES.
32A	11177	11249	72	26											REMOVE SEDIMENT FROM CHANNEL.
33	11424	11439	15										4		REMOVE CONCRETE DEBRIS, PLACE ENGINEERED FILL, REPAIR ROAD SURFACE, AND OUTSLOPE ROAD.
DROP STRUCTURE 5	11555	11595													
34															N/A
35	12053	12151	98						30						INSTALL WILLOW STAKES.
DROP STRUCTURE 4	12195	12223													
36	12236	12253	17			16	8								INSTALL TOE RSP.
37	12390												0.5		REMOVE CONCRETE OBSTRUCTION FROM CULVERT INLET.
38	12449	12609	160							0					REMOVE VEGETATION FROM CHANNEL.
39	12507	12608	101		211		99								INSTALL FULL HEIGHT RSP.
40	12642	12667	25												INSTALL FRENCH DRAIN (25 LF), PER DETAIL 6 ON SHEET C22 AND CONNECT TO NEW CONCRETE CATCH BASIN - SEE DESCRIPTION FOR TREATMENT AREA 40A.
40A	12636														POTHOLE (E) CMP AND FIELD VERIFY CONDITION(?) BEFORE WORK. INSTALL NEW 3-FT X 3-FT CONCRETE CATCH BASIN WITH H-20 RATED STEEL GRATE, RIM ELEV: 454.5. SHAPE LOCAL AREA TO DRAIN TO CATCH BASIN, AS DIRECTED BY THE ENGINEER.
41	12678	12700	22		69		33	1							INSTALL FULL HEIGHT RSP. OVEREXCAVATE 1 FOOT (MINIMUM) INTO COMPETENT MATERIAL AND RECOMPACT ALL SINKHOLES. GRADE ROAD AS NEEDED TO CREATE A SMOOTH ROAD SURFACE THAT DRAINS TOWARD THE CHANNEL, AS DIRECTED BY THE ENGINEER.
DROP STRUCTURE 3	12704	12733	29												
42	12845	13124	279											279	OUTSLOPE ROAD.
43	12898	12920	22			18	14								INSTALL TOE RSP.
44	13025														PLACE 2 CY OF GABION ROCK TO REPAIR SLOPE AND ROAD SURFACE, AS DIRECTED BY ENGINEER.
DROP STRUCTURE 2	13287	13315													
45	13491	13579	88		186		93								PLACE FULL HEIGHT RSP.
46	13632	13713	81											81	OUTSLOPE ROAD AND FILL SMALL SINK HOLES, AS DIRECTED BY THE ENGINEER.
46A	13625														REMOVE CULVERT AND LOOSE MATERIAL, OVEREXCAVATE A MINIMUM OF 1 FT. INTO EXISTING COMPETENT MATERIAL AND REPLACE WITH ENGINEERED FILL, AS DIRECTED BY THE ENGINEER, TO CONSTRUCT A FIRM FOUNDATION FOR CULVERT REINSTALLATION. SHAPE AREA AROUND INLET TO DIRECT RUNOFF INTO CULVERT.
DROP STRUCTURE 1	13735	13763													
47	13763	13793	30		41		12	3							SEE DETAILED SITE PLAN ON SHEET C23.
48															N/A
49	13967														PLACE 3 CY OF GABION ROCK TO RECONSTRUCT ROAD SHOULDER, AS DIRECTED BY ENGINEER.

NOTES

1. LOCATIONS OF TREATMENTS SHOWN ON SHEET C3, C4, AND C5.
2. LOCATIONS AND QUANTITIES SHOWN ARE APPROXIMATE. FINAL LAYOUT, GRADE, AND DIMENSIONS SHALL BE STAKED BY THE ENGINEER IN THE FIELD.

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DESIGNED

DRAWN

CHECKED

REVIEWED BY OPS

PROJ ENGR

ENGR SUPERVISOR

WWW

K8/BZ

WWW

WATERWAYS CONSULTING INC.

509A SWIFT ST.

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ALAMEDA COUNTY WATER DISTRICT

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(510) 668-4200

VALLECITOS CHANNEL PROGRAMMATIC MAINTENANCE PROJECT

100% ADMN. DRAFT SUBMITTAL

SCHEDULE OF WORK (2 OF 2)

FACILITY ID: G05

WATERWAYS

FILE: G05-21D-01-

DATE: 02/09/21

SCALE: AS NOTED

ENGINEER'S STAMP HERE

15-007

ACWD

21003

REV

E. NUMBER

XXXXX

A

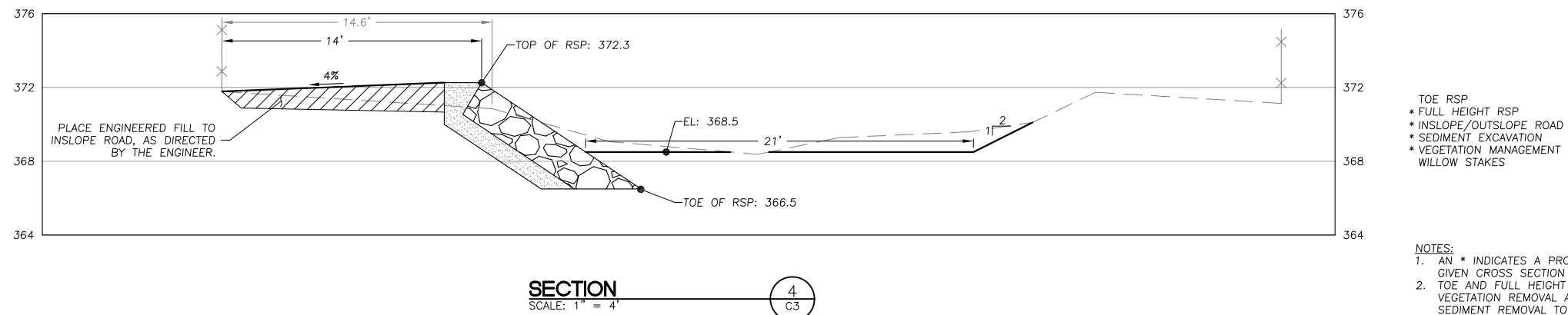
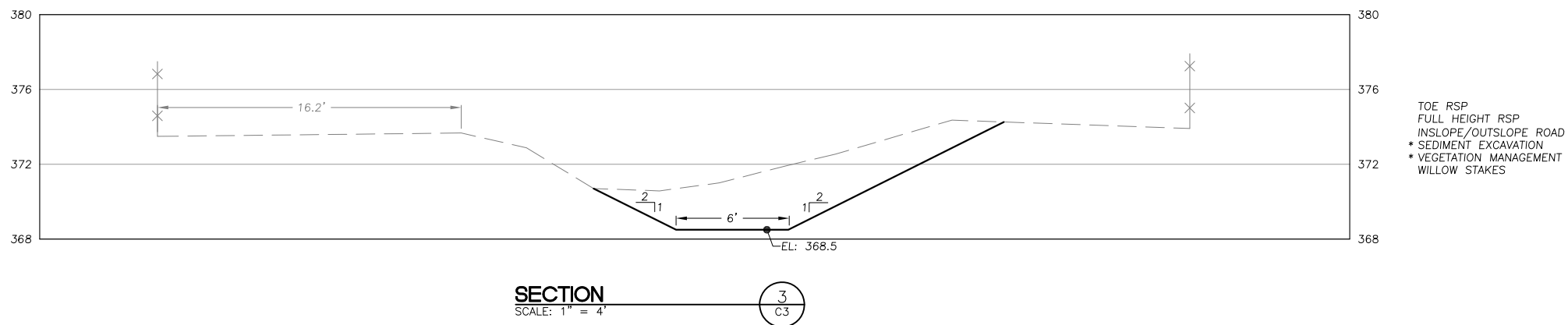
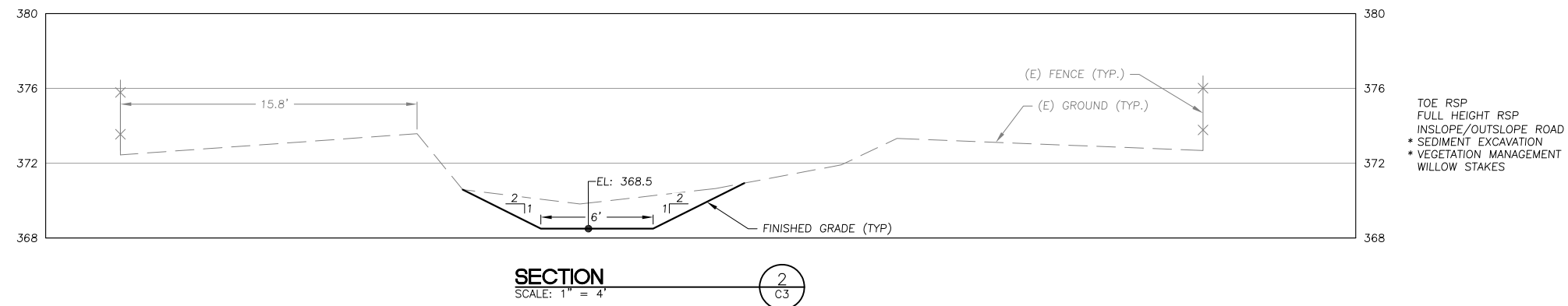
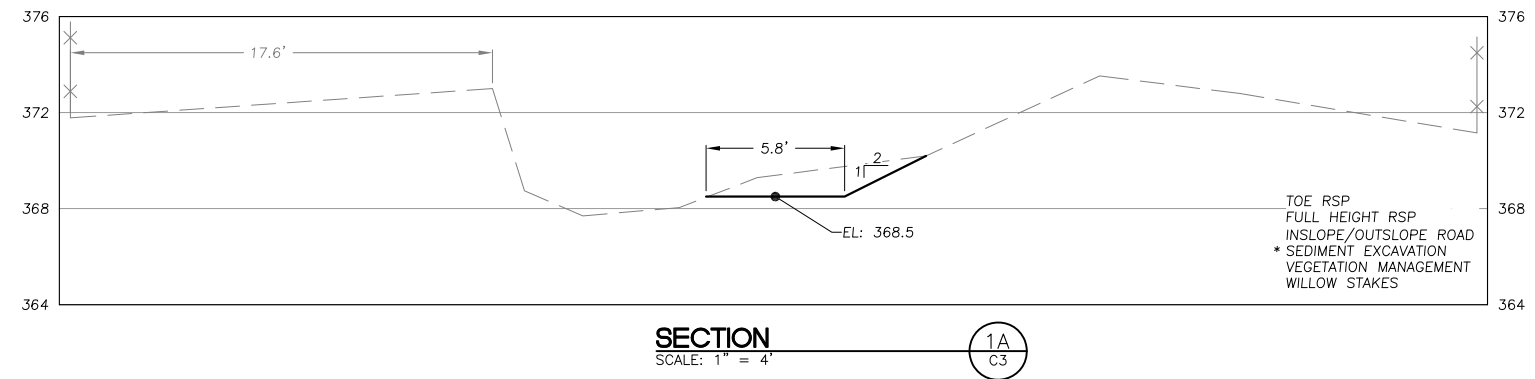
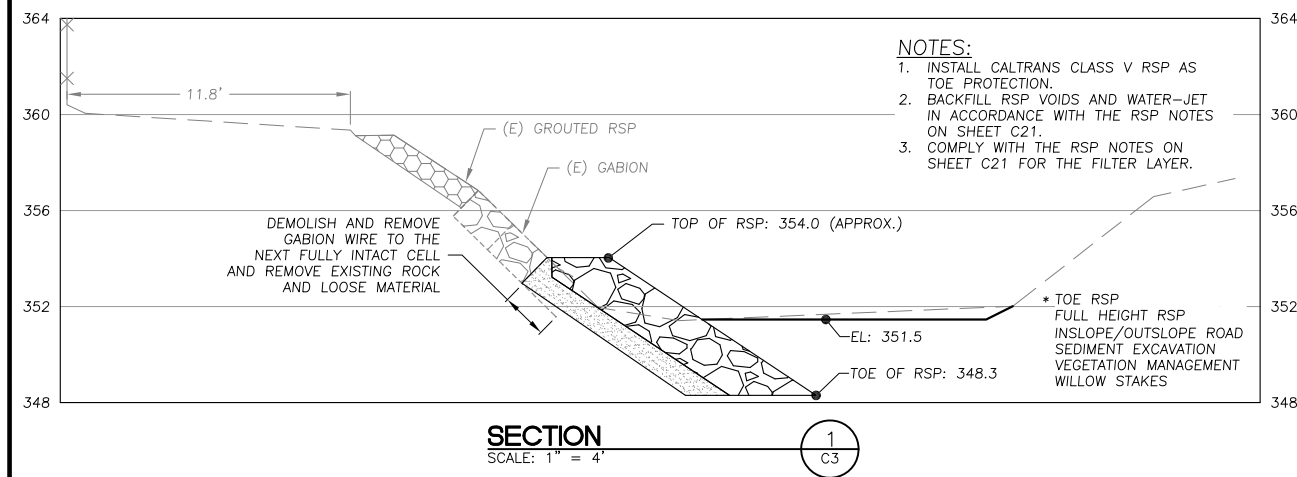
BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

0

1"

SHEET NO

C7



NOTES:

1. AN * INDICATES A PROPOSED TREATMENT AT A GIVEN CROSS SECTION
2. TOE AND FULL HEIGHT RSP BOTH REQUIRE VEGETATION REMOVAL AND MINOR AMOUNTS OF SEDIMENT REMOVAL TO FACILITATE THE WORK.
3. SEDIMENT EXCAVATION REQUIRES VEGETATION REMOVAL TO FACILITATE THE WORK.

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0  1"

SHEET NO

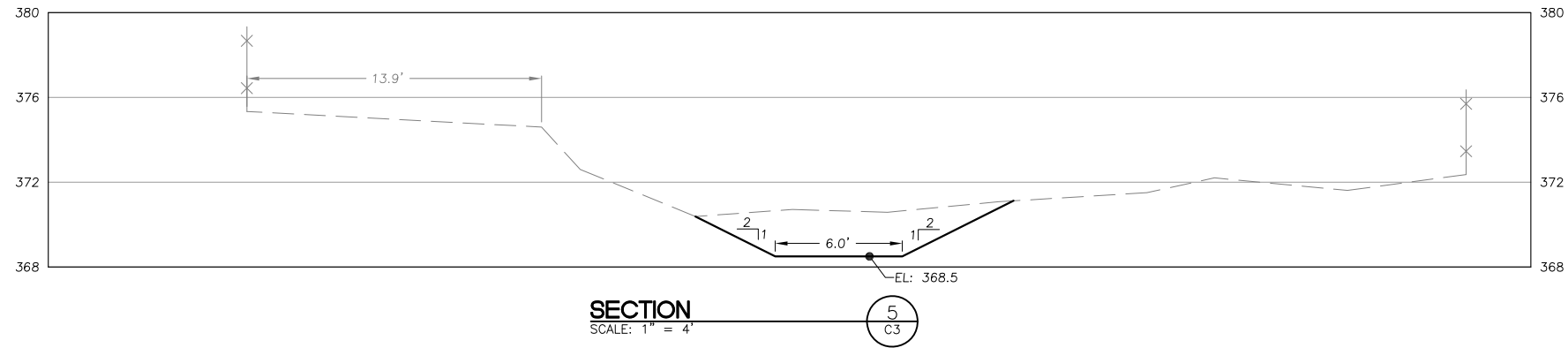
C8

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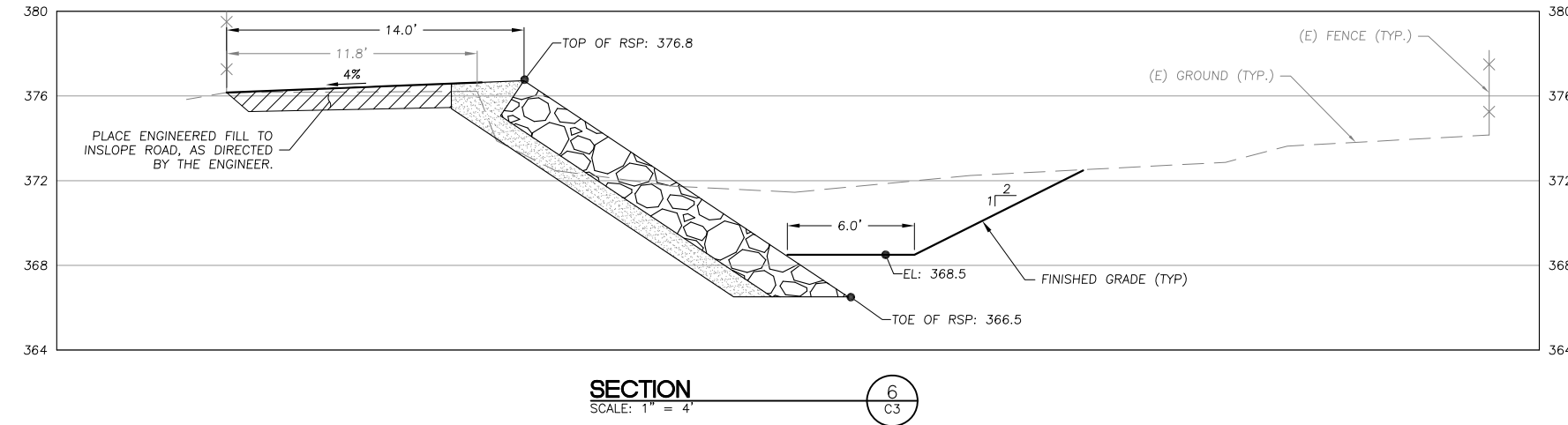
SECTIONS (1 OF 9)

WATERWAYS JOB NO. 15-007	ACWD JOB NO. 21003	FACILITY ID: G05	
		FILE: G05-21D-01-C8	
		DATE: 02/09/21	
		SCALE: AS NOTED	
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		XXXXX	A

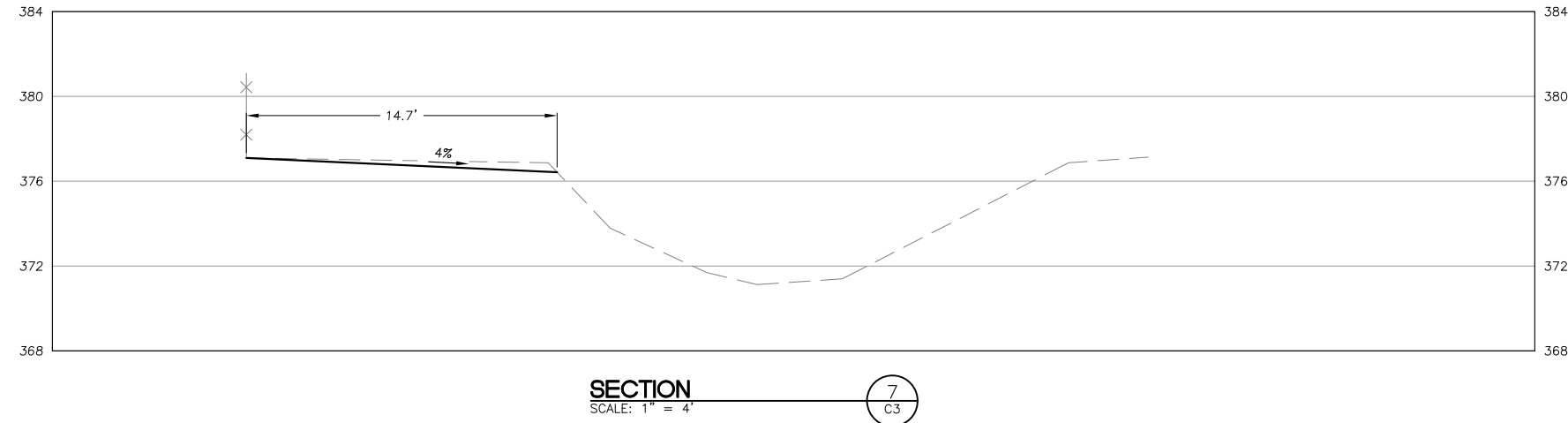
ENGINEER'S
STAMP



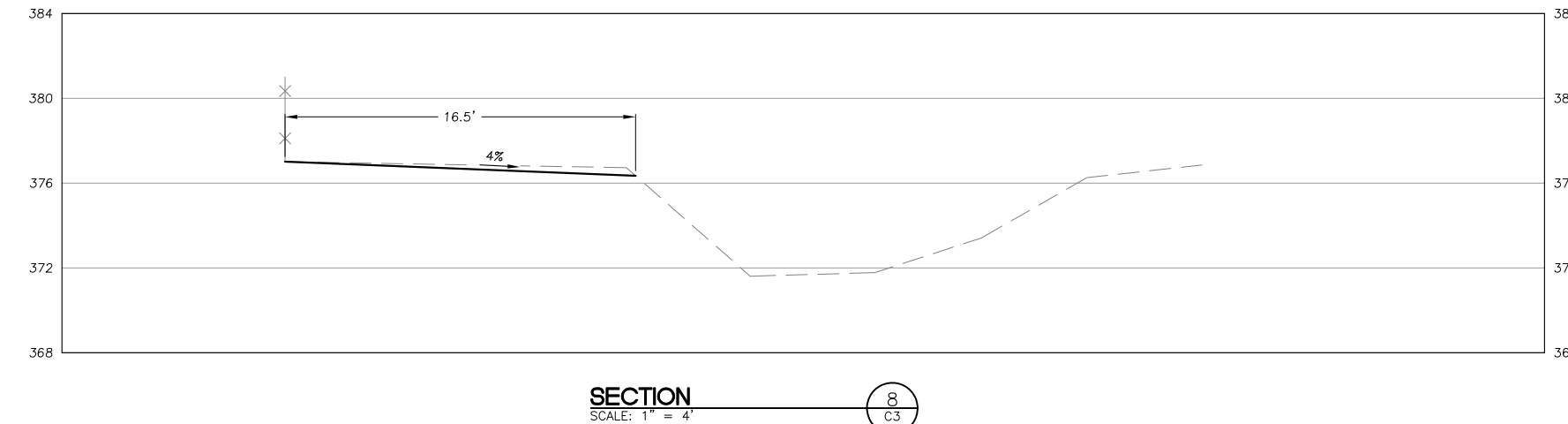
TOE RSP
FULL HEIGHT RSP
INSLOPE/OUTSLOPE ROAD
* SEDIMENT EXCAVATION
VEGETATION MANAGEMENT
WILLOW STAKES



TOE RSP
* FULL HEIGHT RSP
* INSLOPE/OUTSLOPE ROAD
* SEDIMENT EXCAVATION
* VEGETATION MANAGEMENT
WILLOW STAKES



TOE RSP
FULL HEIGHT RSP
* INSLOPE/OUTSLOPE ROAD
SEDIMENT EXCAVATION
VEGETATION MANAGEMENT
WILLOW STAKES



TOE RSP
FULL HEIGHT RSP
* INSLOPE/OUTSLOPE ROAD
SEDIMENT EXCAVATION
VEGETATION MANAGEMENT
WILLOW STAKES

- NOTES:
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SHEET NO
C9

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(510) 668-4200

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PROJ. ENGR
ENGR. SUPERVISOR

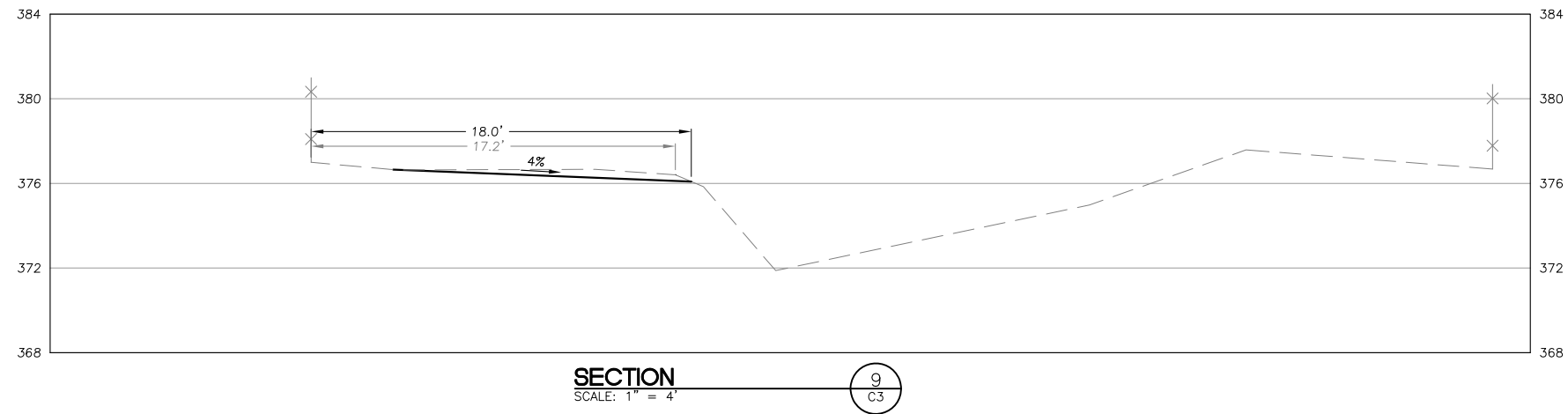
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CONSULTING INC.
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SANTA CRUZ, CA 95060
PH: (831) 437-7777
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REDUCED PLOTS

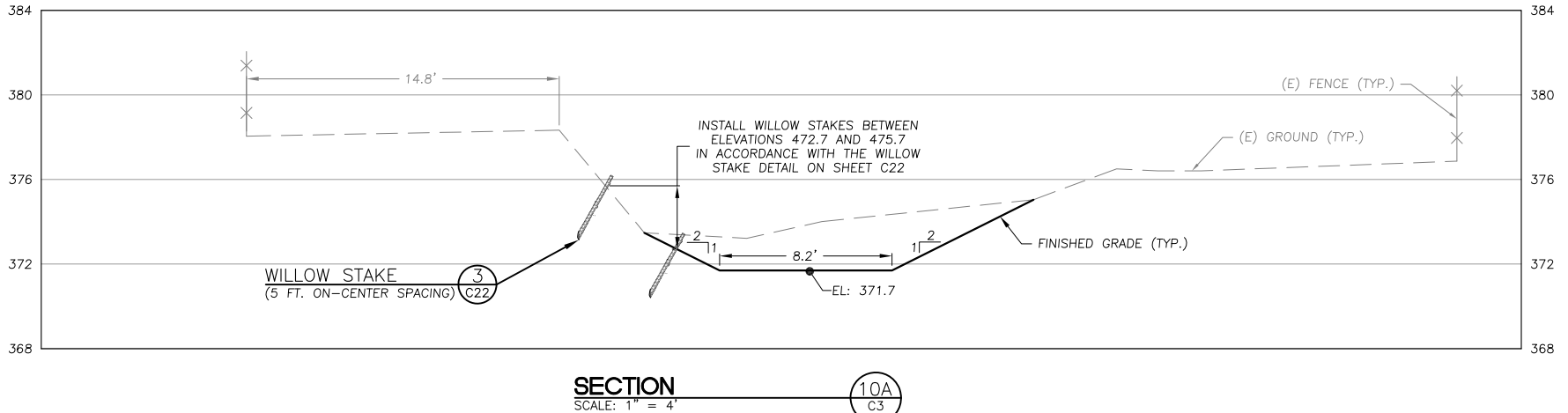
SHEET NO
C9

FACILITY ID: G05
WATERWAYS
FILE: G05-21D-01-C9
DATE: 02/09/21
JOB NO.
15-007
SCALE: AS NOTED
E. NUMBER
XXXXX
REV
A
ENGINEER'S
STAMP
HERE

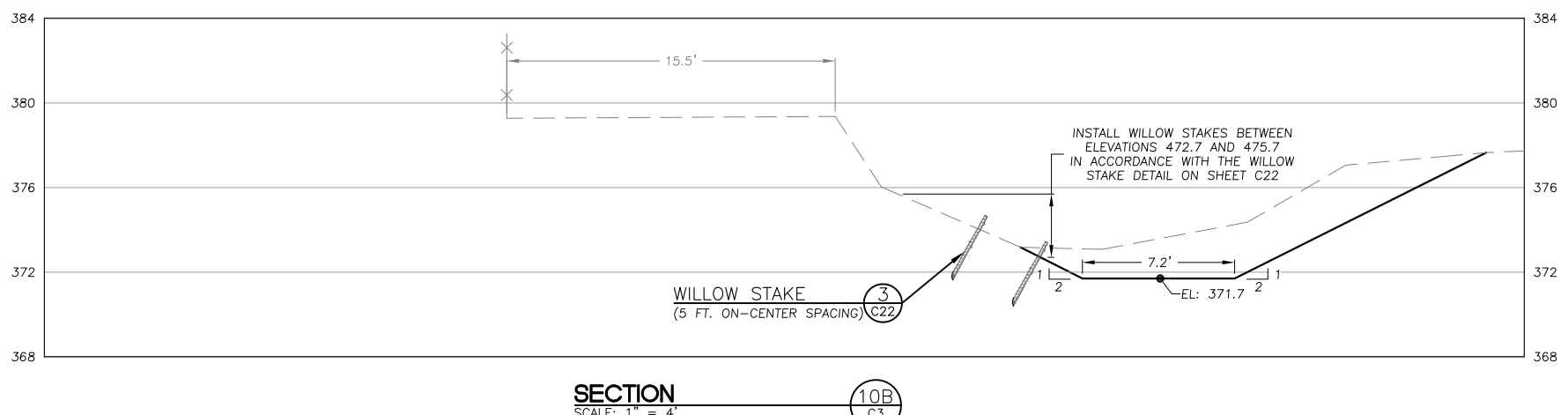
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MAINTENANCE PROJECT
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SECTIONS (2 OF 9)



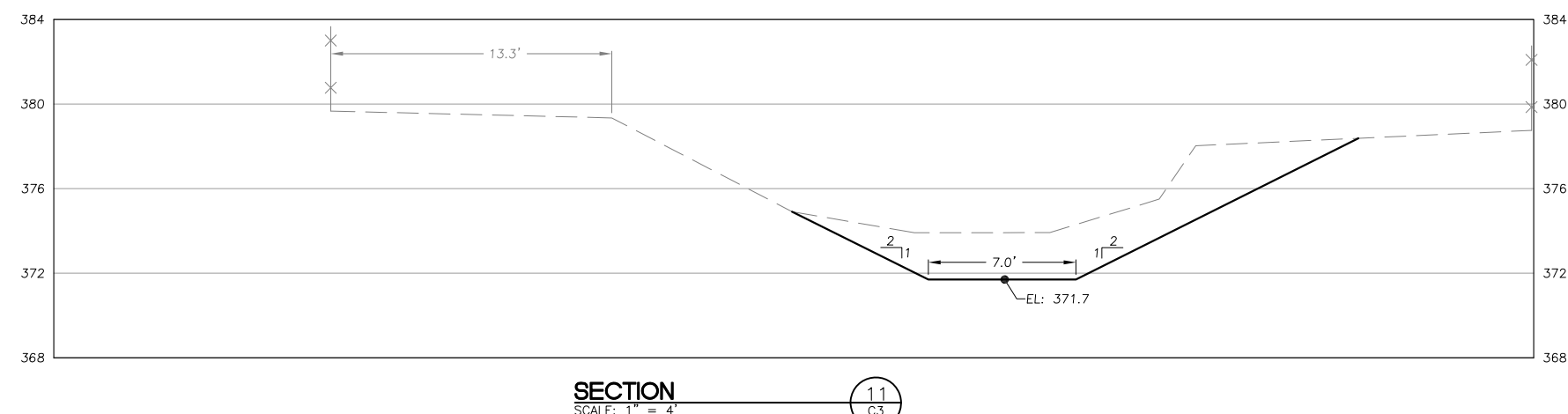
SECTION 9
SCALE: 1" = 4'



SECTION 10A
SCALE: 1" = 4'



SECTION 10B
SCALE: 1" = 4'



SECTION 11
SCALE: 1" = 4'

TOE RSP
FULL HEIGHT RSP
* INSLOPE/OUTSLOPE ROAD
SEDIMENT EXCAVATION
VEGETATION MANAGEMENT
WILLOW STAKES

TOE RSP
FULL HEIGHT RSP
INSLOPE/OUTSLOPE ROAD
* SEDIMENT EXCAVATION
VEGETATION MANAGEMENT
* WILLOW STAKES

TOE RSP
FULL HEIGHT RSP
INSLOPE/OUTSLOPE ROAD
* SEDIMENT EXCAVATION
VEGETATION MANAGEMENT
* WILLOW STAKES

TOE RSP
FULL HEIGHT RSP
INSLOPE/OUTSLOPE ROAD
* SEDIMENT EXCAVATION
VEGETATION MANAGEMENT
WILLOW STAKES

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C10

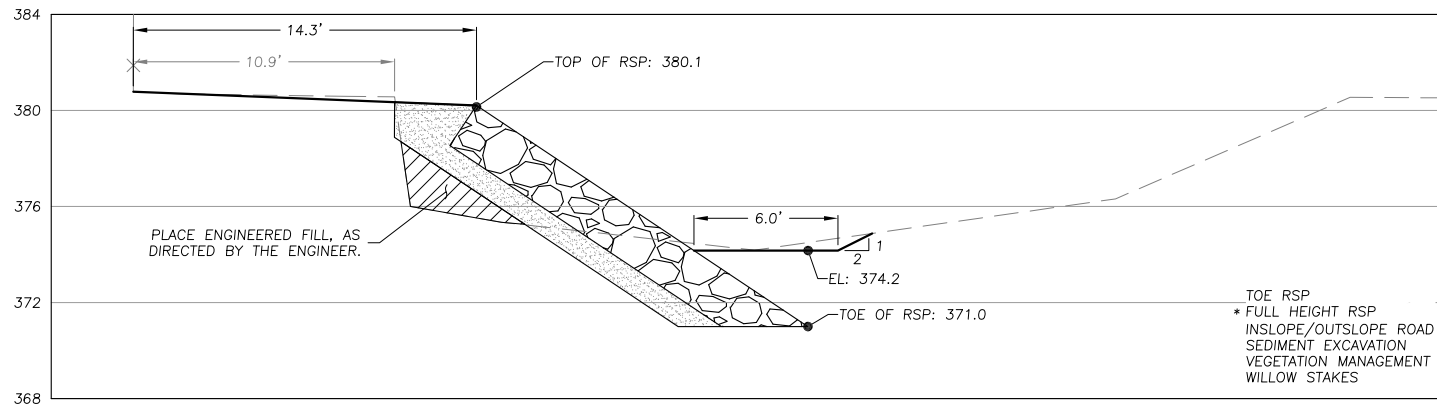
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FREMONT, CA 94537-5110
(510) 668-4200

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PROJ. ENGR
ENGR. SUPERVISOR

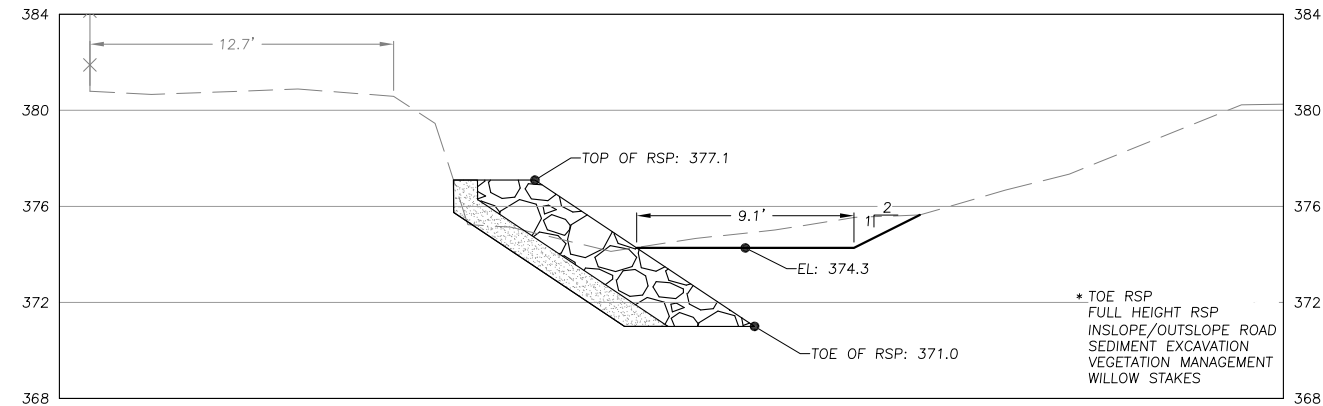
VALLECITOS CHANNEL PROGRAMMATIC MAINTENANCE PROJECT
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SECTIONS (3 OF 9)

FACILITY ID: G05
FILE: G05-21D-01-C10
WATERWAYS
JOB NO.
15-007
DATE: 02/09/21
SCALE: AS NOTED
REV
E. NUMBER
XXXXX
ACWD
JOB NO.
21003

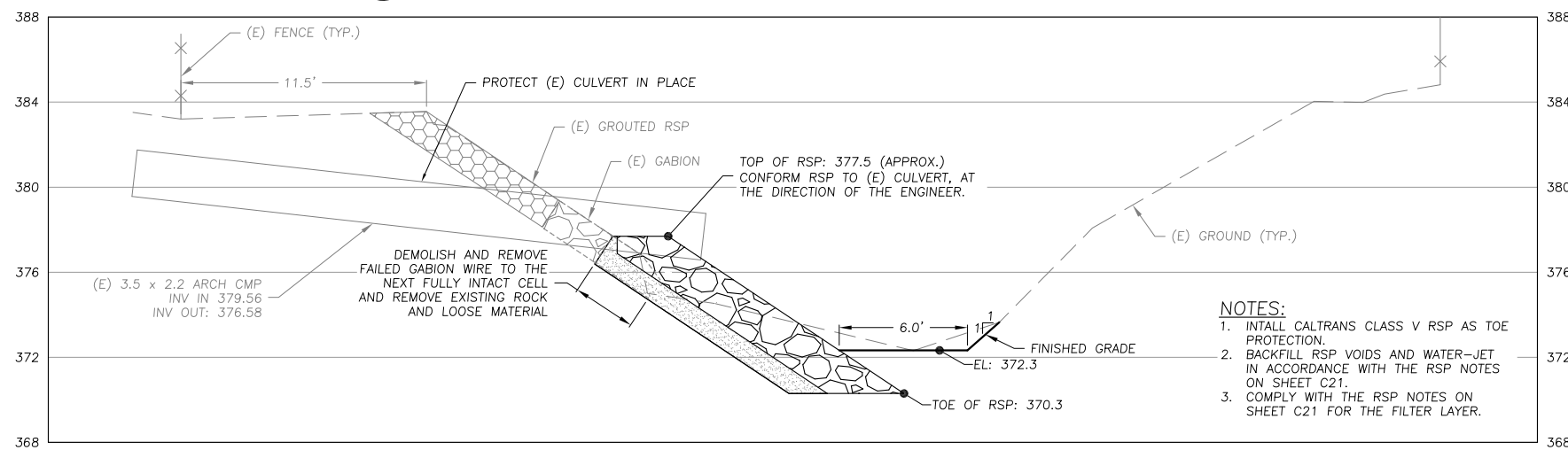
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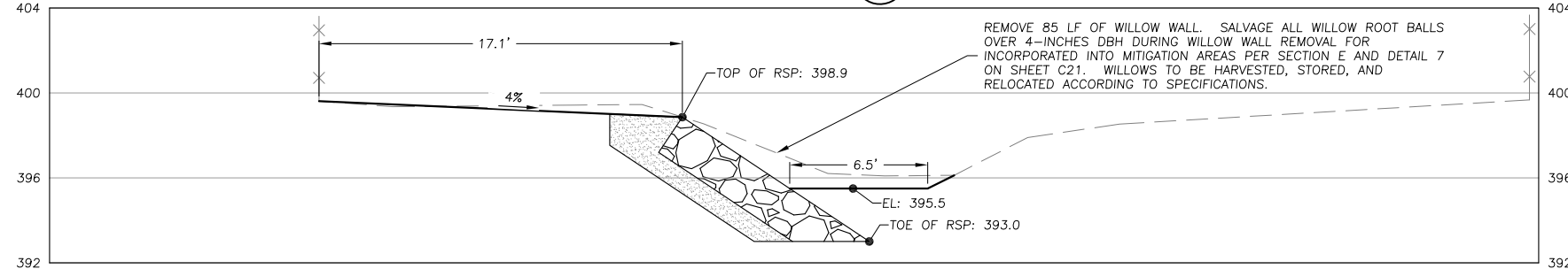
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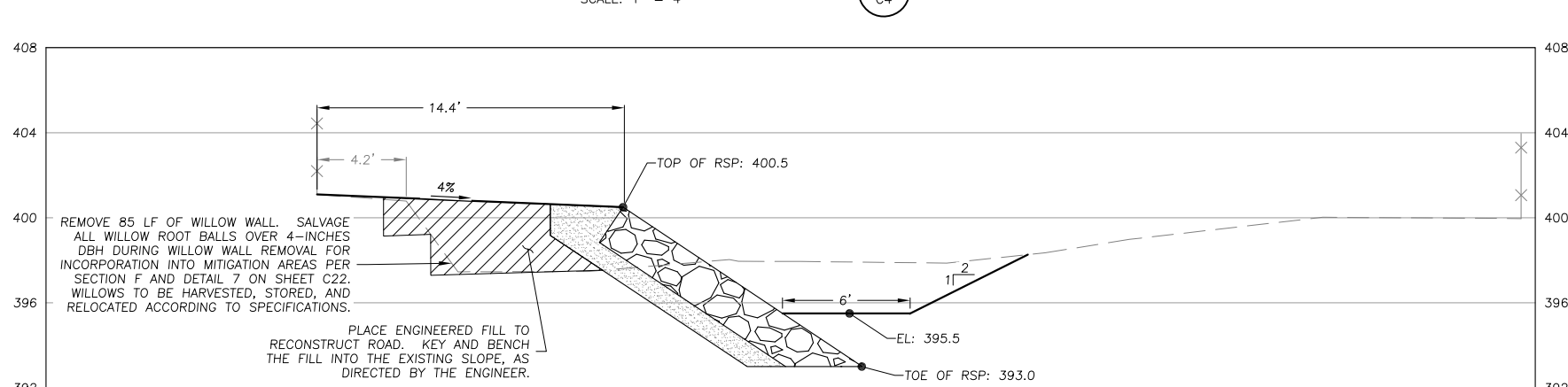
SECTION 11B
SCALE: 1" = 4'



SECTION 11C
SCALE: 1" = 4'



SECTION 12
SCALE: 1" = 4'



SECTION 13
SCALE: 1" = 4'

* TOE RSP
FULL HEIGHT RSP
INSLOPE/OUTSLOPE ROAD
SEDIMENT EXCAVATION
VEGETATION MANAGEMENT
WILLOW STAKES

TOE RSP
* FULL HEIGHT RSP
* INSLOPE/OUTSLOPE ROAD
* SEDIMENT EXCAVATION
* VEGETATION MANAGEMENT
WILLOW STAKES

TOE RSP
* FULL HEIGHT RSP
* INSLOPE/OUTSLOPE ROAD
* SEDIMENT EXCAVATION
* VEGETATION MANAGEMENT
WILLOW STAKES

- NOTES:
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FACILITY ID: G05
FILE: G05-21D-01-C11
WATERWAYS
JOB NO. 15-007
DATE: 02/09/21
SCALE: AS NOTED

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STAMP
HERE

REV
A

E. NUMBER
XXXXX

ACWD
JOB NO.
21003

VALLECITOS CHANNEL PROGRAMMATIC
MAINTENANCE PROJECT
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SECTIONS (4 OF 9)

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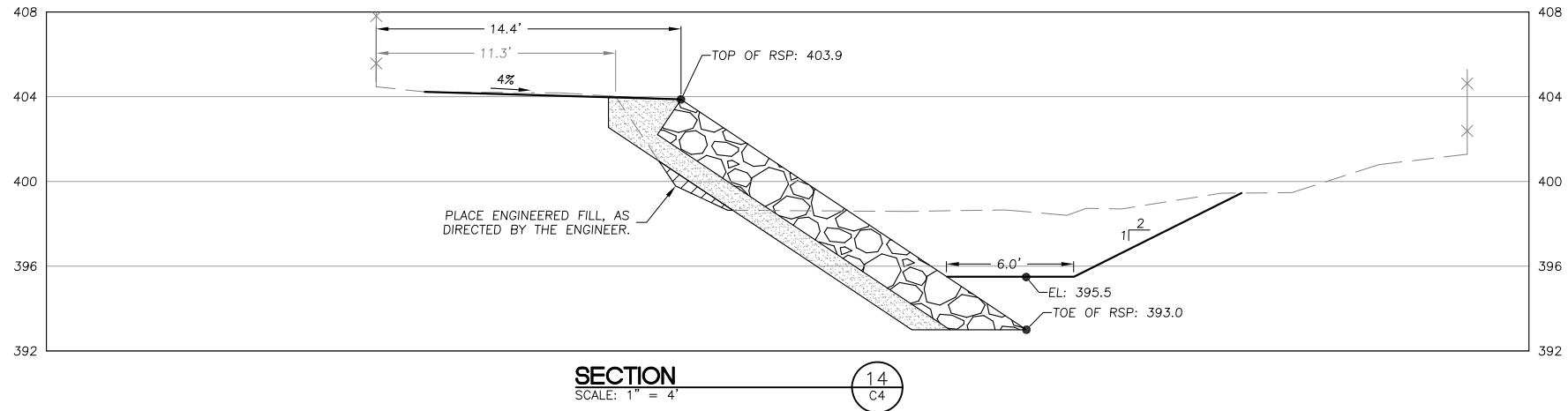
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PROJ. ENGR.
ENGR. SUPERVISOR

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WWW

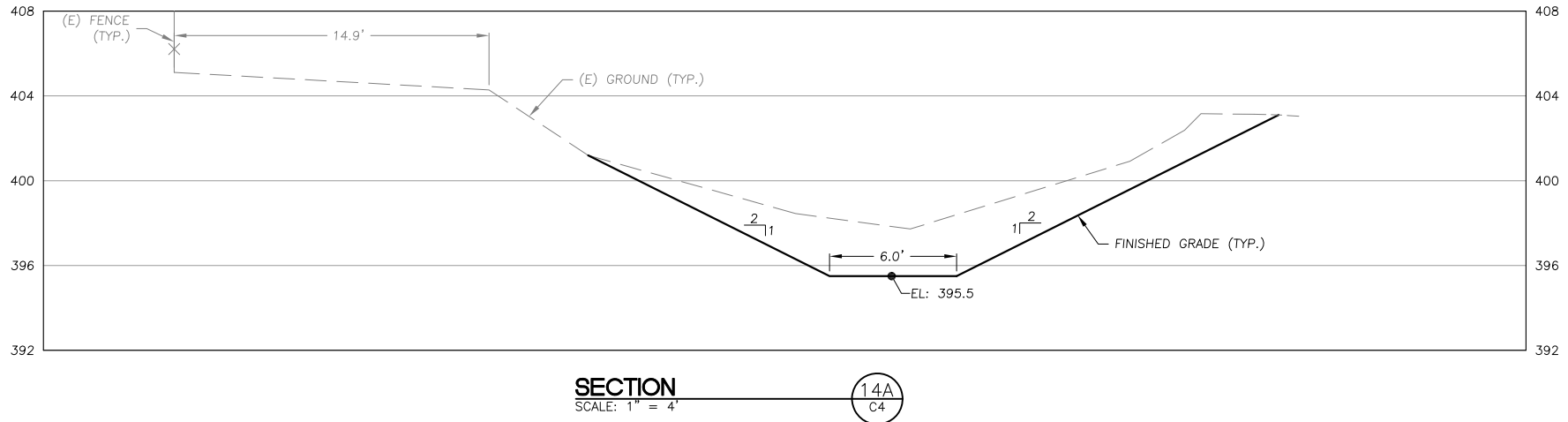
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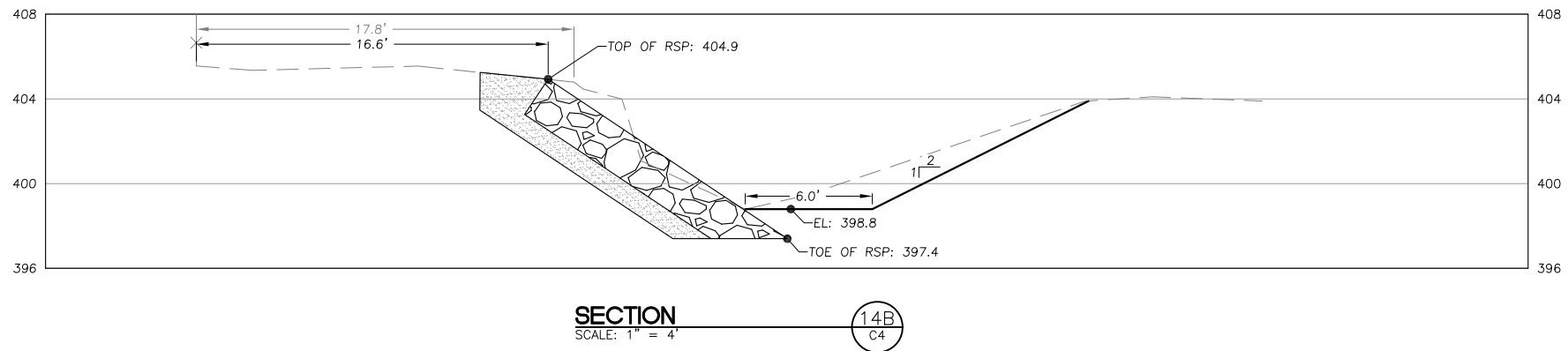
SHEET NO
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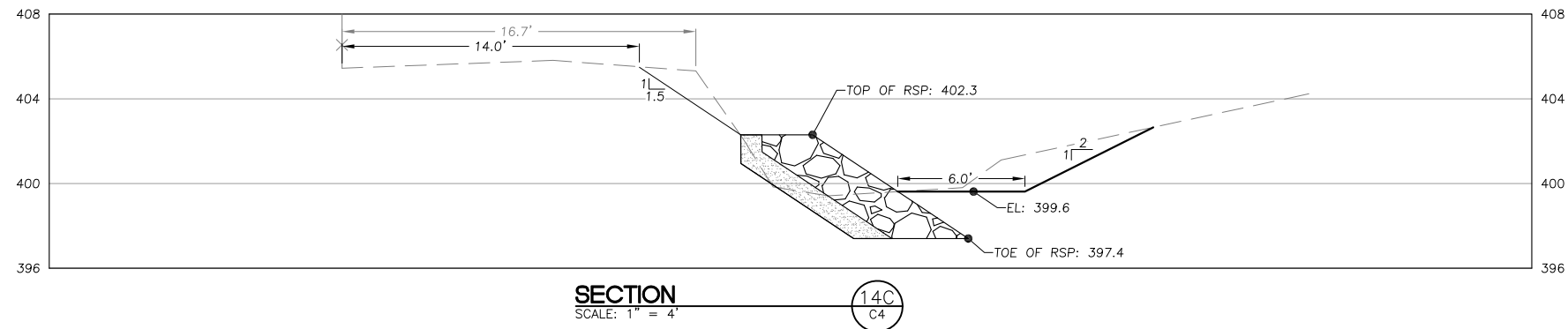
TOE RSP
* FULL HEIGHT RSP
* INSLOPE/OUTSLOPE ROAD
* SEDIMENT EXCAVATION
VEGETATION MANAGEMENT
WILLOW STAKES



TOE RSP
FULL HEIGHT RSP
INSLOPE/OUTSLOPE ROAD
* SEDIMENT EXCAVATION
VEGETATION MANAGEMENT
WILLOW STAKES



TOE RSP
* FULL HEIGHT RSP
INSLOPE/OUTSLOPE ROAD
SEDIMENT EXCAVATION
VEGETATION MANAGEMENT
WILLOW STAKES



* TOE RSP
FULL HEIGHT RSP
INSLOPE/OUTSLOPE ROAD
SEDIMENT EXCAVATION
VEGETATION MANAGEMENT
WILLOW STAKES

- NOTES:
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DESIGNED: MWW
DRAWN: KB/BZ
CHECKED: MWW
REVIEWED BY OPS: MWW
PROJ. ENGR: MWW
ENGR. SUPERVISOR: MWW

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SANTA CRUZ, CA 95060
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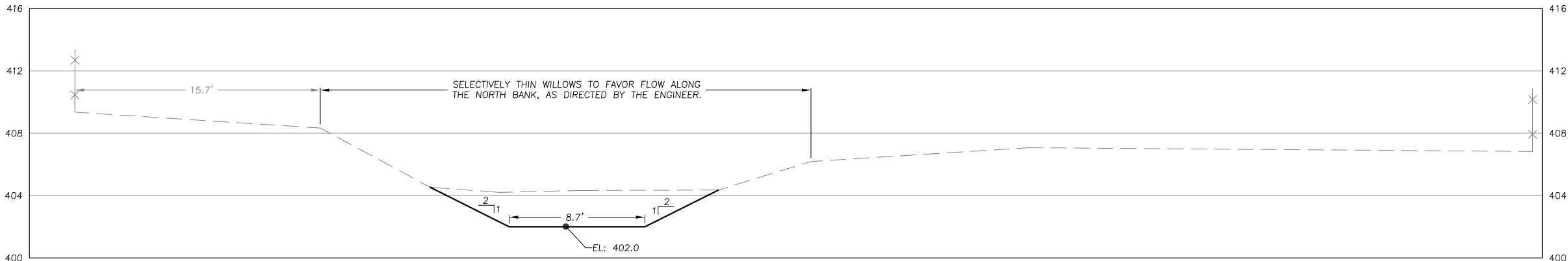
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SHEET NO
C12

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SECTIONS (5 OF 9)

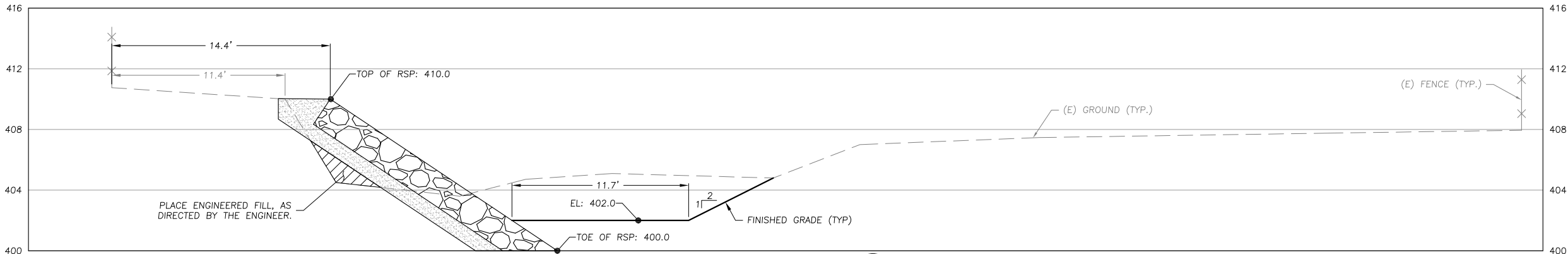
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FILE: G05-21D-01-C12
WATERWAYS
JOB NO. 15-007
DATE: 02/09/21
SCALE: AS NOTED
E. NUMBER XXXXX
ACWD JOB NO. 21003
REV A

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HERE



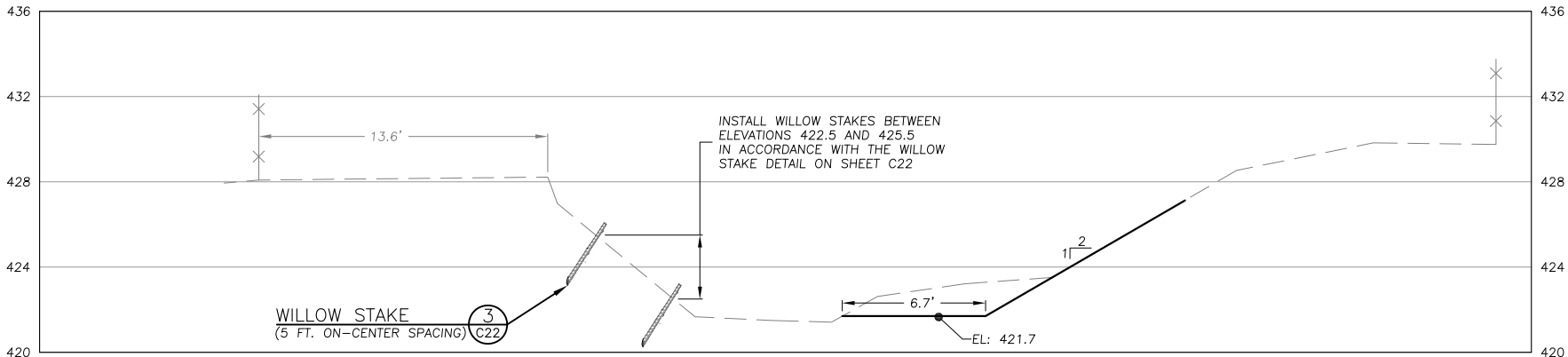
SECTION 15
SCALE: 1" = 4'

TOE RSP
FULL HEIGHT RSP
INSLOPE/OUTSLOPE ROAD
* SEDIMENT EXCAVATION
* VEGETATION MANAGEMENT
WILLOW STAKES



SECTION 16
SCALE: 1" = 4'

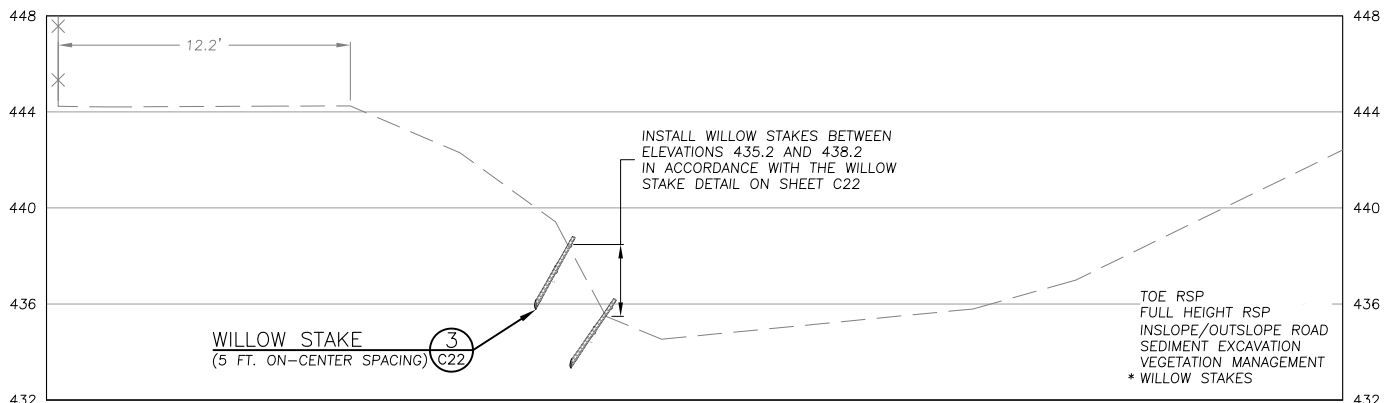
TOE RSP
FULL HEIGHT RSP
INSLOPE/OUTSLOPE ROAD
* SEDIMENT EXCAVATION
* VEGETATION MANAGEMENT
WILLOW STAKES



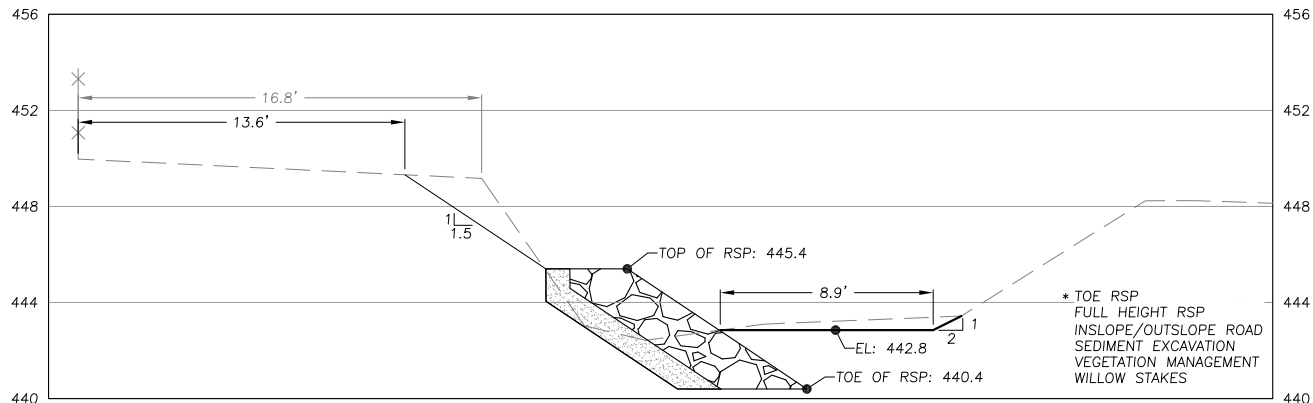
SECTION 17
SCALE: 1" = 4'

TOE RSP
FULL HEIGHT RSP
INSLOPE/OUTSLOPE ROAD
* SEDIMENT EXCAVATION
* VEGETATION MANAGEMENT
* WILLOW STAKES

NOTES:
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SECTION 18
SCALE: 1" = 4'



SECTION 18A
SCALE: 1" = 4'

* TOE RSP
FULL HEIGHT RSP
INSLOPE/OUTSLOPE ROAD
SEDIMENT EXCAVATION
VEGETATION MANAGEMENT
WILLOW STAKES

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FILE: G05-21D-01-C13
WATERWAYS
JOB NO.
15-007
DATE: 02/09/21
SCALE: AS NOTED
REV
E. NUMBER
XXXXX
ACWD
JOB NO.
21003

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SECTIONS (6 OF 9)

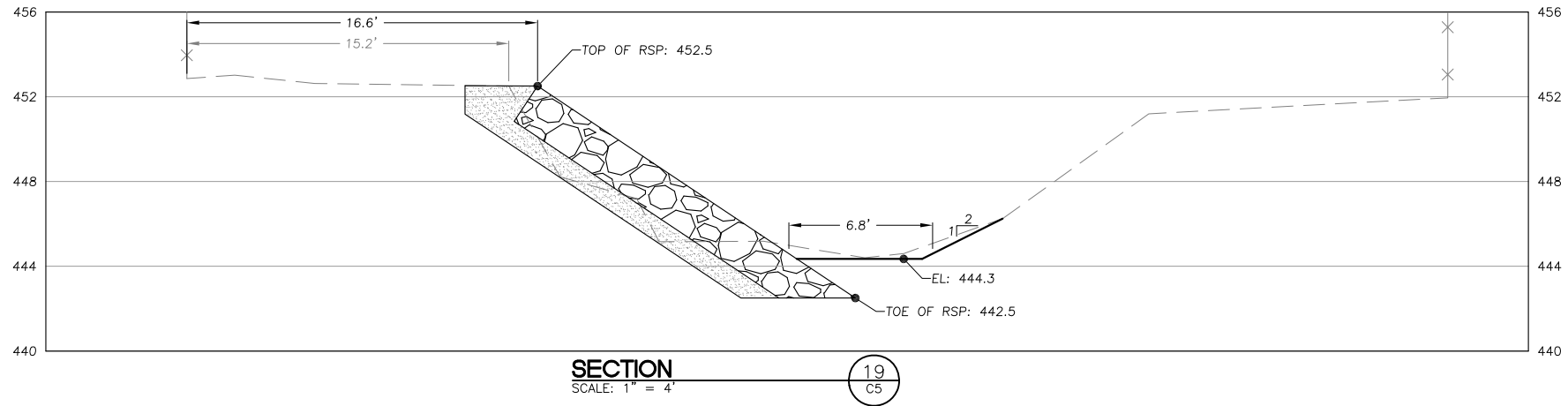
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ENGR. SUPERVISOR

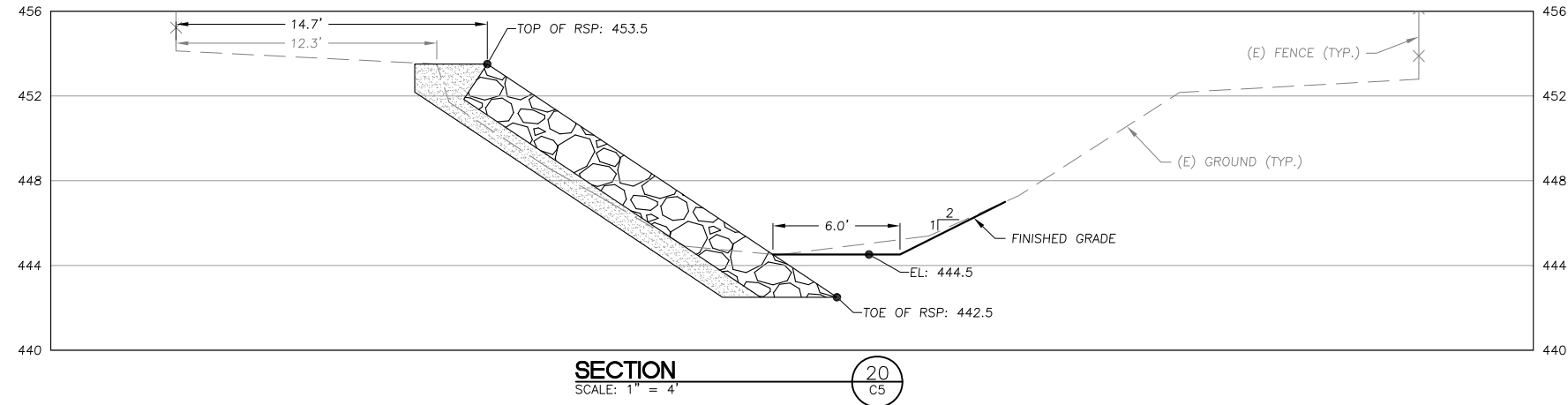
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SANTA CRUZ, CA 95060
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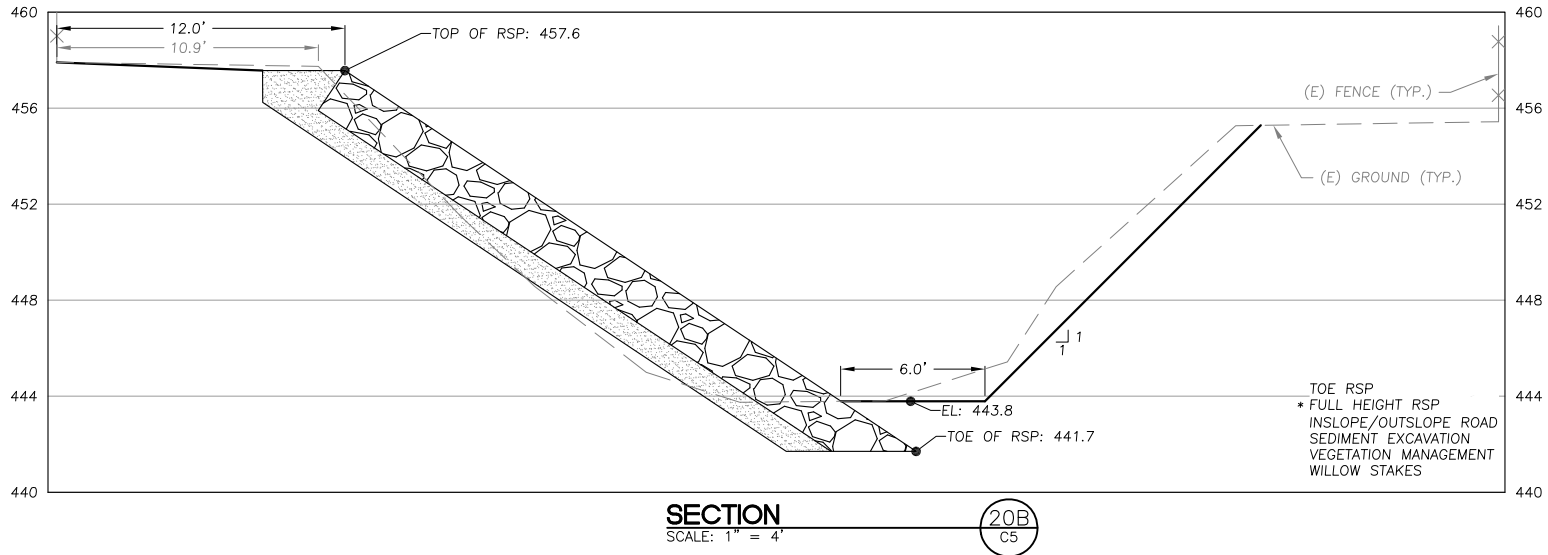
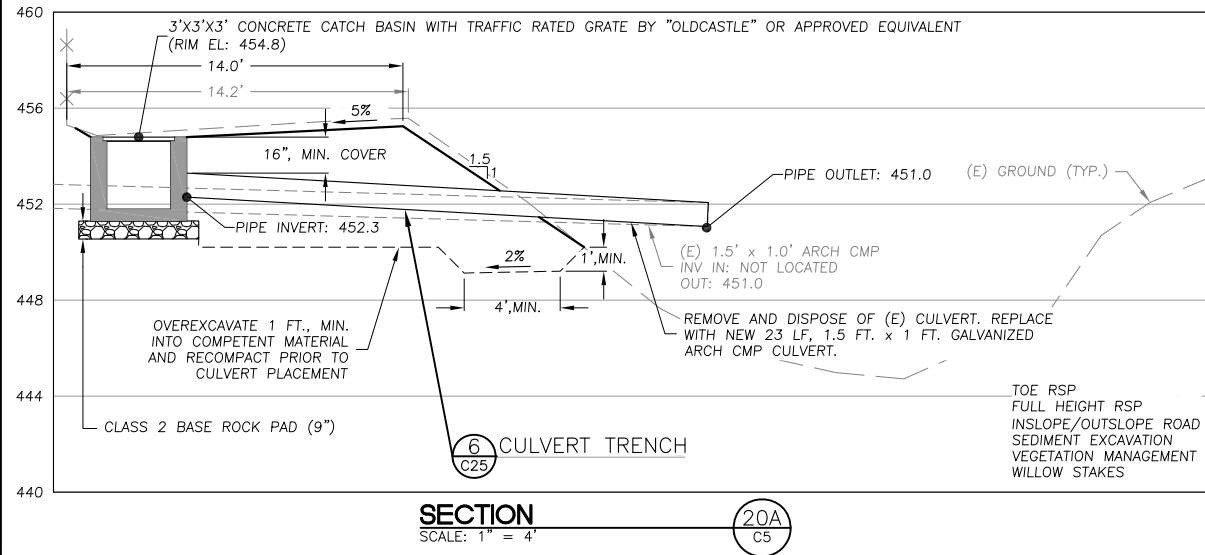
SHEET NO
C13



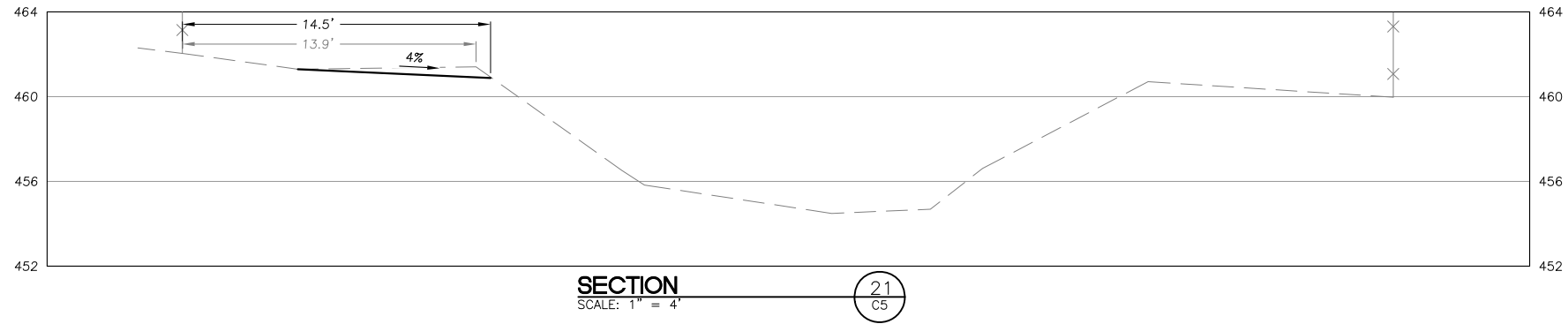
TOE RSP
* FULL HEIGHT RSP
INSLOPE/OUTSLOPE ROAD
SEDIMENT EXCAVATION
* VEGETATION MANAGEMENT
WILLOW STAKES



TOE RSP
* FULL HEIGHT RSP
INSLOPE/OUTSLOPE ROAD
SEDIMENT EXCAVATION
* VEGETATION MANAGEMENT
WILLOW STAKES



TOE RSP
* FULL HEIGHT RSP
INSLOPE/OUTSLOPE ROAD
SEDIMENT EXCAVATION
VEGETATION MANAGEMENT
WILLOW STAKES



TOE RSP
* FULL HEIGHT RSP
INSLOPE/OUTSLOPE ROAD
SEDIMENT EXCAVATION
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WILLOW STAKES

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WATERWAYS	FILE: G05-21D-01-C14	DATE: 02/09/21	SCALE: AS NOTED
JOB NO. 15-007	REV	E. NUMBER	XXXXX
ACWD	JOB NO. 21003		

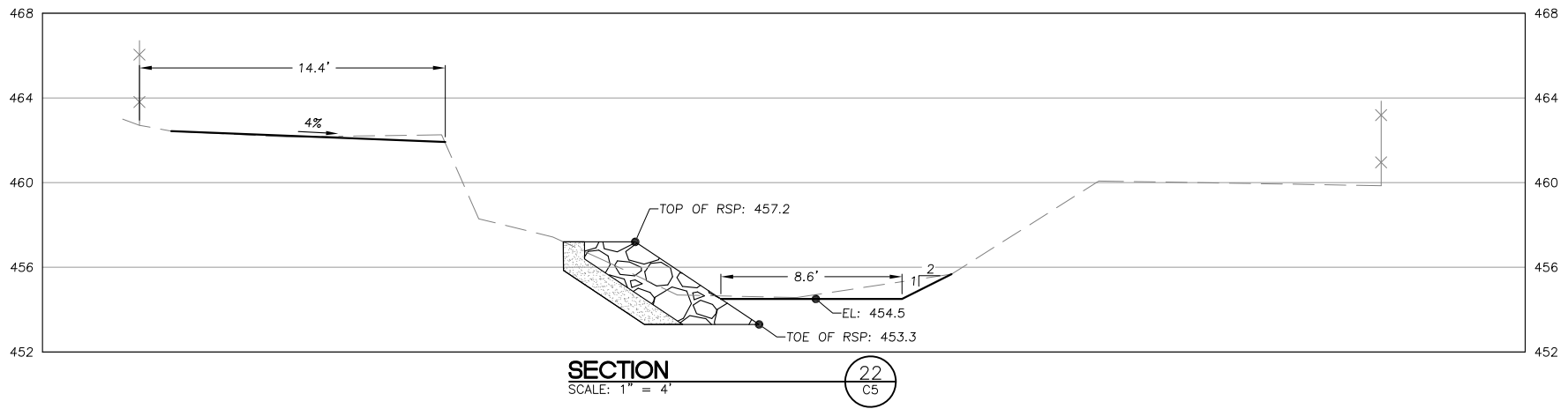
VALLECITOS CHANNEL PROGRAMMATIC
MAINTENANCE PROJECT
100% ADMN. DRAFT SUBMITTAL
SECTIONS (7 OF 9)

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DESIGNED	WWW	CHECKED	WWW
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PROJ. ENGR.		ENGR. SUPERVISOR	

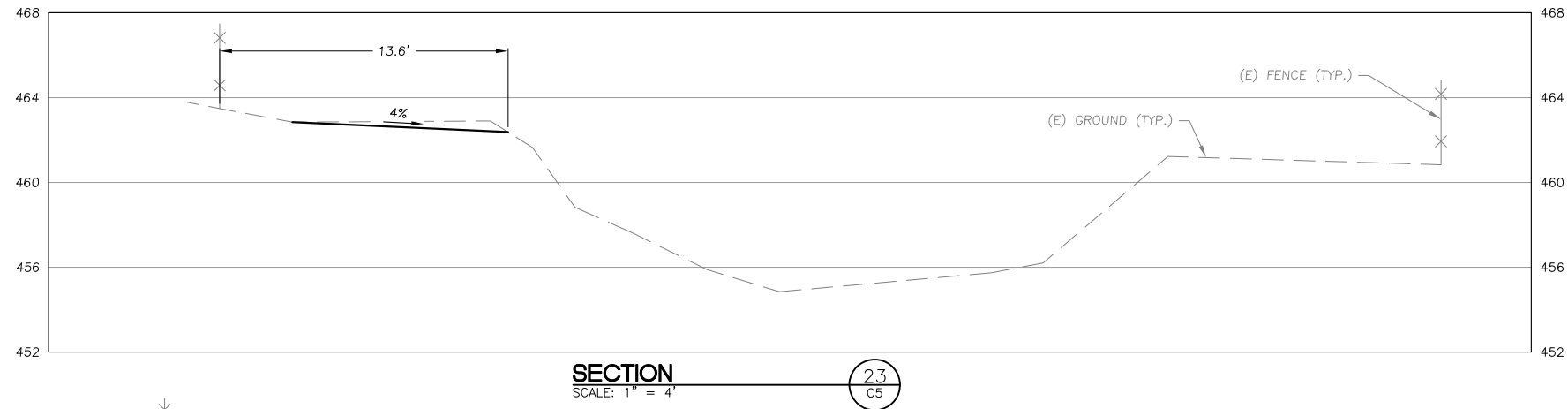
WATERWAYS CONSULTING INC.		509A SWIFT ST. SANTA CRUZ, CA 95060 PH: (831) 437-7777 WWW.WATWAYS.COM	
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BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS
0 1"

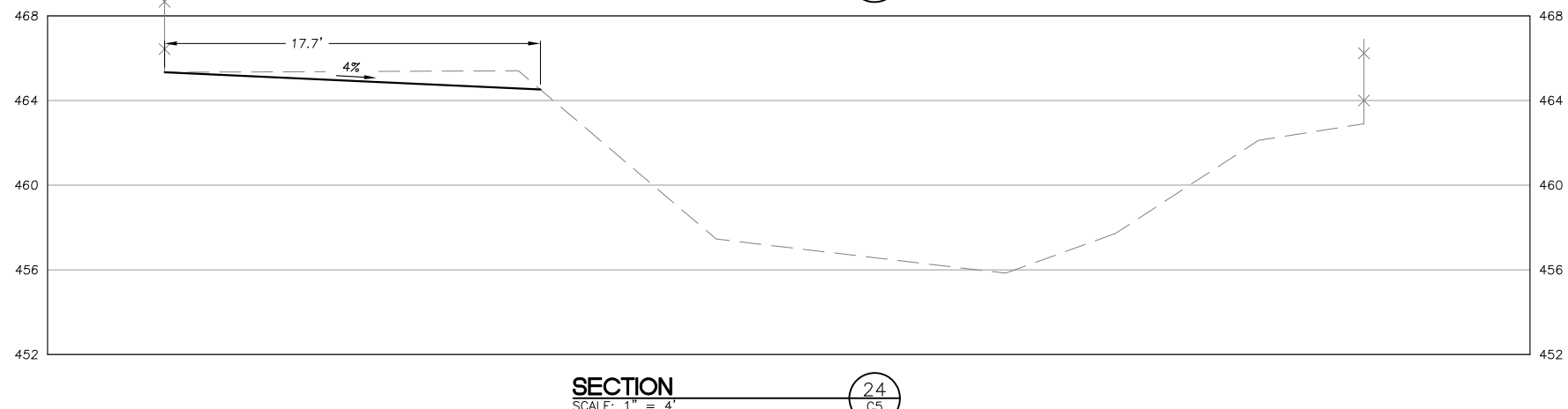
SHEET NO
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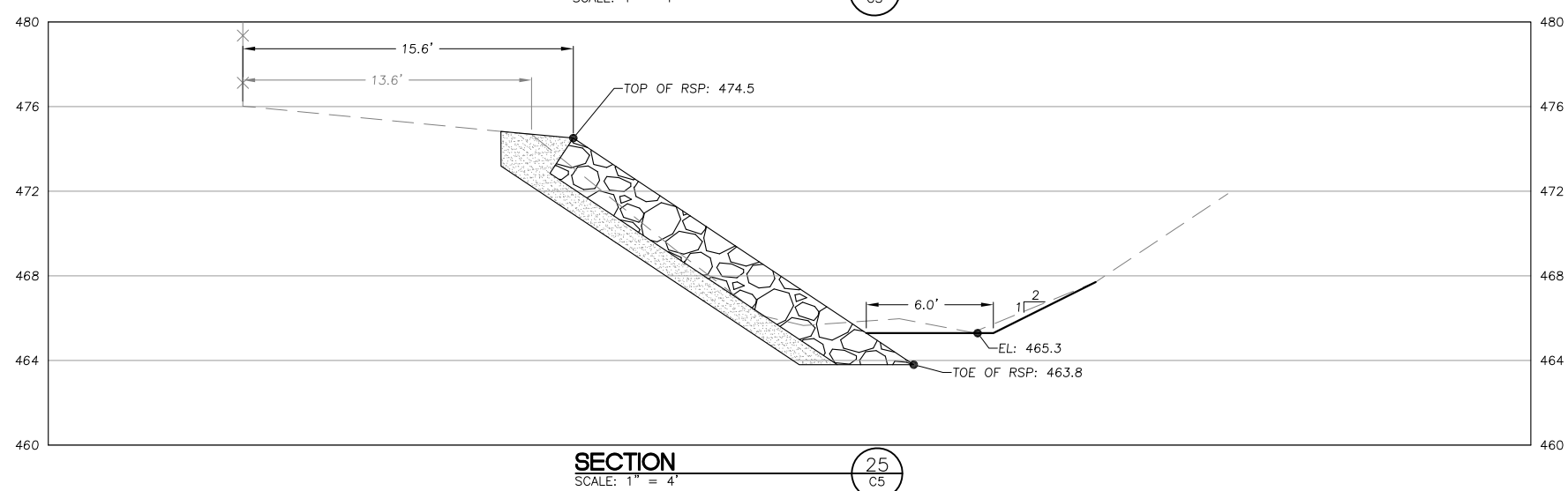
* TOE RSP
* FULL HEIGHT RSP
* INSLOPE/OUTSLOPE ROAD
SEDIMENT EXCAVATION
VEGETATION MANAGEMENT
WILLOW STAKES



TOE RSP
FULL HEIGHT RSP
* INSLOPE/OUTSLOPE ROAD
SEDIMENT EXCAVATION
VEGETATION MANAGEMENT
WILLOW STAKES



TOE RSP
FULL HEIGHT RSP
* INSLOPE/OUTSLOPE ROAD
SEDIMENT EXCAVATION
VEGETATION MANAGEMENT
WILLOW STAKES



TOE RSP
* FULL HEIGHT RSP
INSLOPE/OUTSLOPE ROAD
SEDIMENT EXCAVATION
VEGETATION MANAGEMENT
WILLOW STAKES

- NOTES:
1. AN * INDICATES A PROPOSED TREATMENT AT A GIVEN CROSS SECTION
 2. TOE AND FULL HEIGHT RSP BOTH REQUIRE VEGETATION REMOVAL AND MINOR AMOUNTS OF SEDIMENT REMOVAL TO FACILITATE THE WORK.
 3. SEDIMENT EXCAVATION REQUIRES VEGETATION REMOVAL TO FACILITATE THE WORK.

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0 1"

SHEET NO
C15

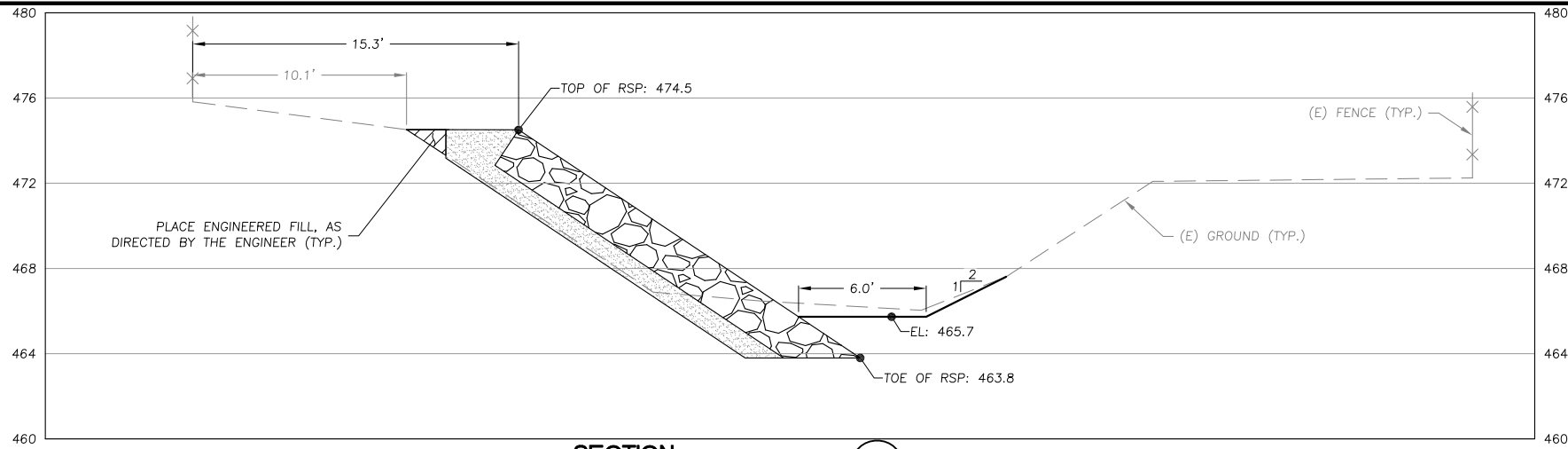
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REVIEWED BY: OPS
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ENGR. SUPERVISOR: MWW

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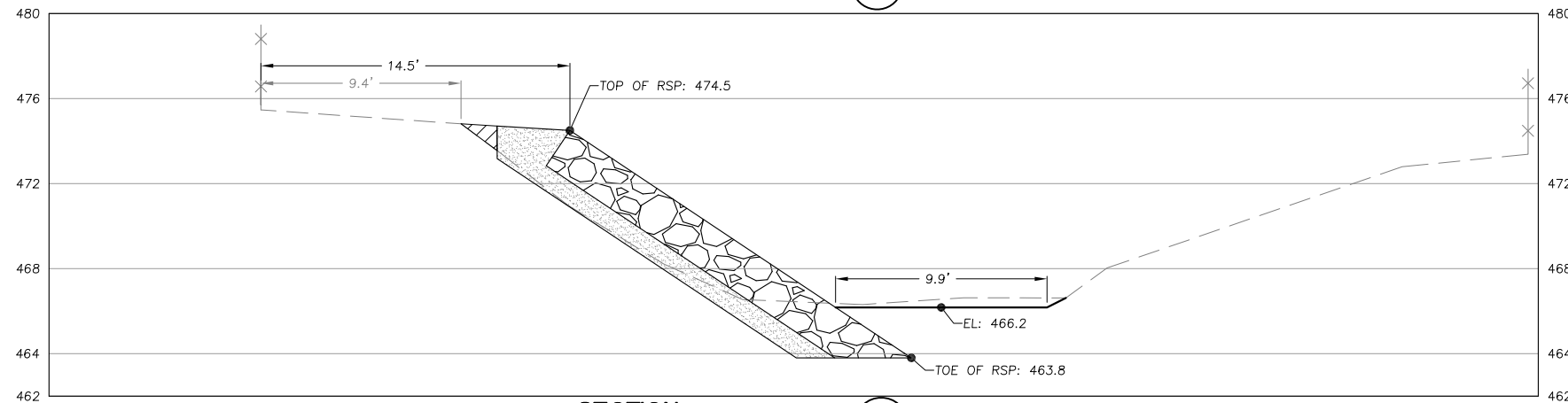
SECTIONS (8 OF 9)

FACILITY ID: G05
FILE: G05-21D-01-C15
WATERWAYS
JOB NO. 15-007
DATE: 02/09/21
SCALE: AS NOTED
E. NUMBER XXXXX
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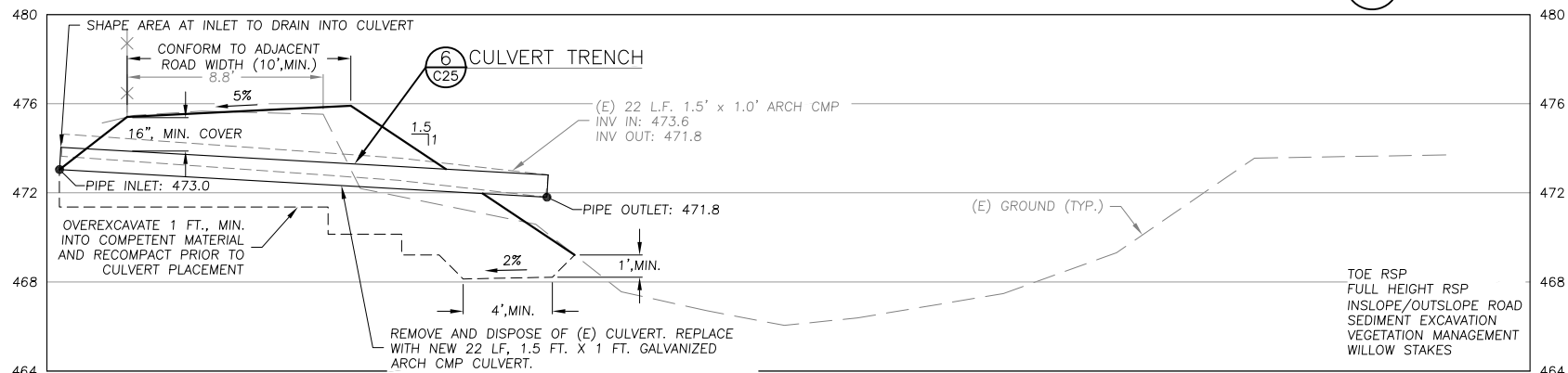
SECTION
SCALE: 1" = 4'

26
C5



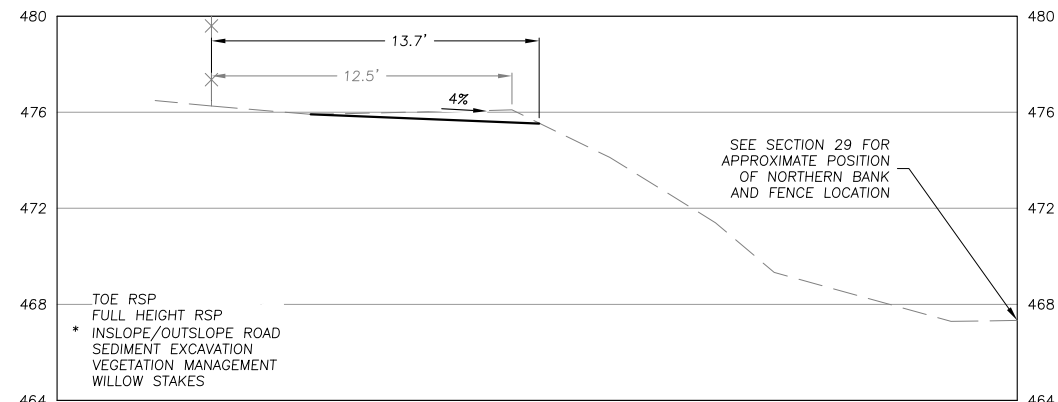
SECTION
SCALE: 1" = 4'

27
C5



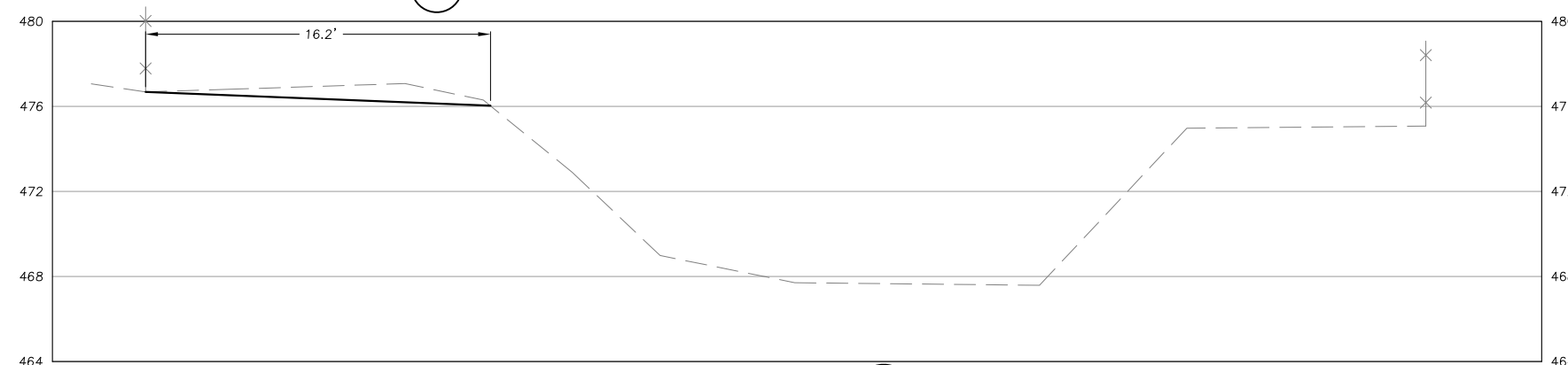
SECTION
SCALE: 1" = 4'

27A
C5



SECTION
SCALE: 1" = 4'

28
C5



SECTION
SCALE: 1" = 4'

29
C5

* TOE RSP
* FULL HEIGHT RSP
* INSLOPE/OUTSLOPE ROAD
* SEDIMENT EXCAVATION
* VEGETATION MANAGEMENT
WILLOW STAKES

TOE RSP
* FULL HEIGHT RSP
INSLOPE/OUTSLOPE ROAD
SEDIMENT EXCAVATION
VEGETATION MANAGEMENT
WILLOW STAKES

TOE RSP
FULL HEIGHT RSP
* INSLOPE/OUTSLOPE ROAD
SEDIMENT EXCAVATION
VEGETATION MANAGEMENT
WILLOW STAKES

TOE RSP
FULL HEIGHT RSP
* INSLOPE/OUTSLOPE ROAD
SEDIMENT EXCAVATION
VEGETATION MANAGEMENT
WILLOW STAKES

- NOTES:
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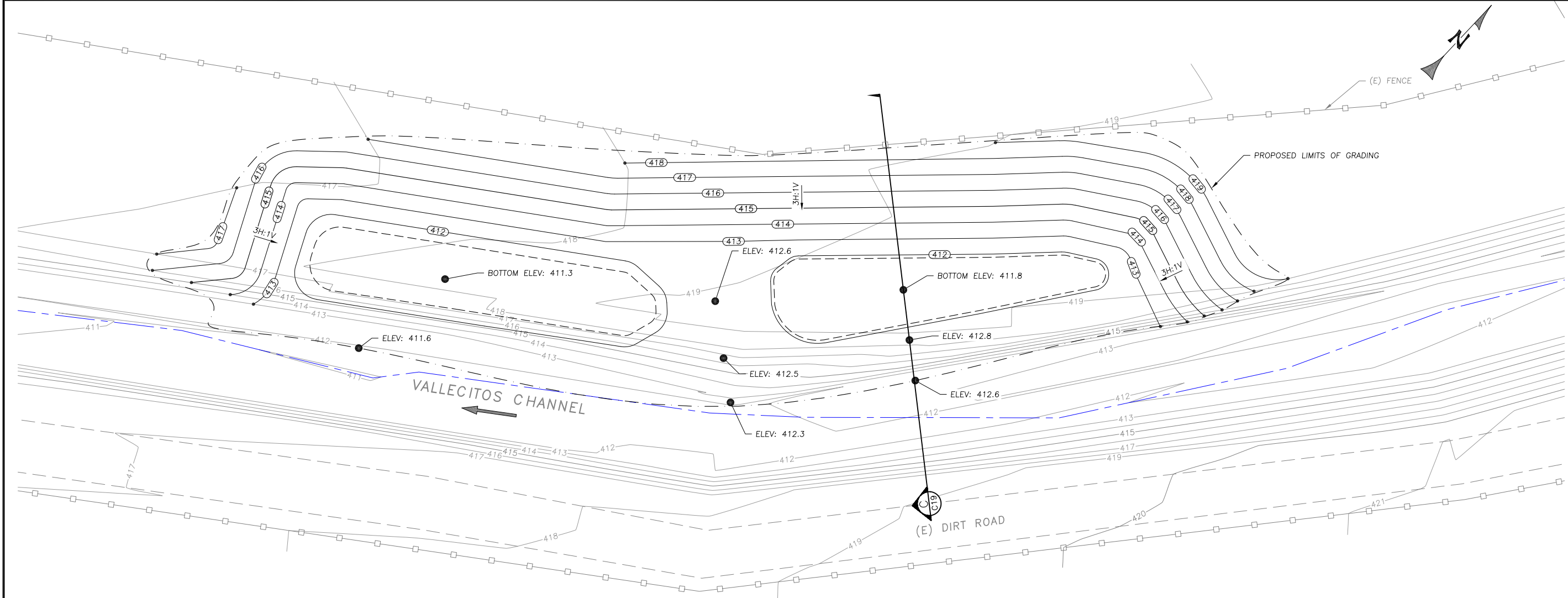
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ENGR. SUPERVISOR

FACILITY ID: G05
FILE: G05-21D-01-C15
WATERWAYS
JOB NO.
15-007
DATE: 02/09/21
SCALE: AS NOTED
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E. NUMBER
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ACWD
JOB NO.
21003

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SECTIONS (9 OF 9)

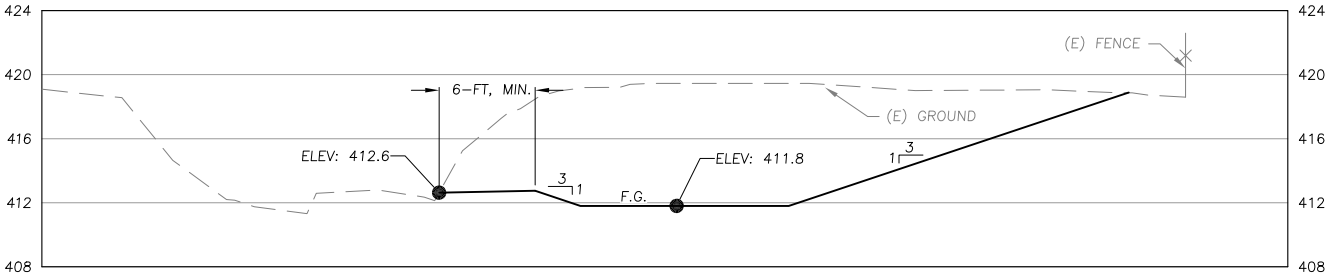
ENGINEER'S
STAMP
HERE



MITIGATION AREA 3 SITE PLAN
SCALE: 1" = 10'

LEGEND

- 85 86 EXISTING CONTOURS
- 100 101 PROPOSED CONTOURS
- EXISTING FLOW LINE
- EXISTING FENCE
- PROPOSED LIMITS OF GRADING
- PROPOSED TOE OF WETLAND DEPRESSION
- PROPOSED SPOT ELEVATION



SECTION
SCALE: 1" = 6'

NOTES:
SEE TYPICAL MITIGATION AREA SECTION, SHEET C22, FOR:
1. TEMPORARY EROSION CONTROL MEASURES DURING CONSTRUCTION
2. REVEGETATION INFORMATION

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FACILITY ID: G05
WATERWAYS
FILE: G05-21D-01-C19
JOB NO.
15-007
DATE: 02/09/21
SCALE: AS NOTED

ENGINEER'S
STAMP
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E. NUMBER
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JOB NO.
21003

MITIGATION AREA 3 SITE PLAN AND SECTION

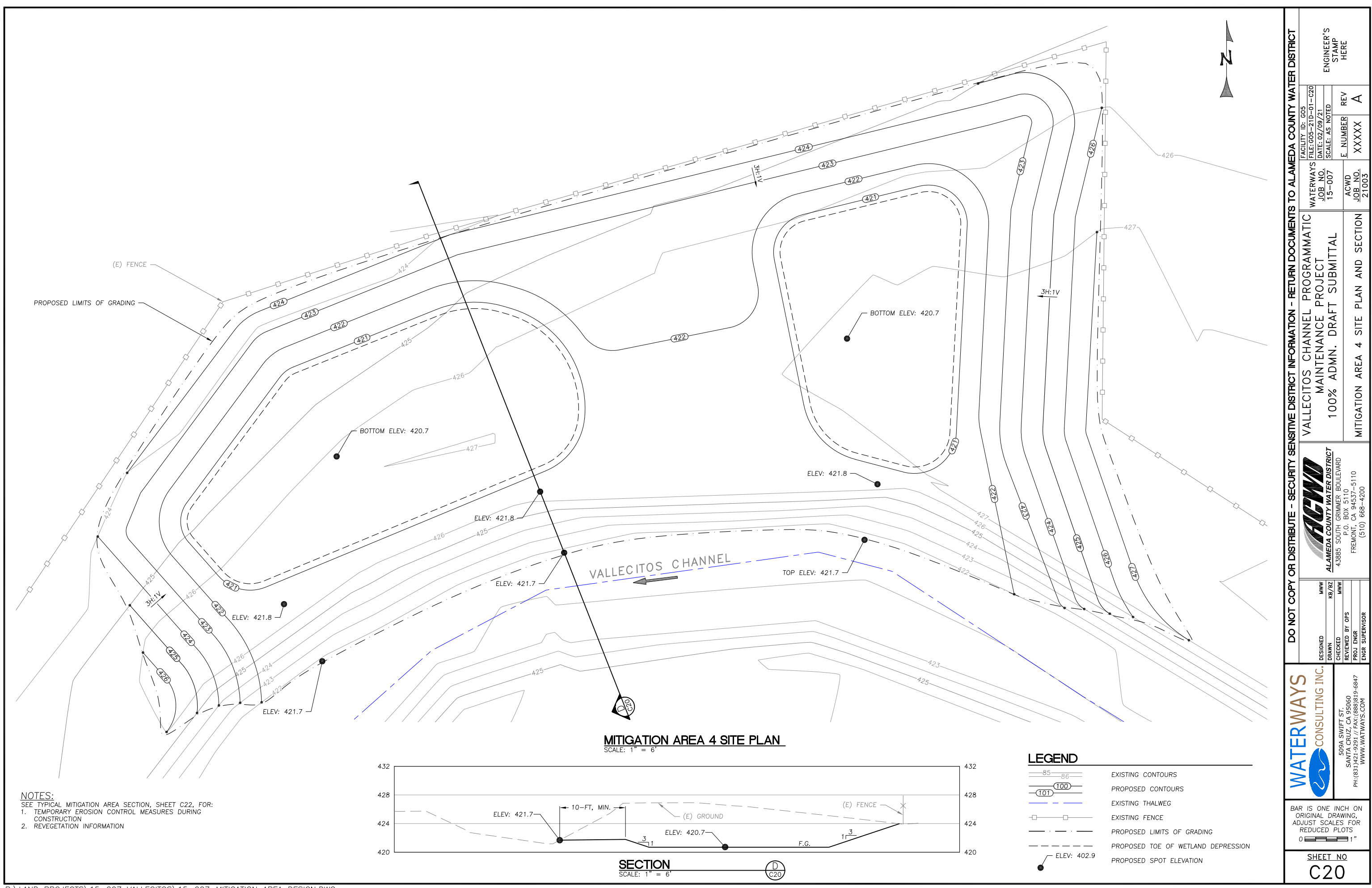
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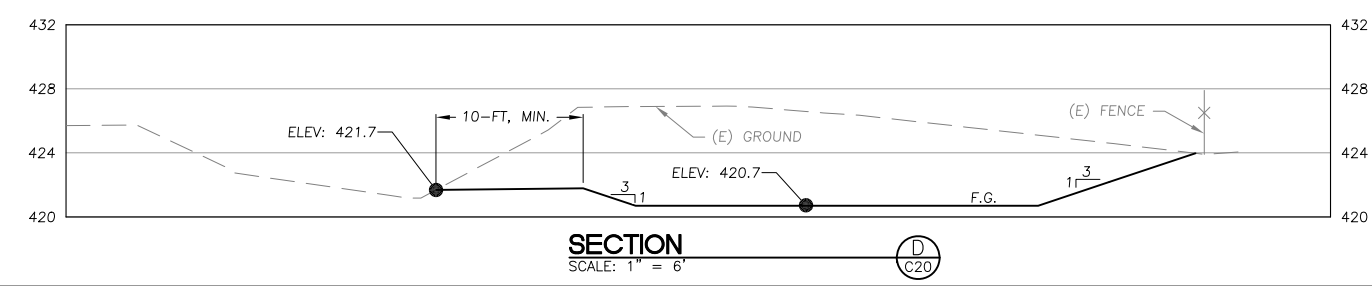
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SHEET NO
C19

R:\LAND PROJECTS\15-007 VALLECITOS\15-007_MITIGATION AREA DESIGN.DWG



NOTES:
SEE TYPICAL MITIGATION AREA SECTION, SHEET C22, FOR:
1. TEMPORARY EROSION CONTROL MEASURES DURING CONSTRUCTION
2. REVEGETATION INFORMATION



LEGEND	
	EXISTING CONTOURS
	PROPOSED CONTOURS
	EXISTING THALWEG
	EXISTING FENCE
	PROPOSED LIMITS OF GRADING
	PROPOSED TOE OF WETLAND DEPRESSION
	PROPOSED SPOT ELEVATION

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MITIGATION AREA 4 SITE PLAN AND SECTION

FACILITY ID: G05
WATERWAYS
FILE: G05-21D-01-C20
JOB NO.
15-007

DATE: 02/09/21
SCALE: AS NOTED

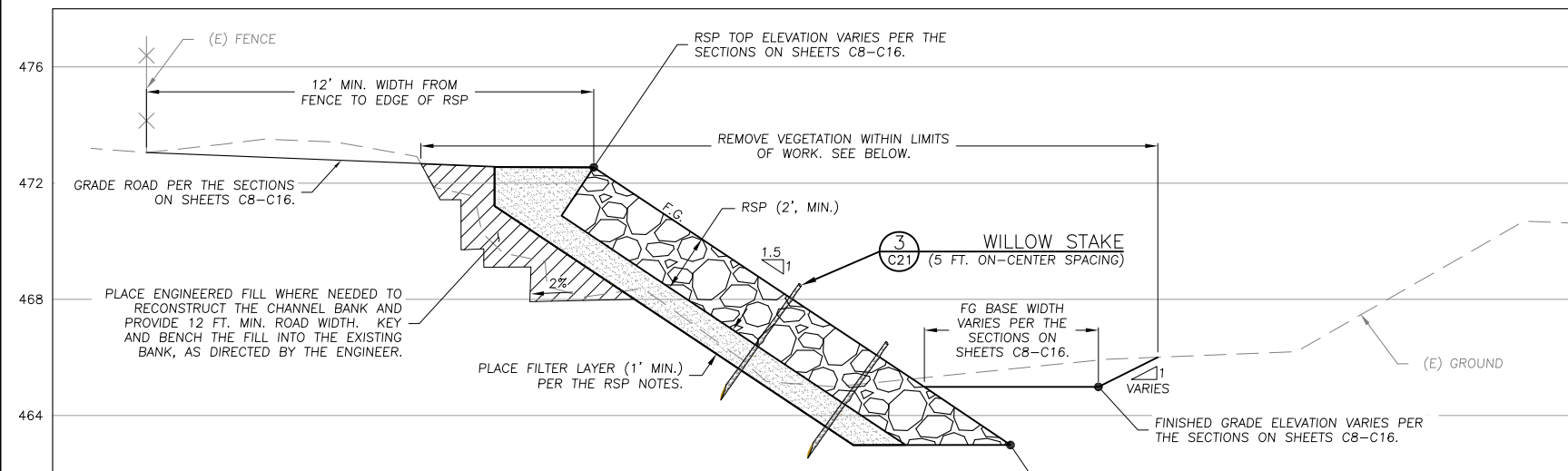
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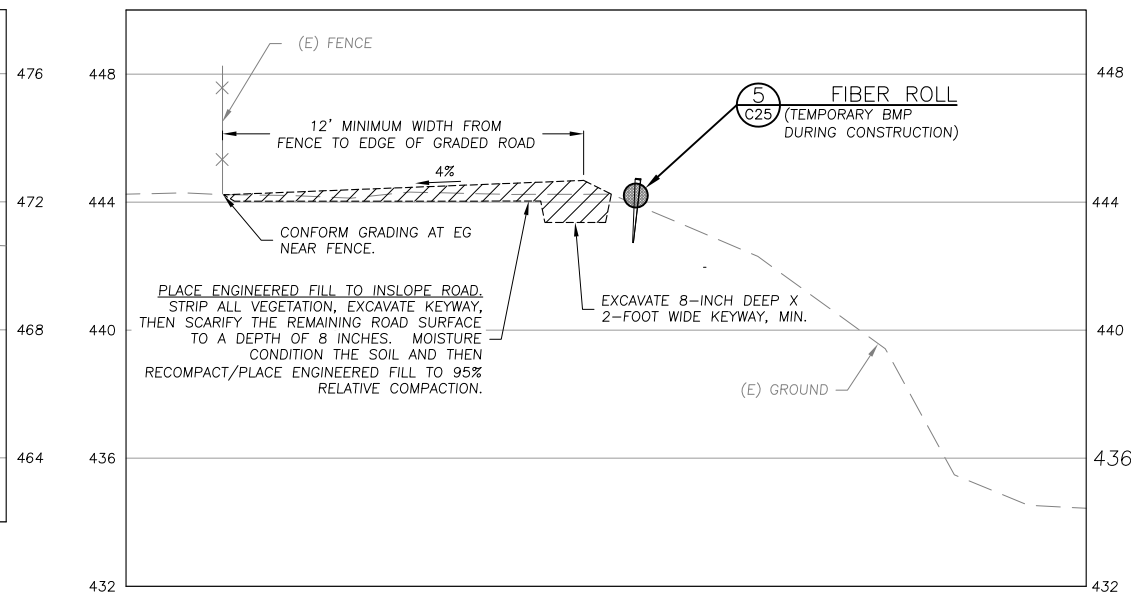
ACWD
JOB NO.
21003

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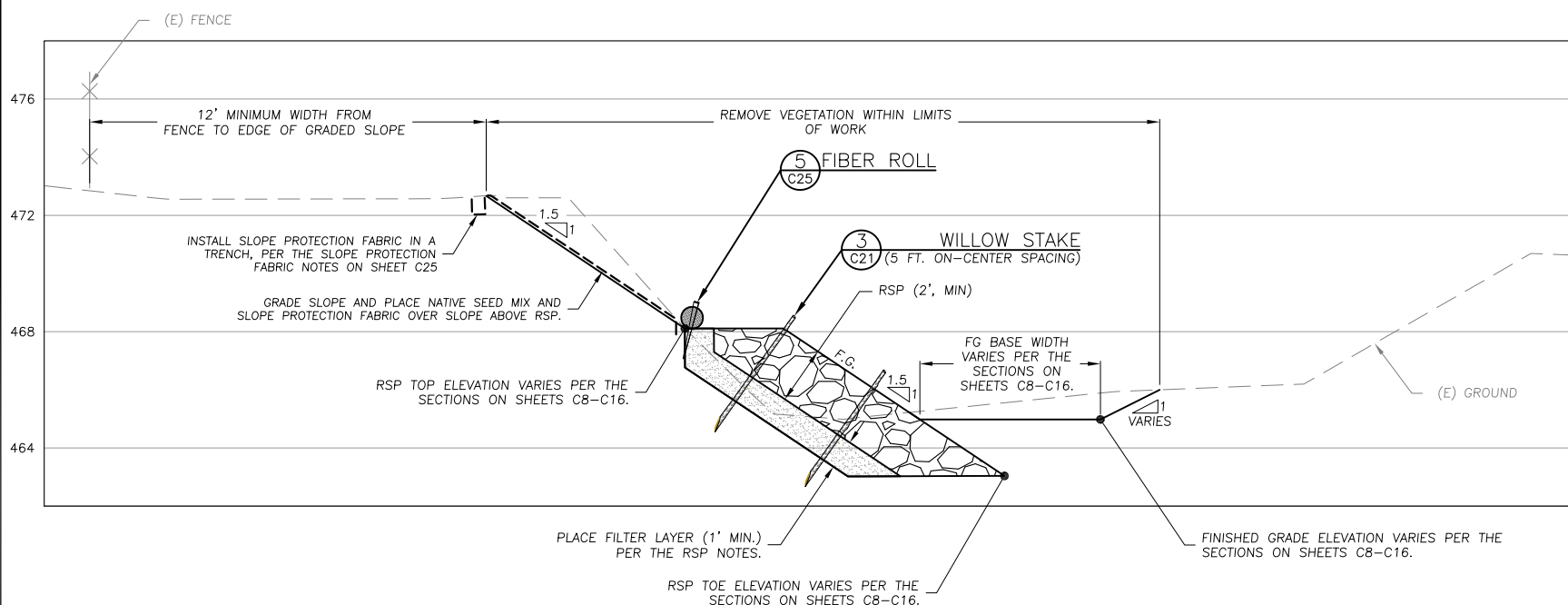
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C20



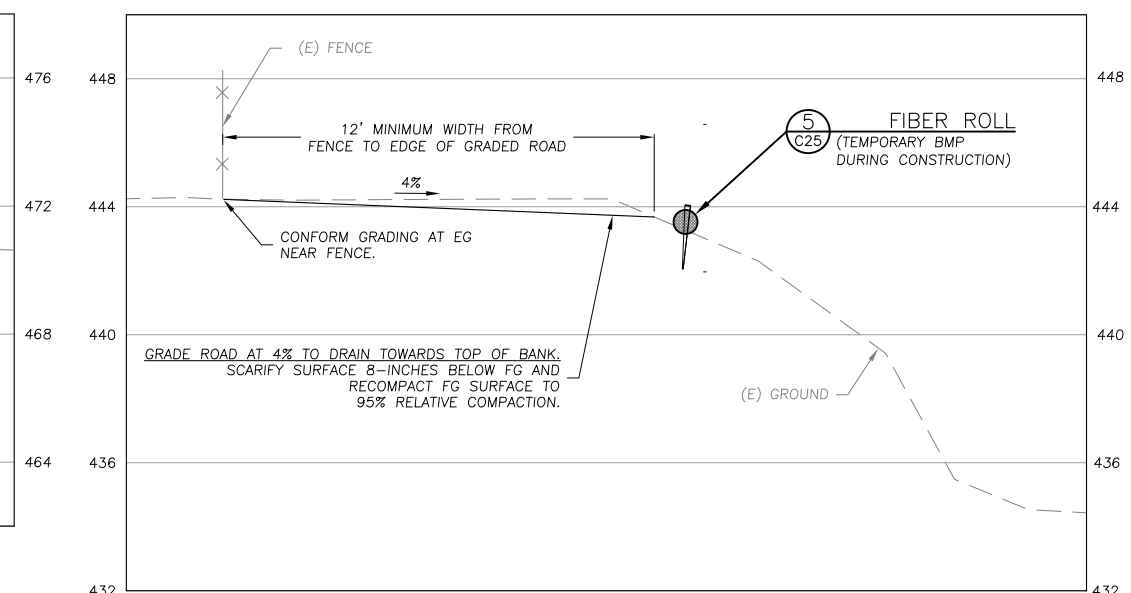
TYPICAL SECTION - FULL RSP (B)
SCALE: 1" = 3' C3,C4,C5,C23



TYPICAL SECTION - INSLOPE ROAD (C1)
SCALE: 1" = 3' C3,C4,C5



TYPICAL SECTION - TOE RSP (A)
SCALE: 1" = 3' C3,C4,C5

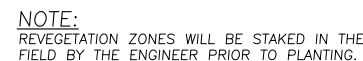


TYPICAL SECTION - OUTSLOPE ROAD (C2)
SCALE: 1" = 3' C3,C4,C5

- RSP NOTES:**
1. INSTALL CALTRANS CLASS III RSP (150 LB., 12-INCH MEDIAN PARTICLE DIAMETER), UNLESS A DIFFERENT ROCK CLASS IS SPECIFIED ON THE SECTIONS SHOWN ON SHEETS C8-C16. BACKFILL VOIDS WITH A 50:50 MIX OF CALTRANS UNIVERSAL GRAVEL FILTER AND CALTRANS CLASS 2 PERMEABLE MATERIAL AND WATER-JET.
 2. PLACE FILTER LAYER, COMPOSED OF A 50:50 MIX OF CALTRANS UNIVERSAL GRAVEL FILTER AND CALTRANS CLASS 2 PERMEABLE MATERIAL, BETWEEN RSP AND THE NATIVE SOILS.

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		E. NUMBER XXXXX	REV A	
VALLECITOS CHANNEL PROGRAMMATIC MAINTENANCE PROJECT 100% ADMN. DRAFT SUBMITTAL		TYPICAL SECTIONS AND DETAILS 1		
ALAMEDA COUNTY WATER DISTRICT 43885 SOUTH GRIMMER BOULEVARD P.O. BOX 5110 FREMONT, CA 94537-5110 (510) 668-4200		DESIGNED: MWW DRAWN: KB/BZ CHECKED: MWW REVIEWED BY: OPS PROJ. ENGR: ENGR. SUPERVISOR:		
WATERWAYS CONSULTING INC. 509A SWIFT ST. SANTA CRUZ, CA 95060 PH: (831) 447-7777 WWW.WATWAYS.COM		BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALES FOR REDUCED PLOTS 0 1"		
SHEET NO C21				

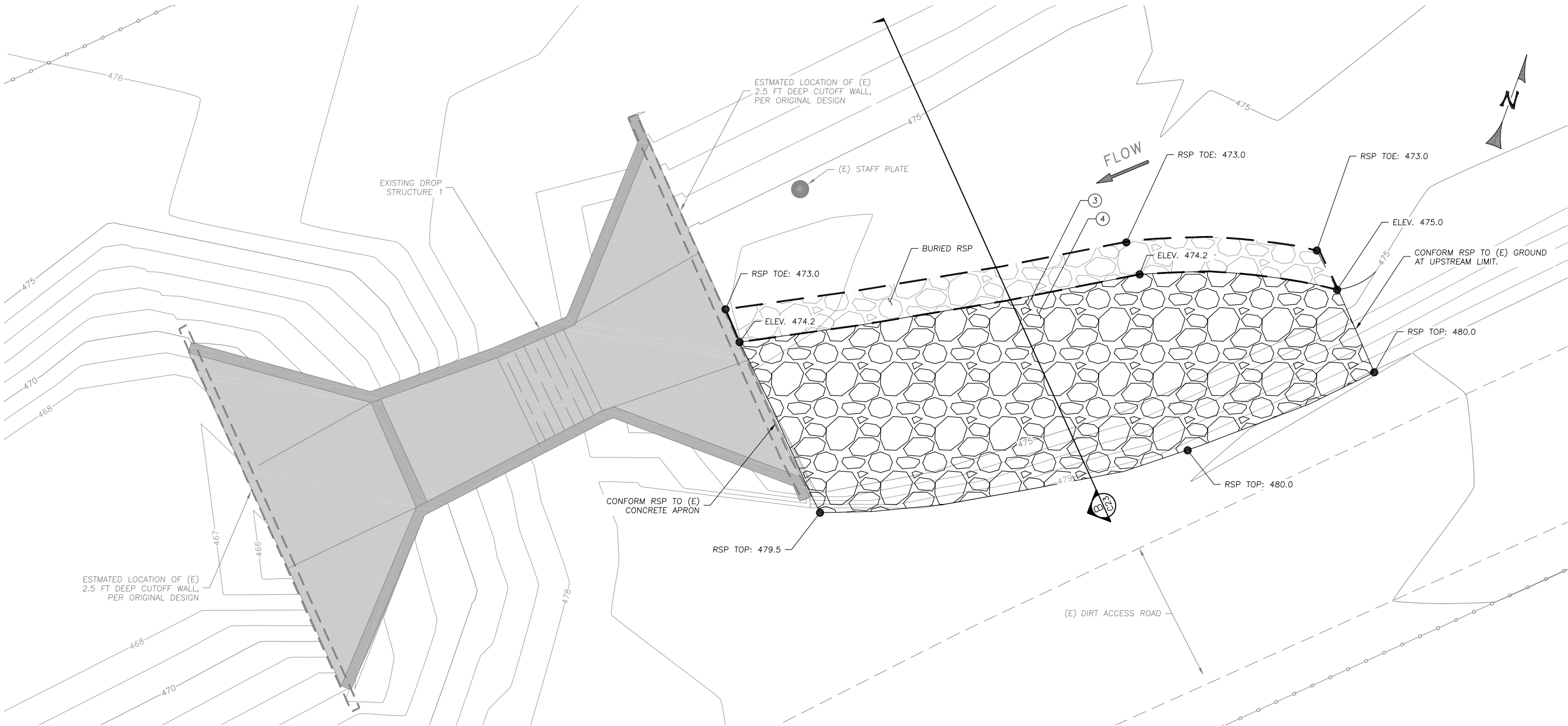


WILLOW STAKE SPECIFICATIONS

1. MATERIALS
 - 1.1. MATERIALS FOR WILLOW STAKES SHALL BE HARVESTED FROM WITHIN THE PROJECT AREA WITHIN 7 DAYS OF INSTALLATION, UNLESS OTHERWISE APPROVED BY THE ENGINEER. ALL SOURCE LOCATIONS FOR WILLOW HARVEST MUST BE APPROVED BY THE ENGINEER.
 - 1.2. ALL CUTS SHALL BE CLEAN, WITHOUT SPLIT OR FRAYED ENDS. WILLOW MATERIALS WITH CROOKED BRANCHES OR FURROWED BARK SHALL NOT BE HARVESTED OR USED FOR WILLOW STAKES.
 - 1.3. WILLOW STAKES SHALL BE 4.5-5 FEET IN LENGTH. ALL WILLOW STAKES SHALL BE 3/4 INCH DIAMETER, MINIMUM AT THE BASAL END. ALL LEAVES AND BRANCHES SHALL BE REMOVED.
2. INSTALLATION
 - 2.1. WILLOW STAKES THAT ARE NOT INSTALLED WITHIN 1 HOUR OF HARVEST SHALL BE STORED SUBMERGED IN CLEAN, FRESH WATER OUT OF DIRECT SUNLIGHT UNTIL INSTALLATION.
 - 2.2. INSTALL WILLOW STAKES TO A DEPTH OF 4 FEET, MINIMUM BELOW FINISHED GRADE. USE OF A PILOT BAR OR AUGER MAY HELP WITH INSTALLATION.
 - 2.3. INSTALLED WILLOW STAKES SHALL HAVE 6-10 INCHES REMAINING ABOVE THE FINISHED GRADE WITH AT LEAST 3 HEALTHY BUDDING POINTS EXPOSED.

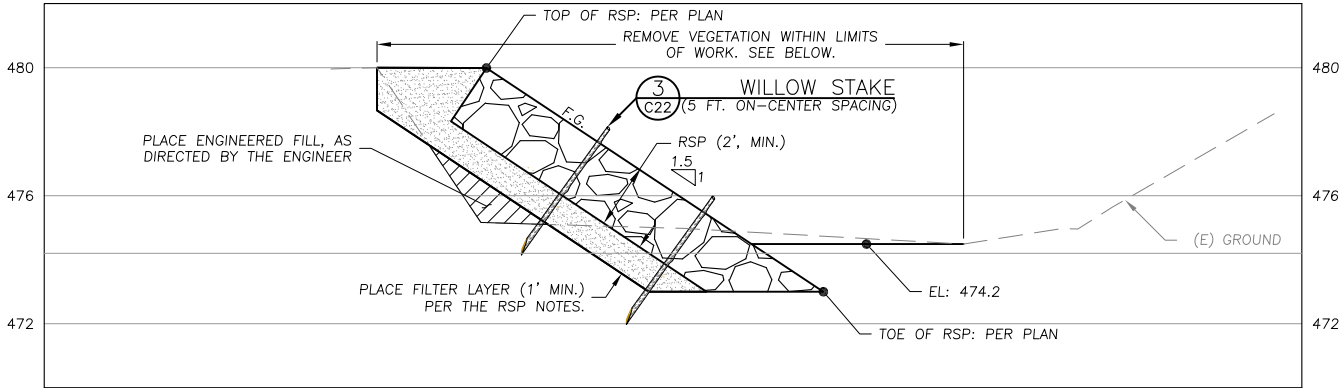


SHEET NO
C22



DETAIL PLAN AT DROP STRUCTURE 1 (1)
SCALE: 1" = 3' (C5)

LEGEND	
	EXISTING CONTOURS
	EXISTING FENCE
	EXISTING EDGE OF ROAD
	EXISTING CONCRETE DROP STRUCTURE
	PROPOSED ROCK SLOPE PROTECTION (RSP)
	PROPOSED BURIED RSP



SECTION (B)
SCALE: 1" = 3' (C23)

NOTES

- THE FINAL REPAIR WILL DEPEND UPON SUBSURFACE PREPARATION AND EVALUATION BY ENGINEER. WE ANTICIPATE THE REPAIR WILL CONSIST OF THE FOLLOWING:
1. DEWATER THE PROJECT SITE AS REQUIRED OR DIRECTED BY THE ENGINEER, AND ACCORDING TO DEWATERING DETAILS SHOWN ON SHEET C25.
 2. EXCAVATE LOOSE BANK MATERIALS AND PREPARE SUBGRADE FOR RSP.
 3. PRIOR TO PLACEMENT OF RSP, ALLOW FOR SUBGRADE INSPECTION BY ENGINEER TO EVALUATE SOIL LOSS AT UPSTREAM FACE OF DROP STRUCTURE 1.
 4. IF VOIDS ARE IDENTIFIED, ENGINEER MAY REQUEST BACKFILL WITH CLSM.

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0 1"

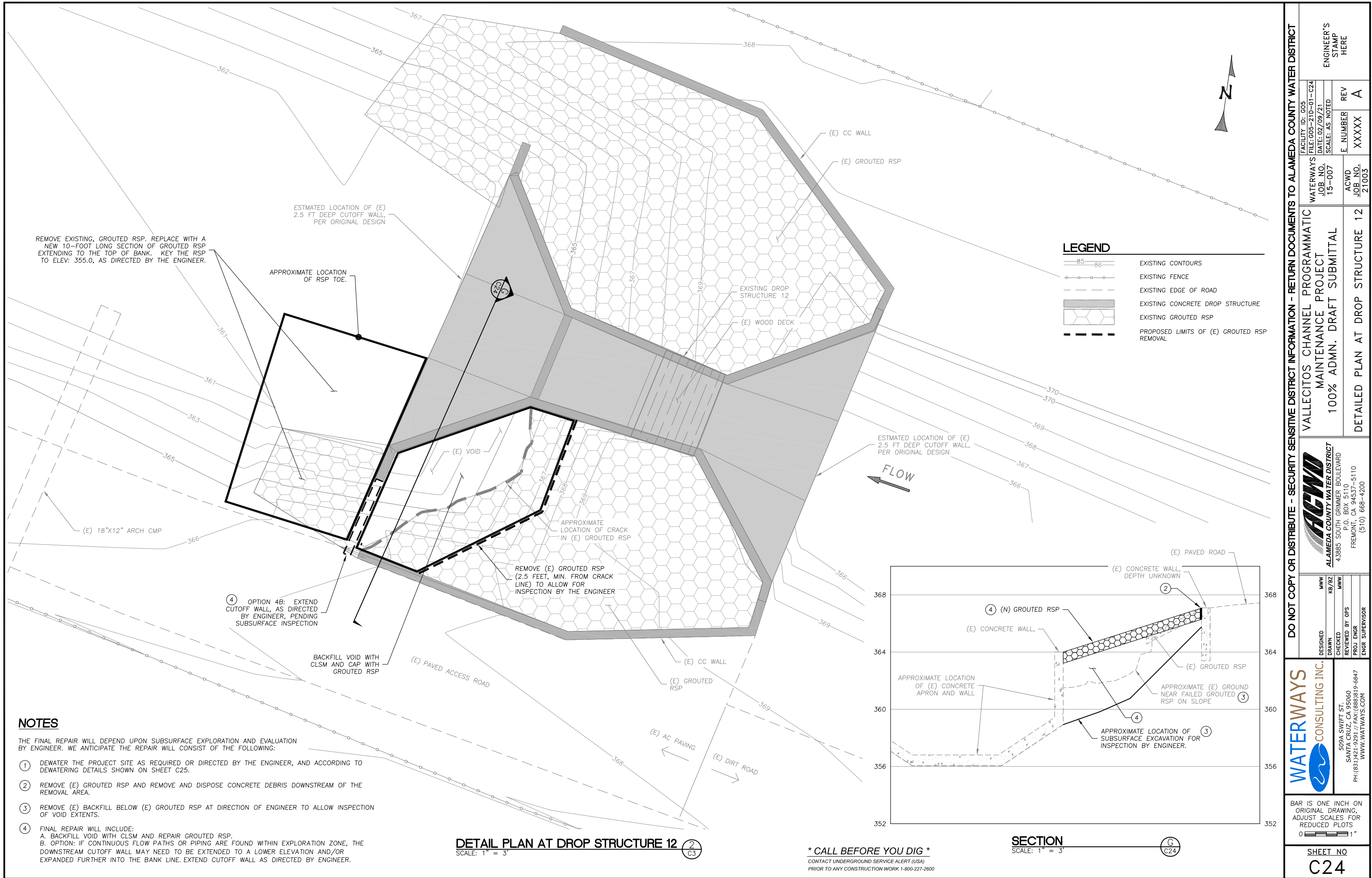
SHEET NO
C23

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PROJ. ENGR.	
ENGR. SUPERVISOR	

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MAINTENANCE PROJECT
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DETAILED PLAN AT DROP STRUCTURE 1

WATERWAYS JOB NO. 15-007	FILE: G05-21D-01-C23 DATE: 02/09/21 SCALE: AS NOTED	REVISIONS REV A	ENGINEER'S STAMP HERE
ACWD JOB NO. 21003	E. NUMBER XXXXX	REV A	



REMOVE EXISTING, GROUTED RSP. REPLACE WITH A NEW 10-FOOT LONG SECTION OF GROUTED RSP EXTENDING TO THE TOP OF BANK. KEY THE RSP TO ELEV: 355.0, AS DIRECTED BY THE ENGINEER.

APPROXIMATE LOCATION OF RSP TOE.

ESTIMATED LOCATION OF (E) 2.5 FT DEEP CUTOFF WALL, PER ORIGINAL DESIGN

LEGEND

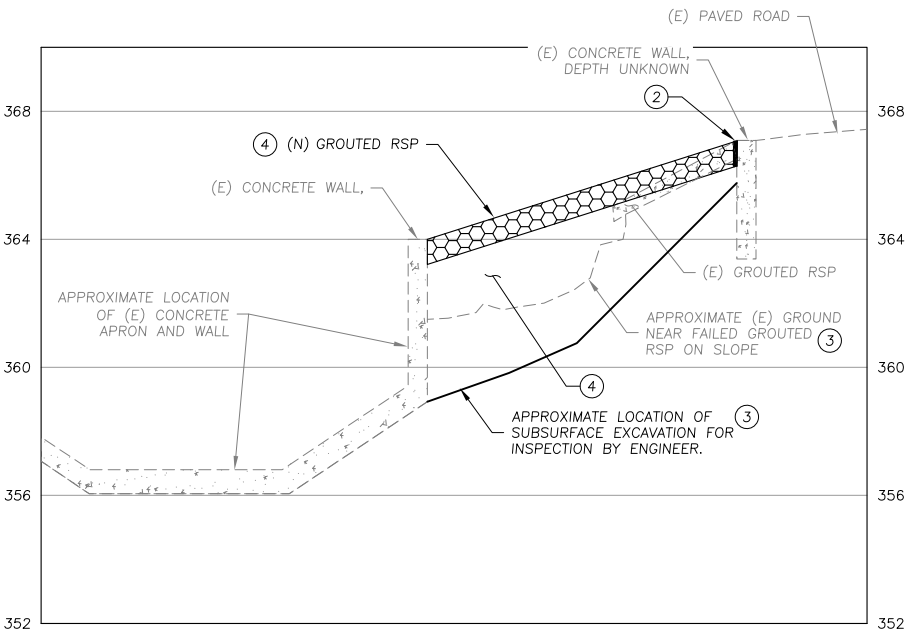
- 85 86 EXISTING CONTOURS
- EXISTING FENCE
- EXISTING EDGE OF ROAD
- EXISTING CONCRETE DROP STRUCTURE
- EXISTING GROUTED RSP
- PROPOSED LIMITS OF (E) GROUTED RSP REMOVAL

NOTES

THE FINAL REPAIR WILL DEPEND UPON SUBSURFACE EXPLORATION AND EVALUATION BY ENGINEER. WE ANTICIPATE THE REPAIR WILL CONSIST OF THE FOLLOWING:

- DEWATER THE PROJECT SITE AS REQUIRED OR DIRECTED BY THE ENGINEER, AND ACCORDING TO DEWATERING DETAILS SHOWN ON SHEET C25.
- REMOVE (E) GROUTED RSP AND REMOVE AND DISPOSE CONCRETE DEBRIS DOWNSTREAM OF THE REMOVAL AREA.
- REMOVE (E) BACKFILL BELOW (E) GROUTED RSP AT DIRECTION OF ENGINEER TO ALLOW INSPECTION OF VOID EXTENTS.
- FINAL REPAIR WILL INCLUDE:
A. BACKFILL VOID WITH CLSM AND REPAIR GROUTED RSP.
B. OPTION: IF CONTINUOUS FLOW PATHS OR PIPING ARE FOUND WITHIN EXPLORATION ZONE, THE DOWNSTREAM CUTOFF WALL MAY NEED TO BE EXTENDED TO A LOWER ELEVATION AND/OR EXPANDED FURTHER INTO THE BANK LINE. EXTEND CUTOFF WALL AS DIRECTED BY ENGINEER.

DETAIL PLAN AT DROP STRUCTURE 12 (2) C3
SCALE: 1" = 3'



SECTION

SCALE: 1" = 3'

(G) C24

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ENGR. SUPERVISOR	

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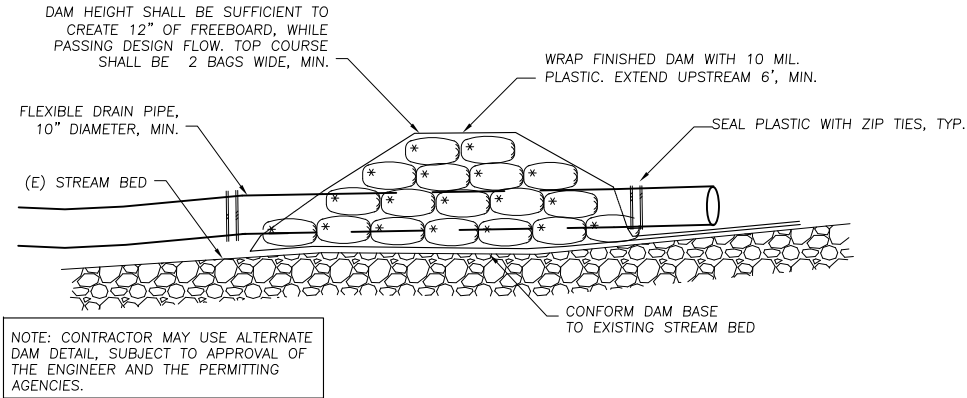
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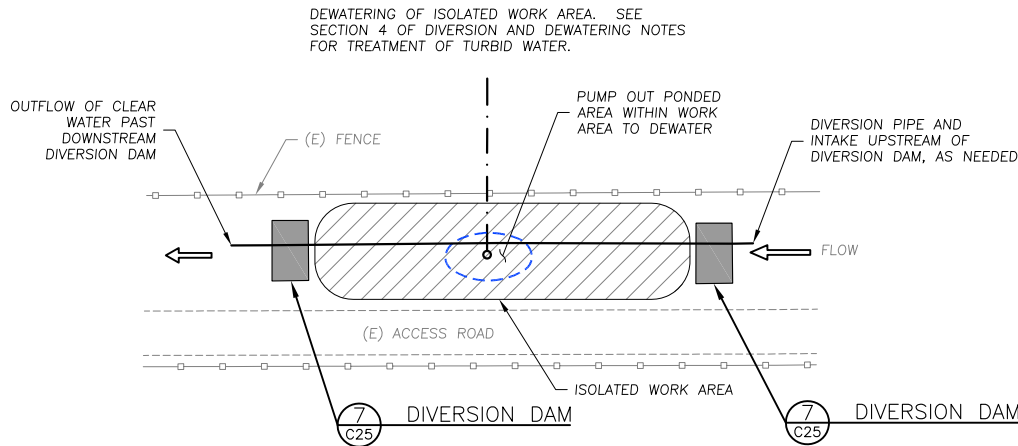
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JOB NO. 15-007		REV A	
DATE: 02/09/21		E. NUMBER XXXXX	
SCALE: AS NOTED		ACWD JOB NO. 21003	

VALLECITOS CHANNEL PROGRAMMATIC MAINTENANCE PROJECT
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DETAILED PLAN AT DROP STRUCTURE 12



DIVERSION DAM PROFILE
SCALE: NTS

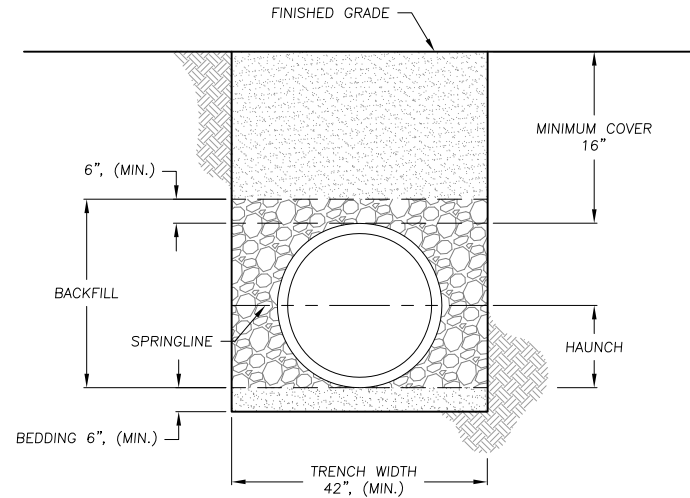


SCHEMATIC PLAN AND PROFILE FOR DEWATERING WORK AREA
SCALE: NTS

DIVERSION AND DEWATERING NOTES

THE DIVERSION AND DEWATERING PLAN SHOWN IS SCHEMATIC. GENERAL REQUIREMENTS ARE PROVIDED BELOW. THE FULL REQUIREMENTS OF THE DIVERSION AND DEWATERING PLAN ARE SPECIFIED IN THE PROJECT TECHNICAL SPECIFICATIONS.


1. GENERAL
 - 1.1. DEWATER THE PROJECT SITE AS REQUIRED TO FACILITATE IN-STREAM CONSTRUCTION AND TO REDUCE THE POTENTIAL IMPACTS TO WATER QUALITY DOWNSTREAM OF THE PROJECT SITE.
 - 1.2. CONSTRUCTION WILL BE PERFORMED IN THE DRY SEASON. DIVERSION OF WATER INTO THE VALLECITOS CHANNEL WILL BE TURNED OFF DURING CONSTRUCTION AND A MAJORITY OF THE CHANNEL WILL BE DRY. HOWEVER, DEWATERING OF SOME WORK AREAS MAY BE REQUIRED TO FACILITATE CONSTRUCTION. A DIVERSION DAM(S) AND DIVERSION PIPE WILL ONLY BE REQUIRED IN THE EVENT THAT THERE IS FLOWING WATER IN THE CHANNEL.
 - 1.3. CONFIRM THAT A FAVORABLE LONG TERM WEATHER FORECAST (1 WEEK, MIN.) IS OBSERVED PRIOR TO PLACEMENT OF DIVERSION STRUCTURES.
 - 1.4. PRIOR TO PLACEMENT OF DIVERSION STRUCTURE, REMOVE AQUATIC ORGANISMS FROM THE PROJECT REACH, IN ACCORDANCE WITH SECTION 2.
 - 1.5. DIVERT FLOW AND DEWATER THE SITE ONLY WHEN THE DIVERSION CONSTRUCTION IS COMPLETE. FOLLOWING ENGINEER'S APPROVAL OF THE COMPLETED WORK, REMOVE DIVERSION BEGINNING AT THE DOWNSTREAM LIMIT, IN AN UPSTREAM DIRECTION.
 - 1.6. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS AND DETAILS.
2. AQUATIC ORGANISM REMOVAL
 - 2.1. AQUATIC ORGANISMS SHALL BE REMOVED FROM EACH WORK AREA BY A QUALIFIED BIOLOGIST PRIOR TO THE START OF CONSTRUCTION AT A PARTICULAR WORK AREA.
3. DIVERSION SYSTEM
 - 3.1. INSTALL A TEMPORARY, SEALED DAM CONSTRUCTED USING GRAVEL FILLED BAGS TO CAPTURE AND DIVERT STREAM FLOW UPSTREAM AND DOWNSTREAM OF A WORK AREA. THE DAM AND METHOD OF SEALING SHALL BE PLACED AT AN APPROPRIATE DEPTH TO CAPTURE SUBSURFACE STREAM FLOW, AS NEEDED TO DEWATER THE STREAMBED. GRAVEL SHALL BE WASHED PRIOR TO PLACEMENT IN BAGS. THE USE OF SAND WILL NOT BE ALLOWED. NO OTHER DIVERSION METHOD SHALL BE USED WITHOUT AUTHORIZATION OF THE ENGINEER. IF AN ALTERNATE DIVERSION METHOD IS PREFERRED BY THE CONTRACTOR, THE CONTRACTOR SHALL SUBMIT A PLAN TO THE ENGINEER FOR APPROVAL, DETAILING THE DESIRED DIVERSION METHOD.
 - 3.2. THE DIVERSION STRUCTURE SHALL BE CONSTRUCTED AS SHOWN ON DETAIL 7 AND DETAIL 8 ON THIS SHEET OR AS DIRECTED BY THE ENGINEER IN THE FIELD.
 - 3.3. IN THE EVENT OF A SIGNIFICANT STORM, THE CONTRACTOR SHALL BE PREPARED TO TAKE NECESSARY MEASURES TO INSURE SAFE PASSAGE OF STORM WATER FLOW THROUGH THE PROJECT AREA, WITHOUT DAMAGE TO EXISTING STRUCTURES, OR INTRODUCTION OF EXCESSIVE SEDIMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY EROSION CONTROL B.M.P.'S.
4. DEWATERING OF CONSTRUCTION AREAS
 - 4.1. CONTRACTOR SHALL SUPPLY ALL NECESSARY PUMPS, PIPING, FILTERS, SHORING, AND OTHER TOOLS AND MATERIALS NECESSARY FOR DEWATERING.
 - 4.2. ANY DEWATERING ACTIVITIES WHICH MAY BE REQUIRED FOR CONSTRUCTION PURPOSES SHALL BE CONDUCTED IN A MANNER WHICH DOES NOT VIOLATE ANY WATER QUALITY STANDARDS ESTABLISHED BY THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD.
 - 4.3. DISCHARGE OF WATER FROM THE DEWATERED CONSTRUCTION SITE, EITHER BY GRAVITY OR PUMPING, SHALL BE PERFORMED IN A MANNER THAT PREVENTS EXCESSIVE TURBIDITY FROM ENTERING THE RECEIVING WATERWAYS AND PREVENTS SCOUR AND EROSION OUTSIDE OF THE CONSTRUCTION SITE. PUMPED WATER SHOULD BE PRE-FILTERED WITH A GRAVEL PACK AROUND SUMPS FOR SUBSURFACE FLOWS AND A SILT FENCE OR HAY BALES AROUND PUMPS FOR SURFACE FLOW. PUMPED WATER SHALL BE DISCHARGED INTO ISOLATED LOCAL DEPRESSIONS, FILTER BAGS, SETTLING (BAKER) TANKS, OR TEMPORARY SEDIMENT BASINS, AS NECESSARY TO MEET WATER QUALITY REQUIREMENTS. WHERE REQUIRED TO MEET PERMIT REQUIREMENTS, WATER TO BE DISCHARGED INTO THE CREEK SHALL BE ROUTED THROUGH A SEDIMENT INTERCEPTOR OR OTHER FACILITIES TO REMOVE SEDIMENT FROM WATER.



CULVERT TRENCH
SCALE: N.T.S.

1. INSTALL ALL PIPE SYSTEMS IN ACCORDANCE WITH PROVISIONS IN SECTION 61-2 "CULVERT AND DRAINAGE PIPE JOINTS" AND SECTION 64, "PLASTIC PIPE" OR SECTION 66 "CORRUGATED METAL PIPE", PENDING THE PIPE MATERIAL, OF THE STATE STANDARD SPECIFICATIONS.
2. **FOUNDATION:** WHERE THE TRENCH BOTTOM IS UNSTABLE, OVER-EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE, AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED WITH A GEOTEXTILE MATERIAL.
3. **BEDDING:** SUITABLE MATERIAL CONSISTS OF CLASS I, II, OR III, PER ASTM D2321. PROVIDE DOCUMENTATION OF MATERIAL SPECIFICATION TO ENGINEER.
4. **BACKFILL:** SUITABLE MATERIAL CONSISTS OF CLASS I, II, OR III, PER ASTM D2321, IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" ABOVE CROWN OF PIPE. SURROUND CRUSHED ROCK WITH A NON-WOVEN FILTER FABRIC SUCH AS "MIRAFI 180N", OR APPROVED EQUAL. PROVIDE DOCUMENTATION OF MATERIAL SPECIFICATION TO THE ENGINEER.

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 <p>ALAMEDA COUNTY WATER DISTRICT 43885 SOUTH GRIMMER BOULEVARD P.O. BOX 5110 FREMONT, CA 94537-5110 (510) 668-4200</p>	VALLECITOS CHANNEL PROGRAMMATIC MAINTENANCE PROJECT 100% ADMN. DRAFT SUBMITTAL		FACILITY ID: G05 FILE: G05-21D-01-C25 DATE: 02/09/21 JOB NO. 15-007		ENGINEER'S STAMP HERE
	DEWATERING PLAN AND EROSION CONTROL DETAILS		WATERWAYS JOB NO. 15-007		
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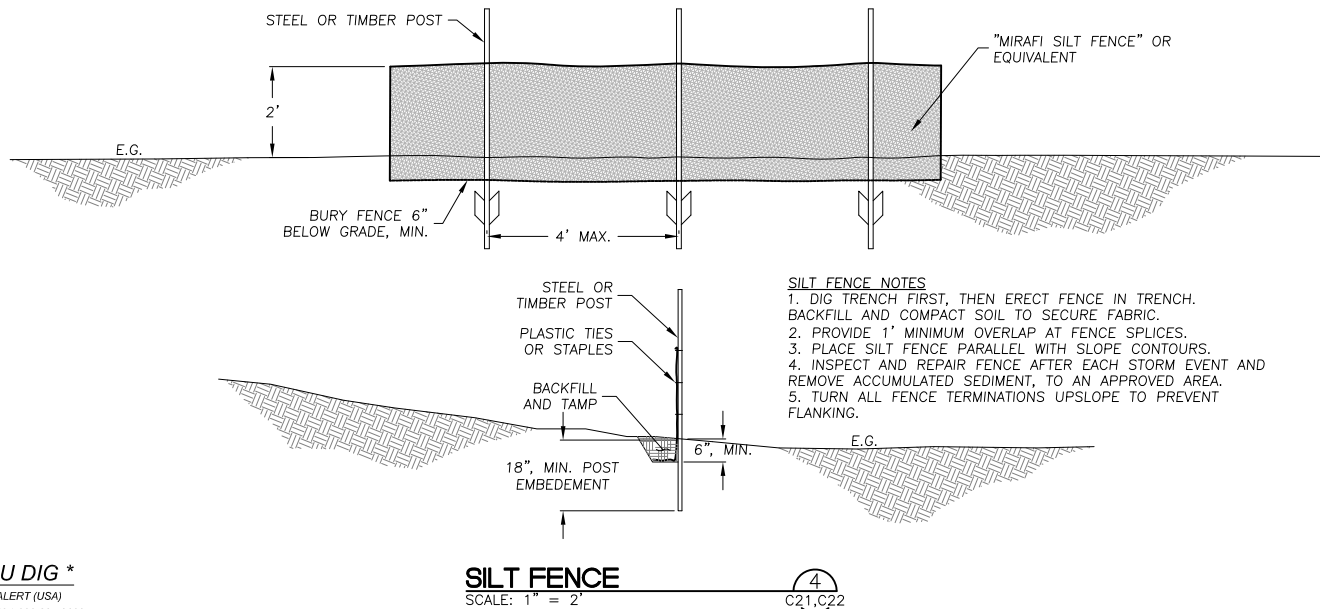
 <p>WATERWAYS CONSULTING INC.</p>	509A SWIFT ST. SANTA CRUZ, CA 95060 PH: (831) 447-7744 WWW.WATWAYS.COM

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

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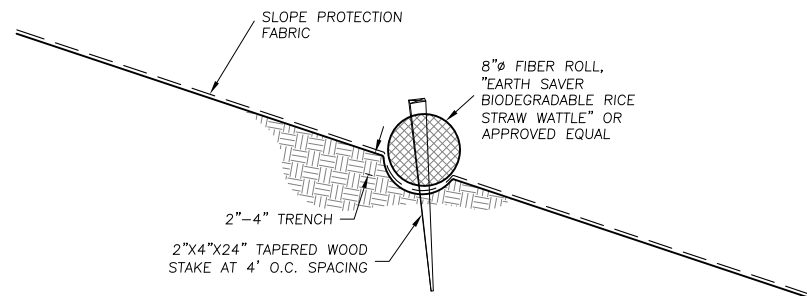
SHEET NO
C25

*** CALL BEFORE YOU DIG ***
CONTACT UNDERGROUND SERVICE ALERT (USA)
PRIOR TO ANY CONSTRUCTION WORK 1-800-227-2600



SLOPE PROTECTION FABRIC NOTES

1. SLOPE PROTECTION FABRIC SHALL BE "NORTH AMERICAN GREEN C125BN", OR APPROVED EQUAL.
2. GROUND ANCHORING DEVICES SHALL CONSIST OF 10" LONG METAL STAPLES. IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE LENGTHS GREATER THAN 8" MAY BE NECESSARY TO PROPERLY ANCHOR SLOPE PROTECTION FABRIC.
3. SECURE UPSLOPE EDGE OF SLOPE PROTECTION FABRIC INTO A 6" X 6" TRENCH WITH A ROW OF GROUND ANCHORING DEVICES SPACED APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF SLOPE PROTECTION FABRIC'S BACK OVER SEED AND COMPACTED SOIL. SECURE SLOPE PROTECTION FABRIC OVER COMPACTED SOIL WITH A ROW OF GROUND ANCHORING DEVICES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE SLOPE PROTECTION FABRIC.
4. UNROLL SLOPE PROTECTION FABRIC DOWNSLOPE. CONSECUTIVE ROLLS SPICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN 18" OVERLAP. WHEN MORE THAN ONE ROLL WIDTH IS REQUIRED, CONSECUTIVE ROLLS SHALL BE SPICED END OVER END IN THE DOWNSTREAM DIRECTION WITH AN 18" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE SLOPE PROTECTION FABRIC'S LENGTH.
5. SECURE SLOPE PROTECTION FABRIC TO SLOPE WITH GROUND ANCHORING DEVICES AT 2' ON-CENTER SPACING. ADDITIONAL STAPLES SHALL BE INSTALLED, AS NECESSARY, TO ENSURE CONSISTENT CONTACT WITH THE GROUND SURFACE.
6. ALL SLOPE PROTECTION FABRIC EDGES SHALL BE INSTALLED IN A 6" X 6" TRENCH WITH A ROW OF GROUND ANCHORING DEVICES SPACED APPROXIMATELY 12" APART AS DESCRIBED ABOVE.



FIBER ROLL
SCALE: 1" = 1'

GENERAL NOTES

1. NOTIFY THE ENGINEER AT LEAST 48 HOURS PRIOR TO CONSTRUCTION. THE ENGINEER OR A DESIGNATED REPRESENTATIVE SHALL OBSERVE THE CONSTRUCTION PROCESS, AS NECESSARY TO ENSURE PROPER INSTALLATION PROCEDURES.

2. EXISTING UNDERGROUND UTILITY LOCATIONS:

1. CALL UNDERGROUND SERVICE ALERT (1-800-642-2444) TO LOCATE ALL UNDERGROUND UTILITY LINES PRIOR TO COMMENCING CONSTRUCTION.

2. PRIOR TO BEGINNING WORK, CONTACT ALL UTILITIES COMPANIES WITH REGARD TO WORKING OVER, UNDER, OR AROUND EXISTING FACILITIES AND TO OBTAIN INFORMATION REGARDING RESTRICTIONS THAT ARE REQUIRED TO PREVENT DAMAGE TO THE FACILITIES.

3. EXISTING UTILITY LOCATIONS SHOWN ARE COMPILED FROM INFORMATION SUPPLIED BY THE APPROPRIATE UTILITY AGENCIES AND FROM FIELD MEASUREMENTS TO ABOVE GROUND FEATURES READILY VISIBLE AT THE TIME OF SURVEY. LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR IS CAUTIONED THAT ONLY ACTUAL EXCAVATION WILL REVEAL THE DIMENSIONS, SIZES, MATERIALS, LOCATIONS, AND DEPTH OF UNDERGROUND UTILITIES.

4. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE LOCATION AND/OR PROTECTION OF ALL EXISTING AND PROPOSED PIPING, UTILITIES, TRAFFIC SIGNAL EQUIPMENT (BOTH ABOVE GROUND AND BELOW GROUND), STRUCTURES, AND ALL OTHER EXISTING IMPROVEMENTS THROUGHOUT CONSTRUCTION.

5. PRIOR TO COMMENCING FABRICATION OR CONSTRUCTION, DISCOVER OR VERIFY THE ACTUAL DIMENSIONS, SIZES, MATERIALS, LOCATIONS, AND ELEVATIONS OF ALL EXISTING UTILITIES AND POTHOLE THOSE AREAS WHERE POTENTIAL CONFLICTS ARE LIKELY OR DATA IS OTHERWISE INCOMPLETE.

6. TAKE APPROPRIATE MEASURES TO PROTECT EXISTING UTILITIES DURING CONSTRUCTION OPERATIONS. CONTRACTOR IS SOLELY RESPONSIBLE FOR THE COST OF REPAIR/REPLACEMENT OF ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION.

7. UPON LEARNING OF THE EXISTENCE AND/OR LOCATIONS OF ANY UNDERGROUND FACILITIES NOT SHOWN OR SHOWN INACCURATELY ON THE PLANS OR NOT PROPERLY MARKED BY THE UTILITY OWNER, IMMEDIATELY NOTIFY THE UTILITY OWNER AND THE CITY BY TELEPHONE AND IN WRITING.

8. UTILITY RELOCATIONS REQUIRED FOR THE CONSTRUCTION OF THE PROJECT FACILITIES WILL BE PERFORMED BY THE UTILITY COMPANY, UNLESS OTHERWISE NOTED.

3. IF DISCREPANCIES ARE DISCOVERED BETWEEN THE CONDITIONS EXISTING IN THE FIELD AND THE INFORMATION SHOWN ON THESE DRAWINGS, NOTIFY THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.

4. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE FULLY INFORMED OF AND TO COMPLY WITH ALL LAWS, ORDINANCES, CODES, REQUIREMENTS AND STANDARDS WHICH IN ANY MANNER AFFECT THE COURSE OF CONSTRUCTION OF THIS PROJECT, THOSE ENGAGED OR EMPLOYED IN THE CONSTRUCTION AND THE MATERIALS USED IN THE CONSTRUCTION.

5. ALL TESTS, INSPECTIONS, SPECIAL OR OTHERWISE, THAT ARE REQUIRED BY THE BUILDING CODES, LOCAL BUILDING DEPARTMENTS, OR THESE PLANS, SHALL BE DONE BY AN INDEPENDENT INSPECTION COMPANY. JOB SITE VISITS BY THE ENGINEER DO NOT CONSTITUTE AN OFFICIAL INSPECTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE REQUIRED TESTS AND INSPECTIONS ARE PERFORMED.

6. PROJECT SCHEDULE: PRIOR TO COMMENCEMENT OF WORK, SUBMIT TO THE ENGINEER FOR REVIEW AND APPROVAL A DETAILED CONSTRUCTION SCHEDULE. DO NOT BEGIN ANY CONSTRUCTION WORK UNTIL THE PROJECT SCHEDULE AND WORK PLAN IS APPROVED BY THE ENGINEER. ALL CONSTRUCTION SHALL BE CLOSELY COORDINATED WITH THE ENGINEER SO THAT THE QUALITY OF WORK CAN BE CHECKED FOR APPROVAL. PURSUE WORK IN A CONTINUOUS AND DILIGENT MANNER TO ENSURE A TIMELY COMPLETION OF THE PROJECT.

7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN, PERMITTING, INSTALLATION, AND MAINTENANCE OF ANY AND ALL TRAFFIC CONTROL MEASURES DEEMED NECESSARY.

8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR GENERAL SAFETY DURING CONSTRUCTION. ALL WORK SHALL CONFORM TO PERTINENT SAFETY REGULATIONS AND CODES. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR FURNISHING, INSTALLING, AND MAINTAINING ALL WARNING SIGNS AND DEVICES NECESSARY TO SAFEGUARD THE GENERAL PUBLIC AND THE WORK, AND PROVIDE FOR THE PROPER AND SAFE ROUTING OF VEHICULAR AND PEDESTRIAN TRAFFIC DURING THE PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE PROVISIONS OF OSHA IN THE CONSTRUCTION PRACTICES FOR ALL EMPLOYEES DIRECTLY ENGAGED IN THE CONSTRUCTION OF THIS PROJECT.

9. CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTION LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF DESIGN PROFESSIONAL. NEITHER THE PROFESSIONAL ACTIVITIES OF CONSULTANT NOR THE PRESENCE OF CONSULTANT OR HIS OR HER EMPLOYEES OR SUB-CONSULTANTS AT A CONSTRUCTION SITE SHALL RELIEVE THE CONTRACTOR AND ITS SUBCONTRACTORS OF THEIR RESPONSIBILITIES INCLUDING, BUT NOT LIMITED TO, CONSTRUCTION MEANS, METHODS, SEQUENCE, TECHNIQUES OR PROCEDURES NECESSARY FOR PERFORMING, SUPERINTENDING OR COORDINATING ALL PORTIONS OF THE WORK OF CONSTRUCTION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND APPLICABLE HEALTH OR SAFETY REQUIREMENTS OF ANY REGULATORY AGENCY OR OF STATE LAW.

10. MAINTAIN A CURRENT, COMPLETE, AND ACCURATE RECORD OF ALL AS-BUILT DEVIATIONS FROM THE CONSTRUCTION AS SHOWN ON THESE DRAWINGS AND SPECIFICATIONS, FOR THE PURPOSE OF PROVIDING THE ENGINEER OF RECORD WITH A BASIS FOR THE PREPARATION OF RECORD DRAWINGS.

11. MAINTAIN THE SITE IN A NEAT AND ORDERLY MANNER THROUGHOUT THE CONSTRUCTION PROCESS. STORE ALL MATERIALS WITHIN APPROVED STAGING AREAS.

12. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE FULLY INFORMED OF AND TO COMPLY WITH ALL PERMIT CONDITIONS, LAWS, ORDINANCES, CODES, REQUIREMENTS AND STANDARDS, WHICH IN ANY MANNER AFFECT THE COURSE OF CONSTRUCTION OF THIS PROJECT, THOSE ENGAGED OR EMPLOYED IN THE CONSTRUCTION AND THE MATERIALS USED IN THE CONSTRUCTION.

13. PROVIDE, AT CONTRACTOR'S SOLE EXPENSE, ALL MATERIALS, LABOR AND EQUIPMENT REQUIRED TO COMPLY WITH ALL APPLICABLE PERMIT CONDITIONS AND REQUIREMENTS.

14. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION STAKING AND LAYOUT, UNLESS OTHERWISE SPECIFIED.

15. FIELD INSPECTIONS AND OR THE PROVISION OF CONSTRUCTION STAKES DO NOT RELIEVE THE CONTRACTOR OF THEIR SOLE RESPONSIBILITY FOR ESTABLISHING ACCURATE CONSTRUCTED LINES AND GRADES, AS SPECIFIED.

16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION AND PRESERVATION OF ALL SURVEY MONUMENTS OR PROPERTY CORNERS. DISTURBED MONUMENTS SHALL BE RESTORED BACK TO THEIR ORIGINAL LOCATION AND SHALL BE CERTIFIED BY A REGISTERED CIVIL ENGINEER OR LAND SURVEYOR AT THE SOLE EXPENSE OF THE CONTRACTOR.

17. THE OWNER SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL PROPERTY LINES AND EASEMENTS AND CONFIRMING THAT PROPOSED PROJECT ELEMENTS ARE LOCATED ON DISTRICT OWNED LANDS OR ARE COORDINATED WITH OWNERS AND APPROPRIATE PERMISSIONS ARE GRANTED FOR THE WORK.

18. CONTRACTOR IS REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.
- EARTHWORK NOTES
1. SEE THE SCHEDULE OF WORK ON SHEETS C6 AND C7 FOR A GRADING SUMMARY.

THE CONTRACTOR SHALL PERFORM AN INDEPENDENT EARTHWORK ESTIMATE FOR THE PURPOSE OF PREPARING BID PRICES FOR EARTHWORK. THE BID PRICE SHALL INCLUDE COSTS FOR ANY NECESSARY IMPORT AND PLACEMENT OF EARTH MATERIALS OR THE EXPORT AND PROPER DISPOSAL OF EXCESS OR UNSUITABLE EARTH MATERIALS.

2. PRIOR TO COMMENCING WORK, PROTECT ALL SENSITIVE AREAS TO REMAIN UNDISTURBED WITH TEMPORARY FENCING, AS SHOWN ON THE DRAWINGS, AS SPECIFIED, OR AS DIRECTED BY THE ENGINEER.

3. DO NOT DISTRURB AREAS OUTSIDE OF THE DESIGNATED LIMITS OF DISTURBANCE, UNLESS AUTHORIZED IN WRITING BY THE ENGINEER. THE COST OF ALL ADDITIONAL WORK ASSOCIATED WITH RESTORATION AND REVEGETATION OF DISTURBED AREAS OUTSIDE THE DESIGNATED LIMITS OF DISTURBANCE, AS SHOWN ON THE DRAWINGS, SHALL BE BORNE SOLELY BY THE CONTRACTOR.

4. REMOVE ALL EXCESS SOILS TO AN APPROVED DUMP SITE OR DISPOSE OF ON SITE AT A LOCATION TO BE APPROVED BY THE ENGINEER, IN A MANNER THAT WILL NOT CAUSE EROSION.

5. CLEARING AND GRUBBING, SUBGRADE PREPARATION AND EARTHWORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 17 & 19 OF THE STANDARD SPECIFICATIONS, THESE DRAWINGS, AND THE TECHNICAL SPECIFICATIONS.

6. PRIOR TO STARTING WORK ON THE PROJECT, SUBMIT FOR ACCEPTANCE BY THE ENGINEER A HAZARDOUS MATERIALS CONTROLS AND SPILL PREVENTION PLAN. INCLUDE PROVISIONS FOR PREVENTING HAZARDOUS MATERIALS FROM CONTAMINATING SOIL OR ENTERING WATER COURSES, AND ESTABLISH A SPILL PREVENTION AND COUNTERMEASURE PLAN.

9. UNLESS AUTHORIZED BY THE GEOTECHNICAL ENGINEER, THE FOLLOWING MATERIALS SHALL NOT BE INCORPORATED INTO THE WORK:

1. ORGANIC MATERIALS SUCH AS PEAT, MULCH, ORGANIC SILT OR SOD.

2. SOILS CONTAINING EXPANSIVE CLAYS.

3. MATERIAL CONTAINING EXCESSIVE MOISTURE.

4. POORLY GRADED COURSE MATERIAL

5. PARTICLE SIZES IN EXCESS OF 6 INCHES.

6. MATERIAL WHICH WILL NOT ACHIEVE SPECIFIED DENSITY OR BEARING.

10. FINE GRADING ELEVATIONS, CONFORMS, AND SLOPES NOT CLEARLY SHOWN ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR IN THE FIELD TO DIRECT DRAINAGE TO PROTECTED DRAINAGE CONTROL STRUCTURES OR NATURAL WATERWAYS IN A MANNER THAT SUPPORTS THE INTENT OF THE DESIGN. ALL FINAL GRADING SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

11. THE TOP 6" OF SUBGRADE UNDER ALL PAVED SURFACES SUBJECT TO VEHICULAR USE SHALL BE COMPACTED TO A MINIMUM OF 95% RELATIVE COMPACTION, IN ACCORDANCE WITH ASTM-D1557. ALL OTHER FILL TO BE COMPACTED TO A MINIMUM OF 90% MAXIMUM DENSITY AS DETERMINED BY ASTM-D1557 AND SO CERTIFIED BY TESTS AND REPORTS FROM THE CIVIL ENGINEER IN CHARGE OF THE GRADING CERTIFICATION.

12. SPREAD FILL MATERIAL IN LIFTS OF APPROXIMATELY 8 INCHES, MOISTENED OR DRIED TO NEAR OPTIMUM MOISTURE CONTENT AND RECOMPACTED. THE MATERIALS FOR ENGINEERED FILL SHALL BE APPROVED BY A REGISTERED CIVIL ENGINEER. ANY IMPORTED MATERIALS MUST BE APPROVED BEFORE BEING BROUGHT TO THE SITE. THE MATERIALS USED SHALL BE FREE OF ORGANIC MATTER AND OTHER DELETERIOUS MATERIALS.

13. ALL CONTACT SURFACES BETWEEN ORIGINAL GROUND AND RECOMPACTED FILL SHALL BE EITHER HORIZONTAL OR VERTICAL. ALL ORGANIC MATERIAL SHALL BE REMOVED AND THE REMAINING SURFACE SCARIFIED TO A DEPTH OF AT LEAST 12 INCHES, UNLESS DEEPER EXCAVATION IS REQUIRED BY THE ENGINEER.

14. REGULATORY AGENCIES MAY REQUIRE A FINAL GRADING COMPLIANCE LETTER. WE CAN ONLY OFFER THIS LETTER IF WE ARE CALLED TO THE SITE TO OBSERVE AND TEST, AS NECESSARY, ANY GRADING AND EXCAVATION OPERATIONS FROM THE START OF CONSTRUCTION. WE CANNOT PREPARE A LETTER IF WE ARE NOT AFFORDED THE OPPORTUNITY OF OBSERVATION FROM THE BEGINNING OF THE GRADING OPERATION. THE CONTRACTOR MUST BE MADE AWARE OF THIS AND EARTHWORK TESTING AND OBSERVATION MUST BE SCHEDULED ACCORDINGLY. PLEASE CONTACT OUR OFFICE: (831) 421-9291.
- EROSION CONTROL NOTES
1. THE EROSION CONTROL PLAN SHOWN IS INTENDED FOR THE SUMMER CONSTRUCTION SEASON (APRIL 15TH TO OCTOBER 31ST). IF THE DRAINAGE FEATURES SHOWN ON THESE DRAWINGS ARE NOT COMPLETED AND DISTURBED AREAS STABILIZED BY OCTOBER 1ST, CONSULT THE ENGINEER FOR ADDITIONAL RAINY SEASON EROSION CONTROL MEASURES.

2. PRIOR TO COMMENCING WORK, PROTECT AREAS TO REMAIN UNDISTURBED WITH ESA FENCING, AS SHOWN ON THE DRAWINGS. ADDITIONAL FENCING MAY BE REQUIRED AT THE DIRECTION OF THE ENGINEER.

3. UTILIZE ONLY THE APPROVED HAUL ROADS AND ACCESS POINTS (AS SHOWN ON THE DRAWINGS) FOR TRANSPORT OF MATERIALS AND EQUIPMENT.

4. BETWEEN OCTOBER 31 AND APRIL 15, PROTECT EXPOSED SOIL FROM EROSION AT ALL TIMES. DURING CONSTRUCTION, SUCH PROTECTION MAY CONSIST OF MULCHING AND/OR PLANTING OF NATIVE VEGETATION OF ADEQUATE DENSITY. BEFORE COMPLETION OF THE PROJECT, STABILIZE ALL EXPOSED SOIL ON DISTURBED SLOPES AGAINST EROSION.

5. MAINTAIN A STANDBY CREW FOR EMERGENCY WORK AT ALL TIMES DURING THE RAINY SEASON (OCTOBER 31 THROUGH APRIL 15). STOCKPILE NECESSARY MATERIALS AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF TEMPORARY DEVICES.

6. CONSTRUCT TEMPORARY EROSION CONTROL MEASURES AS SHOWN ON THIS PLAN AND/OR AS DIRECTED BY THE ENGINEER TO CONTROL DRAINAGE WHICH HAS BEEN AFFECTED BY GRADING AND/OR TRENCHING OPERATIONS.

7. INCORPORATE ADEQUATE DRAINAGE PROCEDURES DURING THE CONSTRUCTION PROCESS TO ELIMINATE EXCESSIVE PONDING AND EROSION.

8. CONSTRUCT AND MAINTAIN EROSION CONTROL MEASURES TO PREVENT THE DISCHARGE OF EARTHEN MATERIALS TO THE CHANNEL FROM DISTURBED AREAS UNDER CONSTRUCTION AND FROM COMPLETED CONSTRUCTION AREAS.

9. INSTALL ALL PROTECTIVE DEVICES AT THE END OF EACH WORK DAY WHEN THE FIVE-DAY RAIN PROBABILITY EQUALS OR EXCEEDS 50 PERCENT AS DETERMINED FROM THE NATIONAL WEATHER SERVICE FORECAST OFFICE: WWW.SRH.NOAA.GOV.

10. AFTER EACH RAINSTORM, REMOVE ALL SILT AND DEBRIS FROM SEDIMENT CONTROL DEVICES.

11. THE EROSION CONTROL DEVICES ON THIS PLAN ARE A SCHEMATIC REPRESENTATION OF WHAT MAY BE REQUIRED. EROSION CONTROL DEVICES MAY BE RELOCATED, DELETED, OR ADDITIONAL ITEMS MAY BE REQUIRED DEPENDING ON THE ACTUAL SOIL CONDITIONS ENCOUNTERED, AT THE DISCRETION OF THE ENGINEER.

12. MAINTAIN ALL EROSION CONTROL DEVICES AND MODIFY THEM AS SITE PROGRESS DICTATES.

13. MONITOR THE EROSION CONTROL DEVICES DURING STORMS AND MODIFY THEM IN ORDER TO PREVENT PROGRESS OF ANY ONGOING EROSION.

14. CLEAN DAILY ANY EROSION OR DEBRIS SPILLING ONTO A PUBLIC STREET.

15. CONTACT THE ENGINEER IN THE EVENT THAT THE EROSION CONTROL PLAN AS DESIGNED REQUIRES ANY SUBSTANTIAL REVISIONS.

16. IMPLEMENT ALL REQUIRED BMP'S PRIOR TO COMMENCING SITE DISTURBING ACTIVITIES.
- DUST CONTROL NOTES
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTINUOUS DUST CONTROL, THROUGHOUT THE CONSTRUCTION, IN ACCORDANCE WITH THE PERMIT CONDITIONS OF APPROVAL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REGULAR CLEANING OF ALL MUD, DIRT, DEBRIS, ETC., FROM ANY AND ALL ADJACENT ROADS AND SIDEWALKS, AT LEAST ONCE EVERY 24 HOURS WHEN OPERATIONS ARE OCCURRING.

2. ALL DISTURBED AREAS, INCLUDING UNPAVED ACCESS ROADS OR STORAGE PILES, NOT BEING ACTIVELY UTILIZED FOR CONSTRUCTION PURPOSES, SHALL BE EFFECTIVELY STABILIZED OF DUST EMISSIONS USING WATER, CHEMICAL STABILIZER/SUPPRESSANT, OR VEGETATIVE GROUND COVER.

3. ALL GROUND-DISTURBING ACTIVITIES (E.G., CLEARING, GRUBBING, SCRAPING, AND EXCAVATION) SHALL BE EFFECTIVELY CONTROLLED OF FUGITIVE DUST EMISSIONS UTILIZING APPLICATION OF WATER OR BY PRE-SOAKING.

4. ALL MATERIALS TRANSPORTED OFFSITE SHALL BE COVERED OR EFFECTIVELY WETTED TO LIMIT DUST EMISSIONS.

5. FOLLOWING THE ADDITION OF MATERIALS TO, OR THE REMOVAL OF MATERIALS FROM, THE SURFACES OF OUTDOOR STORAGE PILES, SAID PILES SHALL BE EFFECTIVELY STABILIZED OF FUGITIVE DUST EMISSIONS UTILIZING SUFFICIENT WATER OR CHEMICAL STABILIZER/SUPPRESANT.

6. ONSITE VEHICLE SPEED ON UNPAVED SURFACES SHALL BE LIMITED TO 15 MPH.

7. DISTURBED AREAS SHALL BE SEEDED PRIOR TO OCTOBER 31ST OR EARLIER AS REQUIRED BY THE APPLICABLE PERMIT CONDITIONS.
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REVIEWED BY OPS

PROJ. ENGR

ENGR SUPERVISOR


WWW

KB/JZ

WWW

WATERWAYS

CONSULTING INC.



509A SWIFT ST.
SANTA CRUZ, CA 95060
PH: (831) 442-7747
WWW.WATWAYS.COM

BAR IS ONE INCH ON ORIGINAL DRAWING, ADJUST SCALES FOR REDUCED PLOTS

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SHEET NO
C26

VALLECITOS CHANNEL PROGRAMMATIC MAINTENANCE PROJECT

100% ADMN. DRAFT SUBMITTAL

NOTES

FACILITY ID: G05

FILE: G05-21D-01-C26

WATERWAYS

JOB NO.

15-007

DATE: 02/09/21

SCALE: AS NOTED

ENGINEER'S STAMP HERE

REV


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A

ACWD

JOB NO.

21003



ALAMEDA COUNTY WATER DISTRICT

43885 SOUTH GRIMMER BOULEVARD

P.O. BOX 5110

FREMONT, CA 94537-5110

(510) 668-4200

Appendix B.

Hydraulic Modeling Summary Memorandum



Ecological Restoration Design ~ Civil Engineering ~ Natural Resource Management

DRAFT TECHNICAL MEMORANDUM

To: Horizon Water and Environment, LLC

From: Waterways Consulting, Inc.

Date: April 25, 2016

Re: *Hydraulic Modeling Summary Memorandum for Vallecitos Channel Evaluation and Restoration Project – Phase One*

INTRODUCTION

In support of the Vallecitos Channel Evaluation and Restoration Project, Waterways Consulting, Incorporated (Waterways) has prepared a detailed HEC-RAS hydraulic model of the Vallecitos Channel within the proposed project area (Figure 1). This technical memorandum has been prepared to summarize our model inputs, describe our methodology, and provide our results and conclusions. Recommendations and concept level maintenance and repair strategies will be provided in a subsequent technical memorandum.

The objective of our modeling task is to evaluate existing and proposed channel hydraulic characteristics (e.g., flood conveyance, velocity, shear, flow depth) under a wide range of flow conditions. The goal is to use the results of our modeling to inform future channel maintenance and management strategies to improve capacity and mitigate bank erosion.

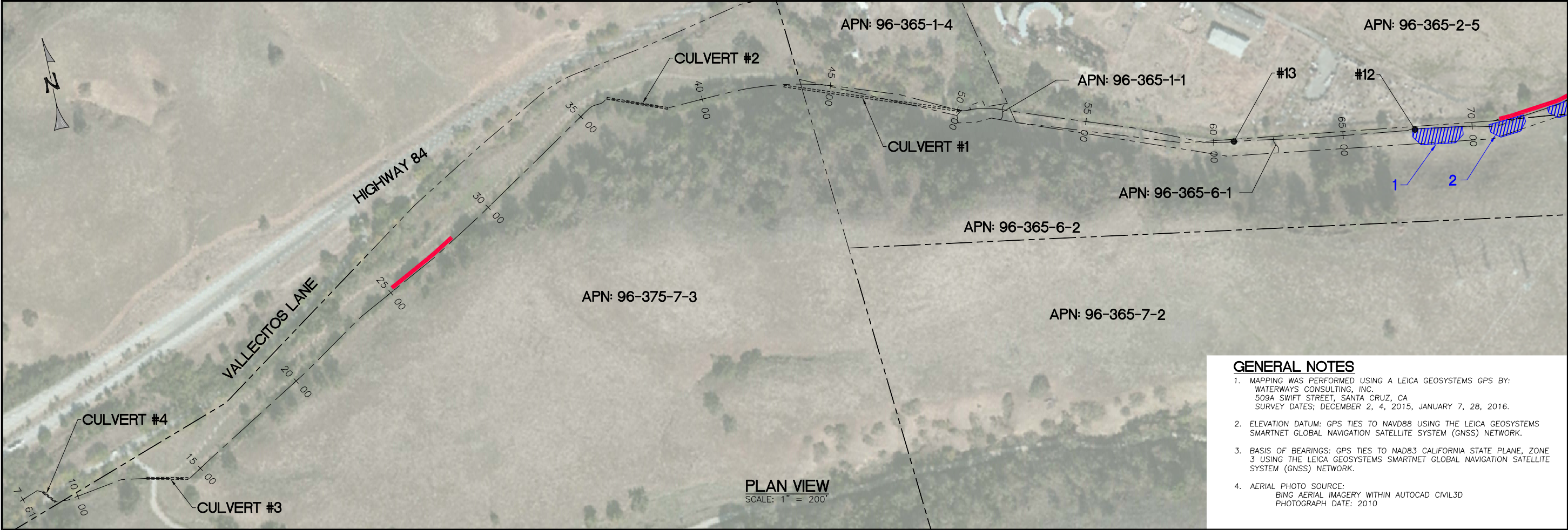
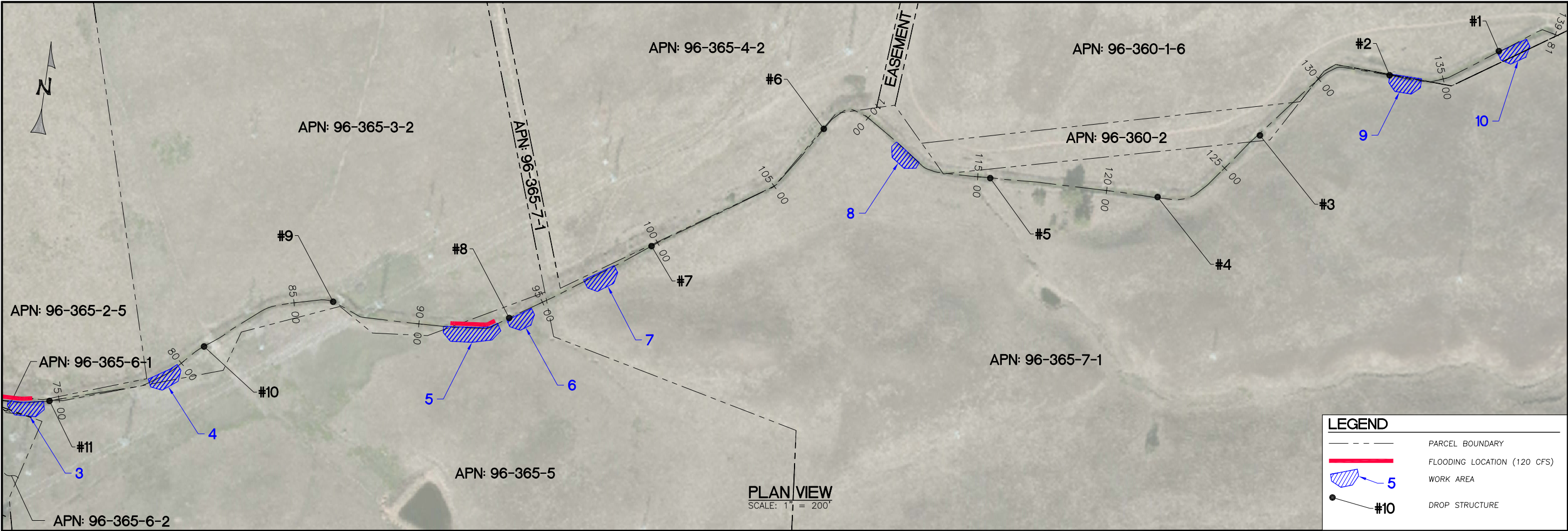
Potential maintenance and management strategies developed following the modelling evaluation will in turn be used as a basis to develop cost estimates for both nearer term interim maintenance treatments, as well as, longer term maintenance options for SJWC. SJWC will use the interim maintenance and management strategies (and their associated costs) to inform their planning process for the future use of the Vallecitos Channel.

MODEL DEVELOPMENT

The modeling was performed using HEC-RAS 4.1 river analysis software, developed by the United States Army Corps of Engineers (USACE). The model was created to analyze steady or unsteady, gradually varied flow conditions, under subcritical, critical, or mixed flow regimes. Computations use the one-dimensional energy equation, with losses calculated using the Manning's equation and contraction/expansion coefficients. Momentum equations are used where rapidly varying flow conditions are encountered, such as at hydraulic jumps, bridges, culverts, and drop structures.

The model was set to use a mixed flow regime. Mixed flow analysis can be used for reaches that have both subcritical and supercritical flow regimes and will typically give higher velocity values where supercritical flow is present.

A total of 151 cross sections, 4 culverts, and 13 drop structures were used to develop the existing and proposed conditions hydraulic models. The cross sections extend along approximately 13,150 feet of channel, beginning just below the SBA pipe outlet at the upstream end of the project (STA 139+06) and ending at the downstream confluence with the natural channel (STA 7+62). Cross sections were located



at channel constrictions, changes in geometry and at hydraulic control structures. Sections were typically spaced more tightly around turns.

MODEL INPUTS

GEOMETRY

The existing conditions hydraulic model geometry was developed using topographic mapping performed by Waterways over several visits during the winter of 2015/2016. Mapping was performed using an electronic total station or GPS receivers. The horizontal datum for the survey is NAD83 California State Plane, Zone III. The vertical datum is NAVD88. The GPS survey was used to establish project control points and to survey in areas with limited tree cover. The total station was used where tree cover precluded the use of GPS or where wading was required in deeper sections of the channel.

The mapped features include:

- Cross sections at approximately 150 foot on center spacing throughout the channel
- More frequently spaced cross sections at drop structures, culverts, or erosion areas
- Detailed topography at all drop structures and culverts
- Detailed topography (1 ft. contours) at ten high priority erosion areas
- Upstream and downstream limits of existing erosion areas
- Upstream and downstream limits of vegetation density transitions
- Upstream and downstream limits of past bank stabilization treatment areas
- Water surface elevations at a 21 cfs test flow
- Other relevant features, including utilities, drainage structures, etc.

The topographic data outlined above was first brought into AutoCAD and used to generate a project base map. After a senior engineer reviewed the base map for accuracy in AutoCAD, individual cross sections and details of the hydraulic control structures were imported into HEC-RAS. Hydraulic control structures included culverts, drop structures, and lateral weirs.

Drop structures were modeled with detailed sections cut at close spacing through the structures and immediately upstream and downstream of the structures. Expansion and contraction coefficients were adjusted to reflect the turbulence associated with the hydraulic jumps anticipated at these locations. Modeled conditions in the immediate vicinity of drop structures (particularly just downstream of them) should be considered approximate, as HEC RAS is not capable of accurately predicting conditions where flow is rapidly varying.

Culverts were modeled with cross sections placed just upstream of the inlet and downstream of the outlet. Culvert shape, size, and inlet/outlet conditions are provided based on field measurements. Culvert material properties are used to determine appropriate Manning's values. Culvert profile slopes were entered based on mapped invert elevations, as were roadway embankment values.

ROUGHNESS VALUES

Manning's roughness coefficients were initially chosen from field observations of the channel geometry, the bed and bank materials, and vegetative conditions. Values were selected from published standards and adjusted based on our experience.

Vegetation density clearly plays an important role in channel hydraulic characteristics. Due to the intermittent flow regime, the long periods of low flows allow for the establishment of dense tule mats (including aggraded sediment at the root base of the tules) within many reaches of the channel. Often, the tules (and their base of sediment and old vegetation) obstruct the entire channel base to heights of over eighteen inches above the bed. In some locations, this has the effect of forcing flows into the banks, thereby exacerbating bank erosion (Figure 2).



Figure 2: Photograph showing tule vegetation forcing flow into eroding bank.

During mapping, we classified the vegetation conditions as moderate, dense or very dense. This evaluation was used to assign Manning’s roughness values to individual cross sections. These values were set to adjust with changes in flow depth, gradually decreasing with increased flow. The initial estimates of Manning’s values were later adjusted during model calibration, as discussed in detail below. Table 1 presents the range of Manning’s values that were initially adopted for the model.

Table 1. Summary of Initial Manning’s Roughness Values

CHANNEL CONDITION	CHANNEL			OVERBANK
	LOW FLOW (<21CFS)	MODERATE FLOW (21 TO APPROX. 80 CFS)	HIGH FLOW (DEPTHS ABOVE 2*D ₂₁)	
CONCRETE	0.015	0.015	0.015	N/A
LIGHT-MODERATE VEGETATION	0.05	0.05 to 0.04	0.04	.06
DENSE VEGETATION	0.1	0.1 to 0.04	0.04	.06
VERY DENSE VEGETATION	0.15	0.15 to 0.04	0.04	.06

INEFFECTIVE FLOW AREAS

Cross sections mapped with dense or very dense vegetation were modeled with partially “obstructed” geometry to account for the observation that the vegetation would either stay upright in place or partially lay down but continue to effectively block flows in the ranges of concern for this study. Initial obstructions were set across the entire channel base to a depth of 0.5 feet for dense vegetation and 1.0 feet for very dense vegetation. This is clearly an oversimplification of the actual geometry, but the modeled results were found to match very closely with observed water surfaces, as described in more detail below.

WATERSHED HYDROLOGY

Estimates for instantaneous peak flood discharge were based from Regional Regression equations developed by the United States Geological Survey (USGS) for the Central Coast Region (Gotvald et al., 2012). Parameters used in the equations include:

1. Drainage area, and
2. Mean annual precipitation

Detailed calculations are attached within **Appendix B**. Results are provided below in Table 2.

Table 2. Summary of Calculated Flood Peaks

Recurrence Interval	Peak Flood Values at the Project Site (cfs)
100-yr	303.9
50-yr	230.7
10-yr	87.4
2-yr	12.5

TRANSFERS AND BLOW-OFF EVENTS

Although the channel within the project area rarely receives significant runoff from large storm events within the watershed, the more commonly occurring peak flows are the result of planned transfers and “blow-off” events from the South Bay Aqueduct that discharge into the Vallecitos Channel at the upstream end of the project study area. Past flow records indicate that sustained flows during transfers are often as high as 40 cfs, while blow-off events have reached 120 cfs. Appendix C, provided by ACWD, provides a summary of recent high flow events.

Based on this historic flow record, a stated goal of any implemented project is to provide adequate capacity for 40 cfs, while providing bank stabilization elements capable of withstanding flows of 120 cfs. For this reason, the model calibration and results focus on these two values.

MODEL CALIBRATION

As discussed above, the presence of dense tule mats within the bed of the channel made it difficult to accurately model conditions at lower flows, where water is primarily flowing within and below the mass of the tules. In some areas, Waterways witnessed water flowing uniformly through the interstices of the mats resulting in low velocities and high depths. Other areas were seen where water was forced around the tules and into a concentrated channel against a bank, typically at higher velocity. This effect is pronounced at channel bends where flows will move toward the outside of the bend anyway due to centrifugal force. One location was witnessed where tules had formed a sort of “tunnel” and most of the flow in the channel was isolated within this one fraction of the channel width. Each of these

conditions is difficult to predict and will vary with flow rate and seasonal changes in tule density. Since the target flow for desired channel capacity (40 cfs) falls in the range of flows where tules play such a large role in determining the hydraulics, it was important to calibrate the model based on actual observations in this flow range.

On January 28th, 2016, ACWD coordinated a scheduled release to be sustained at 21 cfs, allowing Waterways staff to survey the water surface elevation along the entire project area at a known flow rate. The mapped surface water elevations directly observed at channel locations were inserted into the model and used as a basis for adjusting our Manning's and blocked obstruction values to more accurately represent conditions.

The calibration process started by varying the Manning's values of the channel between a specified range to match the observed water surface elevations, as shown in Table 3 below. In a few areas of very dense vegetation, the high end of the Manning's value was still insufficient to raise the water surface to match observed conditions. Where this occurred, the blocked obstructions were increased to 1.5 feet and Manning's was then adjusted within the specified range to achieve the observed water surface. With these adjustments, the modeled results for water depth matched the measured values extremely well.

Table 3. Summary of Initial Manning's Roughness Values

CHANNEL CONDITION	CHANNEL			OVERBANK
	LOW FLOW (<21CFS)	MODERATE FLOW (21 TO APPROX. 80 CFS)	HIGH FLOW (DEPTHS ABOVE 2*D ₂₁)	
CONCRETE	0.015	VARIES WITH DEPTH	0.015	N/A
LIGHT-MODERATE VEGETATION	0.03 to 0.08	VARIES WITH DEPTH	0.04	.06
DENSE VEGETATION	0.1 to 0.12	VARIES WITH DEPTH	0.04	.06
VERY DENSE VEGETATION	0.15 to 0.20	VARIES WITH DEPTH	0.04	.06

MODEL RESULTS

Detailed results of the calibrated existing conditions hydraulic modeling are presented in cross section view and tabular format within Appendix A.

The channel's capacity varies greatly by location. Generally speaking, the channel has sufficient capacity to pass the target of 40 cfs. In fact the Vallecitos Channel has adequate capacity to pass 120 cfs with little difficulty at most locations. Exceptions occur at the following points:

Station 50+80: Flows exceeding approximately 80 cfs exit the channel over a constructed weir on the north bank, effectively leaving the system and rerouting to the natural valley drainage to the north.

Station 72+22 to 73+52: At two cross sections located near the upstream end of the paint ball facility (Stations 73+52 and 72+22), the channel capacity is reduced to as low as 40 cfs due to a low bank on the north side and dense vegetation within the channel. The worst case cross section, with the lowest channel capacity, is shown in Figure 3 under existing and proposed

conditions. This area has been subjected to regular flooding and was within approximately 12 inches of overtopping the channel at a flow of just 21 cfs.

Station 92+68: A low northern bank allows overtopping at flows in excess of approximately 100 cfs. This does not appear to be cause for concern, as there is sufficient containment at adjacent upstream and downstream cross sections.

Velocities vary greatly, within the modeled reach, with the highest velocities occurring in the vicinity of drop structures or culverts. The slope of the channel between drop structures ranges from 0.2% to 0.9%, with an average of 0.7%, which is relatively flat. As a result, the average channel velocities are less than three feet per second over the range of flows that we analyzed. Table 4 presents the range of velocities resulting from model runs at 40 and 120 cfs.

Table 4: Existing Conditions Channel Velocities

Flow (cfs)	Range of Channel Velocities (fps)	Average Velocity (fps)
40	0.4 to 3.4	1.6
120	0.8 to 4.9	2.5

PROPOSED CONDITIONS

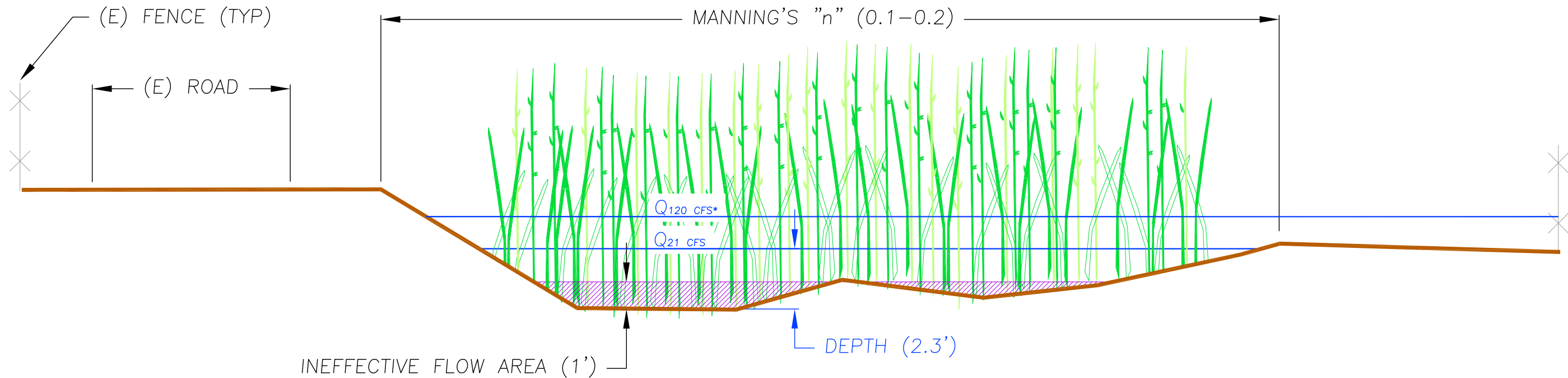
Proposed conditions were modeled to evaluate the effects of vegetation removal on channel capacity and flow velocity. Manning's roughness values were reduced from the vegetated condition (0.1 to 0.2) to a cleared condition of 0.06. The cleared condition was conservatively modeled with short but dense vegetation in the channel, which could be young tules or other species of similar density. Figure 3 presents the existing and proposed conditions hydraulic characteristics at station 72+22, which is just upstream of the paintball facility. For a high flow of 120 cfs, the vegetation removal results in a 1.2 foot reduction in water surface elevation and an increase in velocity from approximately 1.6 feet per second to 2.6 feet per second.

It should be noted that the HEC-RAS model calculates a cross sectional average of velocity, and does not accurately reflect variations in velocity across the channel, including the concentrated areas of high velocity that are currently occurring at the channel margins, as shown in Figure 2. Vegetation thinning will result in conveyance and velocity being more evenly dispersed across the section. So, although the cross sectional average velocity will be increased, thereby improving flood protection, the shear and near-bank velocities will be reduced, assisting with bank erosion concerns.

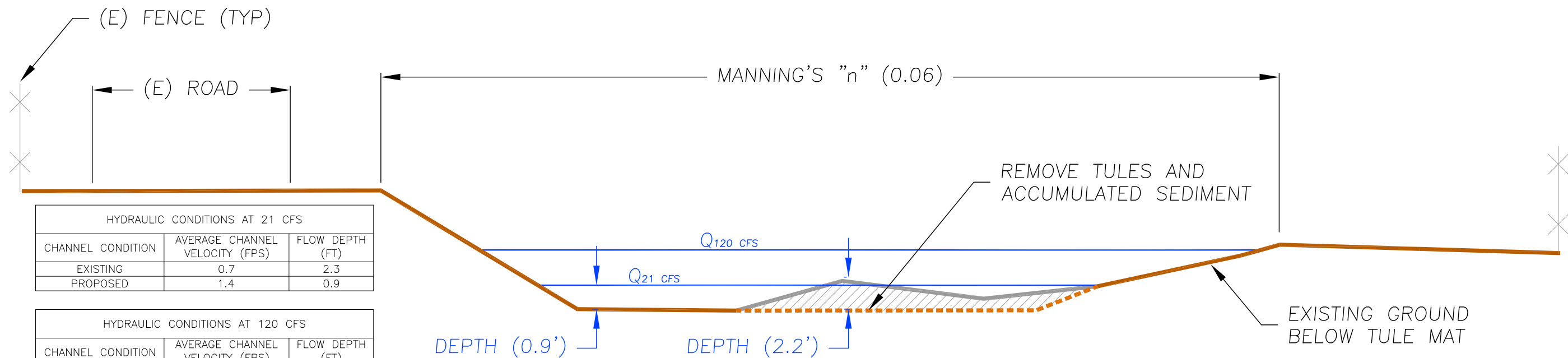
Potential effects of discrete bank stabilization elements have not yet been modeled, as they would vary by site. Generally, erosion repair sites would be restored so that their geometry would result in hydraulic conditions closely representing the average channel conditions at non-eroded areas. These sites will be individually designed and inserted into an updated proposed conditions model as the design process progresses.

CONCLUSIONS

The model results indicate that the channel has 40 cfs capacity at all but one location, with 120 cfs capacity at all but three locations. The proposed vegetation clearing, if maintained, would provide the requested 40 cfs capacity at all locations and would likely provide 120 cfs capacity at all but one location (Station 72+22).



EXISTING CONDITIONS (STA. 72+22)
SCALE: 1" = 2'



PROPOSED CONDITIONS (STA. 72+22)
SCALE: 1" = 2'

HYDRAULIC CONDITIONS AT 21 CFS		
CHANNEL CONDITION	AVERAGE CHANNEL VELOCITY (FPS)	FLOW DEPTH (FT)
EXISTING	0.7	2.3
PROPOSED	1.4	0.9

HYDRAULIC CONDITIONS AT 120 CFS		
CHANNEL CONDITION	AVERAGE CHANNEL VELOCITY (FPS)	FLOW DEPTH (FT)
EXISTING	1.6*	3.4*
PROPOSED	2.6	2.2

NOTE:
* FLOW IS OUT OF BANK IN EXISTING CONDITIONS HEC-RAS MODEL.
THEREFORE, HYDRAULIC PARAMETERS ARE APPROXIMATE FOR 120 CFS.

Average channel velocities are relatively low over the full range of modeled flows. This finding reinforces the idea that the concentrated flows, observed in the presence of channel obstructions formed by vegetation, are the primary cause of bank erosion.

REFERENCES

Federal Emergency Management Agency (FEMA). 2009. Guidelines and Specifications for Flood Hazard Mapping Partners.

Gotvald, A.J., Barth, N.A., Veilleux, A.G., and Parrett, Charles. 2012. Methods for determining magnitude and frequency of floods in California, based on data through water year 2006: U.S. Geological Survey Scientific Investigations Report 2012–5113

U.S. Army Corps of Engineers. 1994. Hydraulic Design of Flood Control Channels, EM-1110-2-1601.

U.S. Army Corps of Engineers. 2010, Hydrologic Engineering Center. Computer Program HEC-RAS Version 4.1. Davis, California.



Ecological Restoration Design ~ Civil Engineering ~ Natural Resource Management

APPENDIX 1

HEC-RAS Plan: Ex Con Vert Varied n River: Vallecitos Reach: Vallecitos

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Vallecitos	13906	21 CFS	21.00	475.74	478.18		478.19	0.005081	0.79	26.62	21.26	0.12
Vallecitos	13906	40 CFS	40.00	475.74	478.60		478.61	0.005845	1.12	35.81	22.95	0.16
Vallecitos	13906	120 CFS	120.00	475.74	479.00		479.11	0.019617	2.64	45.49	24.90	0.34
Vallecitos	13773	21 CFS	21.00	474.17	475.69	475.69	475.94	0.466686	3.97	5.30	10.86	1.00
Vallecitos	13773	40 CFS	40.00	474.17	476.06	475.96	476.34	0.189161	4.22	9.49	11.94	0.83
Vallecitos	13773	120 CFS	120.00	474.17	478.45	476.75	478.55	0.001758	2.59	46.28	18.90	0.29
Vallecitos	13764	21 CFS	21.00	474.17	475.47		475.53	0.000396	1.94	10.82	10.29	0.33
Vallecitos	13764	40 CFS	40.00	474.17	476.20		476.26	0.000286	2.09	19.11	12.44	0.30
Vallecitos	13764	120 CFS	120.00	474.17	478.47		478.54	0.000141	2.18	54.96	19.14	0.23
Vallecitos	13757	21 CFS	21.00	474.15	474.99	474.99	475.41	0.005161	5.20	4.04	4.82	1.00
Vallecitos	13757	40 CFS	40.00	474.15	475.44	475.44	476.08	0.005340	6.45	6.20	4.84	1.01
Vallecitos	13757	120 CFS	120.00	474.15	476.82	476.82	478.16	0.006328	9.27	12.94	4.89	1.01
Vallecitos	13756	21 CFS	21.00	463.55	469.44		469.45	0.000027	0.74	28.42	4.86	0.05
Vallecitos	13756	40 CFS	40.00	463.55	469.94		469.96	0.000081	1.30	30.82	4.87	0.09
Vallecitos	13756	120 CFS	120.00	463.55	470.92		471.10	0.000518	3.37	35.64	4.88	0.22
Vallecitos	13744	21 CFS	21.00	463.70	469.44		469.45	0.000014	0.59	35.61	6.27	0.04
Vallecitos	13744	40 CFS	40.00	463.70	469.94		469.95	0.000041	1.03	38.71	6.27	0.07
Vallecitos	13744	120 CFS	120.00	463.70	470.93		471.04	0.000257	2.67	44.95	6.27	0.18
Vallecitos	13737	21 CFS	21.00	464.97	469.44		469.45	0.000704	0.45	47.09	18.50	0.05
Vallecitos	13737	40 CFS	40.00	464.97	469.94		469.95	0.001297	0.71	56.60	19.91	0.07
Vallecitos	13737	120 CFS	120.00	464.97	470.94		470.98	0.003250	1.54	77.98	22.57	0.15
Vallecitos	13716	21 CFS	21.00	467.40	469.36		469.39	0.024920	1.38	15.20	16.90	0.26
Vallecitos	13716	40 CFS	40.00	467.40	469.82		469.87	0.016847	1.73	23.17	17.98	0.27
Vallecitos	13716	120 CFS	120.00	467.40	470.69		470.83	0.010930	3.02	39.75	20.05	0.38
Vallecitos	13624	21 CFS	21.00	466.05	468.77		468.78	0.002992	0.67	31.49	22.17	0.10
Vallecitos	13624	40 CFS	40.00	466.05	469.23		469.24	0.003572	0.95	42.03	24.01	0.13
Vallecitos	13624	120 CFS	120.00	466.05	470.15		470.20	0.004422	1.84	65.36	26.63	0.21
Vallecitos	13547	21 CFS	21.00	466.10	468.41		468.43	0.007584	0.91	23.14	20.77	0.15
Vallecitos	13547	40 CFS	40.00	466.10	468.81		468.84	0.008062	1.26	31.81	22.39	0.19
Vallecitos	13547	120 CFS	120.00	466.10	469.68		469.76	0.007688	2.29	52.48	25.37	0.28
Vallecitos	13483	21 CFS	21.00	465.50	467.96	466.94	467.98	0.006608	0.99	21.12	16.68	0.16
Vallecitos	13483	40 CFS	40.00	465.50	468.08		468.13	0.016645	1.73	23.14	17.04	0.26
Vallecitos	13483	120 CFS	120.00	465.50	469.01		469.15	0.011945	2.99	40.19	19.87	0.37
Vallecitos	13386	21 CFS	21.00	464.81	465.81	465.81	466.03	0.287541	3.79	5.55	12.36	1.00
Vallecitos	13386	40 CFS	40.00	464.81	467.32	466.06	467.34	0.004741	1.26	31.72	20.44	0.18
Vallecitos	13386	120 CFS	120.00	464.81	468.86	466.74	468.91	0.000884	1.81	66.25	24.40	0.19
Vallecitos	13318	21 CFS	21.00	464.58	465.71	465.71	466.02			4.95	8.88	
Vallecitos	13318	40 CFS	40.00	464.58	466.63	466.03	466.75	0.019853	2.75	14.53	11.90	0.44
Vallecitos	13318	120 CFS	120.00	464.58	468.72	466.90	468.82	0.001682	2.58	46.43	18.72	0.29
Vallecitos	13307	21 CFS	21.00	464.65	465.51	465.51	465.93	0.005173	5.20	4.04	4.84	1.00
Vallecitos	13307	40 CFS	40.00	464.65	465.95	465.95	466.60	0.005301	6.43	6.22	4.86	1.00
Vallecitos	13307	120 CFS	120.00	464.65	467.33	467.33	468.67	0.006303	9.26	12.96	4.92	1.01
Vallecitos	13306	21 CFS	21.00	453.45	458.48		458.49	0.000040	0.87	24.24	4.87	0.07
Vallecitos	13306	40 CFS	40.00	453.45	459.10		459.14	0.000108	1.47	27.29	4.88	0.11
Vallecitos	13306	120 CFS	120.00	453.45	460.19		460.40	0.000638	3.68	32.58	4.89	0.25
Vallecitos	13295	21 CFS	21.00	452.73	458.48		458.48	0.000012	0.56	37.60	6.60	0.04
Vallecitos	13295	40 CFS	40.00	452.73	459.11		459.12	0.000033	0.96	41.74	6.61	0.07
Vallecitos	13295	120 CFS	120.00	452.73	460.21		460.30	0.000203	2.45	49.02	6.61	0.16
Vallecitos	13287	21 CFS	21.00	454.55	458.48		458.48	0.000550	0.49	43.25	17.52	0.05
Vallecitos	13287	40 CFS	40.00	454.55	459.11		459.11	0.000830	0.73	54.83	19.32	0.08
Vallecitos	13287	120 CFS	120.00	454.55	460.21		460.25	0.001778	1.54	77.93	22.36	0.15
Vallecitos	13272	21 CFS	21.00	456.32	458.46		458.47	0.002035	0.68	31.01	22.21	0.10
Vallecitos	13272	40 CFS	40.00	456.32	459.09		459.10	0.001502	0.88	45.40	23.78	0.11
Vallecitos	13272	120 CFS	120.00	456.32	460.19		460.23	0.001083	1.64	73.13	26.54	0.17
Vallecitos	13212	21 CFS	21.00	454.81	458.36		458.37	0.001335	0.65	32.41	16.42	0.08
Vallecitos	13212	40 CFS	40.00	454.81	458.98		458.99	0.002021	0.93	43.15	18.35	0.11
Vallecitos	13212	120 CFS	120.00	454.81	460.07		460.12	0.003305	1.85	64.75	21.10	0.19
Vallecitos	13102	21 CFS	21.00	455.80	458.00		458.02	0.015563	1.13	18.64	18.51	0.20
Vallecitos	13102	40 CFS	40.00	455.80	458.55		458.57	0.009518	1.38	29.02	19.53	0.20
Vallecitos	13102	120 CFS	120.00	455.80	459.57		459.66	0.005377	2.39	50.11	21.46	0.28

HEC-RAS Plan: Ex Con Vert Varied n River: Vallecitos Reach: Vallecitos (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Vallecitos	12945	21 CFS	21.00	454.16	457.31		457.32	0.002053	0.60	35.04	18.91	0.08
Vallecitos	12945	40 CFS	40.00	454.16	457.86		457.87	0.002556	0.88	45.66	19.81	0.10
Vallecitos	12945	120 CFS	120.00	454.16	458.88		458.93	0.004038	1.80	66.83	22.12	0.18
Vallecitos	12733	21 CFS	21.00	454.00	455.52	455.52	455.76	0.527690	3.93	5.35	11.10	1.00
Vallecitos	12733	40 CFS	40.00	454.00	455.98	455.78	456.19	0.128015	3.69	10.85	12.46	0.70
Vallecitos	12733	120 CFS	120.00	454.00	458.31	456.56	458.41	0.001626	2.52	47.68	19.22	0.28
Vallecitos	12725	21 CFS	21.00	453.99	454.86	454.86	455.28	0.005159	5.20	4.04	4.84	1.00
Vallecitos	12725	40 CFS	40.00	453.99	455.31	455.31	455.95	0.005315	6.45	6.21	4.86	1.01
Vallecitos	12725	120 CFS	120.00	453.99	456.69	456.69	458.02	0.006249	9.24	12.98	4.94	1.01
Vallecitos	12724	21 CFS	21.00	442.19	447.64		447.65	0.000033	0.80	26.19	4.88	0.06
Vallecitos	12724	40 CFS	40.00	442.19	448.22		448.24	0.000094	1.38	29.00	4.89	0.10
Vallecitos	12724	120 CFS	120.00	442.19	449.17		449.36	0.000591	3.57	33.65	4.90	0.24
Vallecitos	12713	21 CFS	21.00	441.97	447.64		447.65	0.000014	0.59	35.72	6.33	0.04
Vallecitos	12713	40 CFS	40.00	441.97	448.22		448.23	0.000039	1.02	39.37	6.33	0.07
Vallecitos	12713	120 CFS	120.00	441.97	449.18		449.29	0.000248	2.64	45.47	6.33	0.17
Vallecitos	12706	21 CFS	21.00	443.75	447.64		447.64	0.000713	0.44	47.44	19.37	0.05
Vallecitos	12706	40 CFS	40.00	443.75	448.22		448.23	0.001093	0.68	58.95	20.47	0.07
Vallecitos	12706	120 CFS	120.00	443.75	449.19		449.23	0.002619	1.50	79.81	22.42	0.14
Vallecitos	12632	21 CFS	21.00	444.72	447.51		447.52	0.005971	0.92	22.76	15.93	0.14
Vallecitos	12632	40 CFS	40.00	444.72	448.03		448.06	0.006170	1.27	31.40	17.02	0.17
Vallecitos	12632	120 CFS	120.00	444.72	448.71		448.83	0.013706	2.77	43.27	18.32	0.32
Vallecitos	12342	21 CFS	21.00	443.33	445.63		445.66	0.006870	1.32	15.92	13.19	0.21
Vallecitos	12342	40 CFS	40.00	443.33	446.11		446.16	0.006934	1.77	22.65	14.74	0.25
Vallecitos	12342	120 CFS	120.00	443.33	447.87		447.95	0.001261	2.27	52.79	19.43	0.24
Vallecitos	12222.2	21 CFS	21.00	443.44	444.83		444.89	0.005954	1.91	10.99	10.21	0.32
Vallecitos	12222.2	40 CFS	40.00	443.44	445.54		445.61	0.003196	2.10	19.01	12.42	0.30
Vallecitos	12222.2	120 CFS	120.00	443.44	447.73		447.81	0.001080	2.23	53.77	19.25	0.24
Vallecitos	12222	21 CFS	21.00	443.44	444.83		444.89	0.000373	1.91	10.99	10.21	0.32
Vallecitos	12222	40 CFS	40.00	443.44	445.54		445.61	0.000289	2.10	19.01	12.42	0.30
Vallecitos	12222	120 CFS	120.00	443.44	447.73		447.81	0.000152	2.23	53.77	19.25	0.24
Vallecitos	12215	21 CFS	21.00	443.53	444.36	444.36	444.77	0.005094	5.16	4.07	4.96	1.00
Vallecitos	12215	40 CFS	40.00	443.53	444.80	444.80	445.43	0.005171	6.38	6.27	5.01	1.01
Vallecitos	12215	120 CFS	120.00	443.53	446.16	446.16	447.45	0.005935	9.10	13.18	5.18	1.01
Vallecitos	12214	21 CFS	21.00	432.53	437.29		437.31	0.000042	0.89	23.55	5.03	0.07
Vallecitos	12214	40 CFS	40.00	432.53	437.73		437.77	0.000123	1.55	25.74	5.05	0.12
Vallecitos	12214	120 CFS	120.00	432.53	438.70		438.94	0.000723	3.92	30.64	5.08	0.28
Vallecitos	12203	21 CFS	21.00	431.60	437.30		437.30	0.000017	0.64	32.95	5.79	0.05
Vallecitos	12203	40 CFS	40.00	431.60	437.73		437.75	0.000053	1.13	35.47	5.79	0.08
Vallecitos	12203	120 CFS	120.00	431.60	438.71		438.85	0.000331	2.92	41.16	5.79	0.19
Vallecitos	12196	21 CFS	21.00	433.14	437.30		437.30	0.000308	0.45	46.23	17.73	0.05
Vallecitos	12196	40 CFS	40.00	433.14	437.74		437.75	0.000627	0.74	54.32	18.96	0.08
Vallecitos	12196	120 CFS	120.00	433.14	438.77		438.81	0.001596	1.59	75.30	21.47	0.15
Vallecitos	12169	21 CFS	21.00	436.06	437.16		437.25	0.022394	2.37	8.85	17.01	0.58
Vallecitos	12169	40 CFS	40.00	436.06	437.59		437.68	0.011953	2.37	16.85	20.08	0.46
Vallecitos	12169	120 CFS	120.00	436.06	438.52		438.69	0.009665	3.26	36.83	22.74	0.45
Vallecitos	12057	21 CFS	21.00	434.18	436.55		436.56	0.002690	0.79	26.69	18.57	0.12
Vallecitos	12057	40 CFS	40.00	434.18	436.97		437.00	0.003529	1.15	34.93	20.32	0.15
Vallecitos	12057	120 CFS	120.00	434.18	437.64		437.73	0.007309	2.45	48.98	22.07	0.29
Vallecitos	11717	21 CFS	21.00	432.49	434.04		434.12	0.052969	2.35	8.92	10.61	0.45
Vallecitos	11717	40 CFS	40.00	432.49	434.71		434.79	0.015445	2.31	17.31	14.10	0.37
Vallecitos	11717	120 CFS	120.00	432.49	436.96		437.03	0.000945	2.00	59.86	23.11	0.22
Vallecitos	11598	21 CFS	21.00	432.56	433.83	433.29	433.91	0.000537	2.18	9.62	9.61	0.38
Vallecitos	11598	40 CFS	40.00	432.56	434.58	433.62	434.66	0.000350	2.27	17.64	11.80	0.33
Vallecitos	11598	120 CFS	120.00	432.56	436.91	434.56	436.99	0.000155	2.27	52.97	18.60	0.24
Vallecitos	11588	21 CFS	21.00	432.33	433.75		433.88	0.001029	2.96	7.09	5.11	0.44
Vallecitos	11588	40 CFS	40.00	432.33	434.38		434.61	0.001305	3.88	10.31	5.12	0.48
Vallecitos	11588	120 CFS	120.00	432.33	436.29		436.84	0.002018	5.97	20.11	5.14	0.53
Vallecitos	11575	21 CFS	21.00	432.49	433.35	433.35	433.77	0.005198	5.22	4.03	4.76	1.00
Vallecitos	11575	40 CFS	40.00	432.49	433.80	433.80	434.45	0.005425	6.49	6.16	4.76	1.01

HEC-RAS Plan: Ex Con Vert Varied n River: Vallecitos Reach: Vallecitos (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Vallecitos	11575	120 CFS	120.00	432.49	435.20	435.20	436.56	0.006522	9.35	12.83	4.77	1.01
Vallecitos	11574	21 CFS	21.00	420.79	425.62		425.63	0.000046	0.92	22.91	4.76	0.07
Vallecitos	11574	40 CFS	40.00	420.79	426.07		426.11	0.000134	1.60	25.06	4.76	0.12
Vallecitos	11574	120 CFS	120.00	420.79	426.82		427.09	0.000878	4.19	28.62	4.77	0.30
Vallecitos	11563	21 CFS	21.00	420.48	425.62		425.62	0.000018	0.66	31.89	6.31	0.05
Vallecitos	11563	40 CFS	40.00	420.48	426.07		426.09	0.000053	1.15	34.74	6.31	0.09
Vallecitos	11563	120 CFS	120.00	420.48	426.84		426.98	0.000349	3.03	39.58	6.31	0.21
Vallecitos	11556	21 CFS	21.00	422.29	425.61		425.62	0.002109	0.77	27.13	15.09	0.10
Vallecitos	11556	40 CFS	40.00	422.29	426.07		426.09	0.003267	1.17	34.28	16.43	0.14
Vallecitos	11556	120 CFS	120.00	422.29	426.84		426.94	0.008010	2.51	47.82	18.69	0.28
Vallecitos	11432	21 CFS	21.00	423.11	424.95		424.98	0.025903	1.47	14.29	21.11	0.31
Vallecitos	11432	40 CFS	40.00	423.11	425.36		425.41	0.010624	1.72	23.30	21.94	0.29
Vallecitos	11432	120 CFS	120.00	423.11	426.29		426.41	0.002622	2.70	44.50	23.79	0.35
Vallecitos	11290	21 CFS	21.00	420.70	424.07		424.09	0.002741	0.82	25.68	16.69	0.12
Vallecitos	11290	40 CFS	40.00	420.70	424.62		424.64	0.003265	1.13	35.48	19.19	0.15
Vallecitos	11290	120 CFS	120.00	420.70	425.95		426.00	0.002807	1.85	64.87	24.99	0.20
Vallecitos	11142	21 CFS	21.00	421.61	423.54		423.57	0.004530	1.32	15.89	13.37	0.21
Vallecitos	11142	40 CFS	40.00	421.61	424.01		424.06	0.004680	1.76	22.68	15.43	0.26
Vallecitos	11142	120 CFS	120.00	421.61	425.65		425.73	0.001267	2.27	52.88	21.16	0.25
Vallecitos	10959	21 CFS	21.00	421.30	422.77		422.81	0.003818	1.56	13.48	12.48	0.26
Vallecitos	10959	40 CFS	40.00	421.30	423.36		423.41	0.002787	1.85	21.59	14.96	0.27
Vallecitos	10959	120 CFS	120.00	421.30	425.49		425.54	0.000802	1.91	62.91	23.89	0.21
Vallecitos	10911	21 CFS	21.00	421.15	422.52	421.88	422.58	0.006022	1.86	11.30	11.13	0.33
Vallecitos	10911	40 CFS	40.00	421.15	423.20	422.20	423.27	0.003158	2.06	19.43	12.95	0.30
Vallecitos	10911	120 CFS	120.00	421.15	425.43	423.07	425.50	0.000975	2.06	58.14	22.20	0.22
Vallecitos	10833	21 CFS	21.00	421.11	422.38		422.46	0.000614	2.29	9.15	9.44	0.41
Vallecitos	10833	40 CFS	40.00	421.11	423.11		423.20	0.000398	2.36	16.92	11.84	0.35
Vallecitos	10833	120 CFS	120.00	421.11	425.39		425.47	0.000165	2.29	52.45	19.34	0.24
Vallecitos	10825	21 CFS	21.00	421.07	421.93	421.93	422.35	0.005209	5.20	4.04	4.86	1.01
Vallecitos	10825	40 CFS	40.00	421.07	422.38	422.38	423.02	0.005343	6.44	6.21	4.87	1.01
Vallecitos	10825	120 CFS	120.00	421.07	423.76	423.76	425.09	0.006334	9.27	12.95	4.90	1.01
Vallecitos	10824	21 CFS	21.00	409.57	410.43	410.43	410.85	0.005219	5.20	4.04	4.84	1.01
Vallecitos	10824	40 CFS	40.00	409.57	415.29		415.32	0.000105	1.45	27.62	4.88	0.11
Vallecitos	10824	120 CFS	120.00	409.57	416.36		416.57	0.000625	3.65	32.87	4.89	0.25
Vallecitos	10813	21 CFS	21.00	409.10	409.84	409.84	410.20	0.004894	4.79	4.39	6.24	1.01
Vallecitos	10813	40 CFS	40.00	409.10	415.29		415.30	0.000042	1.04	38.41	6.25	0.07
Vallecitos	10813	120 CFS	120.00	409.10	416.37		416.48	0.000254	2.65	45.21	6.25	0.17
Vallecitos	10805	21 CFS	21.00	411.13	412.16	412.16	494.99	5703.778000	73.00	0.29	8.81	71.23
Vallecitos	10805	40 CFS	40.00	411.13	415.29		415.30	0.002760	0.95	42.19	18.01	0.11
Vallecitos	10805	120 CFS	120.00	411.13	416.38		416.44	0.004410	1.89	63.55	20.86	0.19
Vallecitos	10800	21 CFS	21.00	411.68	412.71	412.71	465.13			0.36	12.23	
Vallecitos	10800	40 CFS	40.00	411.68	415.27		415.29	0.003000	0.96	41.79	20.10	0.12
Vallecitos	10800	120 CFS	120.00	411.68	416.36		416.41	0.003657	1.83	65.50	23.44	0.19
Vallecitos	10616	21 CFS	21.00	411.70	414.19		414.20	0.003113	0.80	26.11	19.58	0.12
Vallecitos	10616	40 CFS	40.00	411.70	414.71		414.73	0.002987	1.09	36.68	20.93	0.15
Vallecitos	10616	120 CFS	120.00	411.70	415.75		415.81	0.002919	2.01	59.78	23.62	0.22
Vallecitos	10479	21 CFS	21.00	411.17	413.72		413.73	0.003859	0.89	23.59	17.56	0.14
Vallecitos	10479	40 CFS	40.00	411.17	414.25		414.27	0.003709	1.19	33.48	19.35	0.16
Vallecitos	10479	120 CFS	120.00	411.17	415.30		415.37	0.003556	2.16	55.43	22.29	0.24
Vallecitos	10179	21 CFS	21.00	409.94	412.68		412.69	0.003120	0.82	25.64	18.49	0.12
Vallecitos	10179	40 CFS	40.00	409.94	413.12		413.14	0.003891	1.17	34.14	20.00	0.16
Vallecitos	10179	120 CFS	120.00	409.94	414.51		414.56	0.002108	1.84	65.51	26.46	0.20
Vallecitos	10008.2	21 CFS	21.00	410.07	411.33		411.41	0.035611	2.21	9.51	9.66	0.39
Vallecitos	10008.2	40 CFS	40.00	410.07	412.03		412.11	0.010053	2.35	17.05	12.00	0.35
Vallecitos	10008.2	120 CFS	120.00	410.07	414.20		414.28	0.001275	2.35	50.96	19.27	0.26
Vallecitos	10008	21 CFS	21.00	410.07	411.33		411.41	0.000557	2.21	9.51	9.66	0.39
Vallecitos	10008	40 CFS	40.00	410.07	412.03		412.11	0.000394	2.35	17.05	12.00	0.35
Vallecitos	10008	120 CFS	120.00	410.07	414.20		414.28	0.000179	2.35	50.96	19.27	0.26
Vallecitos	9999	21 CFS	21.00	410.06	410.89	410.89	411.30	0.005081	5.11	4.11	5.13	1.01

HEC-RAS Plan: Ex Con Vert Varied n River: Vallecitos Reach: Vallecitos (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Vallecitos	9999	40 CFS	40.00	410.06	411.32	411.32	411.94	0.005143	6.32	6.33	5.16	1.01
Vallecitos	9999	120 CFS	120.00	410.06	412.65	412.65	413.92	0.005863	9.03	13.28	5.26	1.00
Vallecitos	9998	21 CFS	21.00	400.06	405.88		405.88	0.000023	0.71	29.78	5.21	0.05
Vallecitos	9998	40 CFS	40.00	400.06	406.51		406.53	0.000066	1.21	33.10	5.23	0.08
Vallecitos	9998	120 CFS	120.00	400.06	408.20		408.32	0.000338	2.86	41.94	5.27	0.18
Vallecitos	9987	21 CFS	21.00	400.10	405.88		405.88	0.000014	0.59	35.55	6.20	0.04
Vallecitos	9987	40 CFS	40.00	400.10	406.51		406.53	0.000039	1.01	39.50	6.20	0.07
Vallecitos	9987	120 CFS	120.00	400.10	408.20		408.29	0.000200	2.40	49.98	6.21	0.15
Vallecitos	9981	21 CFS	21.00	400.40	405.88		405.88	0.000340	0.27	78.26	24.83	0.03
Vallecitos	9981	40 CFS	40.00	400.40	406.52		406.52	0.000593	0.42	94.63	26.48	0.04
Vallecitos	9981	120 CFS	120.00	400.40	408.21		408.23	0.000880	0.84	143.39	30.88	0.07
Vallecitos	9918	21 CFS	21.00	402.60	405.82		405.82	0.005078	0.61	34.40	26.59	0.09
Vallecitos	9918	40 CFS	40.00	402.60	406.43		406.44	0.003878	0.78	51.17	28.17	0.10
Vallecitos	9918	120 CFS	120.00	402.60	408.14		408.16	0.001049	1.16	103.08	32.31	0.11
Vallecitos	9848	21 CFS	21.00	402.79	405.53		405.54	0.003419	0.61	34.25	24.87	0.09
Vallecitos	9848	40 CFS	40.00	402.79	406.16		406.17	0.003775	0.79	50.56	26.67	0.10
Vallecitos	9848	120 CFS	120.00	402.79	408.01		408.03	0.004031	1.15	104.68	32.47	0.11
Vallecitos	9554	21 CFS	21.00	401.66	403.99	403.04	404.00	0.008819	0.89	23.58	19.96	0.14
Vallecitos	9554	40 CFS	40.00	401.66	404.33		404.36	0.011673	1.30	30.67	21.40	0.19
Vallecitos	9554	120 CFS	120.00	401.66	404.20		404.49	0.155691	4.32	27.75	20.82	0.66
Vallecitos	9375.2	21 CFS	21.00	399.44	400.81		400.87	0.044133	1.87	11.25	10.23	0.31
Vallecitos	9375.2	40 CFS	40.00	399.44	401.38		401.46	0.021813	2.29	17.50	11.91	0.33
Vallecitos	9375.2	120 CFS	120.00	399.44	403.52		403.61	0.001306	2.41	49.85	18.26	0.26
Vallecitos	9375	21 CFS	21.00	399.44	400.81		400.87	0.000348	1.87	11.25	10.23	0.31
Vallecitos	9375	40 CFS	40.00	399.44	401.38		401.46	0.000362	2.29	17.50	11.91	0.33
Vallecitos	9375	120 CFS	120.00	399.44	403.52		403.61	0.000184	2.41	49.85	18.26	0.26
Vallecitos	9368	21 CFS	21.00	399.30	400.68		400.83	0.001134	3.08	6.81	4.99	0.47
Vallecitos	9368	40 CFS	40.00	399.30	401.04		401.37	0.002156	4.67	8.56	5.01	0.63
Vallecitos	9368	120 CFS	120.00	399.30	401.93	401.93	403.24	0.006122	9.17	13.08	5.05	1.00
Vallecitos	9367	21 CFS	21.00	397.80	400.71		400.74	0.000146	1.46	14.41	5.03	0.15
Vallecitos	9367	40 CFS	40.00	397.80	401.08		401.18	0.000383	2.45	16.31	5.05	0.24
Vallecitos	9367	120 CFS	120.00	397.80	401.78		402.35	0.002096	6.05	19.82	5.07	0.54
Vallecitos	9356	21 CFS	21.00	393.93	400.71		400.72	0.000010	0.47	45.16	14.50	0.05
Vallecitos	9356	40 CFS	40.00	393.93	401.10		401.11	0.000028	0.78	51.25	17.02	0.08
Vallecitos	9356	120 CFS	120.00	393.93	401.88		401.93	0.000130	1.82	65.94	20.68	0.18
Vallecitos	9340	21 CFS	21.00	397.72	400.71		400.72	0.002103	0.64	32.57	23.13	0.10
Vallecitos	9340	40 CFS	40.00	397.72	401.09		401.11	0.003111	0.95	41.92	25.49	0.13
Vallecitos	9340	120 CFS	120.00	397.72	401.87		401.92	0.005464	1.91	62.79	28.30	0.23
Vallecitos	9268	21 CFS	21.00	398.59	400.47		400.48	0.005668	0.76	27.60	32.96	0.15
Vallecitos	9268	40 CFS	40.00	398.59	400.79		400.81	0.005559	1.04	38.42	34.17	0.17
Vallecitos	9268	120 CFS	120.00	398.59	401.46		401.52	0.005728	1.89	63.92	43.73	0.26
Vallecitos	8973	21 CFS	21.00	395.13	397.48	396.76	397.52	0.022357	1.58	13.31	13.42	0.28
Vallecitos	8973	40 CFS	40.00	395.13	397.96	397.07	398.02	0.019371	1.97	20.31	16.13	0.31
Vallecitos	8973	120 CFS	120.00	395.13	398.82	397.88	398.98	0.014089	3.30	36.77	26.84	0.45
Vallecitos	8873	21 CFS	21.00	394.30	396.14		396.19	0.008795	1.78	11.79	10.22	0.29
Vallecitos	8873	40 CFS	40.00	394.30	396.80		396.86	0.007704	2.03	19.75	13.97	0.30
Vallecitos	8873	120 CFS	120.00	394.30	398.10		398.22	0.004670	2.77	43.36	23.04	0.36
Vallecitos	8753	21 CFS	21.00	392.77	395.15	394.03	395.20	0.007805	1.84	11.41	7.89	0.27
Vallecitos	8753	40 CFS	40.00	392.77	395.70	394.49	395.79	0.010225	2.46	16.24	9.66	0.33
Vallecitos	8753	120 CFS	120.00	392.77	397.64	395.71	397.76	0.003139	2.82	42.52	18.34	0.33
Vallecitos	8687	21 CFS	21.00	393.16	394.58		394.63	0.009528	1.86	11.31	10.04	0.31
Vallecitos	8687	40 CFS	40.00	393.16	395.30		395.37	0.004344	2.07	19.32	12.13	0.29
Vallecitos	8687	120 CFS	120.00	393.16	397.56		397.64	0.001032	2.21	54.19	18.70	0.23
Vallecitos	8679	21 CFS	21.00	393.17	394.04	394.04	394.46	0.005155	5.25	4.00	4.67	1.00
Vallecitos	8679	40 CFS	40.00	393.17	394.49	394.49	395.15	0.005334	6.50	6.15	4.72	1.00
Vallecitos	8679	120 CFS	120.00	393.17	395.91	395.91	397.24	0.006263	9.27	12.94	4.89	1.00
Vallecitos	8678	21 CFS	21.00	382.67	386.73		386.75	0.000074	1.11	18.87	4.72	0.10
Vallecitos	8678	40 CFS	40.00	382.67	387.08		387.14	0.000219	1.95	20.53	4.73	0.16
Vallecitos	8678	120 CFS	120.00	382.67	388.20		388.53	0.001126	4.65	25.82	4.77	0.35

HEC-RAS Plan: Ex Con Vert Varied n River: Vallecitos Reach: Vallecitos (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Vallecitos	8667	21 CFS	21.00	381.37	386.73		386.74	0.000018	0.65	32.50	6.06	0.05
Vallecitos	8667	40 CFS	40.00	381.37	387.09		387.11	0.000055	1.15	34.65	6.06	0.09
Vallecitos	8667	120 CFS	120.00	381.37	388.23		388.36	0.000315	2.89	41.58	6.07	0.19
Vallecitos	8659	21 CFS	21.00	382.57	386.74		386.74	0.000009	0.51	41.12	16.34	0.06
Vallecitos	8659	40 CFS	40.00	382.57	387.09		387.10	0.000023	0.85	47.12	17.41	0.09
Vallecitos	8659	120 CFS	120.00	382.57	388.25		388.29	0.000075	1.73	69.21	20.63	0.17
Vallecitos	8645	21 CFS	21.00	385.60	386.68		386.73	0.004995	1.68	12.46	16.80	0.34
Vallecitos	8645	40 CFS	40.00	385.60	387.00		387.08	0.005096	2.22	18.00	17.64	0.39
Vallecitos	8645	120 CFS	120.00	385.60	388.12		388.26	0.003179	3.04	39.49	21.14	0.39
Vallecitos	8623	21 CFS	21.00	385.40	386.26	386.23	386.47	0.041191	3.64	5.77	12.05	0.93
Vallecitos	8623	40 CFS	40.00	385.40	386.72		386.90	0.013849	3.35	11.93	14.63	0.65
Vallecitos	8623	120 CFS	120.00	385.40	387.99		388.17	0.004690	3.48	34.48	20.57	0.47
Vallecitos	8482	21 CFS	21.00	383.87	385.47		385.53	0.002445	1.91	11.00	9.36	0.31
Vallecitos	8482	40 CFS	40.00	383.87	386.01		386.11	0.002907	2.43	16.47	10.95	0.35
Vallecitos	8482	120 CFS	120.00	383.87	387.43		387.61	0.003472	3.40	35.32	16.01	0.40
Vallecitos	8384	21 CFS	21.00	383.90	384.92		385.12	0.007790	3.56	5.90	7.32	0.70
Vallecitos	8384	40 CFS	40.00	383.90	385.27		385.61	0.009665	4.66	8.59	8.23	0.80
Vallecitos	8384	120 CFS	120.00	383.90	386.82		387.19	0.004851	4.86	24.71	12.74	0.61
Vallecitos	8220	21 CFS	21.00	382.63	383.70	383.49	383.89	0.007350	3.51	5.99	7.36	0.69
Vallecitos	8220	40 CFS	40.00	382.63	384.36	383.87	384.55	0.004278	3.50	11.44	9.14	0.55
Vallecitos	8220	120 CFS	120.00	382.63	386.58	384.90	386.73	0.001438	3.13	38.29	15.27	0.35
Vallecitos	8170.2	21 CFS	21.00	382.30	383.58		383.66	0.002461	2.29	9.19	9.53	0.41
Vallecitos	8170.2	40 CFS	40.00	382.30	384.31		384.39	0.001571	2.35	16.99	11.81	0.35
Vallecitos	8170.2	120 CFS	120.00	382.30	386.58		386.66	0.000671	2.32	51.77	18.85	0.25
Vallecitos	8170	21 CFS	21.00	382.30	383.58		383.66	0.000616	2.29	9.18	9.53	0.41
Vallecitos	8170	40 CFS	40.00	382.30	384.31		384.39	0.000393	2.35	16.99	11.81	0.35
Vallecitos	8170	120 CFS	120.00	382.30	386.58		386.66	0.000168	2.32	51.77	18.85	0.25
Vallecitos	8162	21 CFS	21.00	382.27	383.13	383.13	383.55	0.005155	5.20	4.04	4.84	1.00
Vallecitos	8162	40 CFS	40.00	382.27	383.57	383.57	384.22	0.005311	6.44	6.21	4.86	1.01
Vallecitos	8162	120 CFS	120.00	382.27	384.95	384.95	386.28	0.006255	9.24	12.98	4.94	1.01
Vallecitos	8145	21 CFS	21.00	382.24	383.05	383.05	383.43	0.005014	4.98	4.21	5.50	1.00
Vallecitos	8145	40 CFS	40.00	382.24	383.46	383.46	384.05	0.005041	6.18	6.47	5.51	1.01
Vallecitos	8145	120 CFS	120.00	382.24	384.73	384.73	385.96	0.005737	8.92	13.46	5.51	1.01
Vallecitos	8144	21 CFS	21.00	375.44	377.64		377.68	0.000245	1.76	11.91	5.50	0.21
Vallecitos	8144	40 CFS	40.00	375.44	378.12		378.24	0.000513	2.74	14.59	5.50	0.30
Vallecitos	8144	120 CFS	120.00	375.44	379.06		379.64	0.002075	6.07	19.78	5.51	0.56
Vallecitos	8134	21 CFS	21.00	375.44	377.64		377.67	0.000174	1.54	13.62	6.29	0.18
Vallecitos	8134	40 CFS	40.00	375.44	378.12		378.21	0.000360	2.40	16.69	6.29	0.26
Vallecitos	8134	120 CFS	120.00	375.44	379.07		379.51	0.001429	5.29	22.68	6.30	0.49
Vallecitos	8125	21 CFS	21.00	372.32	377.65		377.65	0.000094	0.33	63.27	22.70	0.04
Vallecitos	8125	40 CFS	40.00	372.32	378.16		378.17	0.000191	0.53	75.30	24.36	0.05
Vallecitos	8125	120 CFS	120.00	372.32	379.27		379.29	0.000559	1.15	104.33	27.97	0.10
Vallecitos	8073	21 CFS	21.00	375.37	377.62		377.64	0.002688	1.01	20.83	18.36	0.17
Vallecitos	8073	40 CFS	40.00	375.37	378.11		378.14	0.002674	1.31	30.65	21.75	0.19
Vallecitos	8073	120 CFS	120.00	375.37	379.16		379.23	0.002305	2.12	56.49	27.09	0.26
Vallecitos	7943	21 CFS	21.00	374.13	377.15		377.16	0.005365	0.63	33.32	24.99	0.10
Vallecitos	7943	40 CFS	40.00	374.13	377.64		377.65	0.005667	0.87	45.79	26.61	0.12
Vallecitos	7943	120 CFS	120.00	374.13	378.78		378.81	0.004443	1.54	78.02	29.93	0.17
Vallecitos	7639	21 CFS	21.00	371.86	375.16		375.17	0.008169	0.79	26.71	18.51	0.12
Vallecitos	7639	40 CFS	40.00	371.86	375.64		375.66	0.007704	1.11	36.08	20.17	0.15
Vallecitos	7639	120 CFS	120.00	371.86	376.02		376.13	0.024804	2.73	43.93	21.46	0.34
Vallecitos	7487.2	21 CFS	21.00	371.05	373.21		373.24	0.022123	1.31	16.00	11.24	0.19
Vallecitos	7487.2	40 CFS	40.00	371.05	373.67		373.73	0.024581	1.86	21.55	12.81	0.25
Vallecitos	7487.2	120 CFS	120.00	371.05	375.31		375.41	0.001933	2.55	47.07	18.36	0.28
Vallecitos	7487	21 CFS	21.00	371.05	373.21		373.24	0.000125	1.31	16.00	11.24	0.19
Vallecitos	7487	40 CFS	40.00	371.05	373.67		373.73	0.000202	1.86	21.54	12.80	0.25
Vallecitos	7487	120 CFS	120.00	371.05	375.31		375.41	0.000221	2.55	47.06	18.36	0.28
Vallecitos	7475	21 CFS	21.00	371.08	373.16		373.22	0.000378	2.09	10.07	4.94	0.26
Vallecitos	7475	40 CFS	40.00	371.08	373.51		373.69	0.000893	3.39	11.80	4.97	0.39
Vallecitos	7475	120 CFS	120.00	371.08	374.11		375.13	0.004397	8.09	14.83	5.02	0.83

HEC-RAS Plan: Ex Con Vert Varied n River: Vallecitos Reach: Vallecitos (Continued)

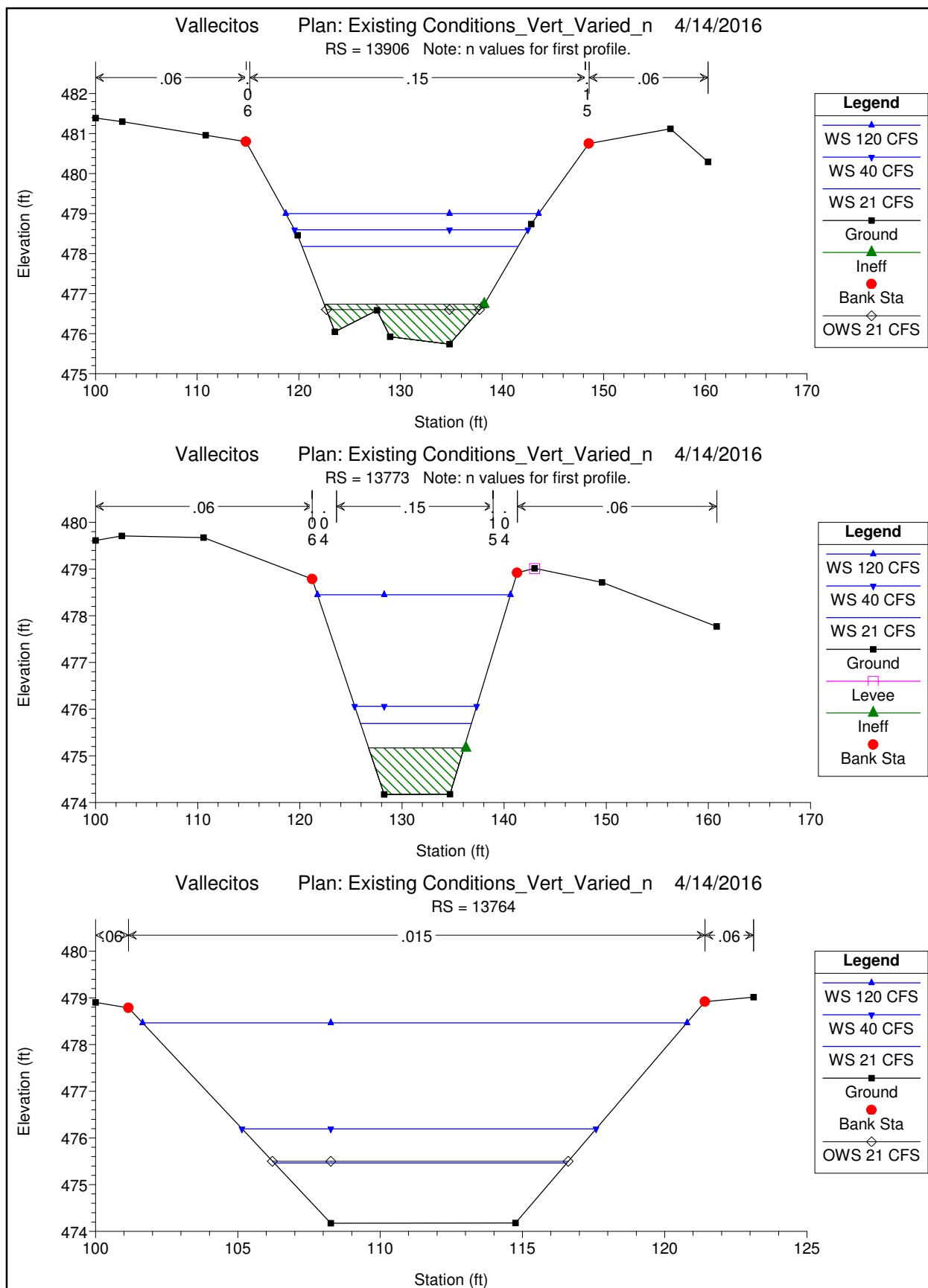
Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Vallecitos	7474	21 CFS	21.00	370.08	373.16		373.19	0.000130	1.40	15.02	4.98	0.14
Vallecitos	7474	40 CFS	40.00	370.08	373.52		373.61	0.000354	2.38	16.82	5.00	0.23
Vallecitos	7474	120 CFS	120.00	370.08	374.21		374.75	0.001989	5.93	20.24	5.05	0.52
Vallecitos	7464	21 CFS	21.00	365.79	373.17		373.17	0.000008	0.43	48.73	13.93	0.04
Vallecitos	7464	40 CFS	40.00	365.79	373.54		373.55	0.000024	0.74	54.36	16.52	0.07
Vallecitos	7464	120 CFS	120.00	365.79	374.30		374.35	0.000122	1.74	69.00	21.85	0.17
Vallecitos	7436	21 CFS	21.00	371.13	373.13		373.16	0.124914	1.49	14.05	32.09	0.40
Vallecitos	7436	40 CFS	40.00	371.13	373.50		373.54	0.043746	1.51	26.57	34.75	0.30
Vallecitos	7436	120 CFS	120.00	371.13	374.25		374.33	0.017988	2.19	54.74	40.10	0.33
Vallecitos	7352	21 CFS	21.00	369.33	372.33	371.20	372.33	0.003313	0.49	43.11	34.16	0.08
Vallecitos	7352	40 CFS	40.00	369.33	372.74	371.34	372.75	0.003898	0.70	57.36	35.32	0.10
Vallecitos	7352	120 CFS	120.00	369.33	373.56	371.76	373.59	0.005153	1.35	90.34	45.92	0.15
Vallecitos	7222	21 CFS	21.00	369.60	371.88	370.93	371.89	0.003524	0.66	31.91	28.92	0.11
Vallecitos	7222	40 CFS	40.00	369.60	372.24	371.09	372.26	0.003624	0.89	45.84	40.72	0.13
Vallecitos	7222	120 CFS	120.00	369.60	372.99	371.56	373.03	0.003684	1.59	76.56	41.95	0.19
Vallecitos	7000	21 CFS	21.00	366.92	368.89	368.89	369.11	0.836444	3.74	5.62	12.84	1.00
Vallecitos	7000	40 CFS	40.00	366.92	369.13	369.13	369.45	0.613754	4.51	8.87	14.17	1.01
Vallecitos	7000	120 CFS	120.00	366.92	369.82	369.82	370.38	0.238196	6.00	20.01	17.99	1.00
Vallecitos	6799	21 CFS	21.00	365.38	366.58	366.08	366.66	0.000636	2.33	9.03	9.29	0.42
Vallecitos	6799	40 CFS	40.00	365.38	367.30	366.43	367.39	0.000421	2.44	16.42	11.30	0.36
Vallecitos	6799	120 CFS	120.00	365.38	369.54	367.37	369.63	0.000191	2.46	48.76	17.57	0.26
Vallecitos	6791	21 CFS	21.00	365.25	366.13	366.13	366.55	0.005134	5.18	4.06	4.91	1.00
Vallecitos	6791	40 CFS	40.00	365.25	366.58	366.58	367.22	0.005242	6.40	6.25	4.94	1.00
Vallecitos	6791	120 CFS	120.00	365.25	367.95	367.95	369.26	0.006147	9.19	13.06	5.03	1.01
Vallecitos	6790	21 CFS	21.00	355.95	361.39		361.40	0.000032	0.79	26.45	4.97	0.06
Vallecitos	6790	40 CFS	40.00	355.95	361.91		361.94	0.000092	1.38	29.03	4.98	0.10
Vallecitos	6790	120 CFS	120.00	355.95	362.92		363.11	0.000567	3.52	34.07	5.01	0.24
Vallecitos	6779	21 CFS	21.00	355.09	361.39		361.39	0.000011	0.54	38.99	6.25	0.04
Vallecitos	6779	40 CFS	40.00	355.09	361.91		361.92	0.000033	0.95	42.24	6.25	0.06
Vallecitos	6779	120 CFS	120.00	355.09	362.93		363.03	0.000213	2.47	48.63	6.25	0.16
Vallecitos	6772	21 CFS	21.00	357.04	361.39		361.39	0.000423	0.44	47.87	18.15	0.05
Vallecitos	6772	40 CFS	40.00	357.04	361.91		361.92	0.000769	0.69	57.58	19.19	0.07
Vallecitos	6772	120 CFS	120.00	357.04	362.94		362.98	0.002020	1.52	78.70	21.90	0.14
Vallecitos	6690	21 CFS	21.00	358.92	361.29		361.30	0.005755	1.01	20.79	17.61	0.16
Vallecitos	6690	40 CFS	40.00	358.92	361.75		361.78	0.005725	1.37	29.27	19.22	0.20
Vallecitos	6690	120 CFS	120.00	358.92	362.56		362.67	0.007425	2.60	46.15	22.08	0.32
Vallecitos	6387	21 CFS	21.00	357.96	359.73	359.05	359.76	0.004466	1.45	14.53	17.24	0.28
Vallecitos	6387	40 CFS	40.00	357.96	360.06	359.37	360.12	0.005199	1.95	20.54	19.10	0.33
Vallecitos	6387	120 CFS	120.00	357.96	361.15	360.04	361.27	0.003130	2.79	43.08	22.35	0.35
Vallecitos	6168	21 CFS	21.00	356.68	357.84	357.54	357.97	0.019098	2.95	7.13	8.21	0.56
Vallecitos	6168	40 CFS	40.00	356.68	358.52	357.88	358.65	0.008740	2.95	13.55	11.76	0.49
Vallecitos	6168	120 CFS	120.00	356.68	360.73	358.90	360.81	0.001430	2.31	52.02	22.26	0.27
Vallecitos	6098	21 CFS	21.00	356.43	357.76		357.84	0.000574	2.26	9.28	9.24	0.40
Vallecitos	6098	40 CFS	40.00	356.43	358.47		358.56	0.000408	2.40	16.69	11.61	0.35
Vallecitos	6098	120 CFS	120.00	356.43	360.69		360.78	0.000180	2.36	50.75	19.03	0.26
Vallecitos	6090	21 CFS	21.00	356.48	357.32	357.32	357.73	0.005135	5.15	4.08	4.99	1.01
Vallecitos	6090	40 CFS	40.00	356.48	357.76	357.76	358.39	0.005229	6.38	6.27	5.01	1.01
Vallecitos	6090	120 CFS	120.00	356.48	359.11	359.11	360.41	0.006074	9.14	13.12	5.09	1.00
Vallecitos	6089	21 CFS	21.00	348.48	353.00		353.01	0.000047	0.93	22.46	5.04	0.08
Vallecitos	6089	40 CFS	40.00	348.48	353.53		353.57	0.000130	1.59	25.16	5.05	0.13
Vallecitos	6089	120 CFS	120.00	348.48	354.63		354.87	0.000718	3.91	30.72	5.07	0.28
Vallecitos	6078	21 CFS	21.00	348.11	353.00		353.01	0.000021	0.70	29.97	6.16	0.06
Vallecitos	6078	40 CFS	40.00	348.11	353.53		353.56	0.000060	1.20	33.27	6.17	0.09
Vallecitos	6078	120 CFS	120.00	348.11	354.65		354.79	0.000340	2.99	40.14	6.17	0.21
Vallecitos	6070	21 CFS	21.00	349.67	353.00		353.00	0.000122	0.46	45.75	18.67	0.05
Vallecitos	6070	40 CFS	40.00	349.67	353.54		353.54	0.000219	0.72	55.89	19.13	0.07
Vallecitos	6070	120 CFS	120.00	349.67	354.66		354.70	0.000591	1.54	78.12	20.76	0.14
Vallecitos	6063	21 CFS	21.00	351.42	352.99		353.00	0.001104	0.90	23.33	19.57	0.15
Vallecitos	6063	40 CFS	40.00	351.42	353.52		353.54	0.001167	1.18	34.03	20.79	0.16

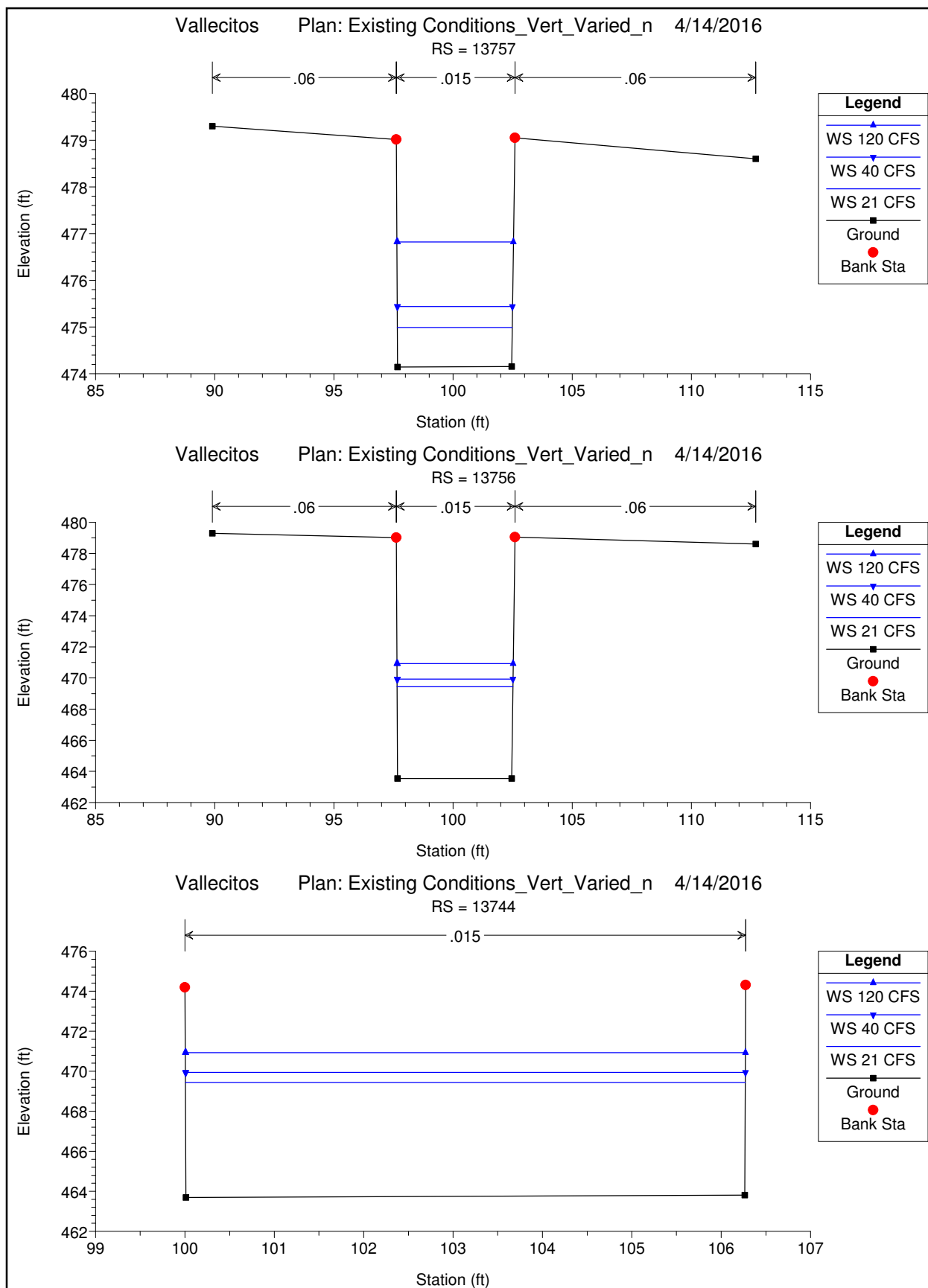
HEC-RAS Plan: Ex Con Vert Varied n River: Vallecitos Reach: Vallecitos (Continued)

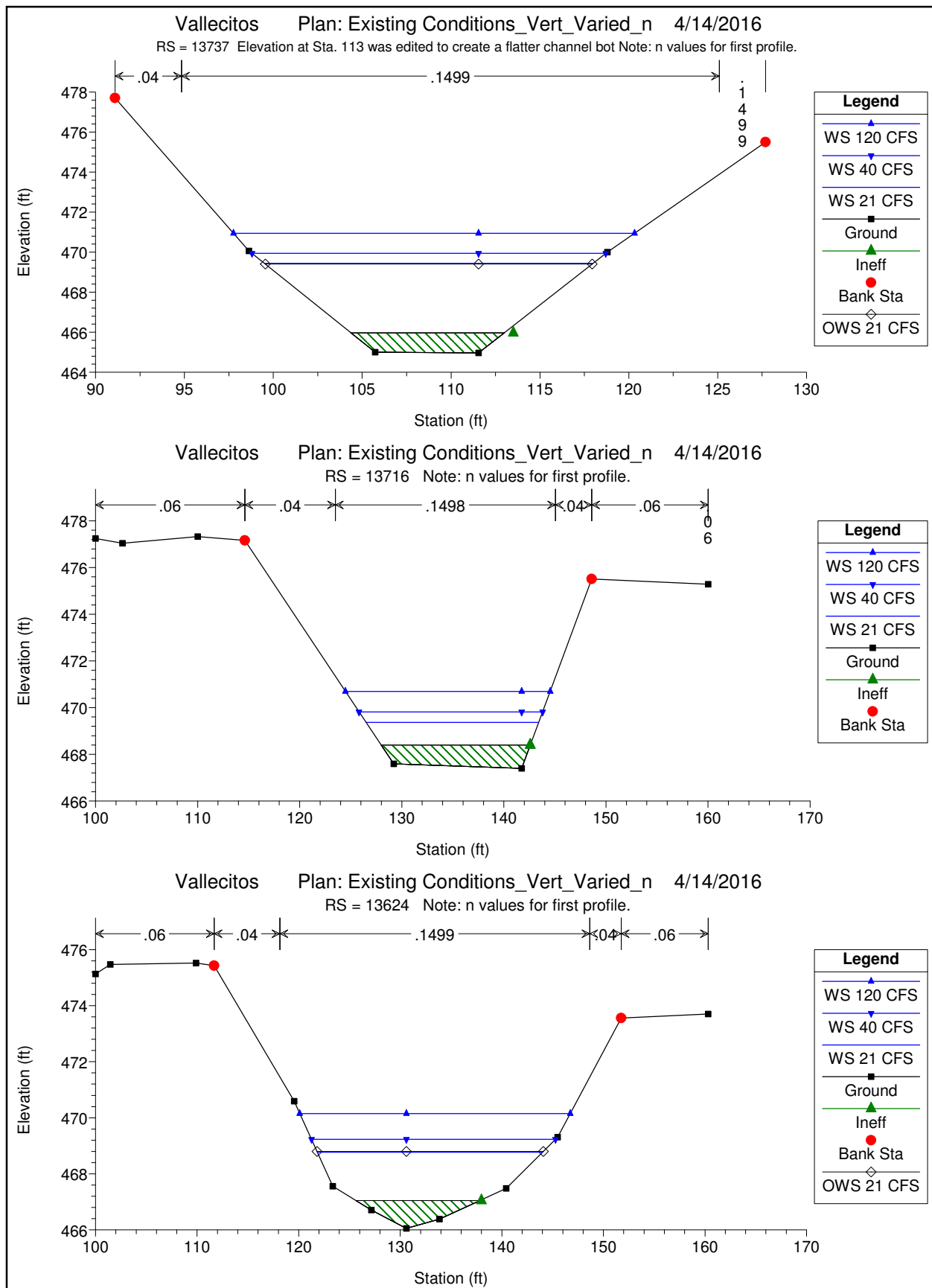
Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Vallecitos	6063	120 CFS	120.00	351.42	354.62		354.69	0.001774	2.06	58.39	23.34	0.23
Vallecitos	5994	21 CFS	21.00	351.72	352.56		352.78	0.019462	3.78	5.55	8.52	0.83
Vallecitos	5994	40 CFS	40.00	351.72	353.20		353.35	0.009268	3.14	12.76	14.87	0.60
Vallecitos	5994	120 CFS	120.00	351.72	354.28		354.47	0.005471	3.54	33.94	22.00	0.50
Vallecitos	5692	21 CFS	21.00	349.23	351.30	350.26	351.35	0.001994	1.78	11.82	8.81	0.27
Vallecitos	5692	40 CFS	40.00	349.23	351.96	350.66	352.03	0.002463	2.03	19.72	14.93	0.31
Vallecitos	5692	120 CFS	120.00	349.23	353.28	351.89	353.40	0.002418	2.76	43.41	20.48	0.33
Vallecitos	5331	21 CFS	21.00	348.97	350.49		350.54	0.002531	1.83	11.46	10.94	0.32
Vallecitos	5331	40 CFS	40.00	348.97	351.06		351.13	0.002521	2.03	19.67	16.07	0.32
Vallecitos	5331	120 CFS	120.00	348.97	352.52		352.63	0.001878	2.56	46.82	21.13	0.30
Vallecitos	5142	21 CFS	21.00	348.43	349.99	349.17	350.03	0.002811	1.66	12.66	10.83	0.27
Vallecitos	5142	40 CFS	40.00	348.43	350.52	349.50	350.58	0.003365	2.01	19.88	16.48	0.32
Vallecitos	5142	120 CFS	120.00	348.43	352.26	350.49	352.33	0.001214	2.13	56.40	25.00	0.25
Vallecitos	5086		Lat Struct									
Vallecitos	5015	21 CFS	21.00	347.92	348.66	348.66	348.97	0.091604	4.49	4.68	7.56	1.01
Vallecitos	5015	40 CFS	40.00	347.92	349.01	349.01	349.45	0.053520	5.35	7.48	8.52	1.01
Vallecitos	5015	120 CFS	103.35	347.92	352.11		352.19	0.001089	2.19	47.20	17.05	0.23
Vallecitos	5008	21 CFS	21.00	344.66	346.29	345.73	346.50	0.001703	3.65	5.75	3.69	0.52
Vallecitos	5008	40 CFS	40.00	344.66	346.98	346.27	347.34	0.002315	4.81	8.31	3.69	0.57
Vallecitos	5008	120 CFS	103.35	344.66	351.93	347.62	352.16	0.000914	3.88	26.65	3.72	0.26
Vallecitos	5007		Culvert									
Vallecitos	4321	21 CFS	21.00	340.28	344.50		344.52	0.000113	1.28	16.44	3.94	0.11
Vallecitos	4321	40 CFS	40.00	340.28	345.00		345.07	0.000311	2.17	18.43	3.94	0.18
Vallecitos	4321	120 CFS	103.35	340.28	345.88		346.23	0.001376	4.72	21.91	3.94	0.35
Vallecitos	4308	21 CFS	21.00	343.26	344.45		344.52	0.000481	2.02	10.38	11.00	0.37
Vallecitos	4308	40 CFS	40.00	343.26	344.98		345.07	0.000451	2.41	16.62	12.73	0.37
Vallecitos	4308	120 CFS	103.35	343.26	346.00		346.17	0.000509	3.30	31.27	15.88	0.42
Vallecitos	4255	21 CFS	21.00	342.39	344.44		344.46	0.001850	1.24	16.97	15.56	0.21
Vallecitos	4255	40 CFS	40.00	342.39	344.97		345.01	0.001810	1.53	26.12	18.45	0.23
Vallecitos	4255	120 CFS	103.35	342.39	346.02		346.09	0.001717	2.16	47.84	23.22	0.27
Vallecitos	3986	21 CFS	21.00	342.50	343.96		343.99	0.001673	1.33	15.74	12.53	0.21
Vallecitos	3986	40 CFS	40.00	342.50	344.46		344.51	0.001954	1.78	22.45	14.37	0.25
Vallecitos	3986	120 CFS	103.35	342.50	345.46		345.57	0.002153	2.66	38.87	18.33	0.32
Vallecitos	3874	21 CFS	21.00	342.41	343.13	343.13	343.43	0.045932	4.42	4.75	7.79	1.00
Vallecitos	3874	40 CFS	40.00	342.41	343.47	343.47	343.90	0.034931	5.28	7.58	8.86	1.01
Vallecitos	3874	120 CFS	103.35	342.41	344.25	344.25	344.94	0.023796	6.66	15.53	11.33	1.00
Vallecitos	3861	21 CFS	21.00	337.78	339.25	338.95	339.58	0.003137	4.66	4.50	3.28	0.70
Vallecitos	3861	40 CFS	40.00	337.78	340.07	339.53	340.55	0.003315	5.56	7.20	3.30	0.66
Vallecitos	3861	120 CFS	103.35	337.78	341.00	341.00	342.57	0.009022	10.03	10.30	3.33	1.01
Vallecitos	3860		Culvert									
Vallecitos	3625	21 CFS	21.00	315.28	322.54		322.55	0.000054	0.89	23.55	3.41	0.06
Vallecitos	3625	40 CFS	40.00	315.28	323.08		323.12	0.000164	1.57	25.40	3.43	0.10
Vallecitos	3625	120 CFS	103.35	315.28	323.82		324.02	0.000942	3.57	28.95	7.26	0.32
Vallecitos	3612	21 CFS	21.00	318.15	322.54		322.55	0.000042	0.40	52.09	18.04	0.04
Vallecitos	3612	40 CFS	40.00	318.15	323.10		323.11	0.000084	0.64	62.57	19.59	0.06
Vallecitos	3612	120 CFS	103.35	318.15	323.93		323.96	0.000272	1.29	79.91	22.27	0.12
Vallecitos	3561	21 CFS	21.00	320.75	322.49		322.53	0.003100	1.73	12.12	10.00	0.28
Vallecitos	3561	40 CFS	40.00	320.75	323.01		323.09	0.004112	2.18	18.36	14.94	0.35
Vallecitos	3561	120 CFS	103.35	320.75	323.74		323.91	0.005751	3.25	31.78	21.43	0.47
Vallecitos	3248	21 CFS	21.00	319.82	321.46		321.47	0.003630	0.92	22.78	21.19	0.16
Vallecitos	3248	40 CFS	40.00	319.82	321.89		321.91	0.003351	1.23	32.58	23.84	0.19
Vallecitos	3248	120 CFS	103.35	319.82	322.62		322.69	0.002699	2.03	50.96	26.23	0.26
Vallecitos	2948	21 CFS	21.00	317.98	320.40	319.01	320.41	0.003459	0.94	22.38	18.83	0.15
Vallecitos	2948	40 CFS	40.00	317.98	320.91	319.39	320.93	0.003229	1.23	32.60	21.26	0.17
Vallecitos	2948	120 CFS	103.35	317.98	321.73	320.14	321.80	0.003296	2.01	51.42	23.98	0.24
Vallecitos	2689	21 CFS	21.00	317.60	319.73	318.29	319.74	0.001985	0.77	27.10	20.39	0.12
Vallecitos	2689	40 CFS	40.00	317.60	320.29	318.59	320.31	0.001844	1.01	39.52	24.39	0.14
Vallecitos	2689	120 CFS	103.35	317.60	321.17	319.29	321.21	0.001636	1.63	63.55	29.50	0.20

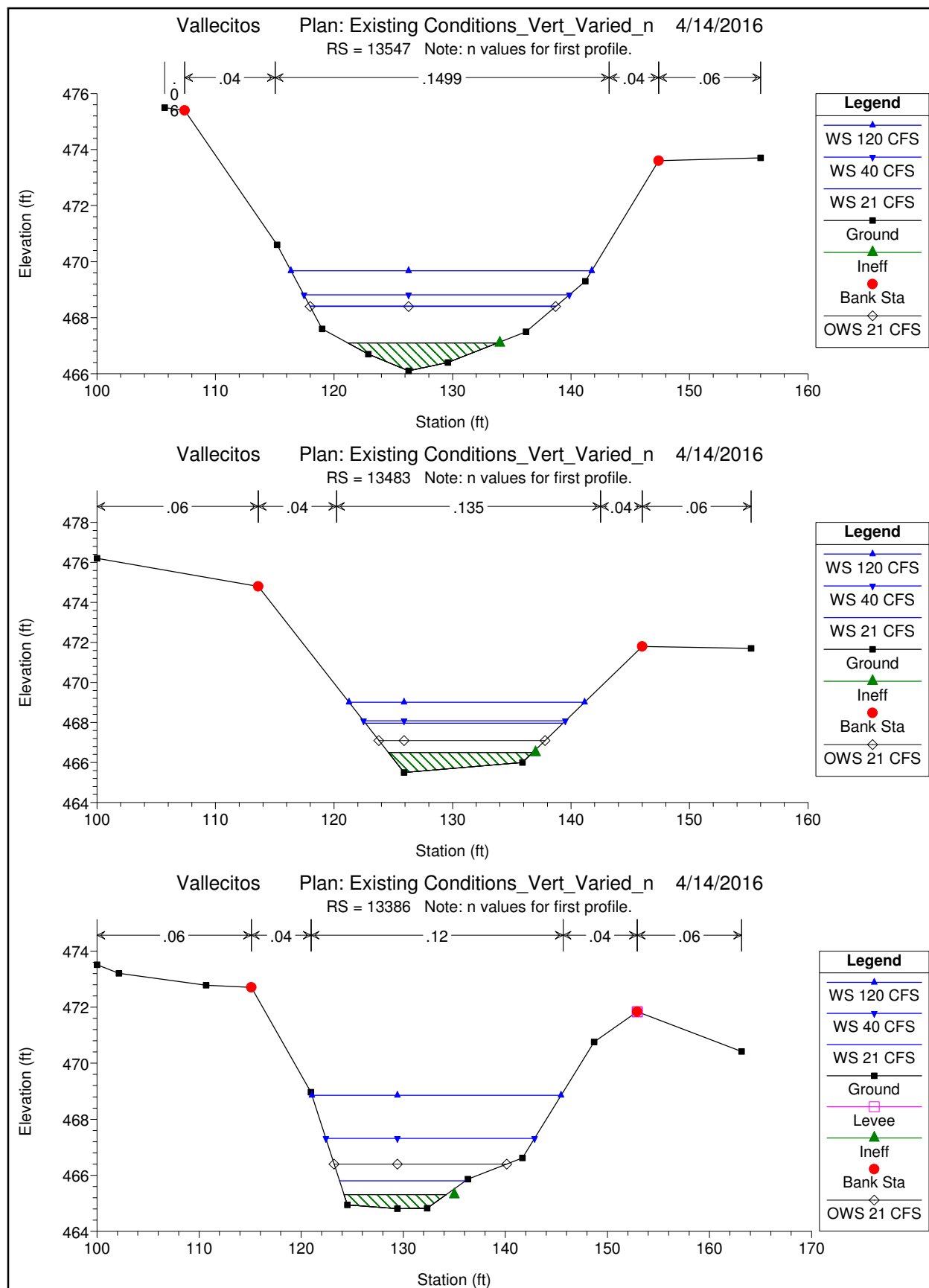
HEC-RAS Plan: Ex Con Vert Varied n River: Vallecitos Reach: Vallecitos (Continued)

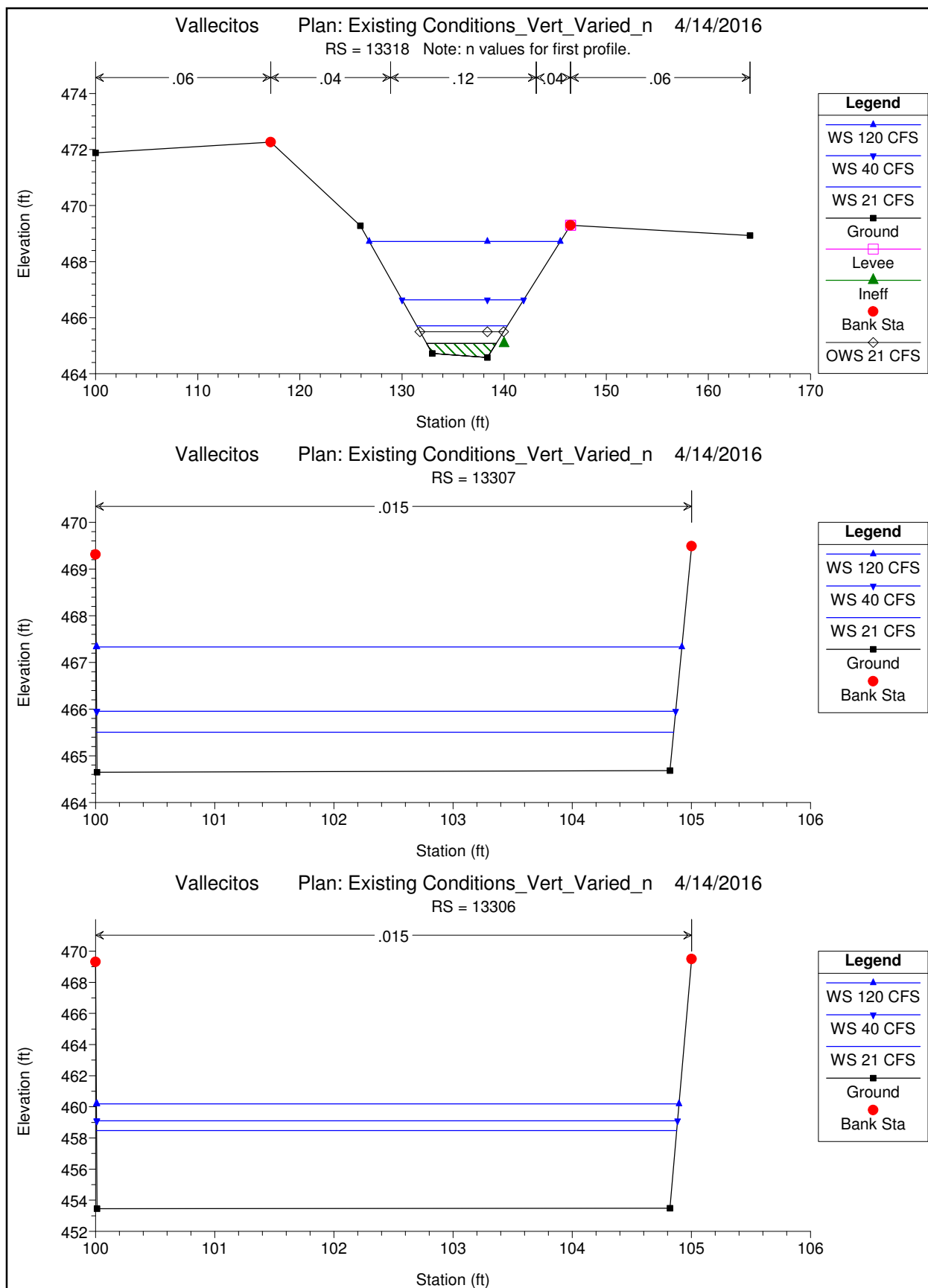
Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Vallecitos	2344	21 CFS	21.00	316.87	318.98		319.00	0.002303	1.26	16.66	13.44	0.20
Vallecitos	2344	40 CFS	40.00	316.87	319.53		319.57	0.002479	1.56	25.72	18.90	0.24
Vallecitos	2344	120 CFS	103.35	316.87	320.46		320.55	0.002253	2.30	44.91	21.98	0.28
Vallecitos	2055	21 CFS	21.00	315.95	318.37		318.39	0.001966	1.11	18.97	16.35	0.18
Vallecitos	2055	40 CFS	40.00	315.95	318.92		318.95	0.001876	1.39	28.71	19.05	0.20
Vallecitos	2055	120 CFS	103.35	315.95	319.84		319.91	0.002081	2.17	47.56	21.61	0.26
Vallecitos	1755	21 CFS	21.00	315.79	317.49		317.54	0.004366	1.68	12.53	10.57	0.27
Vallecitos	1755	40 CFS	40.00	315.79	318.11		318.17	0.003800	1.97	20.34	15.04	0.30
Vallecitos	1755	120 CFS	103.35	315.79	318.95		319.09	0.003774	3.00	34.50	18.36	0.39
Vallecitos	1537	21 CFS	21.00	314.84	316.48		316.54	0.004792	1.86	11.27	8.02	0.28
Vallecitos	1537	40 CFS	40.00	314.84	316.96		317.06	0.007149	2.54	15.74	11.54	0.38
Vallecitos	1537	120 CFS	103.35	314.84	317.87		318.06	0.005980	3.46	29.83	17.68	0.47
Vallecitos	1457	21 CFS	21.00	315.10	315.85	315.85	316.15	0.004190	4.42	4.75	7.88	1.00
Vallecitos	1457	40 CFS	40.00	315.10	316.19	316.19	316.62	0.003829	5.27	7.60	8.93	1.01
Vallecitos	1457	120 CFS	103.35	315.10	316.97	316.97	317.66	0.003381	6.67	15.48	11.35	1.01
Vallecitos	1438	21 CFS	21.00	311.70	313.39	312.78	313.61	0.001847	3.78	5.56	3.31	0.51
Vallecitos	1438	40 CFS	40.00	311.70	314.20	313.36	314.57	0.002384	4.83	8.28	3.32	0.54
Vallecitos	1438	120 CFS	103.35	311.70	314.82	314.82	316.38	0.009201	10.02	10.31	3.33	1.00
Vallecitos	1437		Culvert									
Vallecitos	1277	21 CFS	21.00	296.50	301.37		301.38	0.000065	1.03	20.42	4.20	0.08
Vallecitos	1277	40 CFS	40.00	296.50	301.68		301.73	0.000202	1.84	21.73	4.21	0.14
Vallecitos	1277	120 CFS	103.35	296.50	302.29		302.57	0.001035	4.25	24.31	4.21	0.31
Vallecitos	1178	21 CFS	21.00	298.50	301.35		301.37	0.000511	0.87	25.65	16.69	0.10
Vallecitos	1178	40 CFS	40.00	298.50	301.65		301.68	0.001103	1.42	31.24	20.69	0.15
Vallecitos	1178	120 CFS	103.35	298.50	302.26		302.36	0.002637	2.71	46.26	28.69	0.26
Vallecitos	1122	21 CFS	21.00	300.50	301.10	301.10	301.25	0.082848	3.15	6.66	22.24	1.02
Vallecitos	1122	40 CFS	40.00	300.50	301.28	301.28	301.48	0.060869	3.57	11.22	28.86	1.01
Vallecitos	1122	120 CFS	103.35	300.50	301.62	301.62	301.98	0.031357	4.80	21.51	30.42	1.01
Vallecitos	959	21 CFS	21.00	296.50	297.81		297.86	0.007269	1.79	11.73	14.10	0.35
Vallecitos	959	40 CFS	40.00	296.50	298.45		298.50	0.003112	1.83	21.89	17.38	0.29
Vallecitos	959	120 CFS	103.35	296.50	300.10		300.16	0.000915	1.83	56.42	24.39	0.21
Vallecitos	909	21 CFS	21.00	296.50	297.59	297.19	297.73	0.001223	3.02	6.96	6.38	0.51
Vallecitos	909	40 CFS	40.00	296.50	298.18	297.57	298.39	0.001256	3.74	10.70	6.39	0.51
Vallecitos	909	120 CFS	103.35	296.50	299.66	298.51	300.06	0.001447	5.13	20.15	6.39	0.51
Vallecitos	908		Culvert									
Vallecitos	851	21 CFS	21.00	295.50	296.17	296.17	296.50	0.004772	4.64	4.53	6.78	1.00
Vallecitos	851	40 CFS	40.00	295.50	296.52	296.52	297.04	0.004667	5.76	6.94	6.78	1.00
Vallecitos	851	120 CFS	103.35	295.50	297.43	297.43	298.40	0.004845	7.91	13.06	6.79	1.01
Vallecitos	825	21 CFS	21.00	295.10	295.99		296.07	0.015741	2.33	9.01	13.59	0.50
Vallecitos	825	40 CFS	40.00	295.10	296.27		296.41	0.015134	3.08	12.97	14.65	0.58
Vallecitos	825	120 CFS	103.35	295.10	296.82		297.18	0.012768	4.75	21.74	16.77	0.74
Vallecitos	762	21 CFS	21.00	294.00	294.94	294.65	295.04	0.017022	2.54	8.27	11.52	0.53
Vallecitos	762	40 CFS	40.00	294.00	295.23	294.94	295.41	0.017001	3.38	11.83	12.37	0.61
Vallecitos	762	120 CFS	103.35	294.00	295.78	295.58	296.24	0.017032	5.48	18.91	13.92	0.81

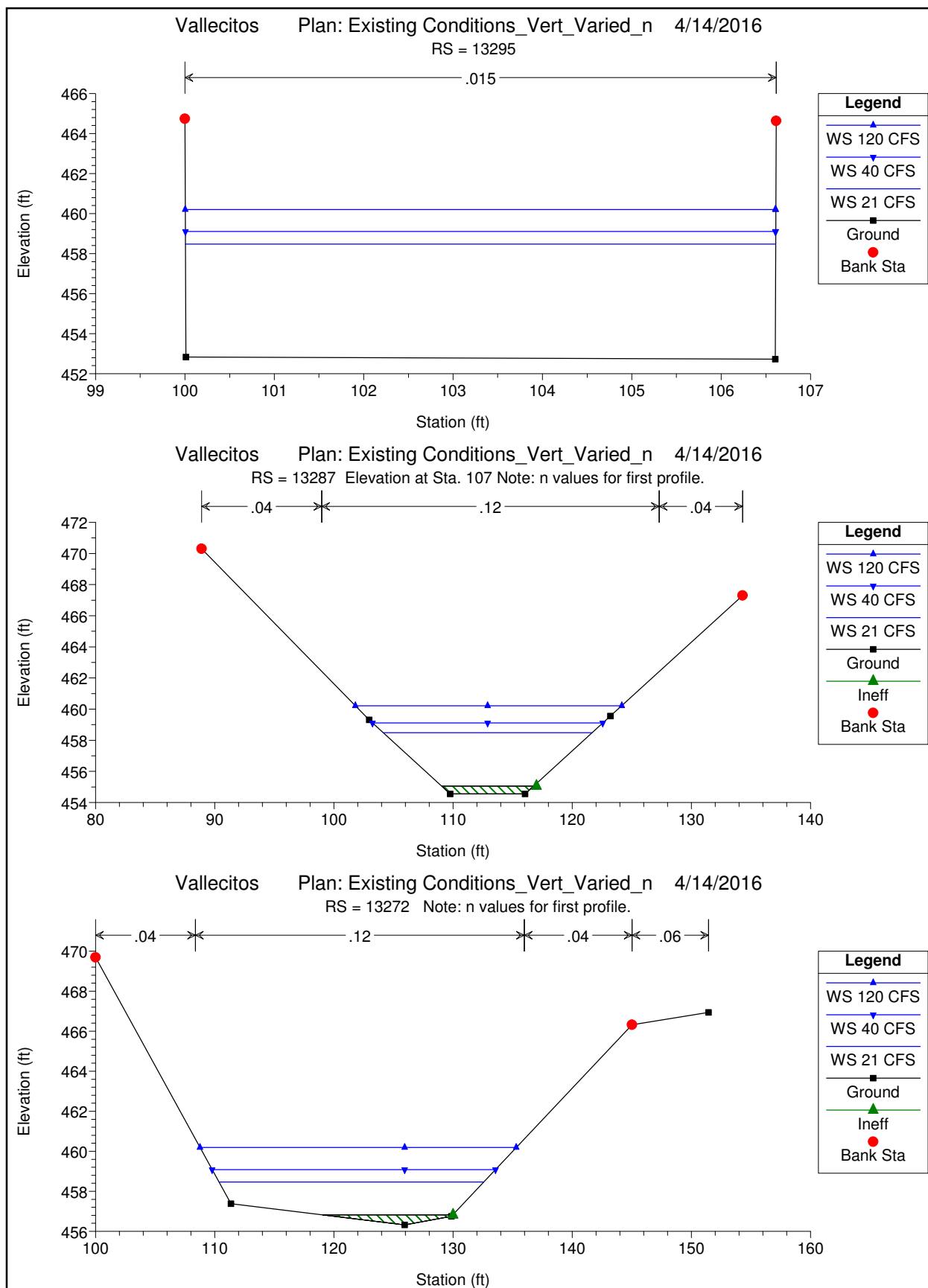


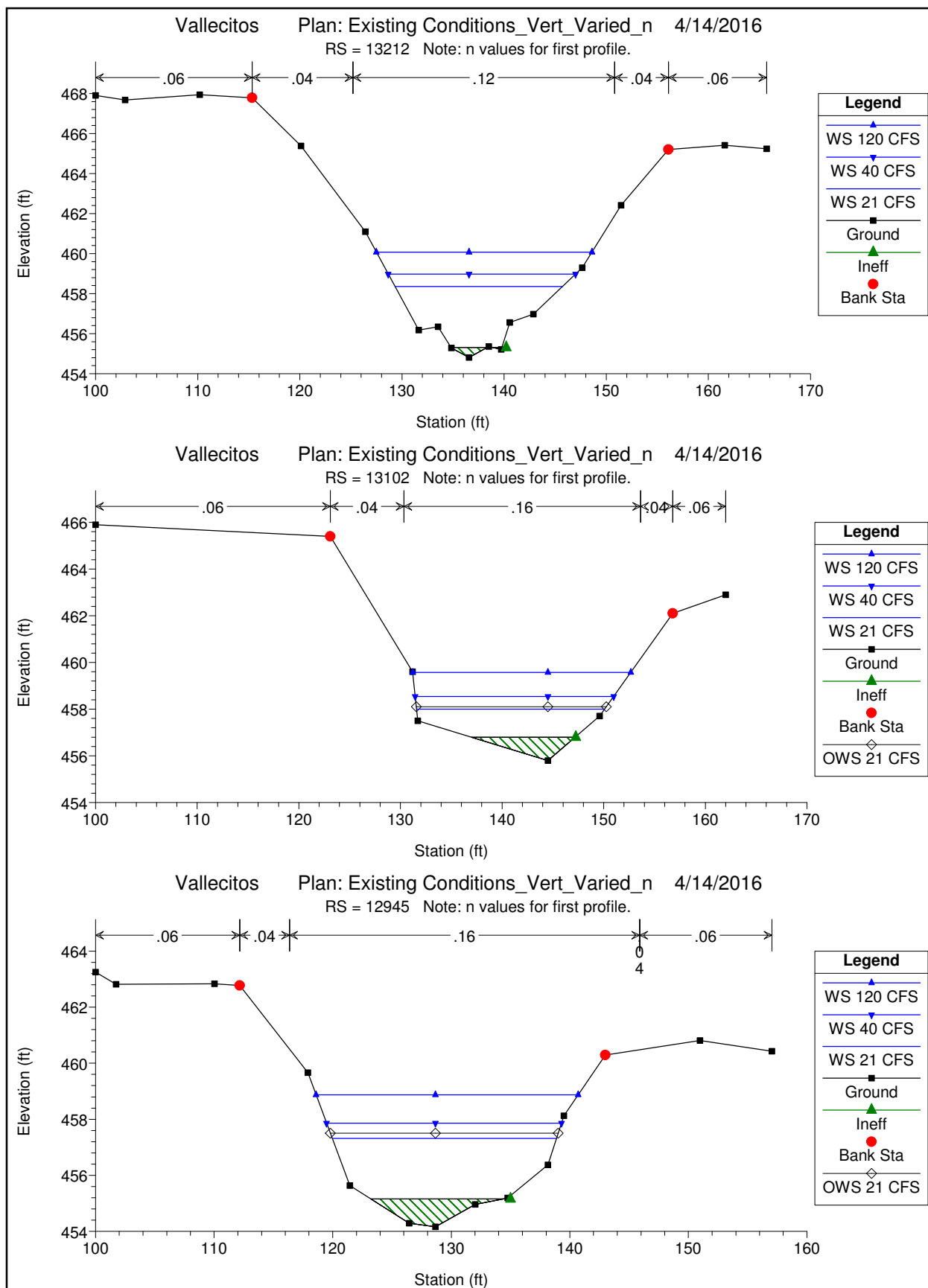


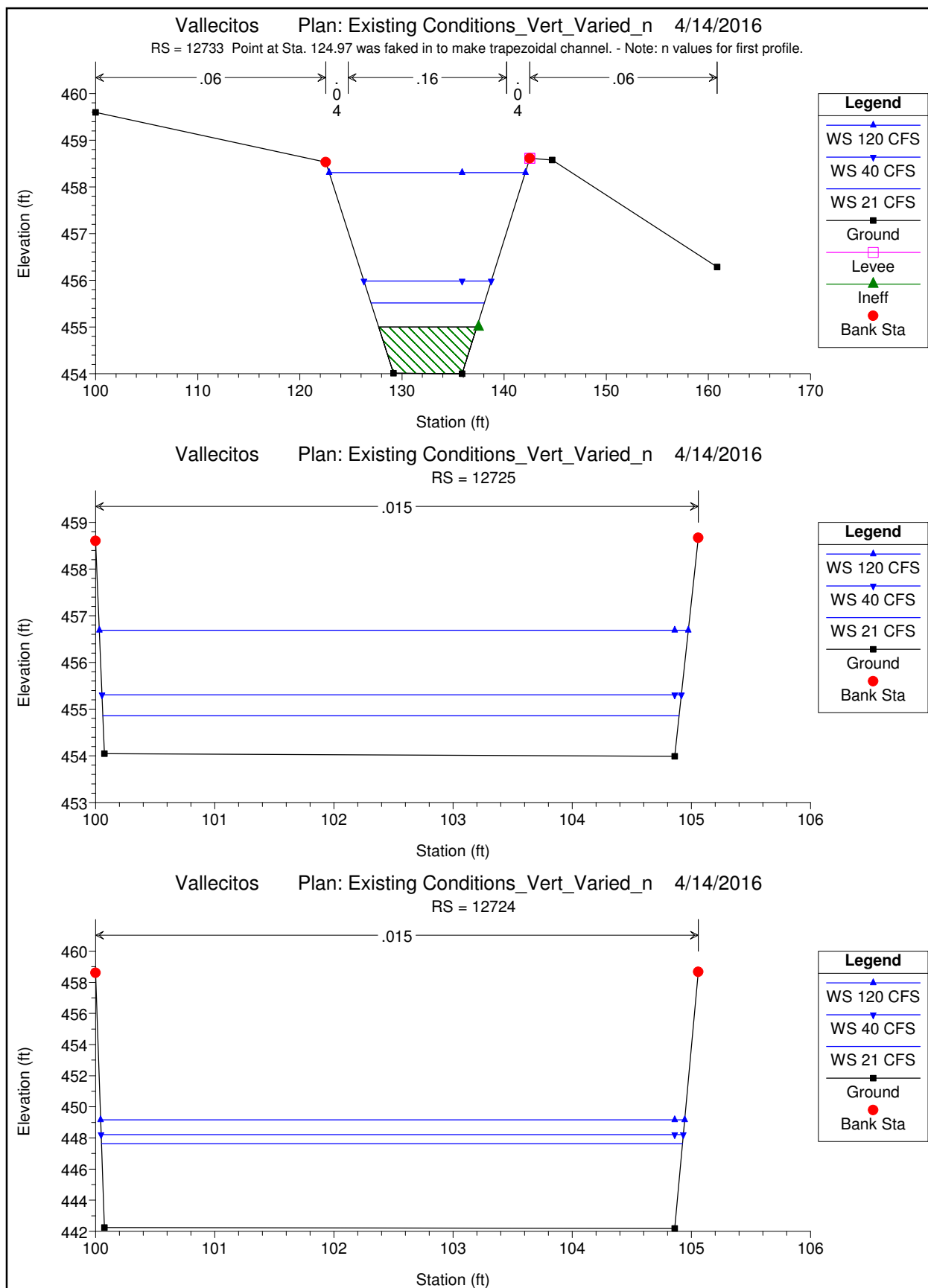


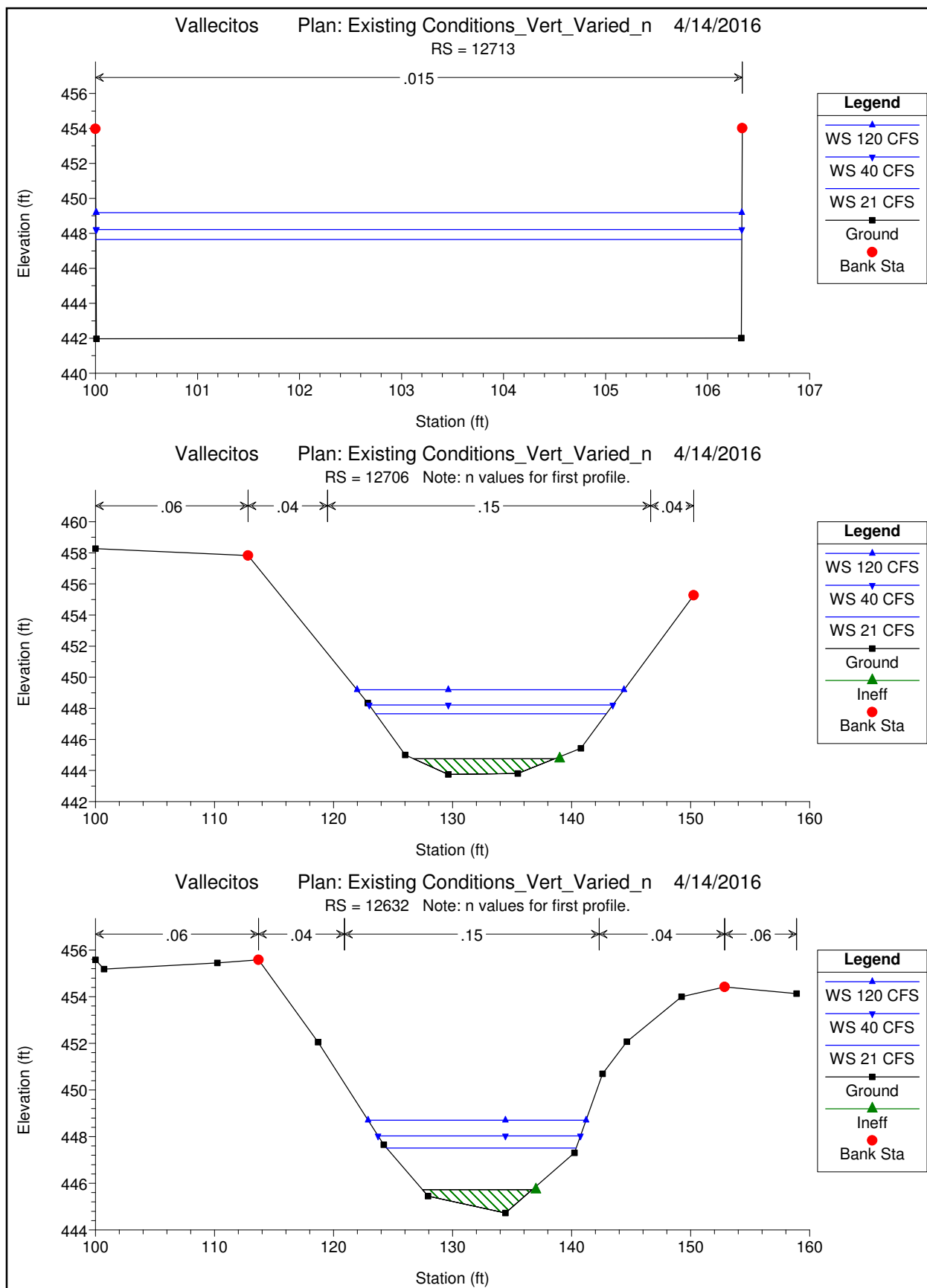


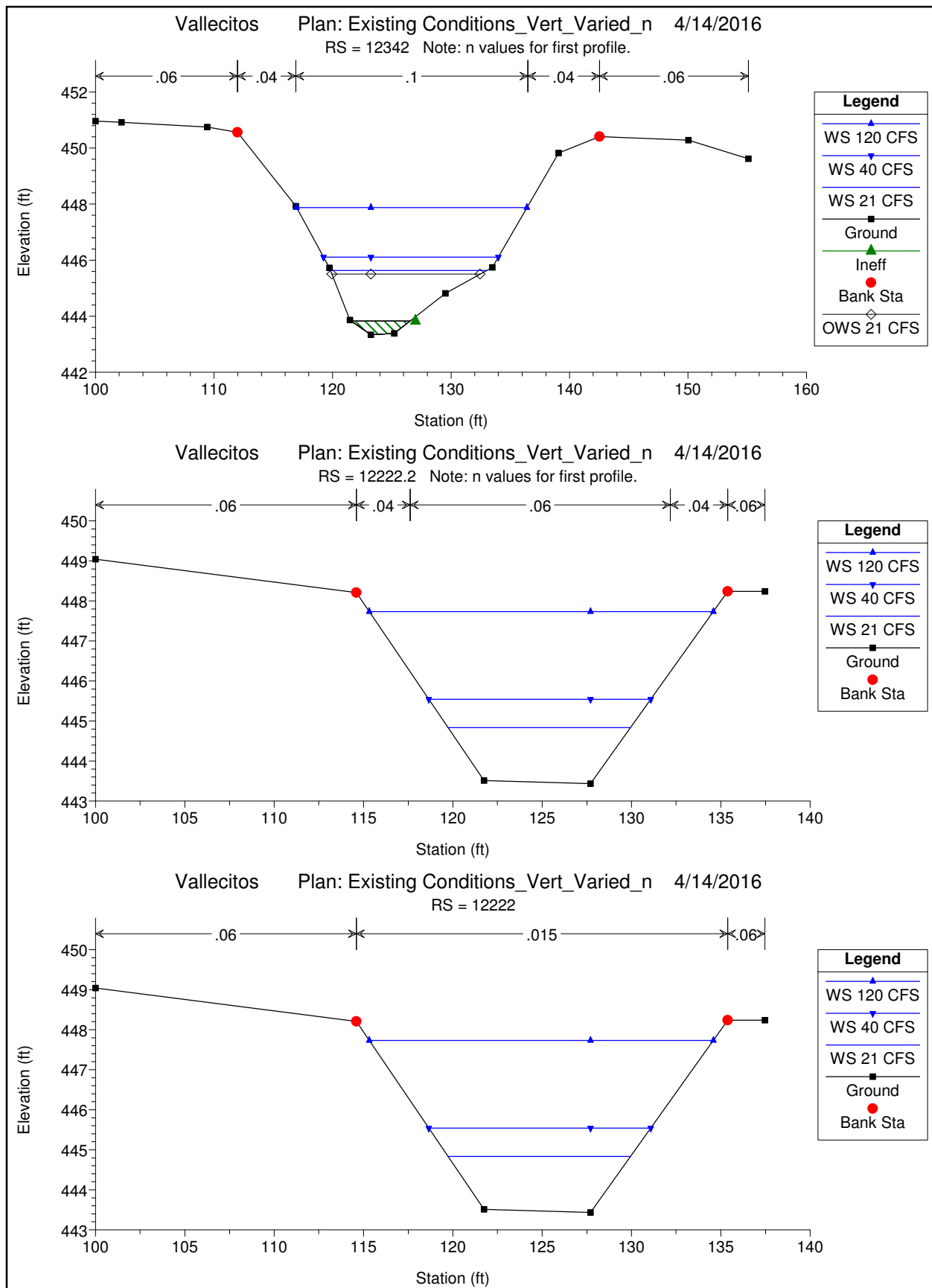


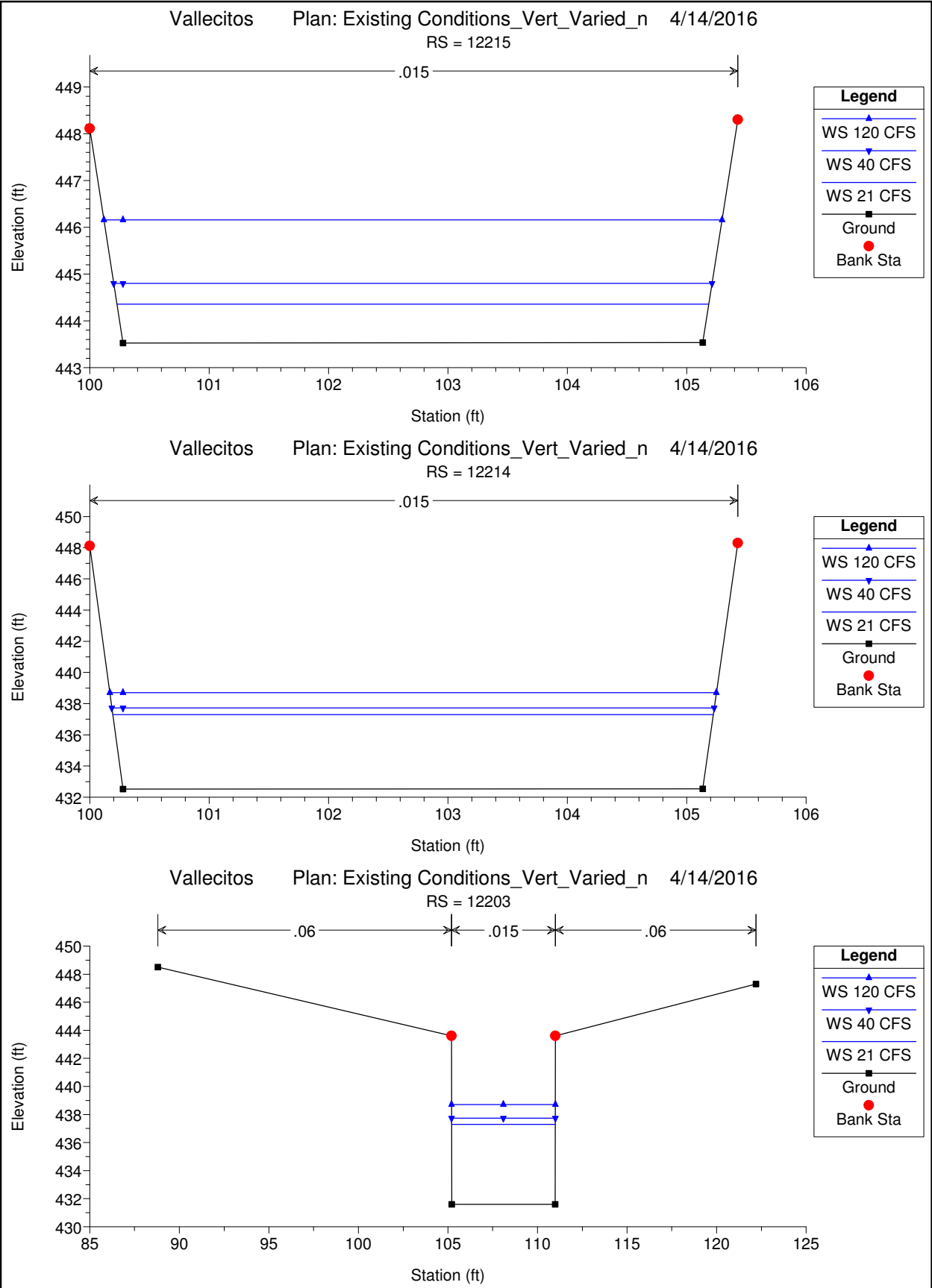


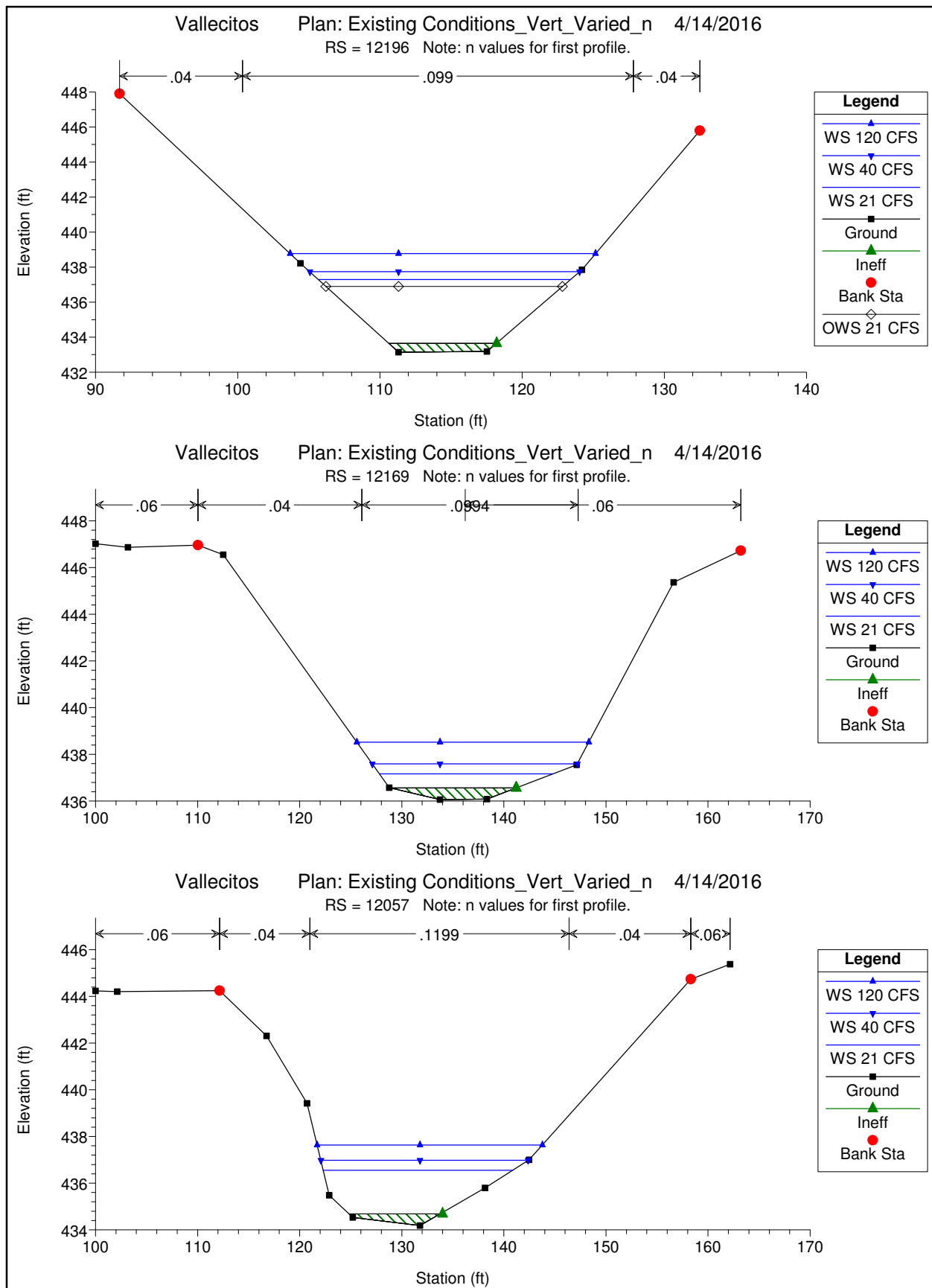


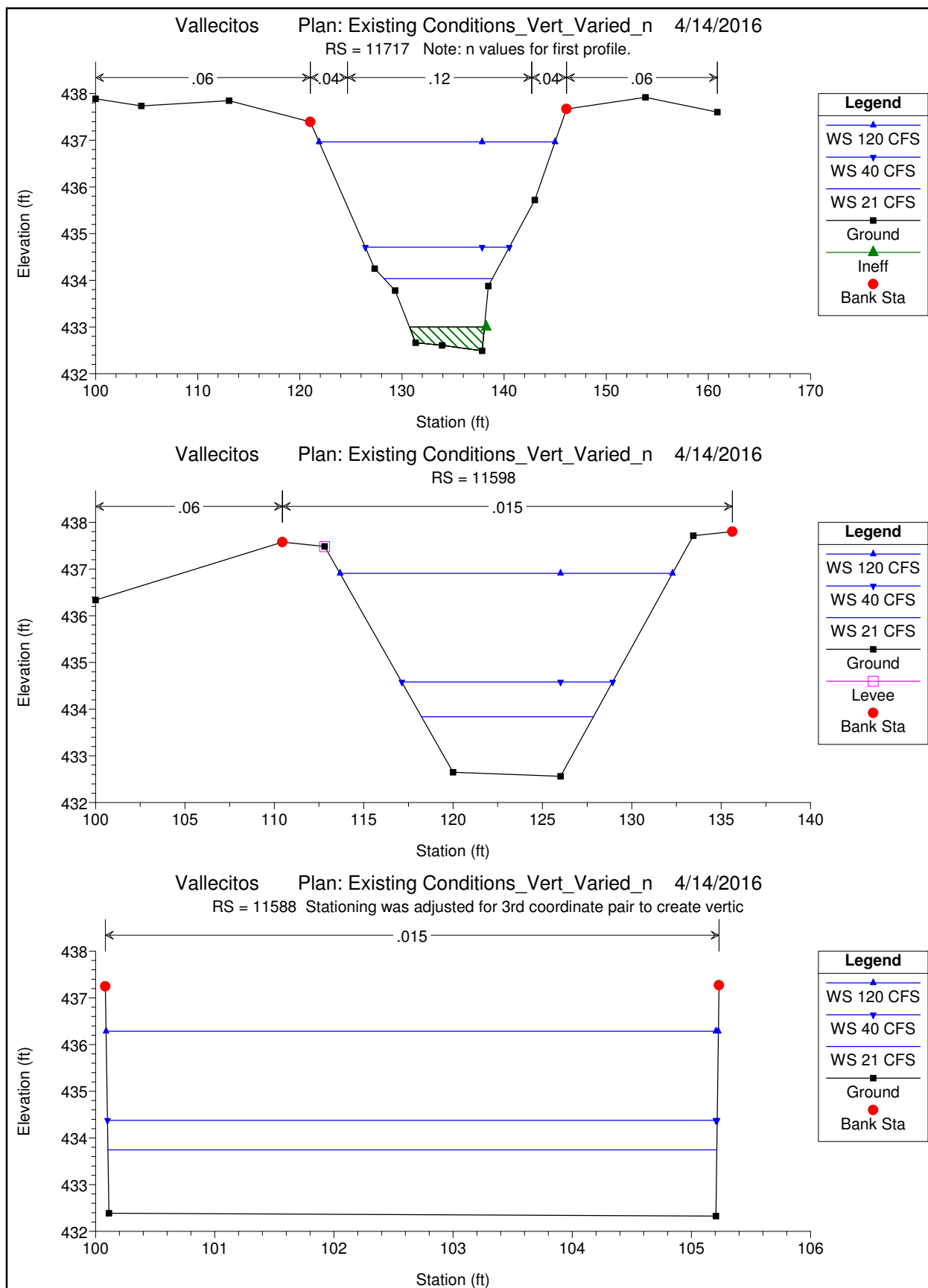


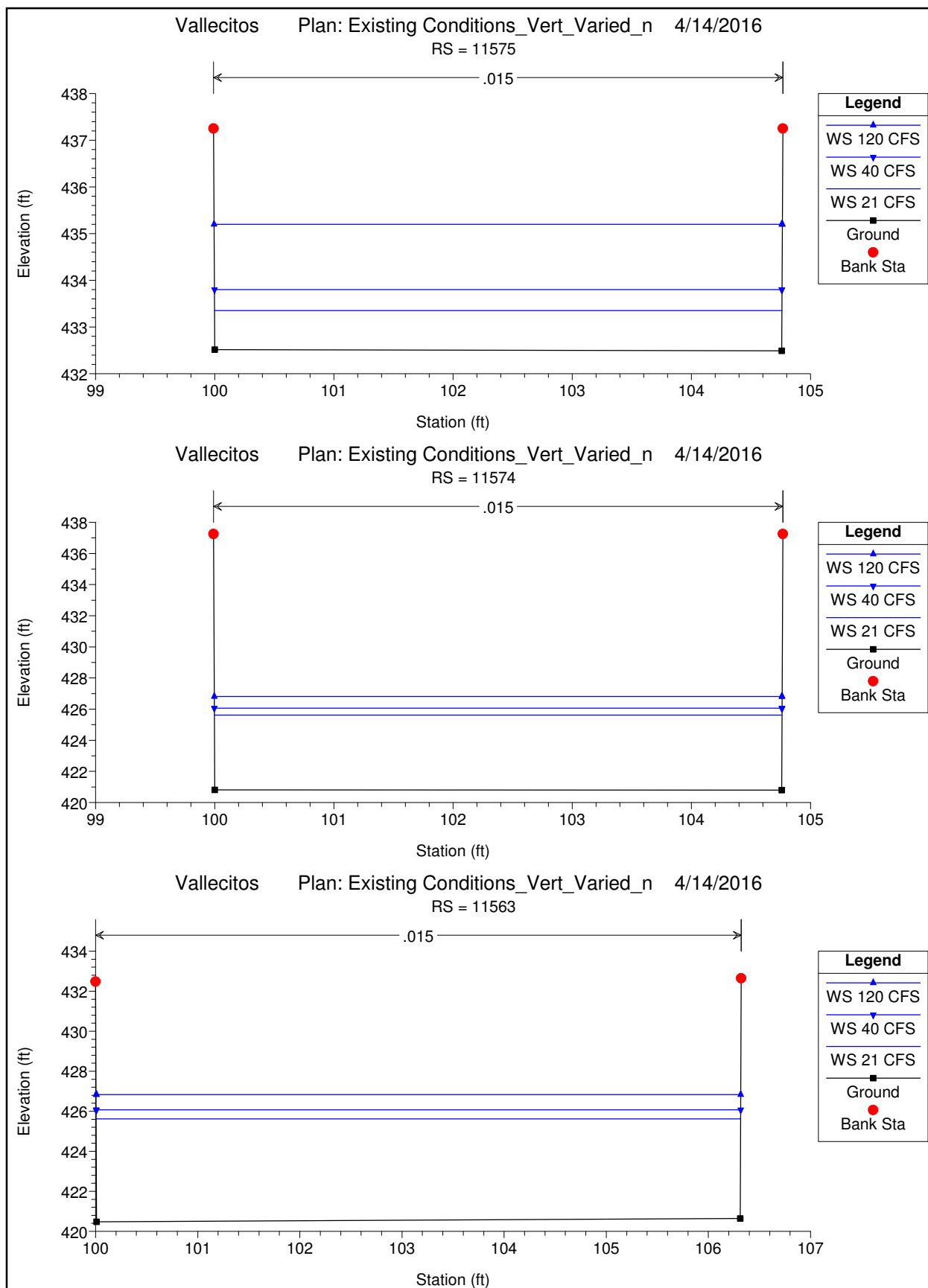


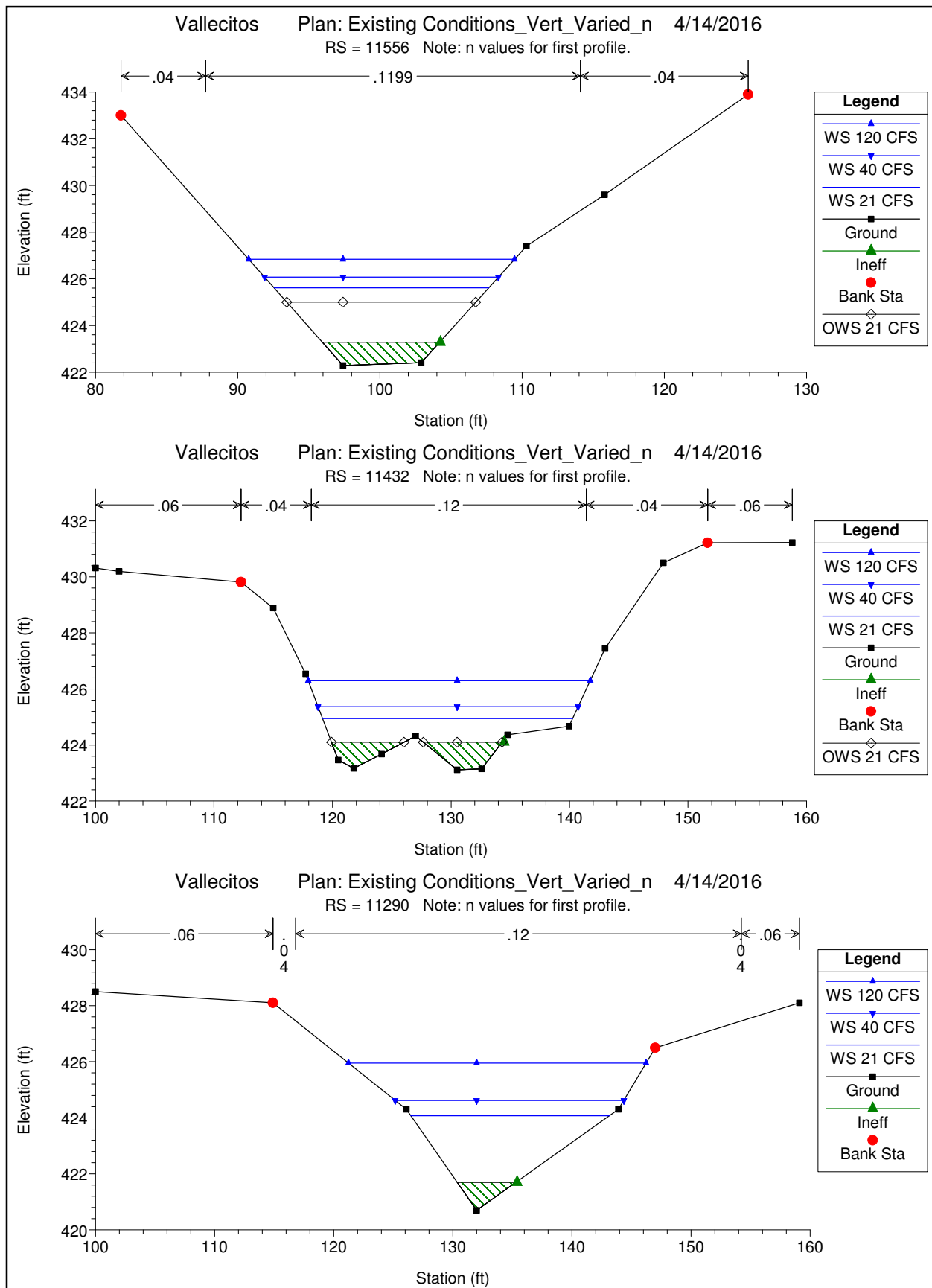


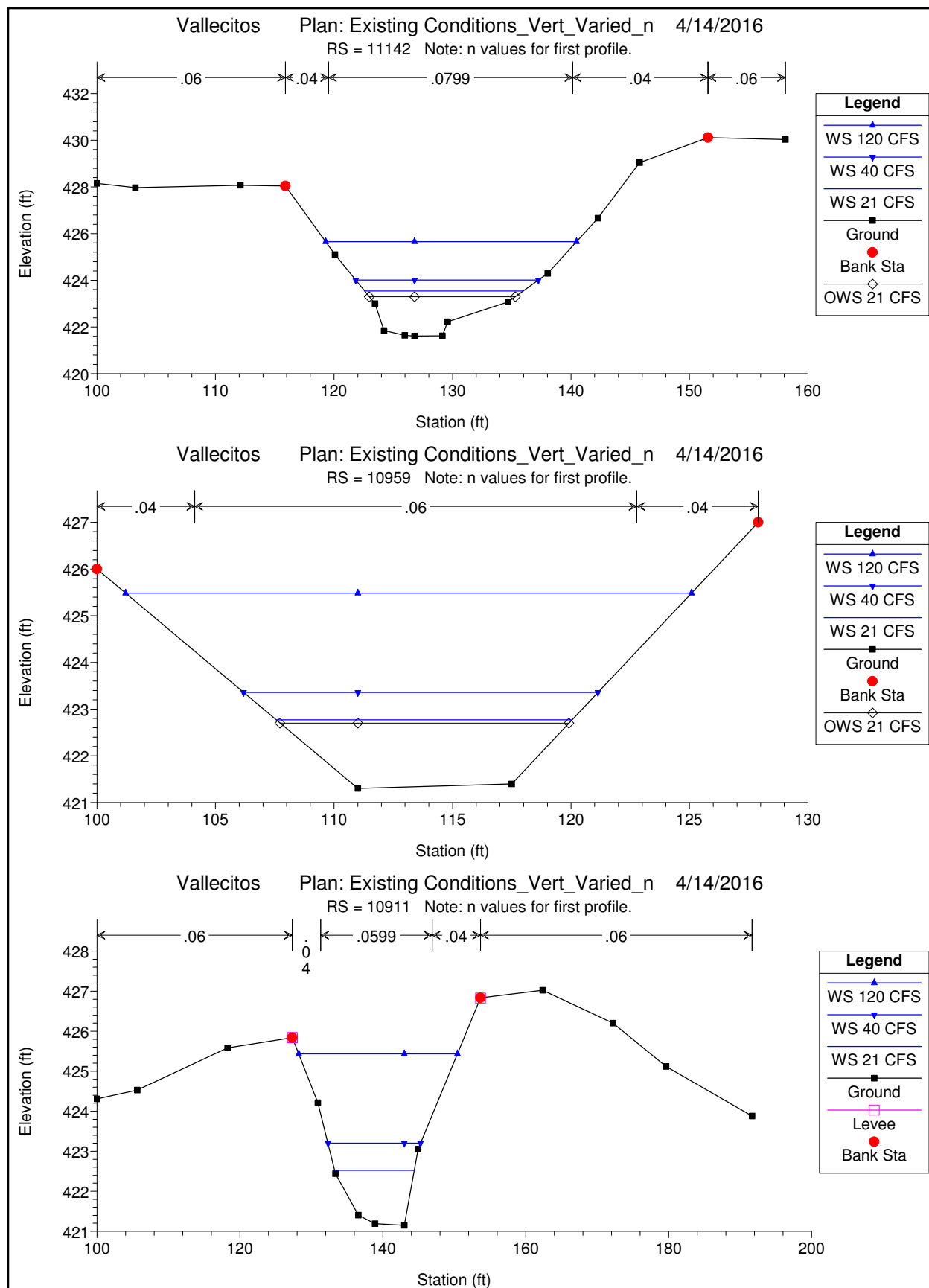


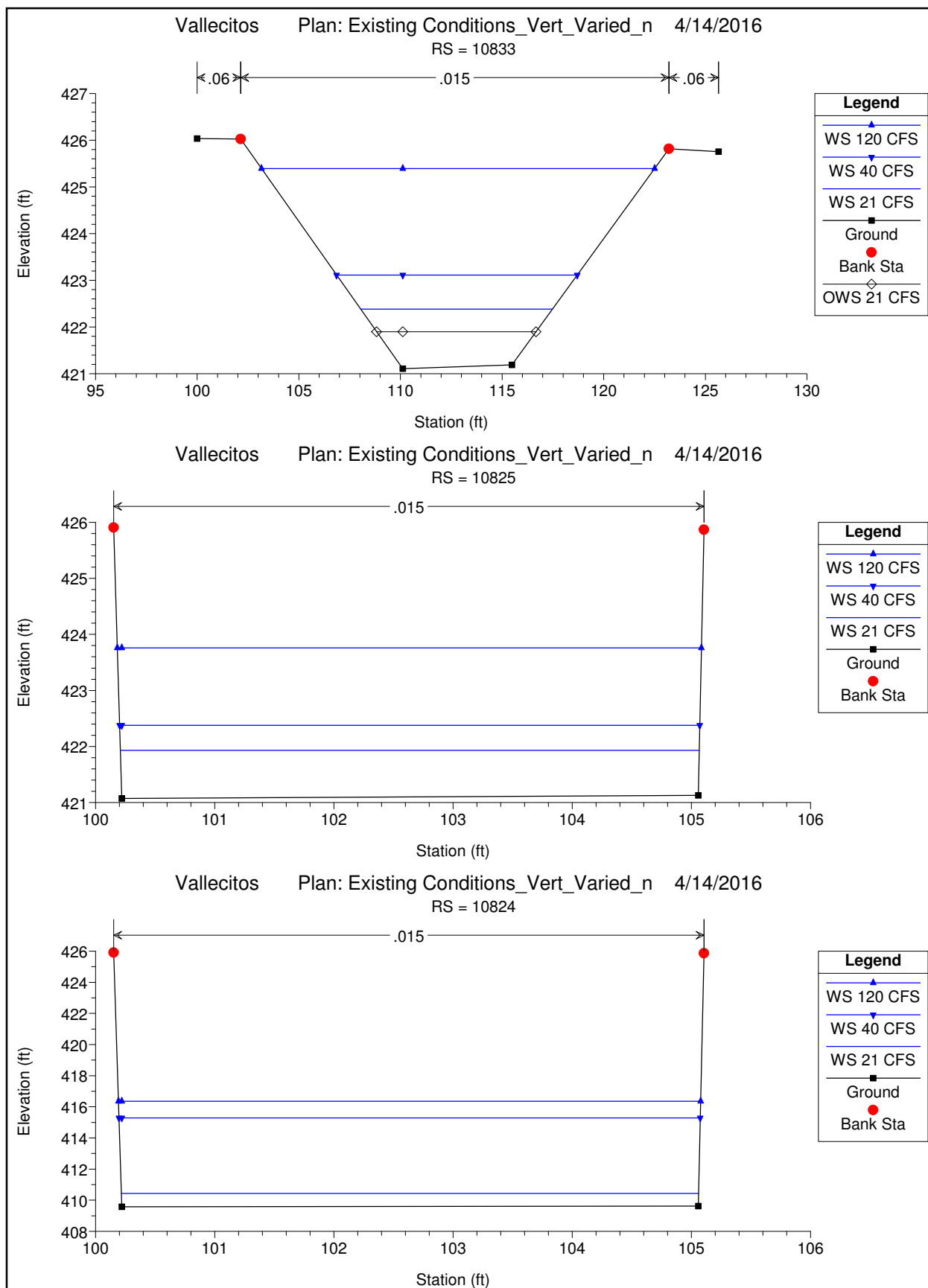


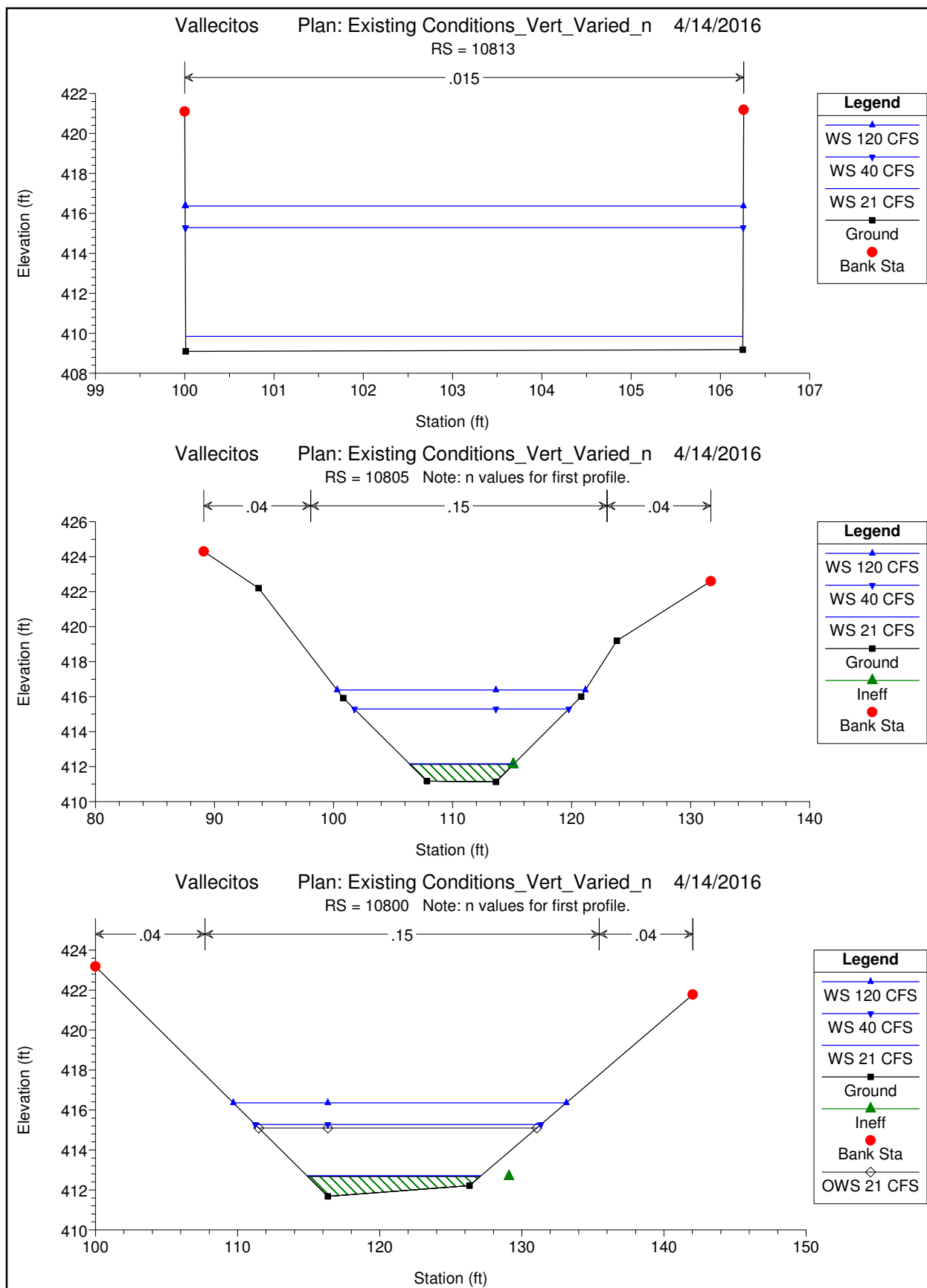


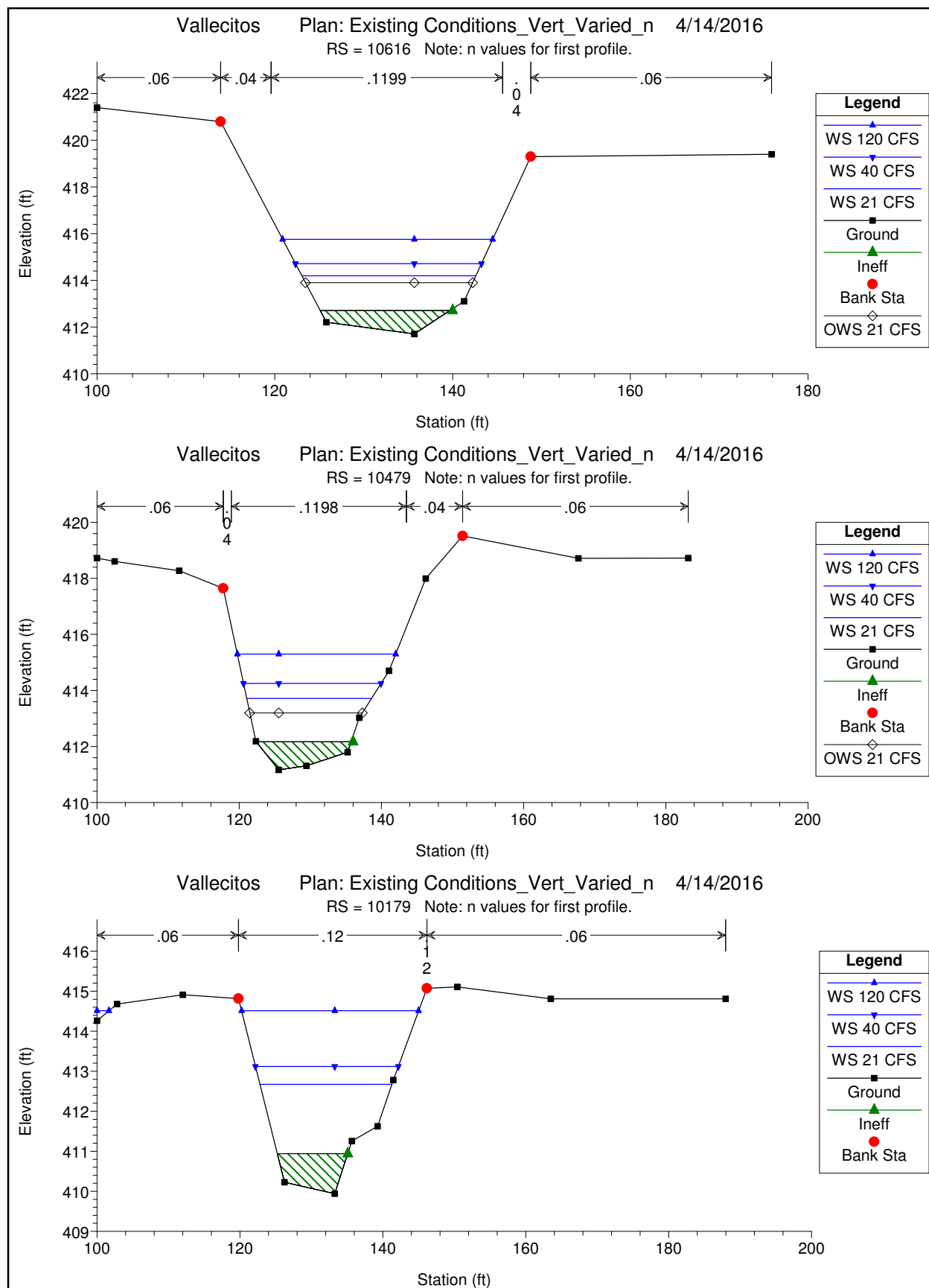


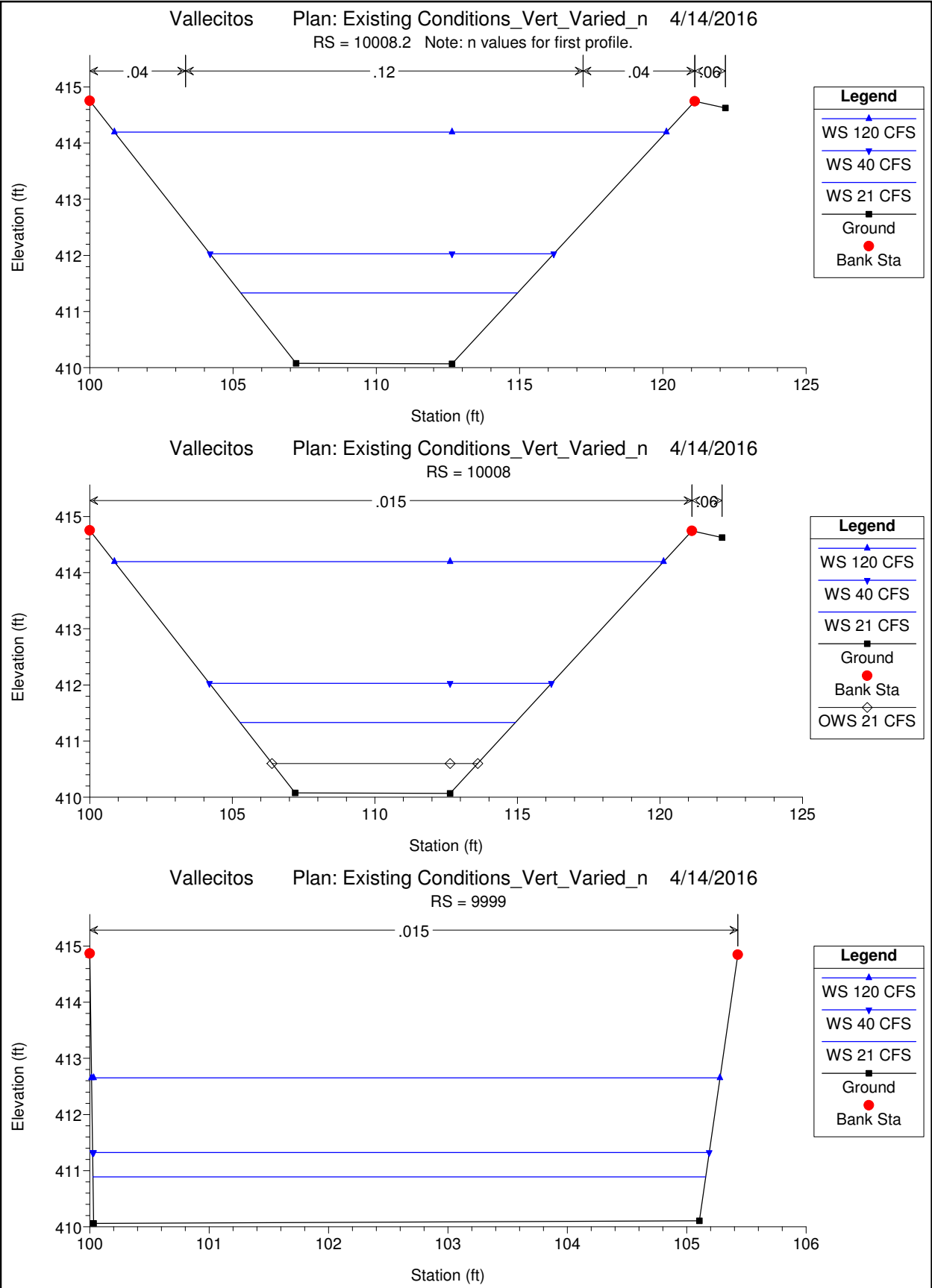


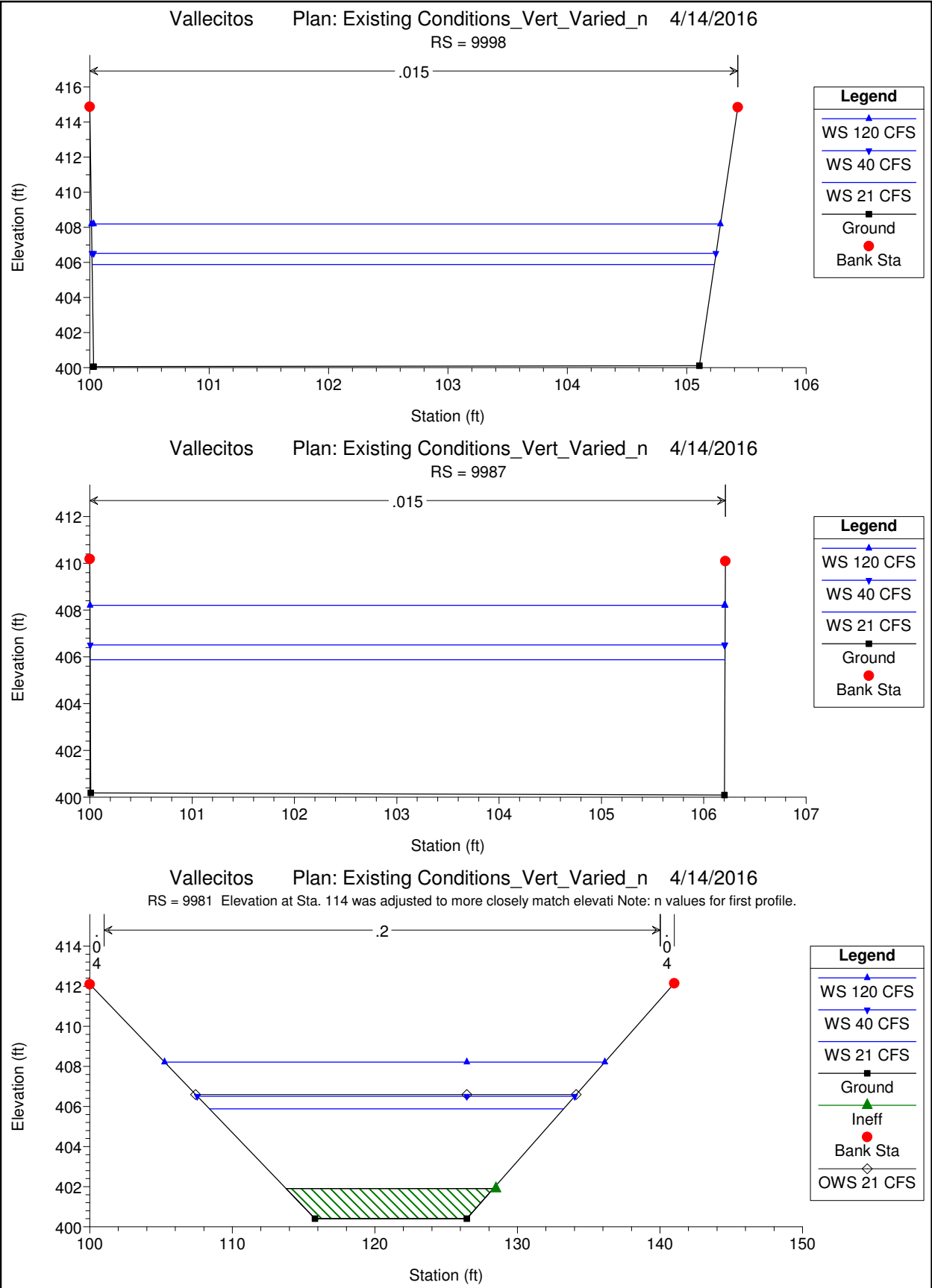


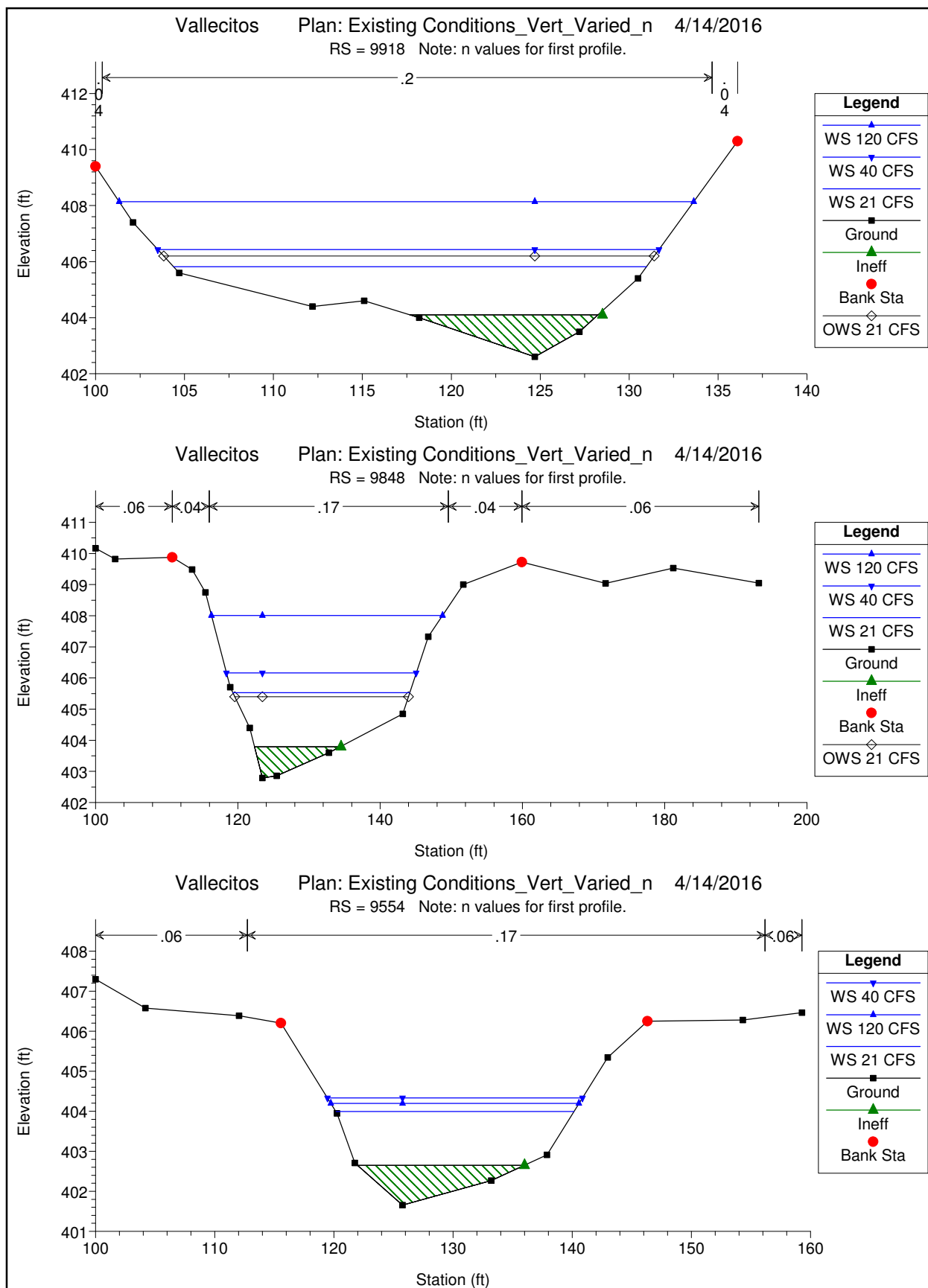


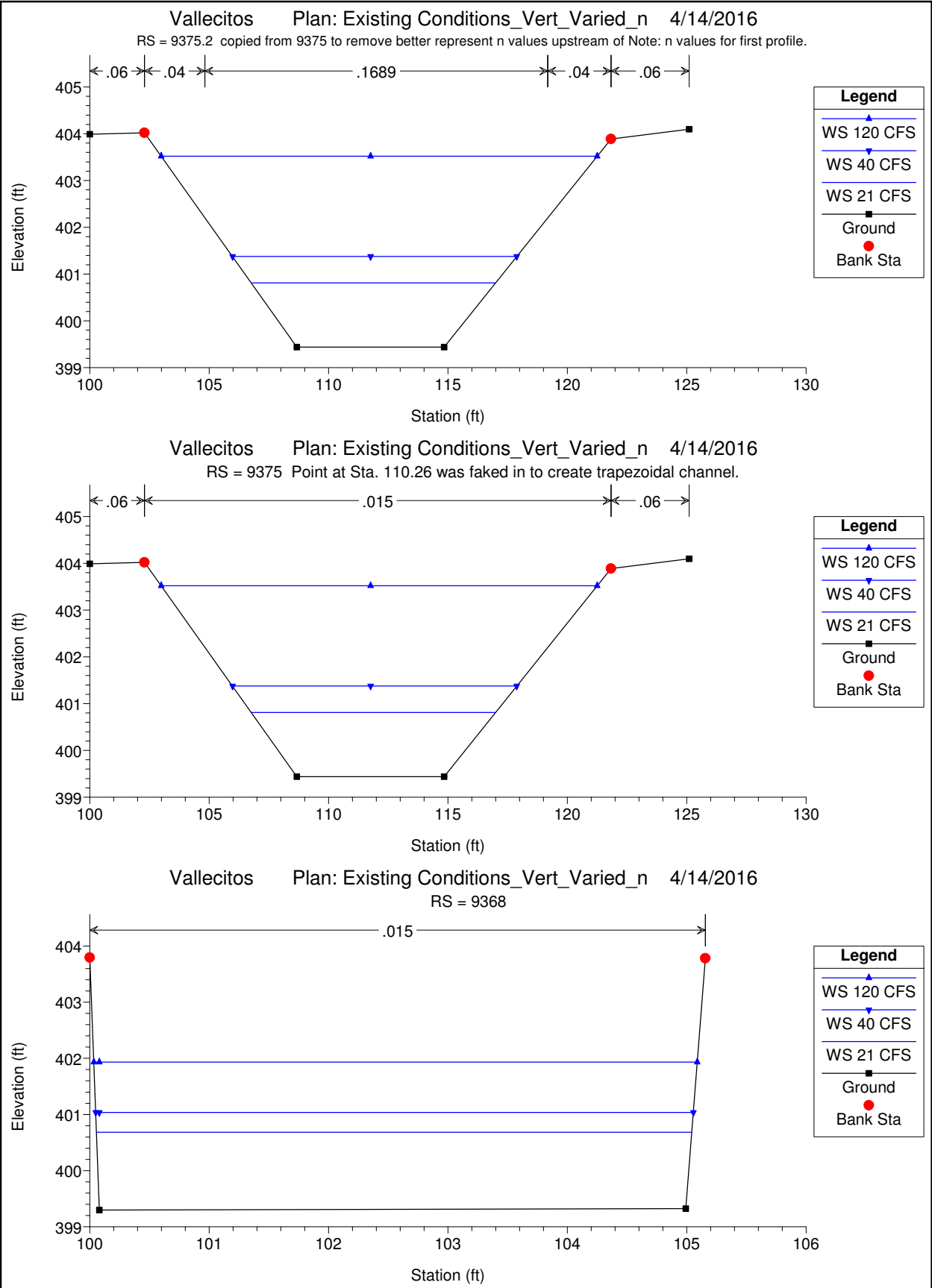


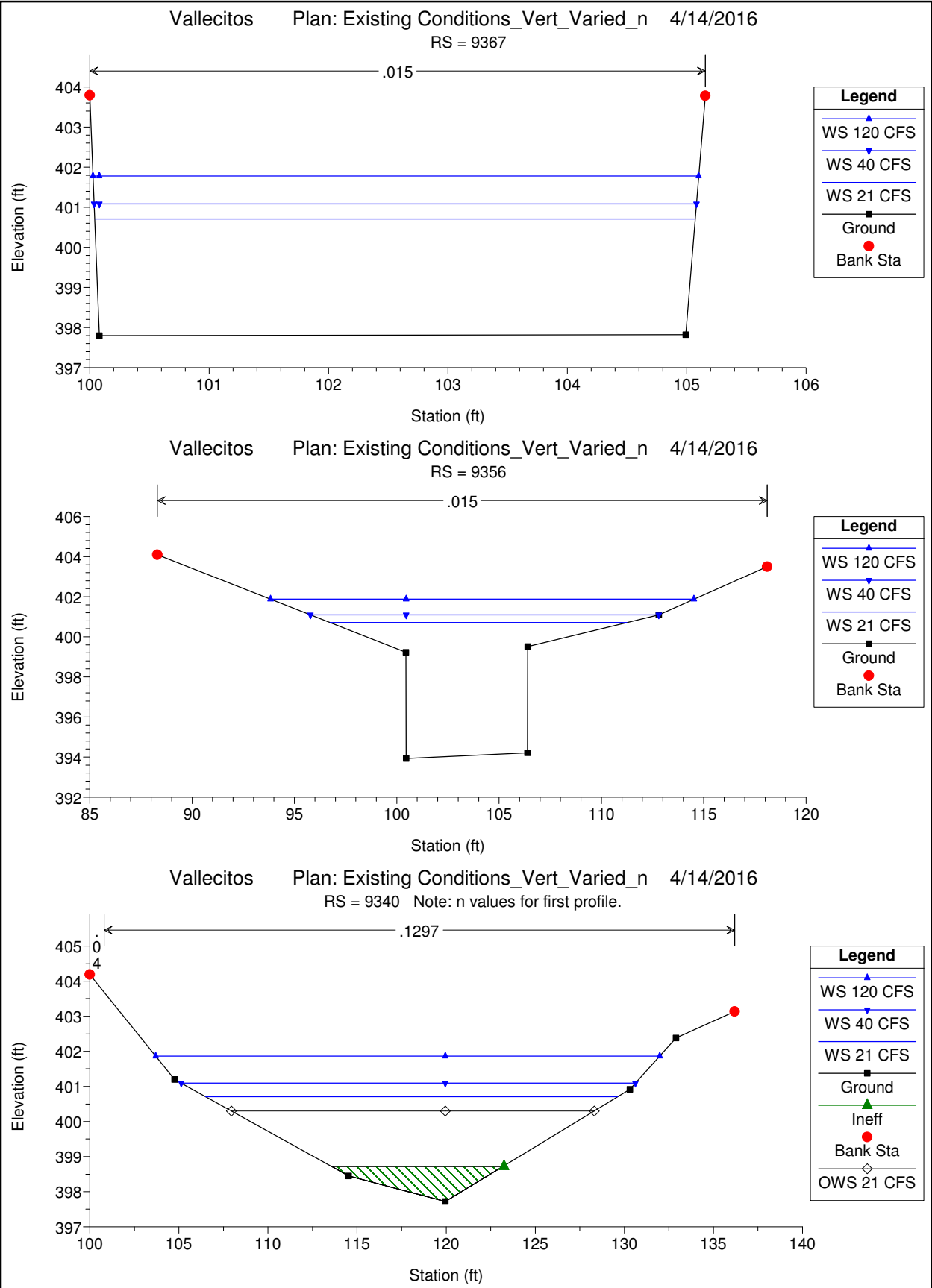


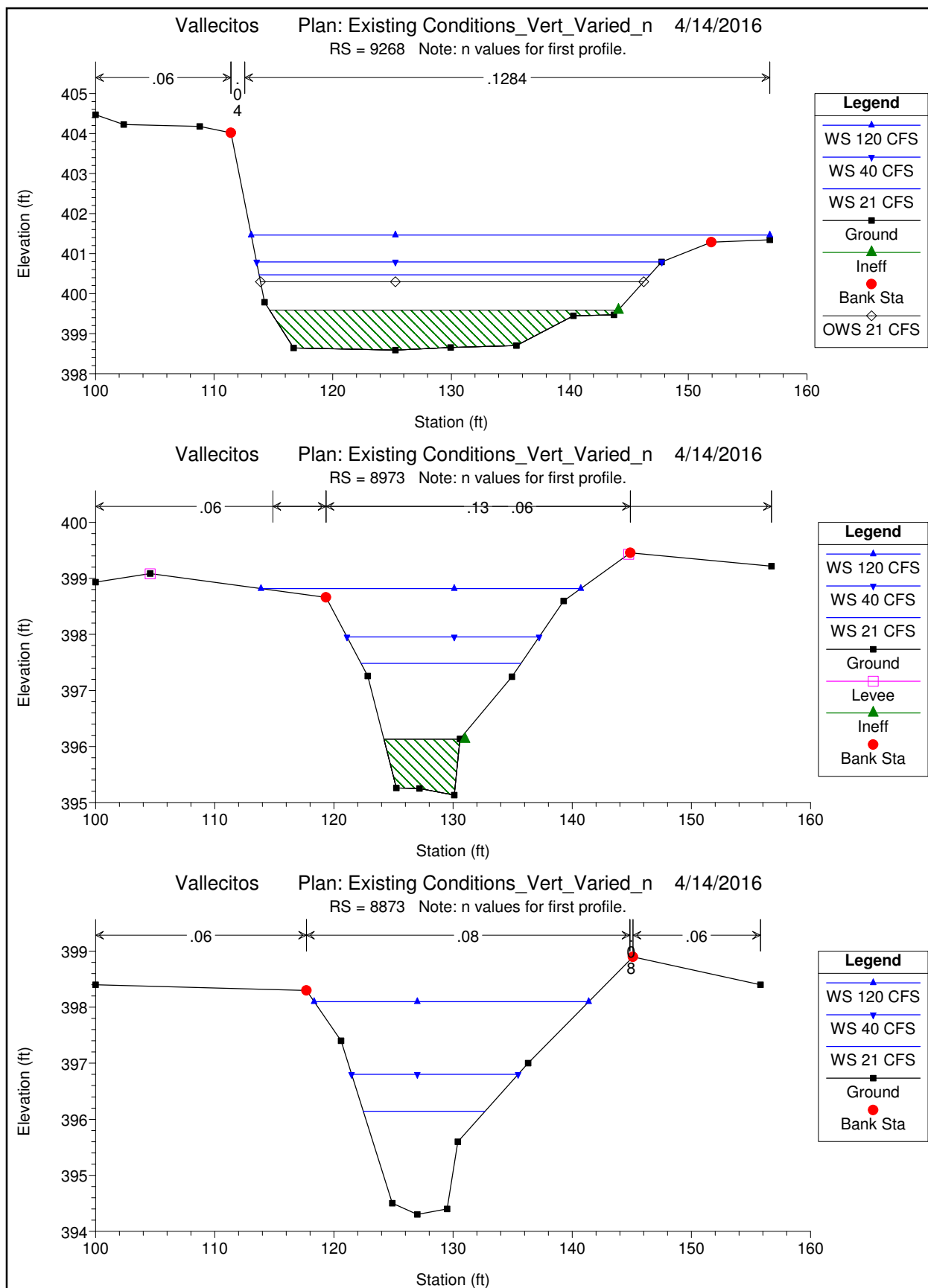


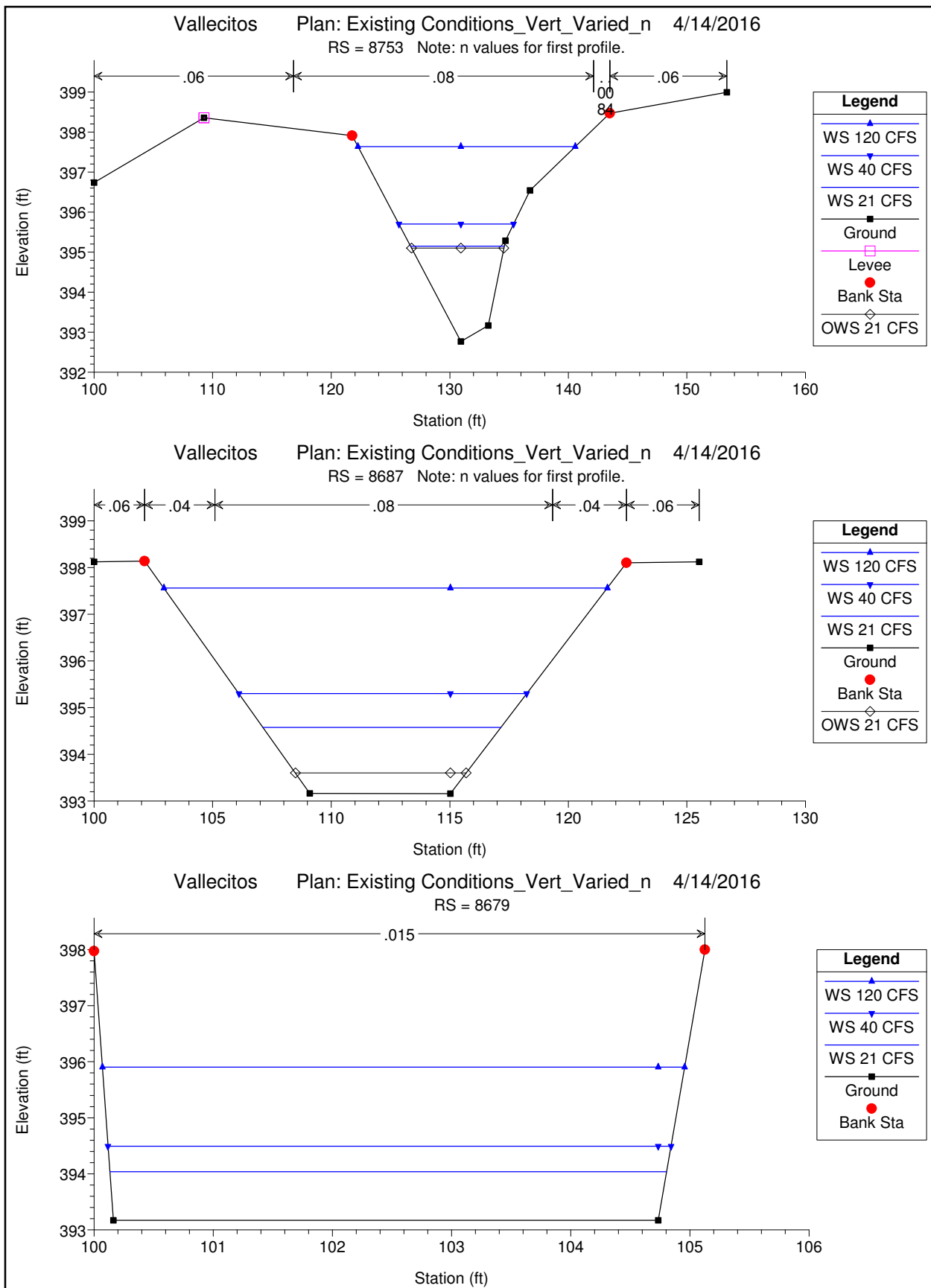


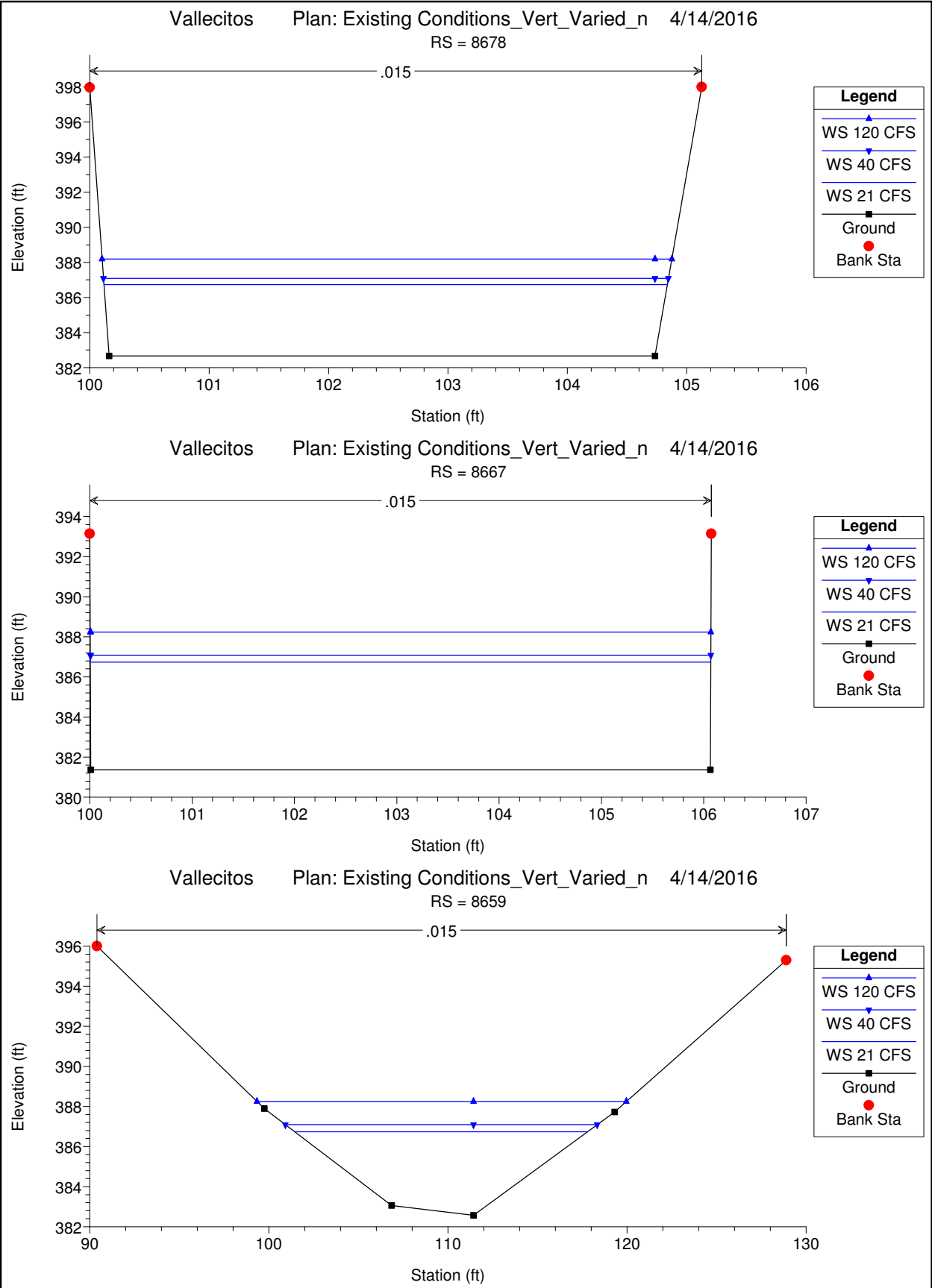


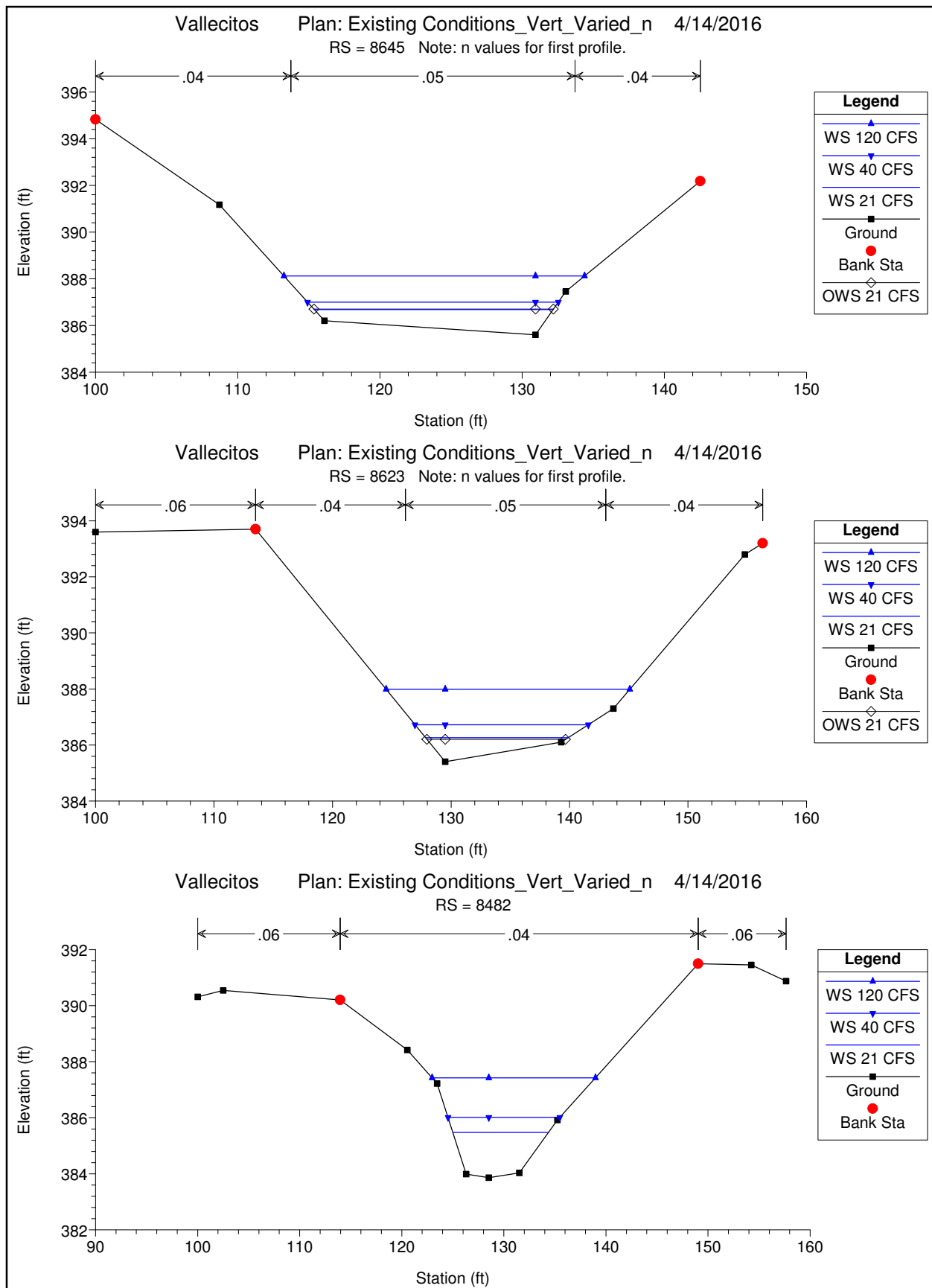


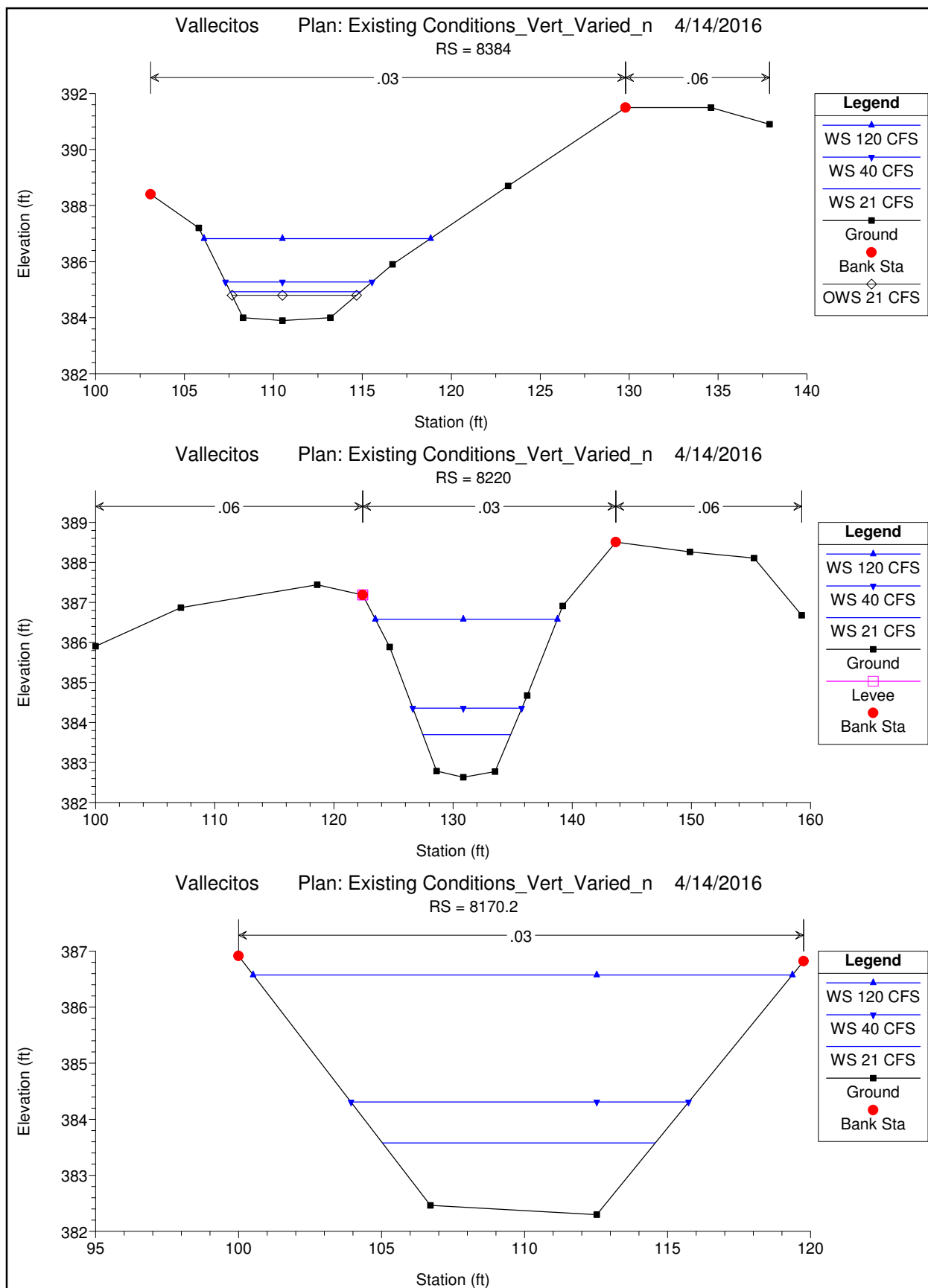


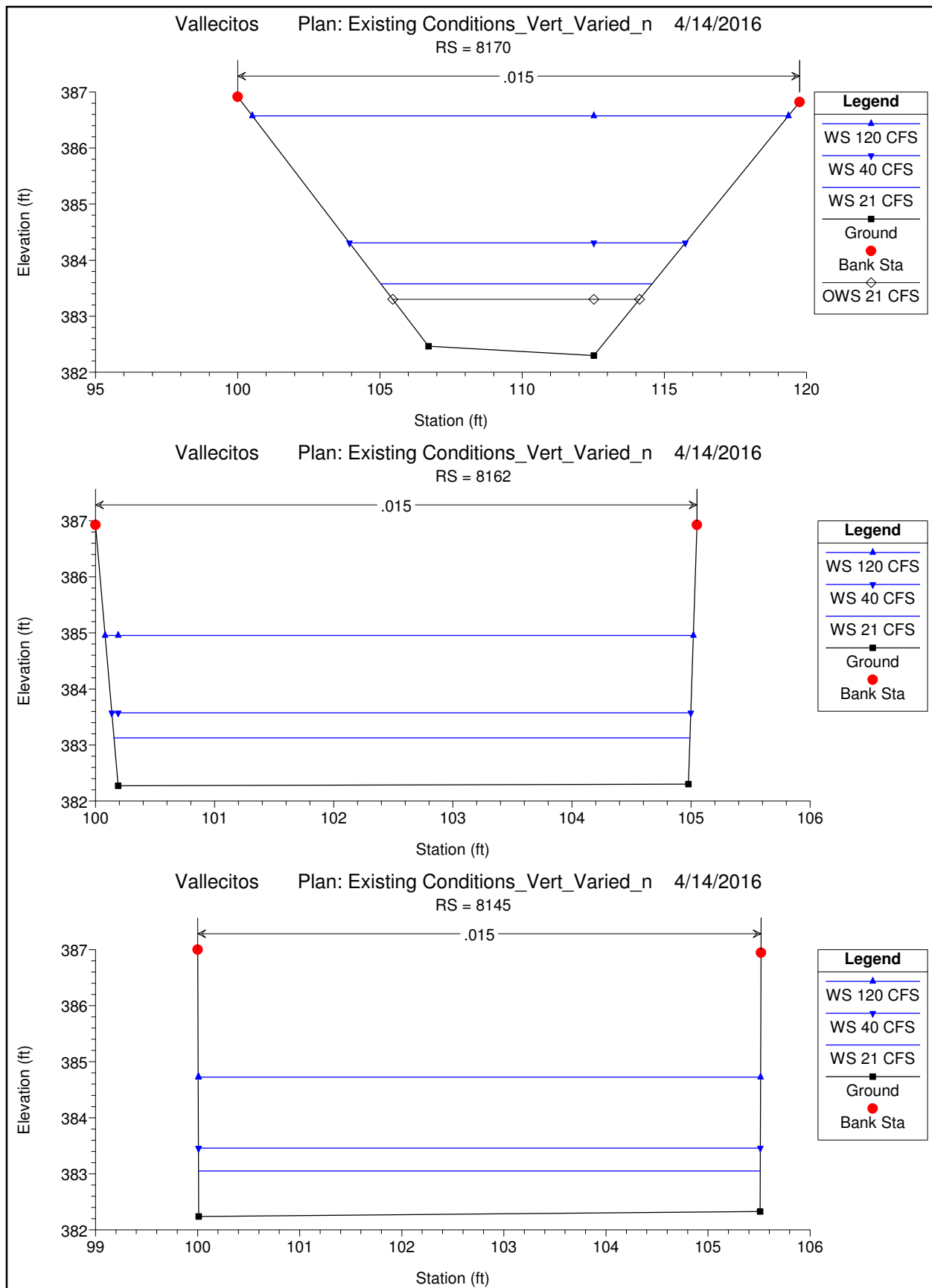


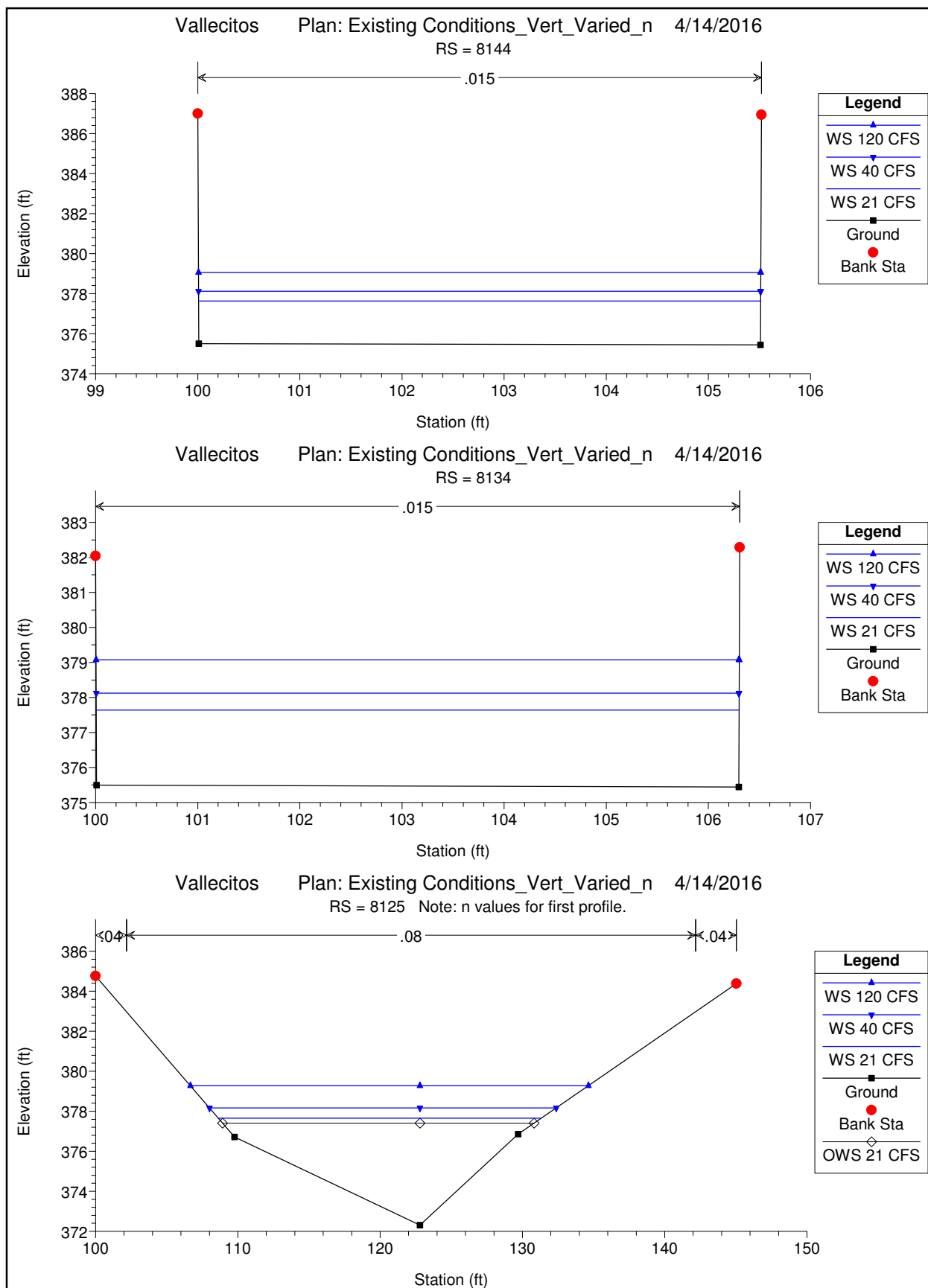


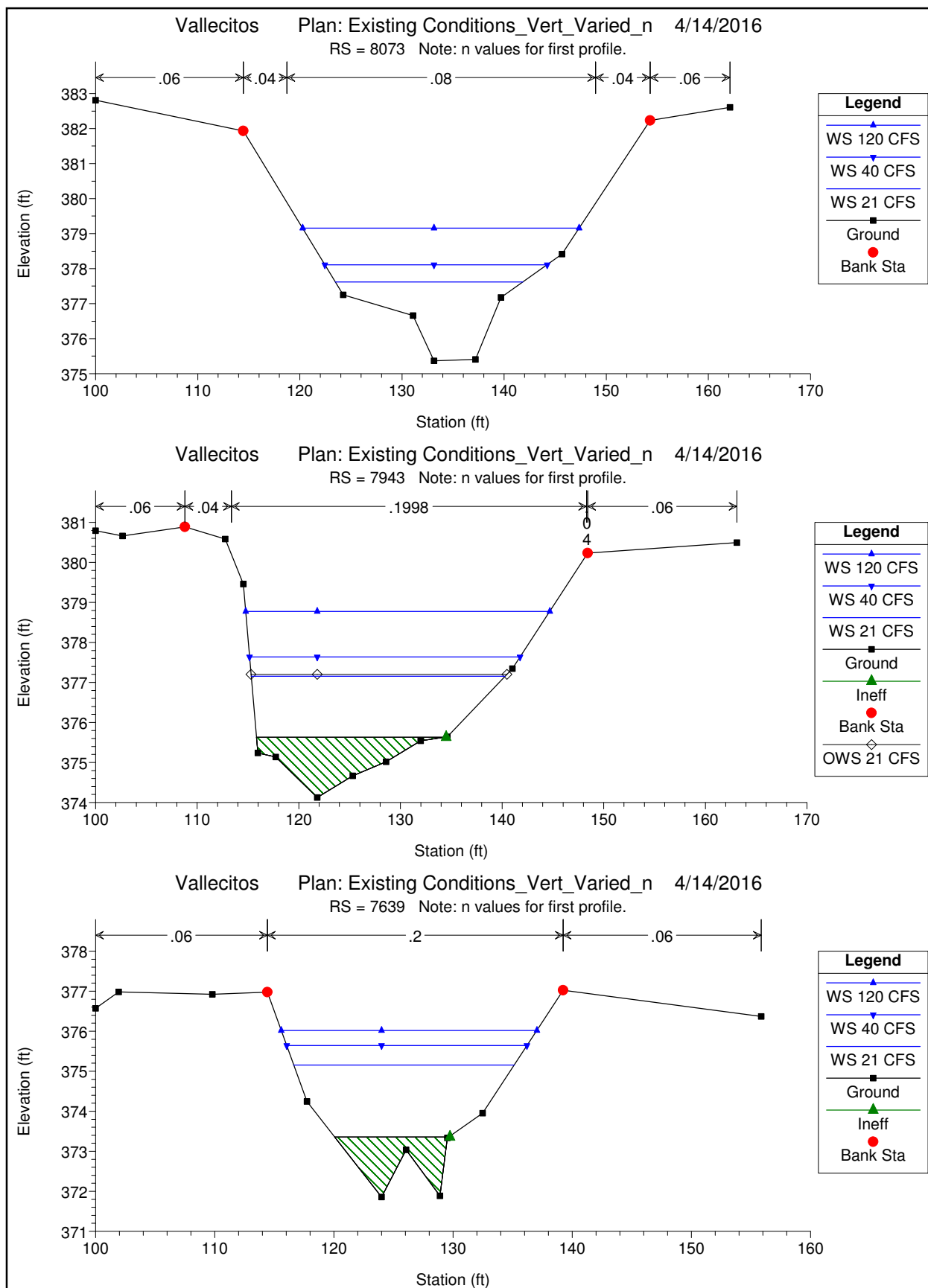


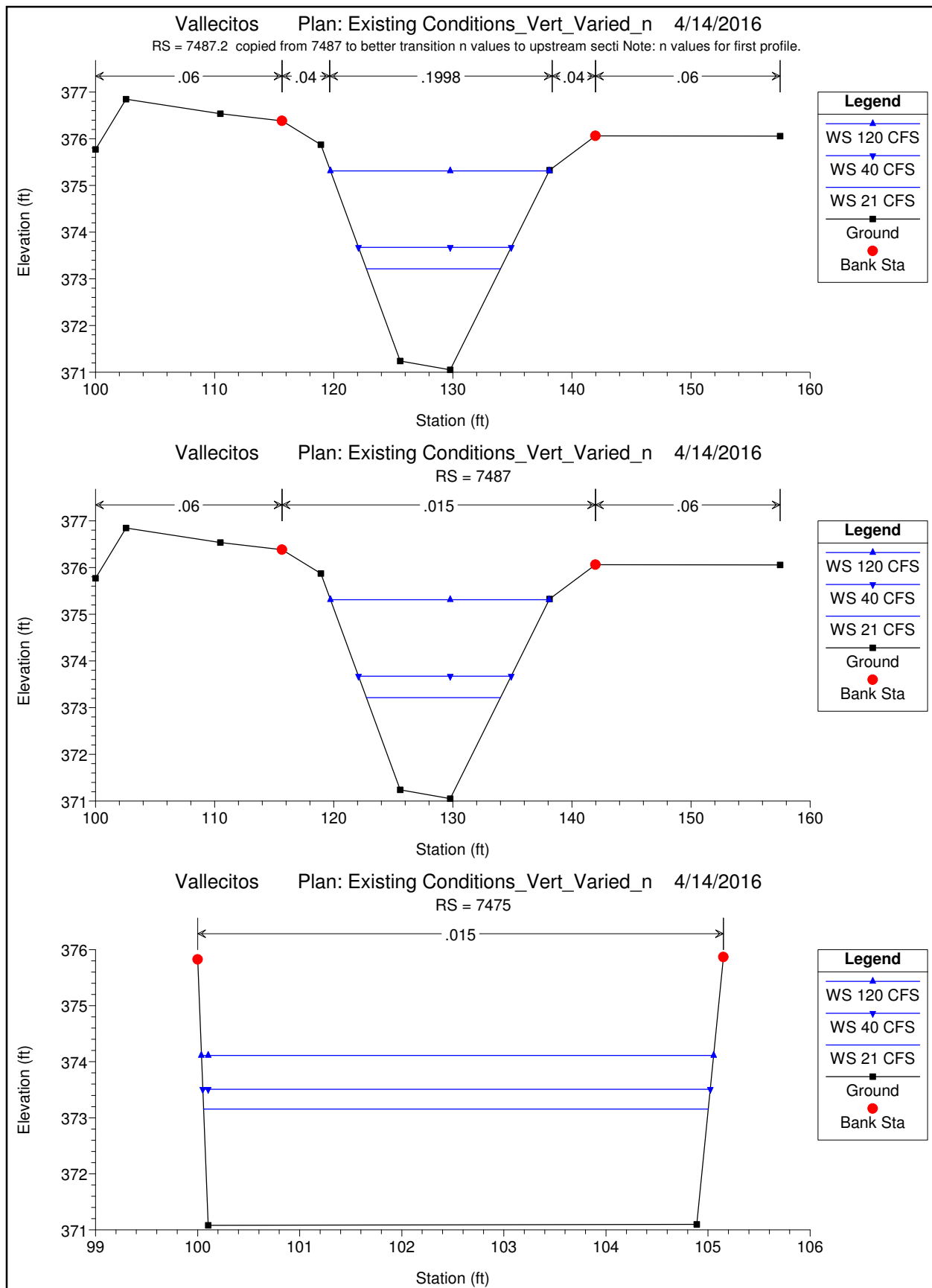


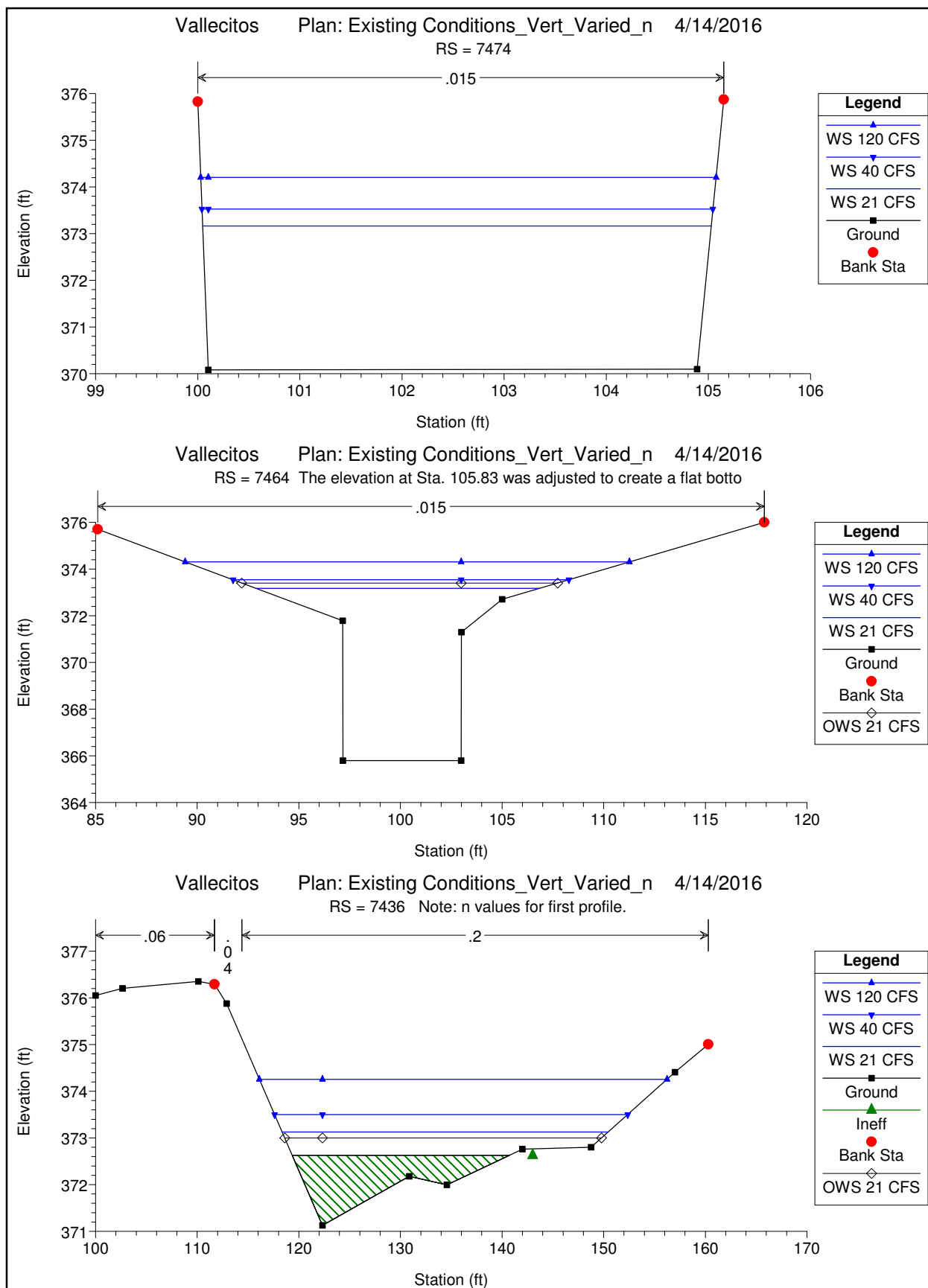


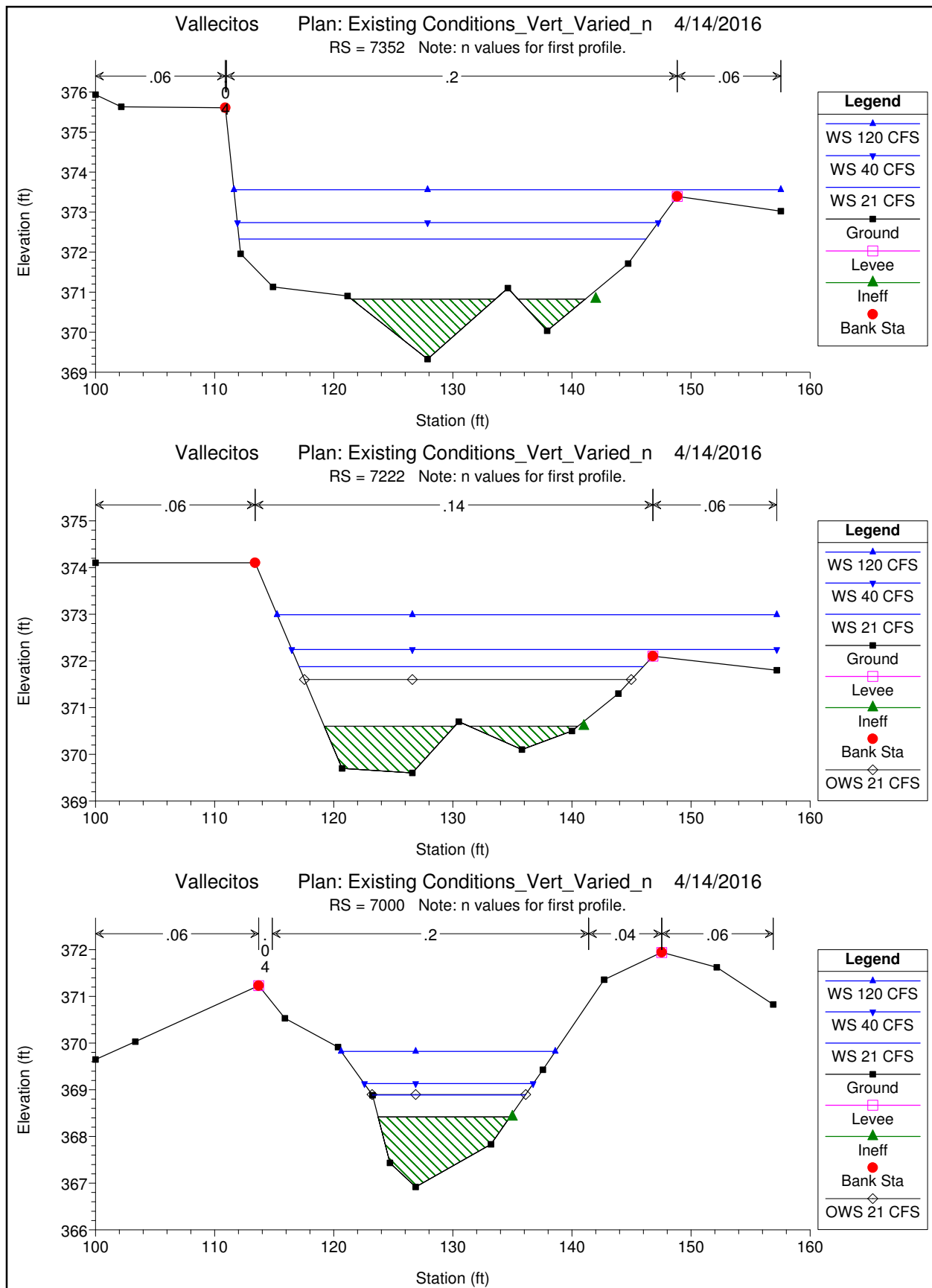


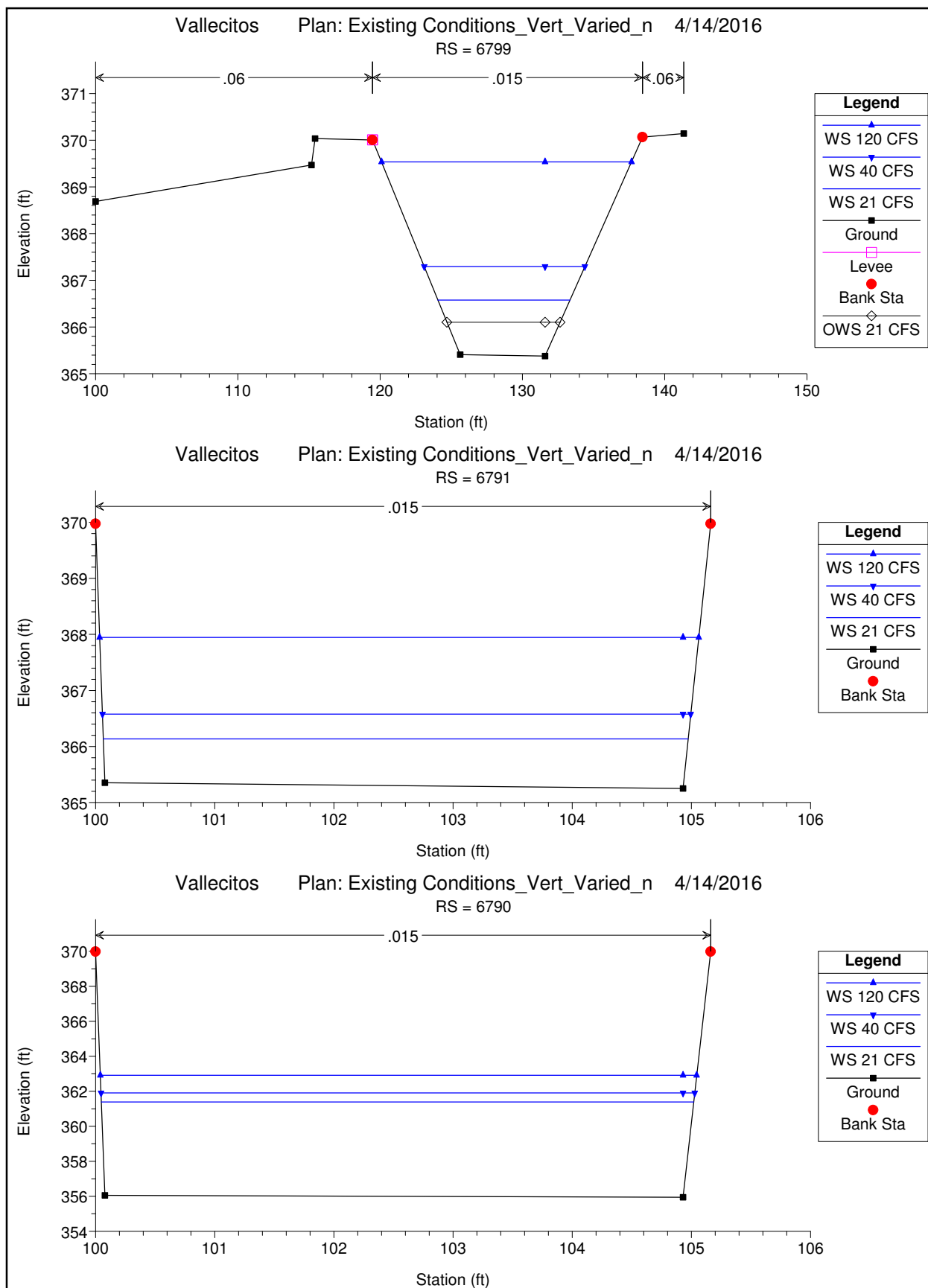


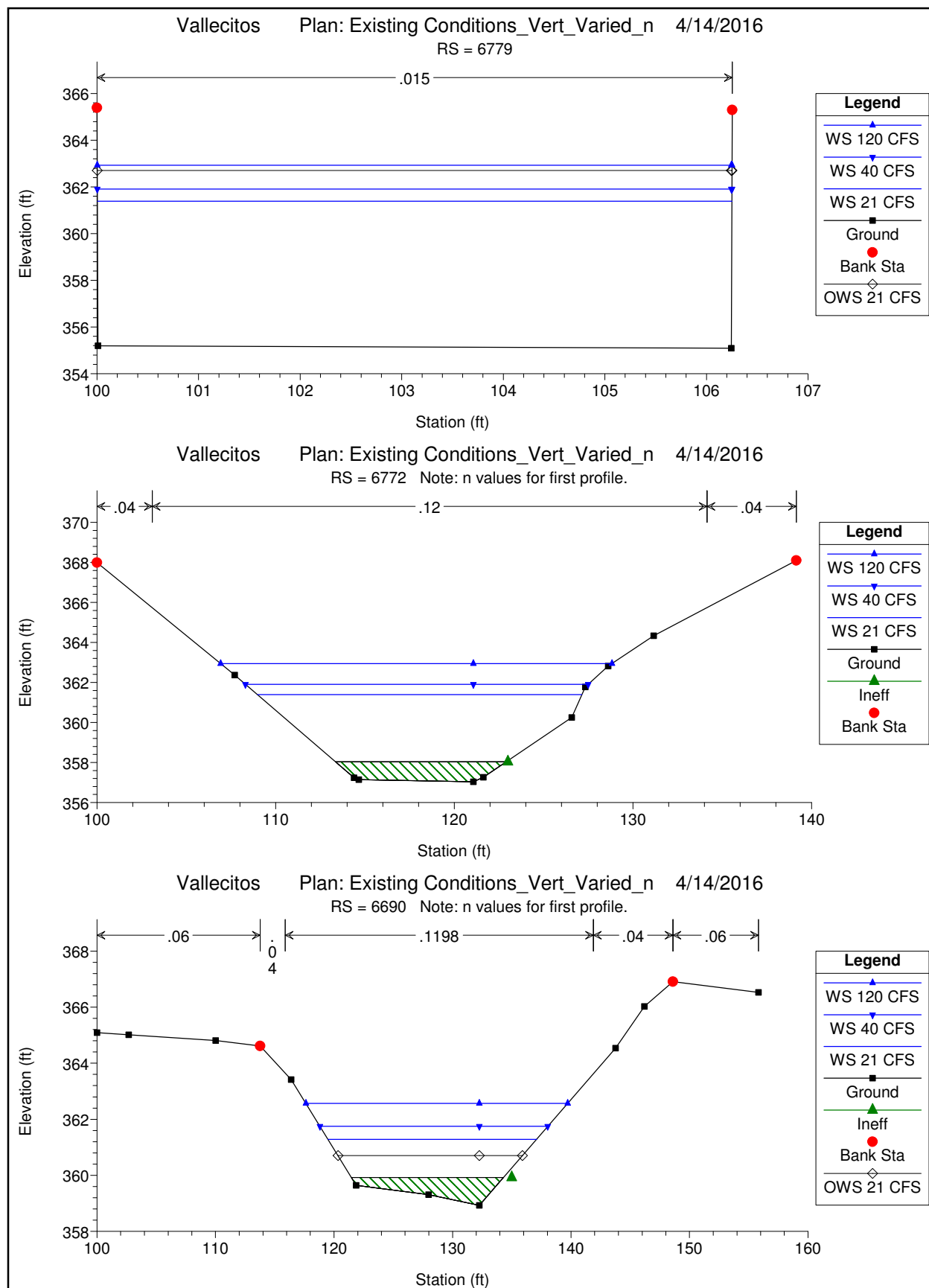


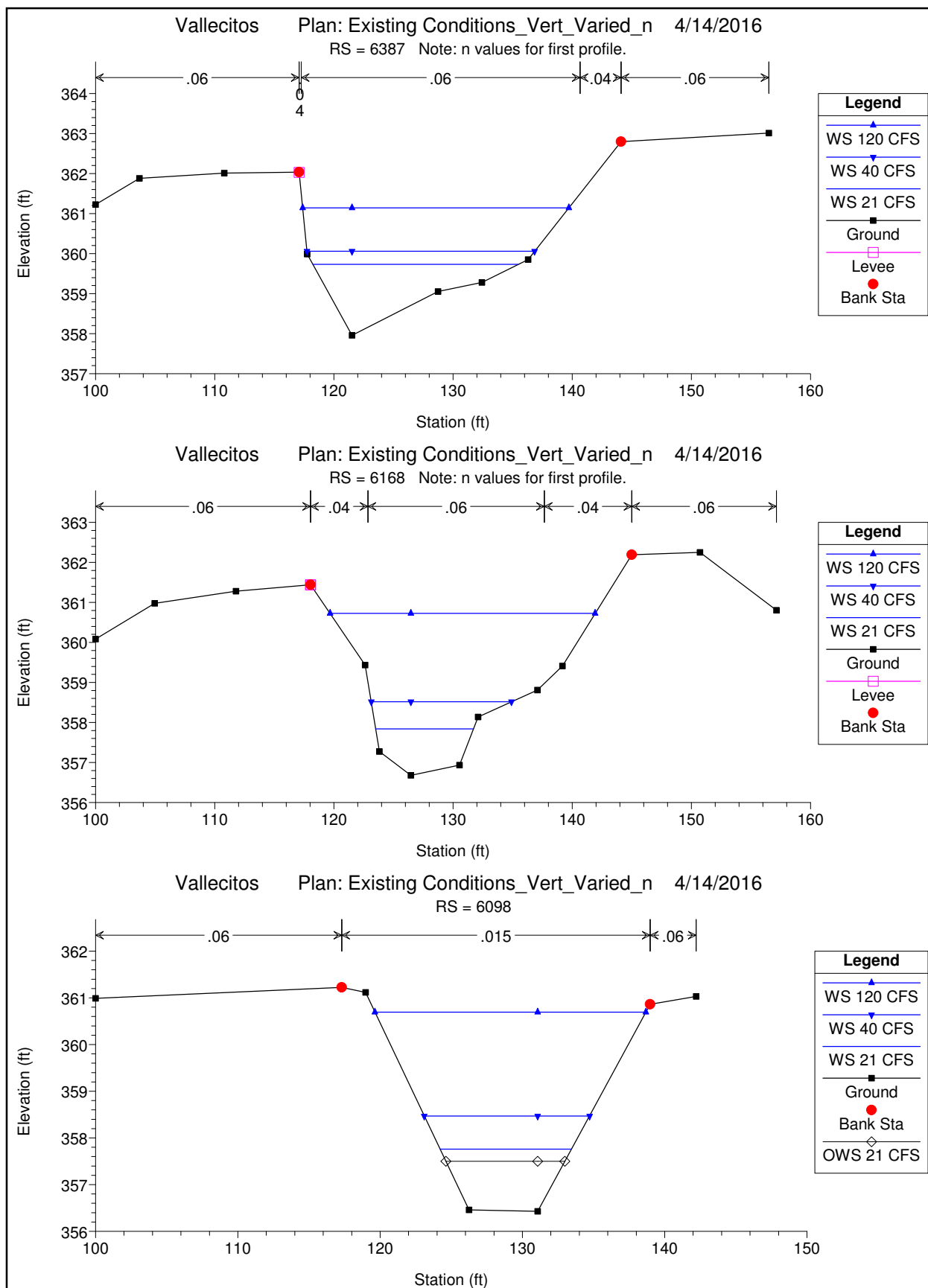


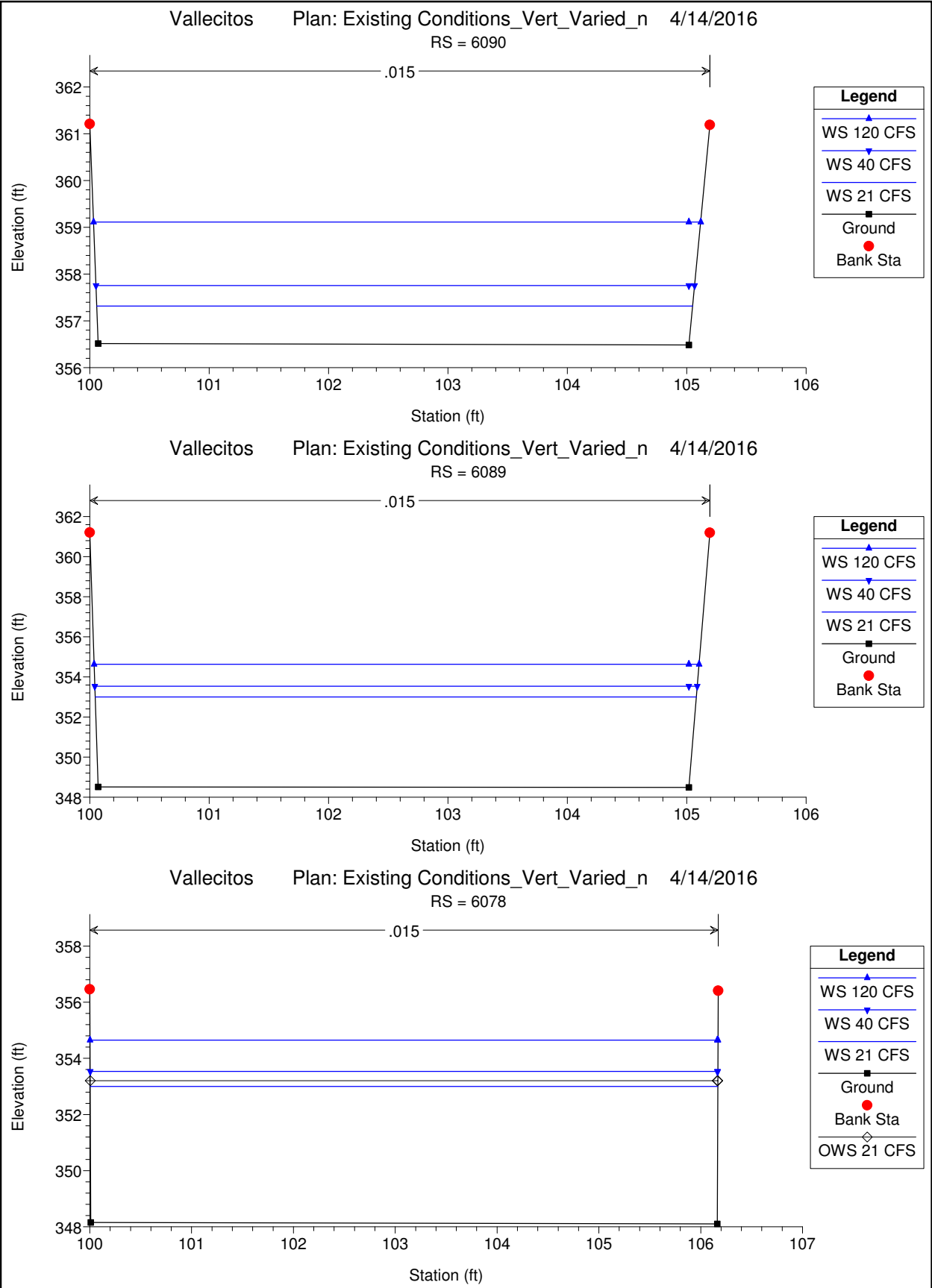


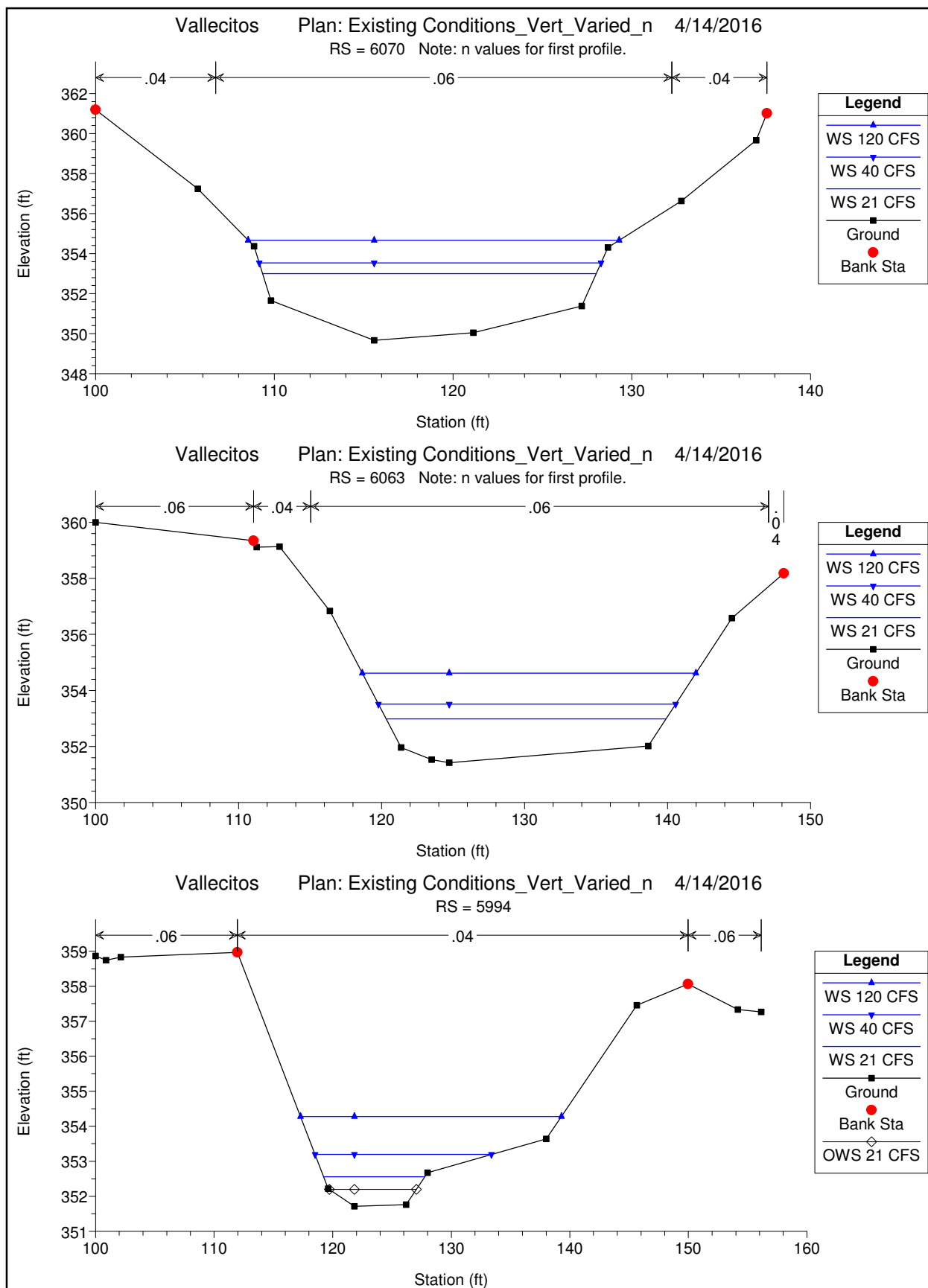


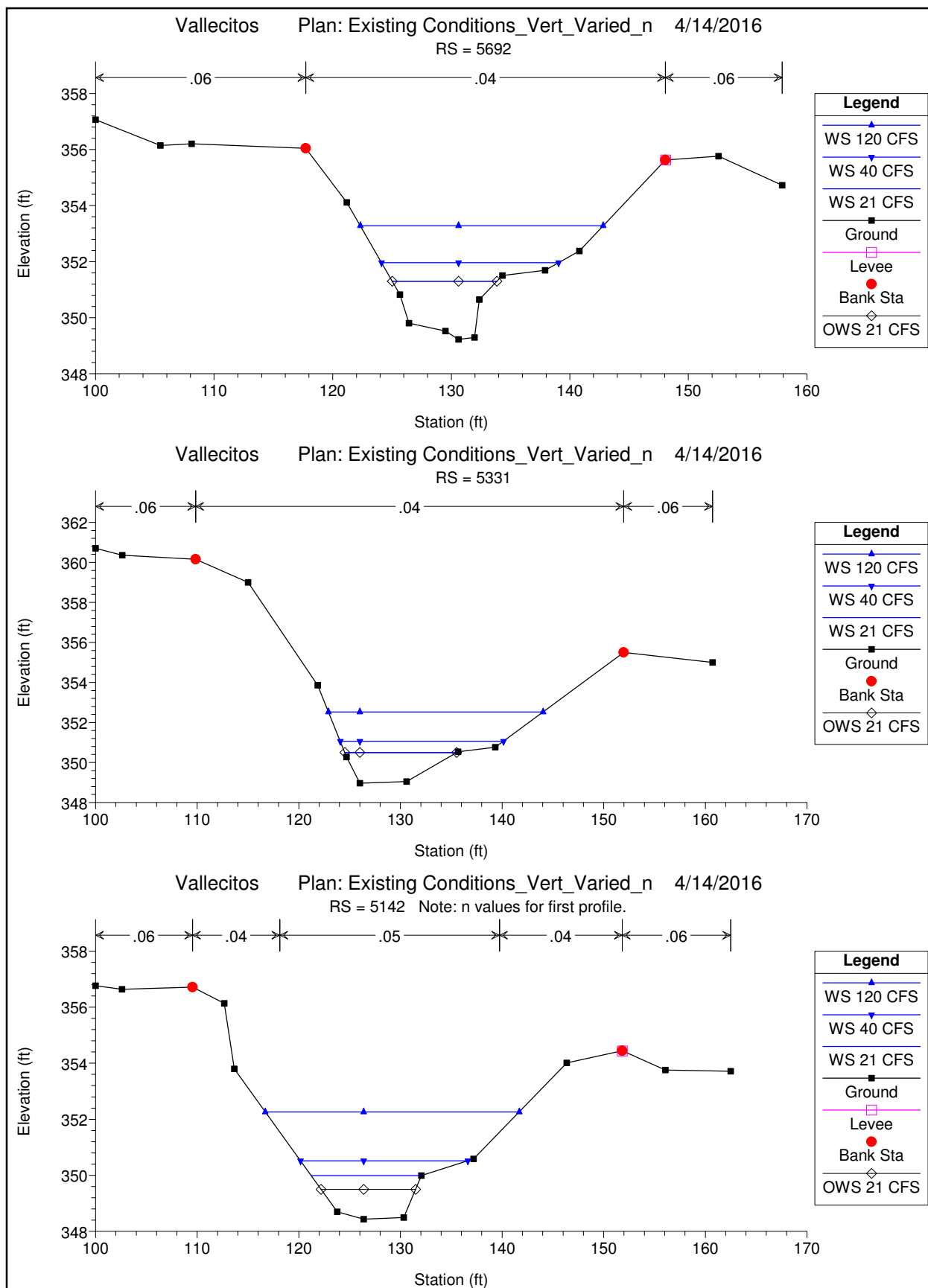


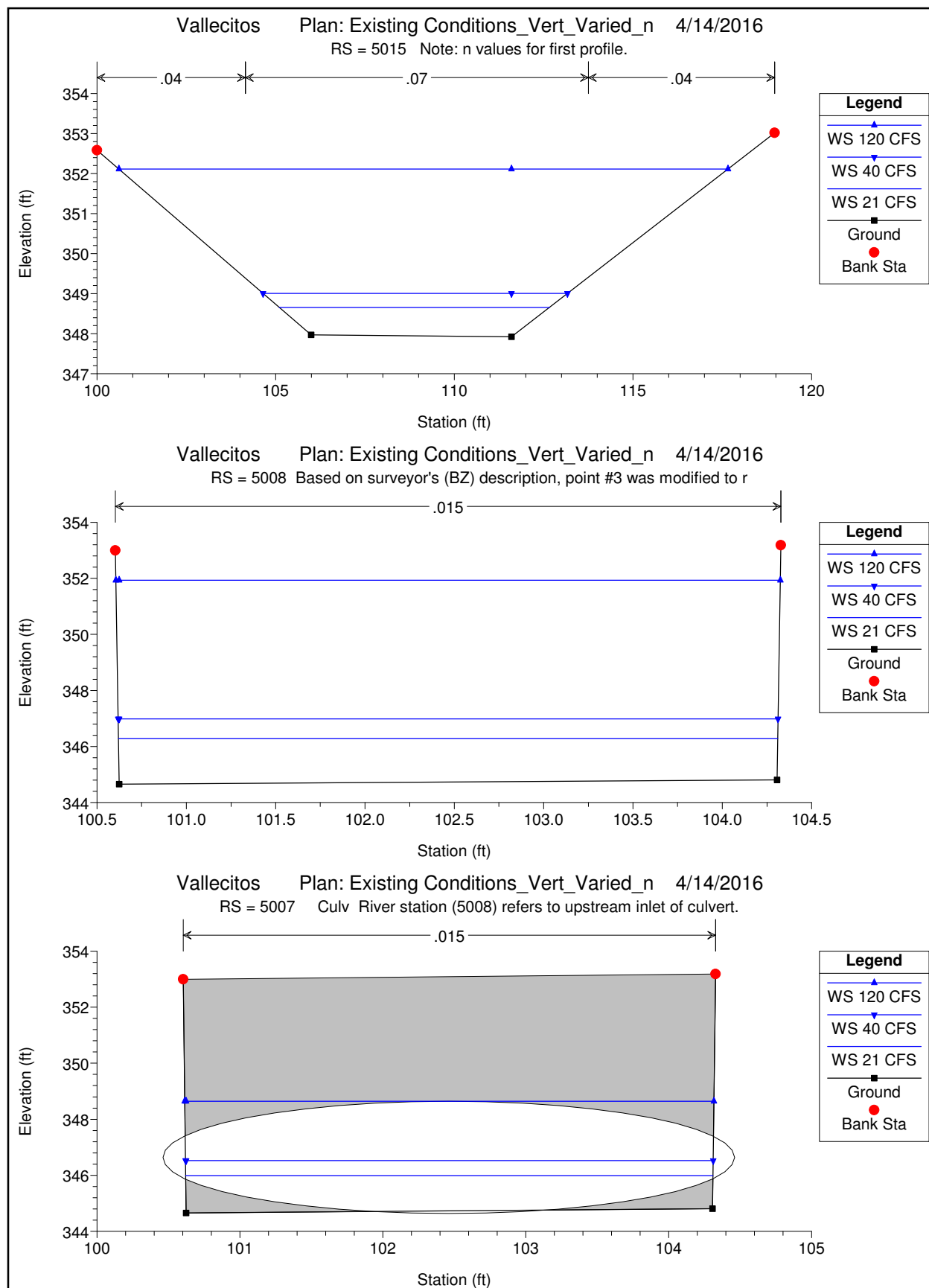




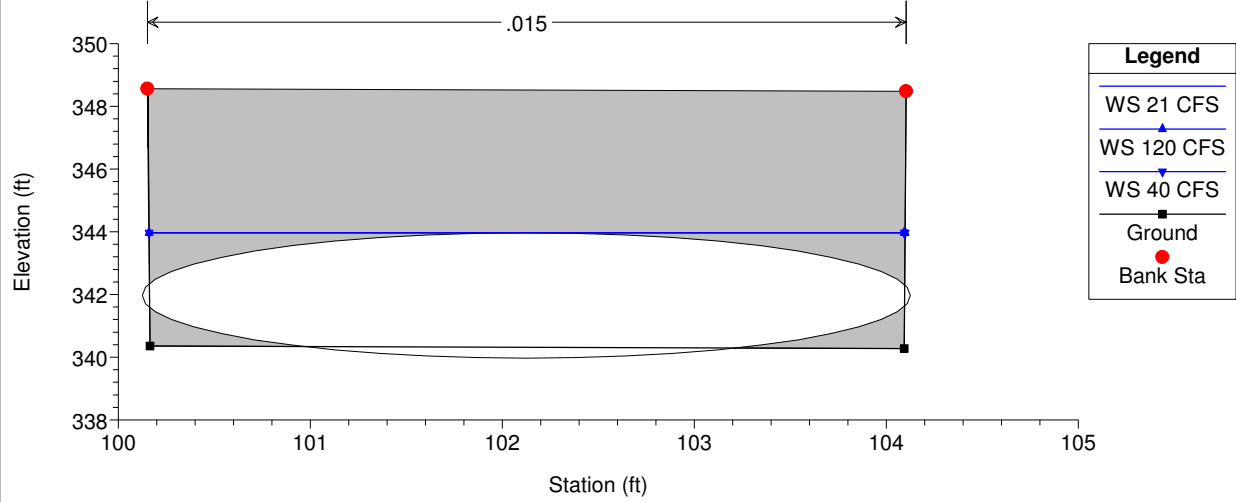




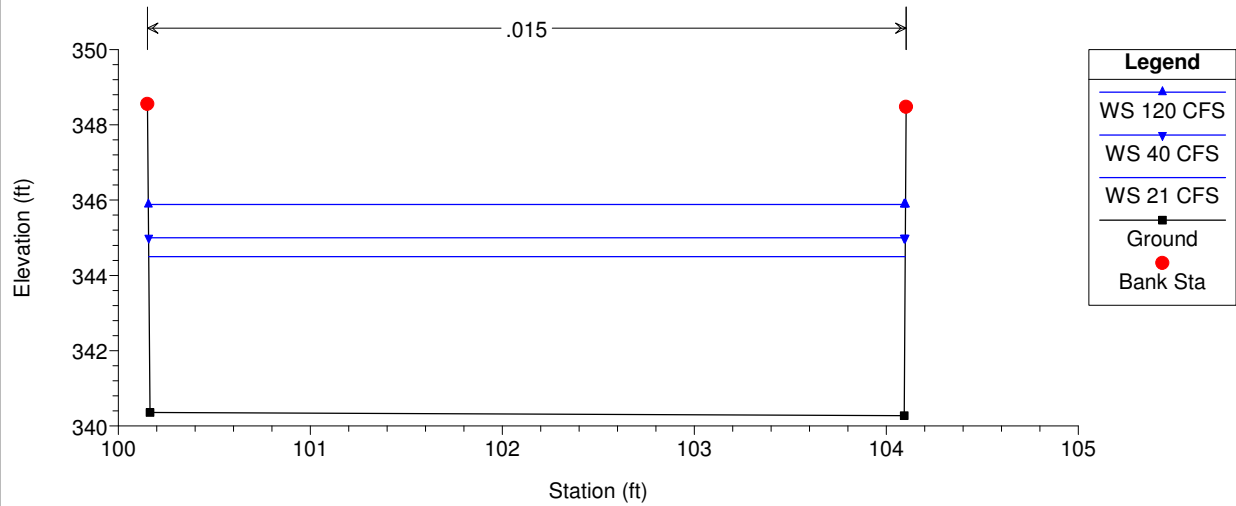




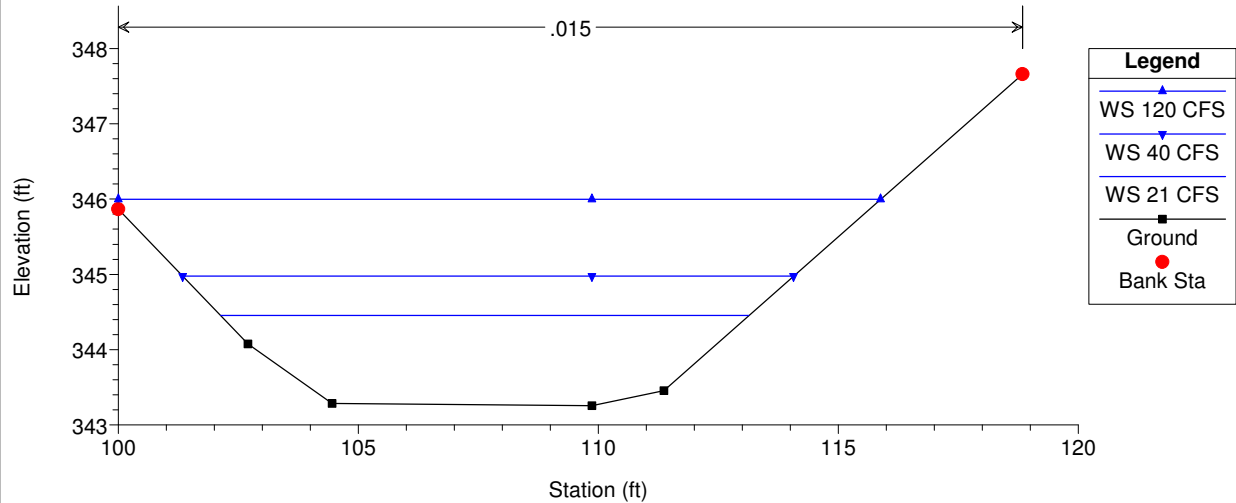
Vallecitos Plan: Existing Conditions_Vert_Varied_n 4/14/2016
RS = 5007 Culv River station (5008) refers to upstream inlet of culvert.

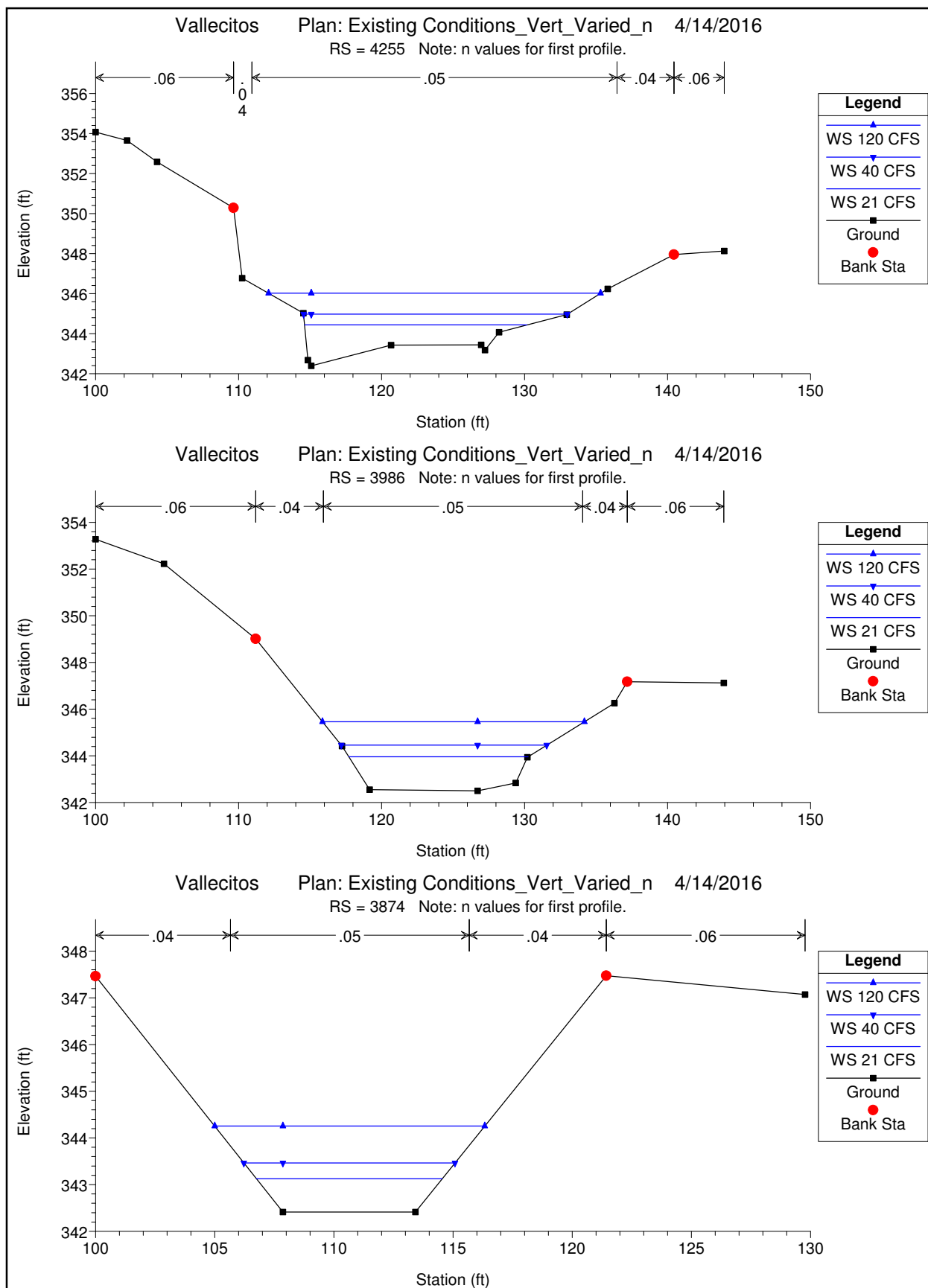


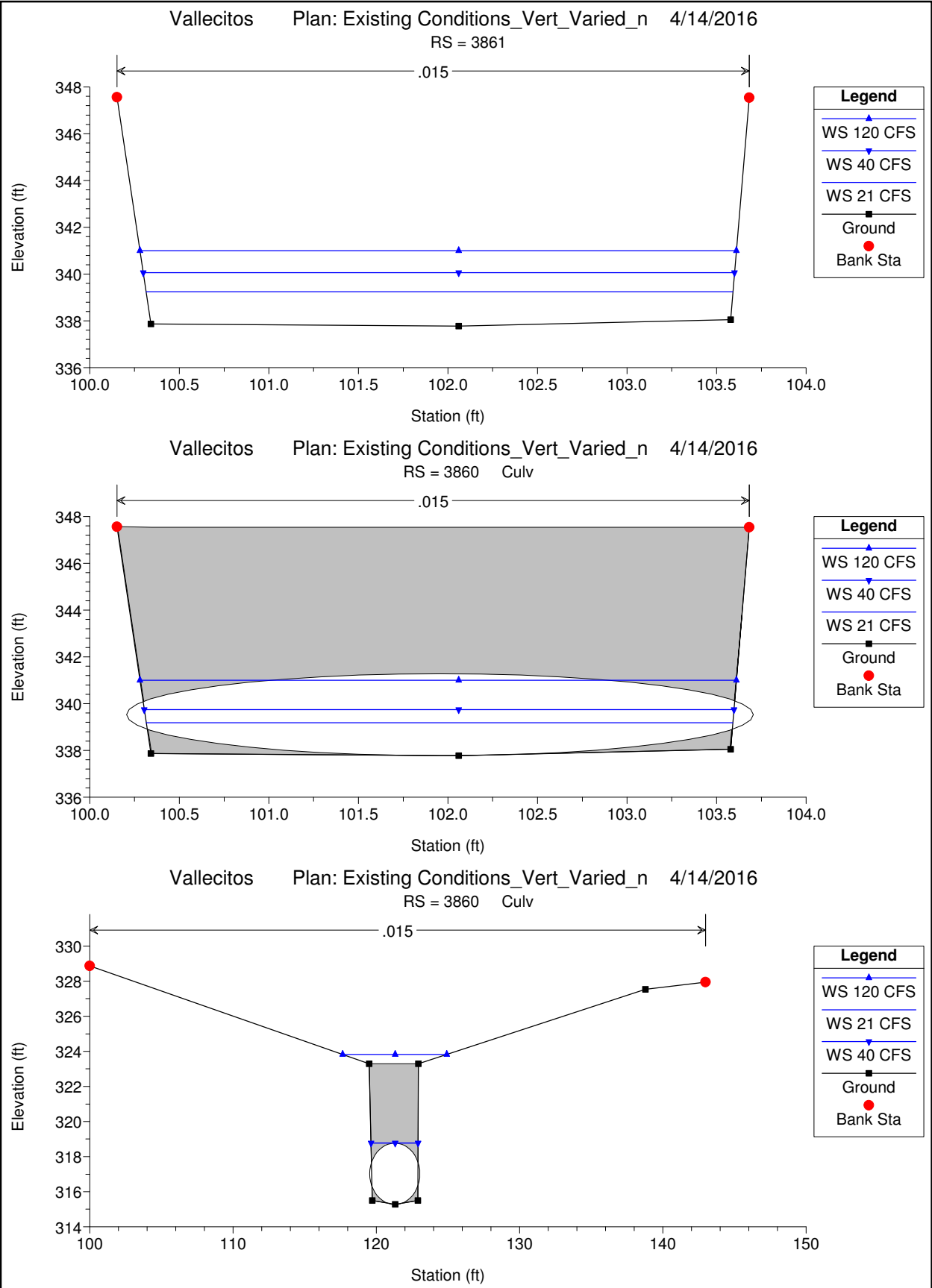
Vallecitos Plan: Existing Conditions_Vert_Varied_n 4/14/2016
RS = 4321

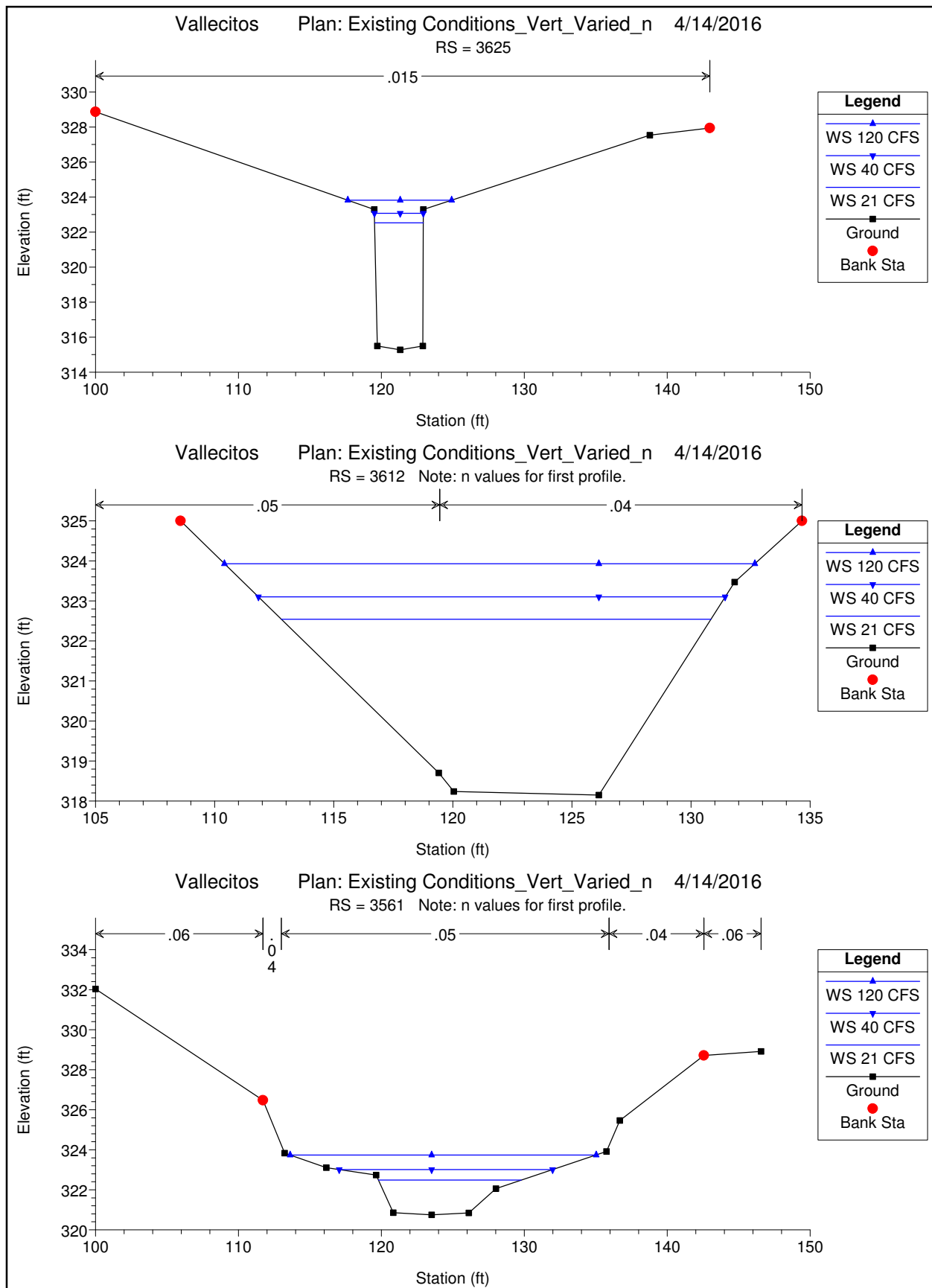


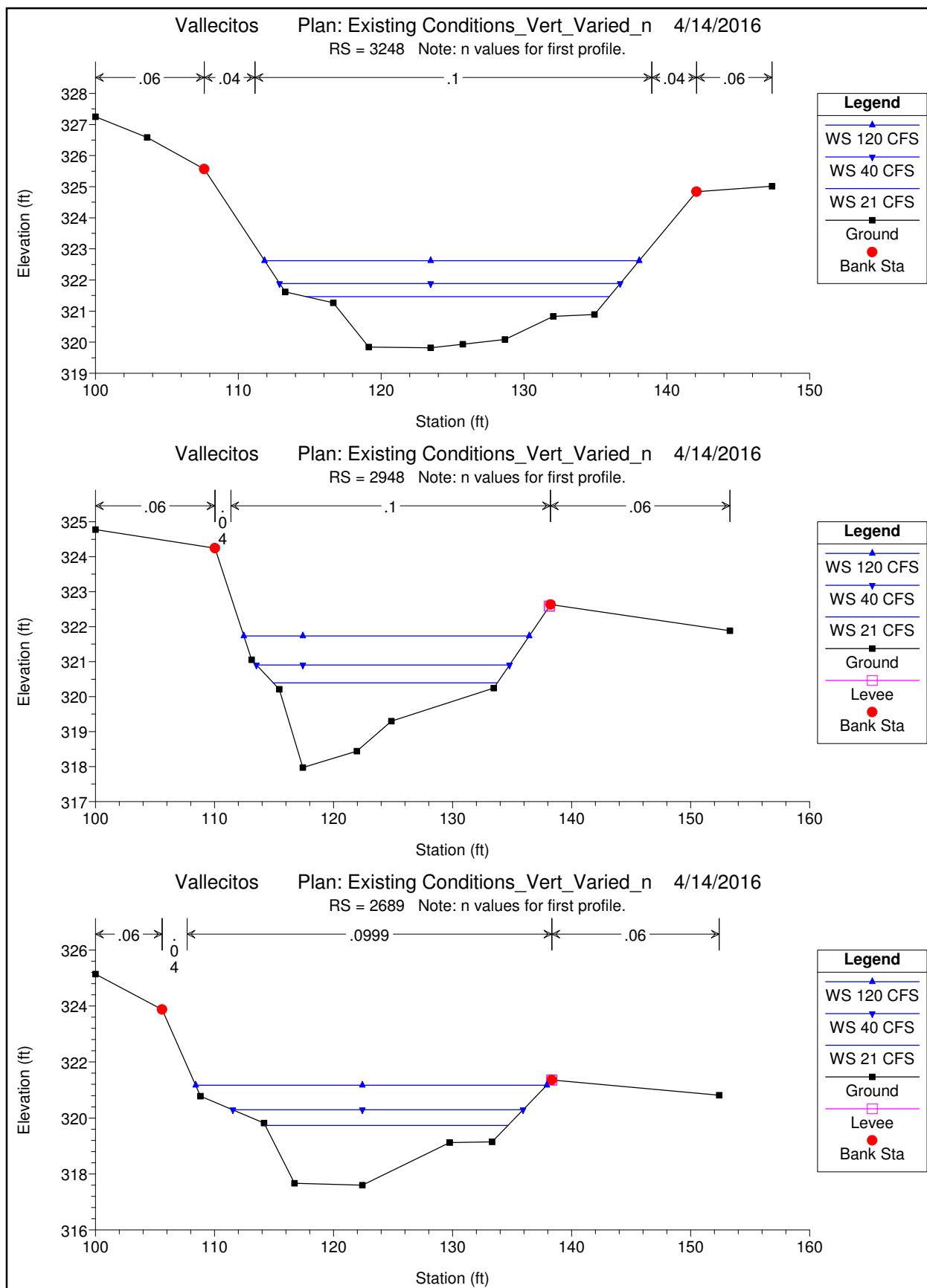
Vallecitos Plan: Existing Conditions_Vert_Varied_n 4/14/2016
RS = 4308

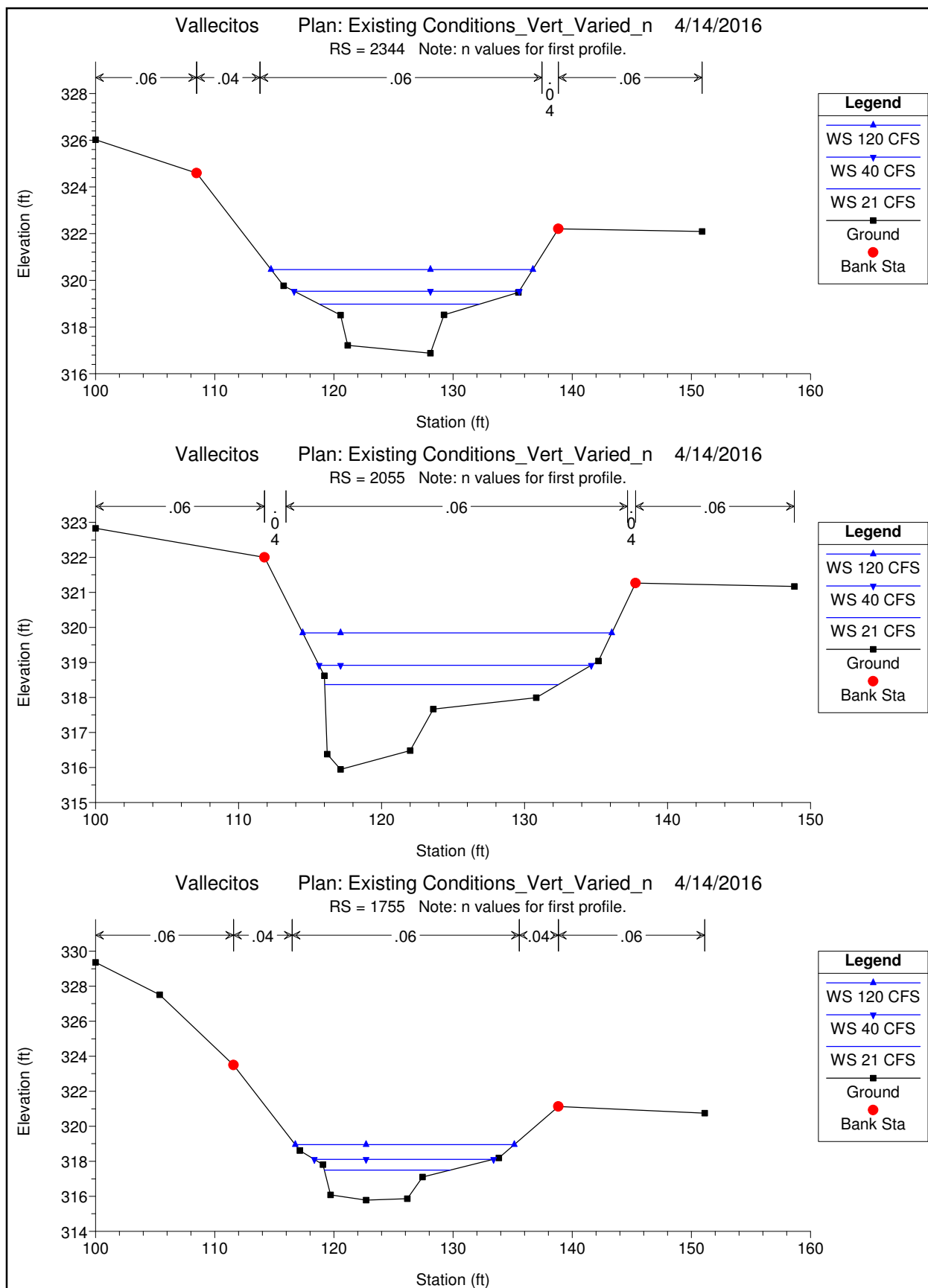


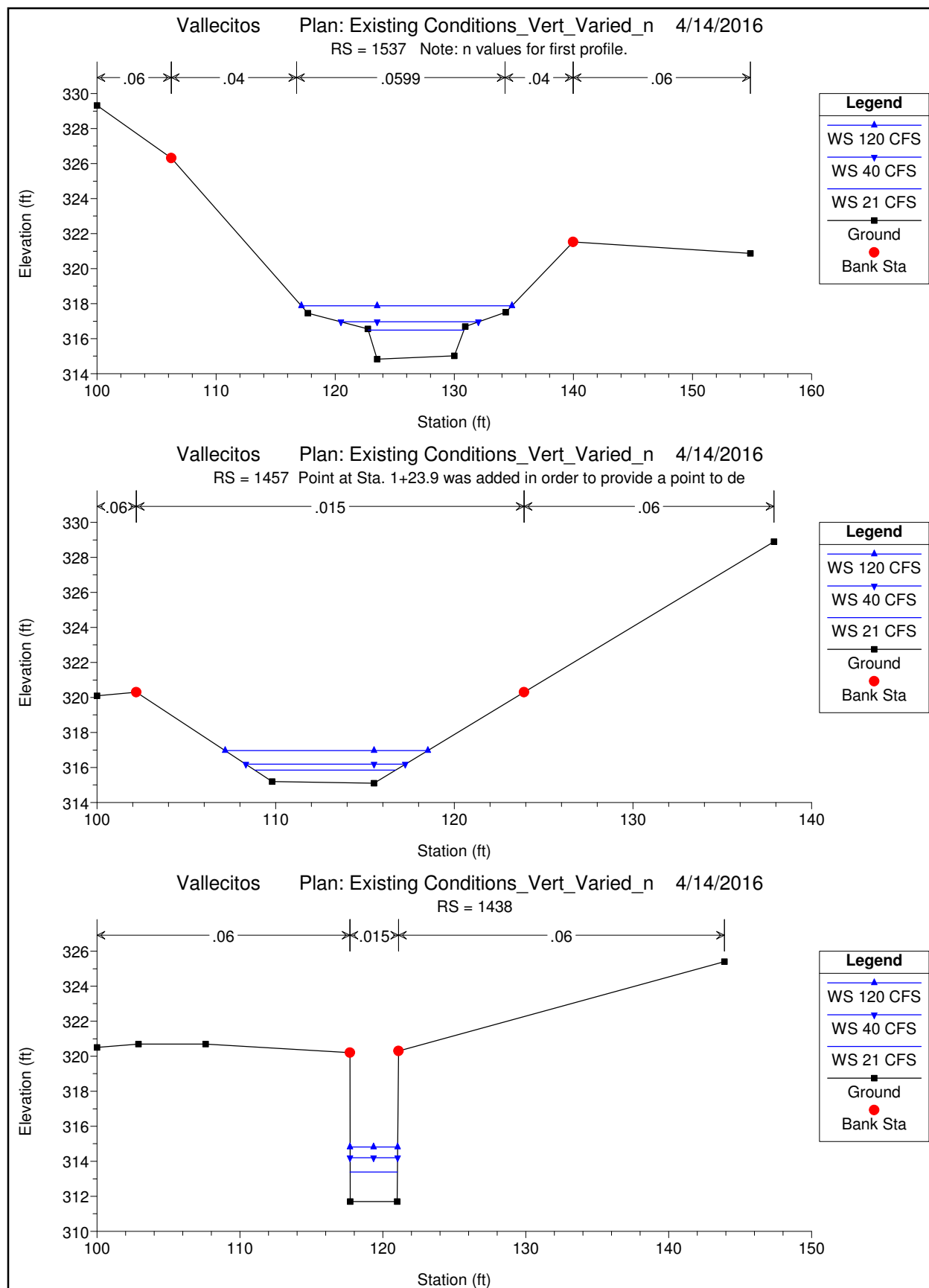


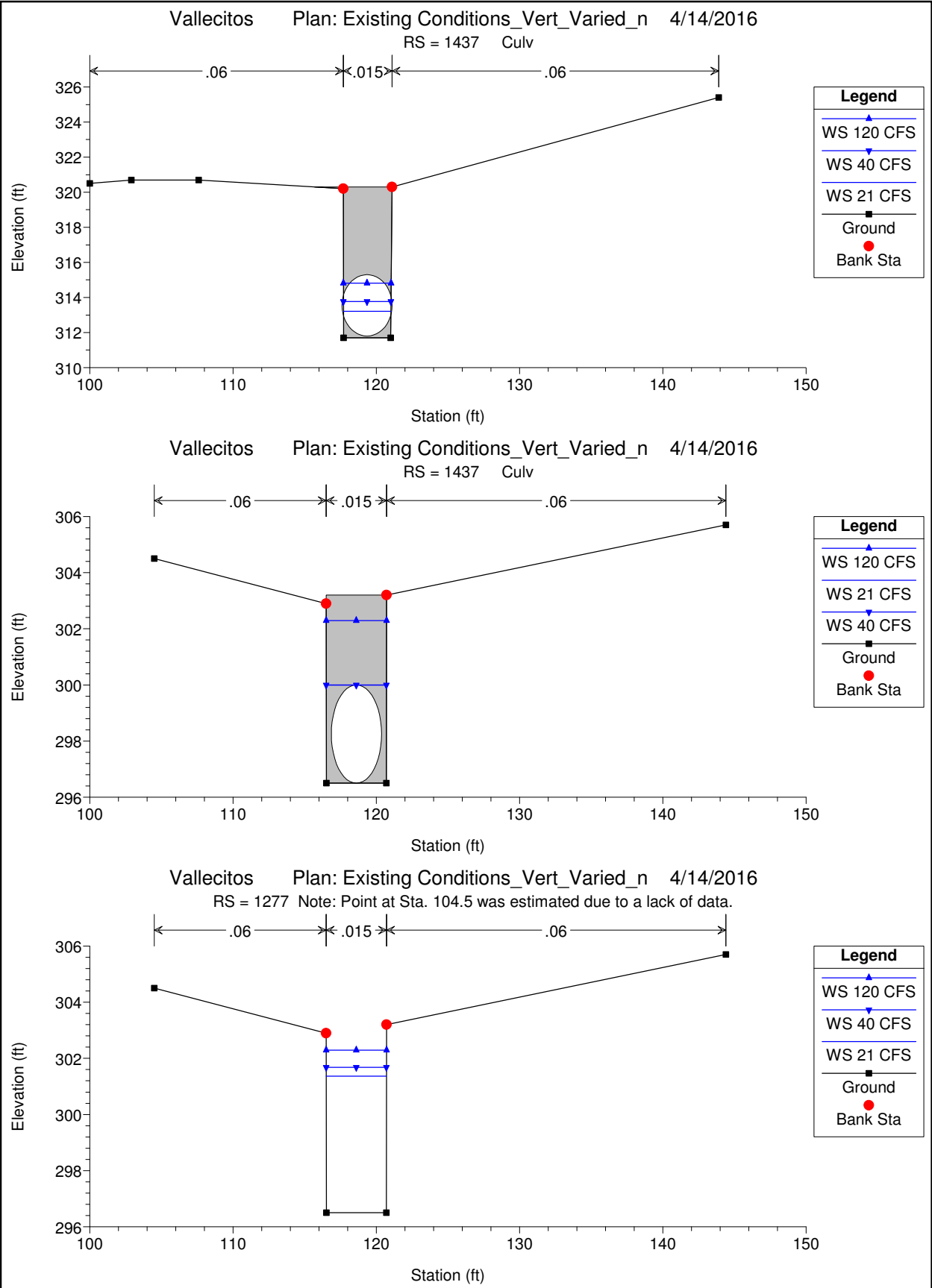


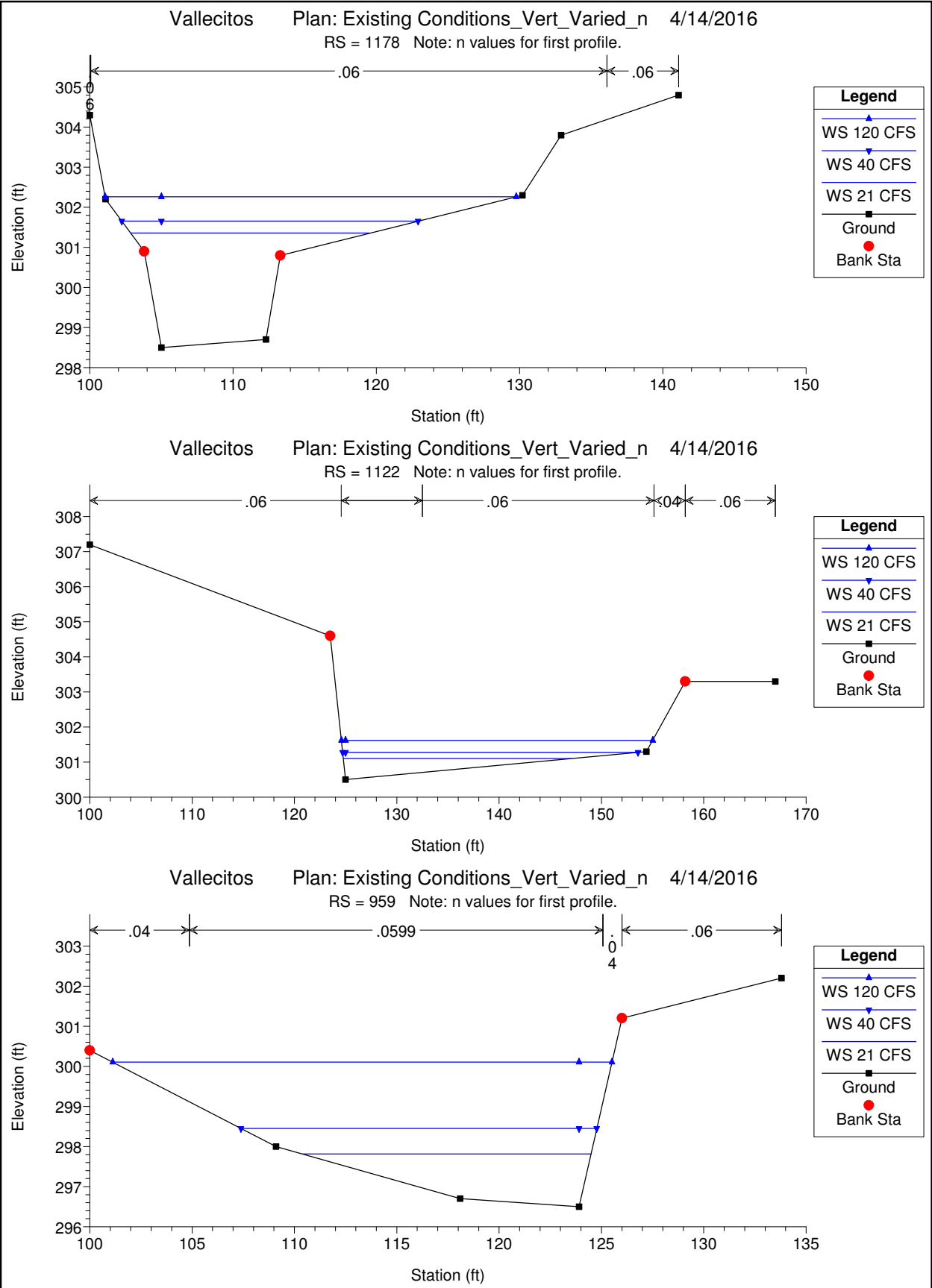




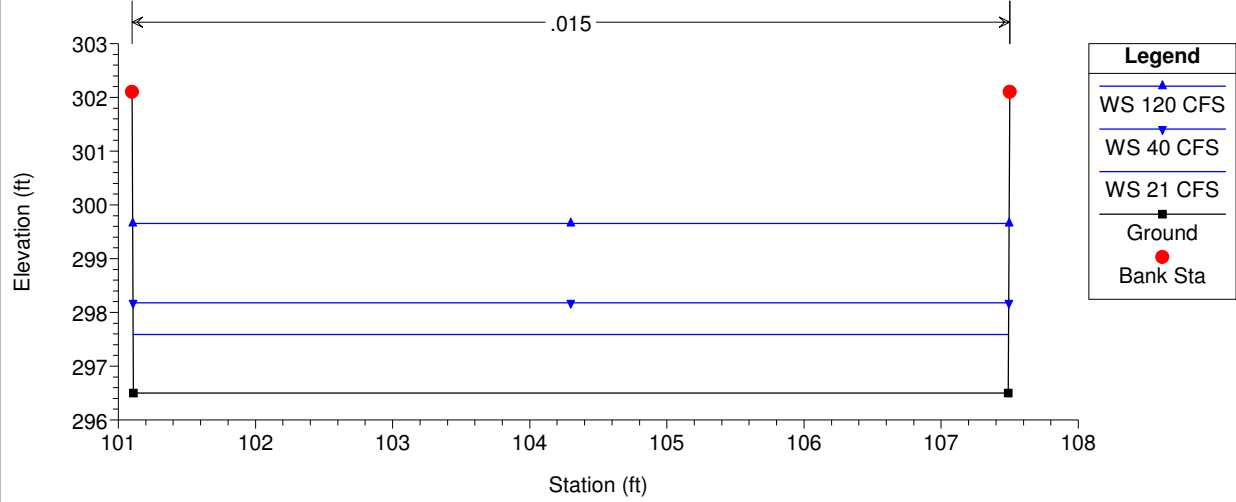




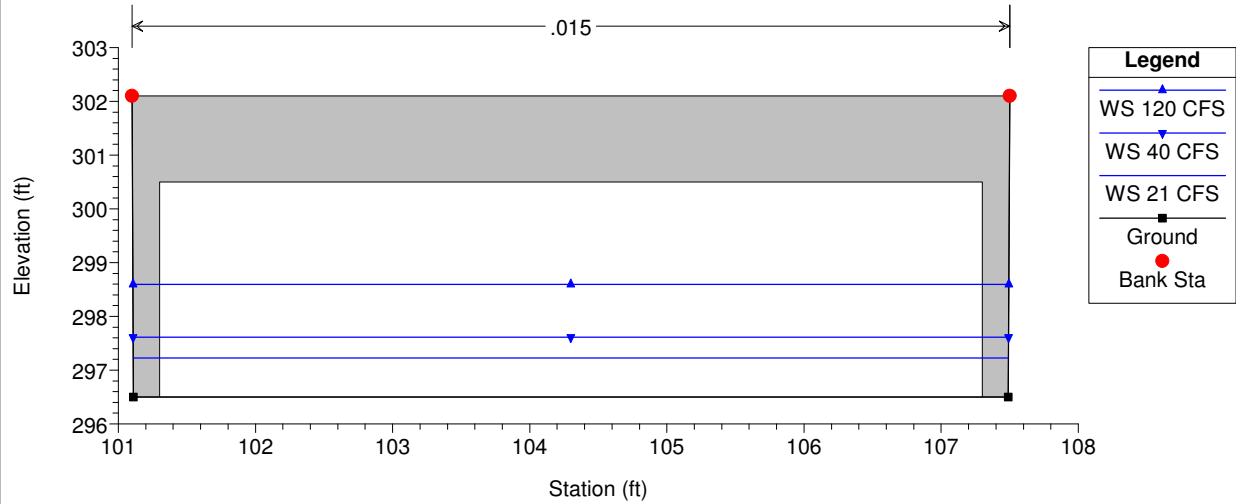




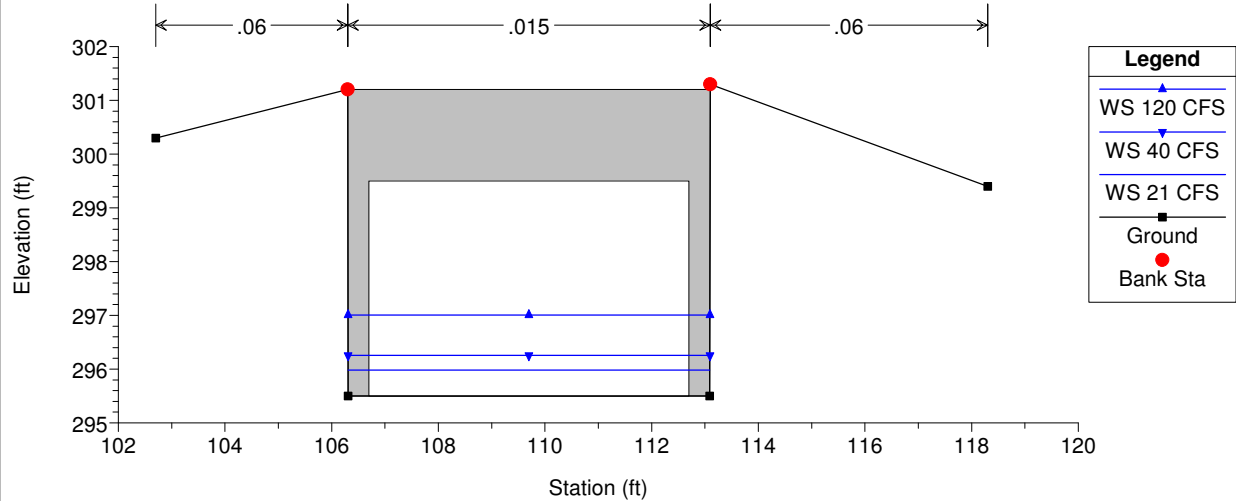
Vallecitos Plan: Existing Conditions_Vert_Varied_n 4/14/2016
RS = 909 Point at Sta. 106.5 was altered to match the elevation of point

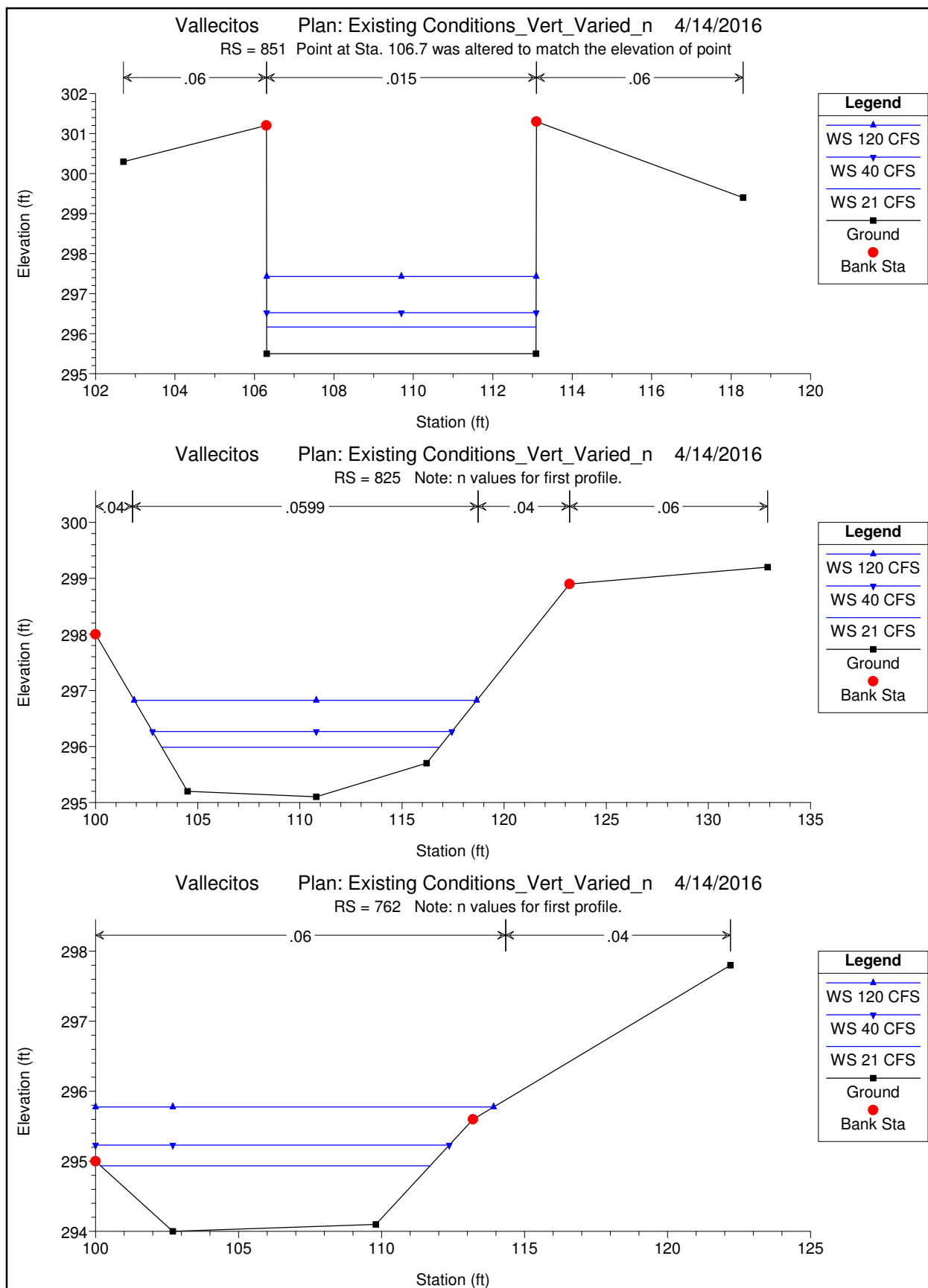


Vallecitos Plan: Existing Conditions_Vert_Varied_n 4/14/2016
RS = 908 Culv



Vallecitos Plan: Existing Conditions_Vert_Varied_n 4/14/2016
RS = 908 Culv





APPENDIX 2

StreamStats Version 3.0

Flow Statistics Ungaged Site Report

Date: Mon Apr 11, 2016 12:35:53 PM GMT-7

Study Area: California

NAD 1983 Latitude: 37.5964 (37 35 47)

NAD 1983 Longitude: -121.8388 (-121 50 20)

Drainage Area: 1.7 mi²

Peak-Flow Basin Characteristics			
100% 2012 5113 Region 4 Central Coast (1.7 mi ²)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	1.7	0.11	4600
Mean Annual Precipitation (inches)	18	7	46

Peak-Flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
PK2	12.5	ft ³ /s	160		1.88	83.6
PK5	45.9	ft ³ /s	97		11.6	182
PK10	87.4	ft ³ /s	79		26.8	285
PK25	160	ft ³ /s	70		54.5	471
PK50	231	ft ³ /s	66		82.8	643
PK100	304	ft ³ /s	67		108	853
PK200	386	ft ³ /s	68		137	1090
PK500	501	ft ³ /s	72		166	1520

#<http://pubs.usgs.gov/sir/2012/5113/#>

Gotvald_ A.J._ Barth_ N.A._ Veilleux_ A.G._ and Parrett_ Charles_ 2012_ Methods for determining magnitude and frequency of floods in California_ based on data through water year 2006: U.S. Geological Survey Scientific Investigations Report 2012-5113_ 38 p._ 1 pl.

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URL: http://streamstatsags.cr.usgs.gov/v3_beta/FTreport.htm

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[Streamstats Status](#)

[News](#)



Project: Vallcitos
 Project #: 15-007
 Date: 4/11/2016
 Calculated by: BMS
 Checked by: mw

U.S. Geological Survey Scientific Investigations Report 2012-5113

Central Coast Region

Q2 =	0.0046	A^	0.856	P^	2.58
Q10 =	0.46	A^	0.846	P^	1.66
Q50 =	5.32	A^	0.84	P^	1.15
Q100 =	11	A^	0.84	P^	0.994

where: Q = Peak discharge (cfs)

A = Area (sq. mi)

P = Mean annual precipitation (Rantz, 1969)

At Culvert Site Data

Parameter	Value	Units	Reference
Area =	1.70	sq. mi.	
P value =	18	in	Rantz, 1969

Results

Q2 =	12.5	cfs
Q10 =	87.4	cfs
Q50 =	230.7	cfs
Q100 =	303.9	cfs

APPENDIX 3

Project 21003 - Vallecitos Channel Programmatic Repair Project
 Data available for SBA releases, as of January 28, 2015

Unplanned SBA Releases to Vallecitos Channel		
date	release amount	duration
	(cfs)	(hours)
2013	NA	
8/24/2012	30	?
2011	NA	
2010	NA	
7/7/2009	20-35	?
4/30/2009	"minimal"	?
10/13/2008	20	3
4/29/2008	?	1
8/16/2007	15-20	5.5
4/16/2007	115	?
10/27/2006	8	2
5/25/2005	45	12.75
2004	NA	
2003	NA	

Appendix C.

Air Quality, Greenhouse Gas Emissions, and Energy Calculations

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Annual

Vallecitos Channel Maintenance Project
Bay Area AQMD Air District, Annual**1.0 Project Characteristics**

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	64
Climate Zone	4			Operational Year	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MW hr)	206	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Annual

Project Characteristics - Carbon Intensity based on PG&E latest reported value for 2019

https://www.pgecorp.com/corp_responsibility/reports/2019/en02_climate_change.html

Land Use - This is a water channel project with custom construction list, limited operational activities.

Construction Phase - Demolition same time as earthwork to account for concrete removal and fugitive emissions.

Off-road Equipment - Assume air compressor for hydraulic hammer/ jackhammer

Off-road Equipment - Based on data request. Other General Industrial Equipment represents chainsaws. Other Construction Equipment represents 2 pickups with horsepower similar to off-highway trucks as this is horsepower of typical pickup truck.

Off-road Equipment - From Data Request. Generator Set covers any use of power auger assumed at 2 hours per day.

Off-road Equipment - Based on Data Request

Trips and VMT - Based on data request. Assumed 1 worker per equipment plus laborers. Demolition included with earthwork. Haul trips assume not phased and 1 trip per 16 CY.

On-road Fugitive Dust - Assumed 85% unpaved roads to be conservative. Changed Mean Vehicle Speed to 15 for unpaved road speed limit. Average vehicle weight unchanged.

Demolition - Based on 10 CY concrete converted to 20 tons

Grading - From Data Request

4333 CY vegetation + 5129 CY Sediment hauled off site

1524 CY Rock Hauled

10 CY concrete under demolition

Vehicle Trips - Use trip rate of .27 per week to roughly equal 12 trips for workers and 2 hauling trips. Changed default trip lengths

Road Dust - Changed to conservatively assume 85% unpaved and unpaved speed of 15 mph

Energy Use -

Construction Off-road Equipment Mitigation - Assumed Improved Dumptrucks either Tier 4 final or Onroad 2010 or newer

Operational Off-Road Equipment - To cover use of small landscaping equipment up to 100 hours per year.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	0.5
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Annual

tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	0.00	20.00
tblConstructionPhase	NumDays	0.00	40.00
tblConstructionPhase	NumDays	0.00	40.00
tblConstructionPhase	NumDays	0.00	5.00
tblGrading	MaterialExported	0.00	9,462.00
tblGrading	MaterialImported	0.00	1,524.00
tblOffRoadEquipment	HorsePower	81.00	78.00
tblOffRoadEquipment	HorsePower	172.00	402.00
tblOffRoadEquipment	LoadFactor	0.73	0.48
tblOffRoadEquipment	LoadFactor	0.42	0.38
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Annual

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	1.00	2.00
tblOnRoadDust	HaulingPercentPave	100.00	85.00
tblOnRoadDust	HaulingPercentPave	100.00	85.00
tblOnRoadDust	MeanVehicleSpeed	40.00	15.00
tblOnRoadDust	MeanVehicleSpeed	40.00	15.00
tblOnRoadDust	MeanVehicleSpeed	40.00	15.00
tblOnRoadDust	MeanVehicleSpeed	40.00	15.00
tblOnRoadDust	WorkerPercentPave	100.00	85.00
tblOnRoadDust	WorkerPercentPave	100.00	85.00
tblOnRoadDust	WorkerPercentPave	100.00	85.00
tblOnRoadDust	WorkerPercentPave	100.00	85.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	20.00
tblOperationalOffRoadEquipment	OperHoursPerDay	8.00	5.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	2.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	206
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblRoadDust	MeanVehicleSpeed	40	15
tblRoadDust	RoadPercentPave	100	85
tblTripsAndVMT	HaulingTripNumber	1,373.00	1,374.00
tblTripsAndVMT	WorkerTripNumber	8.00	14.00
tblTripsAndVMT	WorkerTripNumber	3.00	0.00

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Annual

tblTripsAndVMT	WorkerTripNumber	48.00	52.00
tblTripsAndVMT	WorkerTripNumber	0.00	16.00
tblVehicleTrips	CNW_TL	6.60	22.00
tblVehicleTrips	CNW_TTP	0.00	7.00
tblVehicleTrips	CW_TL	14.70	20.00
tblVehicleTrips	CW_TTP	0.00	93.00
tblVehicleTrips	PR_TP	0.00	100.00
tblVehicleTrips	ST_TR	0.00	0.27

2.0 Emissions Summary

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Annual

2.1 Overall Construction**Unmitigated Construction**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.1507	1.5029	1.0208	3.6200e-003	3.0719	0.0507	3.1226	0.3239	0.0468	0.3706	0.0000	323.2942	323.2942	0.0872	0.0000	325.4746
Maximum	0.1507	1.5029	1.0208	3.6200e-003	3.0719	0.0507	3.1226	0.3239	0.0468	0.3706	0.0000	323.2942	323.2942	0.0872	0.0000	325.4746

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0921	0.9006	1.3274	3.6200e-003	3.0719	0.0281	3.1000	0.3239	0.0262	0.3500	0.0000	323.2939	323.2939	0.0872	0.0000	325.4743
Maximum	0.0921	0.9006	1.3274	3.6200e-003	3.0719	0.0281	3.1000	0.3239	0.0262	0.3500	0.0000	323.2939	323.2939	0.0872	0.0000	325.4743

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	38.91	40.08	-30.04	0.00	0.00	44.63	0.73	0.00	44.05	5.56	0.00	0.00	0.00	0.00	0.00	0.00

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	7-1-2021	9-30-2021	1.6498	0.9889
		Highest	1.6498	0.9889

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	2.0000e-005	1.0000e-004	2.8000e-004	0.0000	9.7500e-003	0.0000	9.7500e-003	9.8000e-004	0.0000	9.9000e-004	0.0000	0.1061	0.1061	0.0000	0.0000	0.1061
Offroad	4.1200e-003	0.0366	0.0460	8.0000e-005		1.8400e-003	1.8400e-003		1.8400e-003	1.8400e-003	0.0000	7.0651	7.0651	3.4000e-004	0.0000	7.0735
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	4.1400e-003	0.0367	0.0462	8.0000e-005	9.7500e-003	1.8400e-003	0.0116	9.8000e-004	1.8400e-003	2.8300e-003	0.0000	7.1712	7.1712	3.4000e-004	0.0000	7.1796

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Annual

2.2 Overall Operational**Mitigated Operational**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	2.0000e-005	1.0000e-004	2.8000e-004	0.0000	9.7500e-003	0.0000	9.7500e-003	9.8000e-004	0.0000	9.9000e-004	0.0000	0.1061	0.1061	0.0000	0.0000	0.1061
Offroad	4.1200e-003	0.0366	0.0460	8.0000e-005		1.8400e-003	1.8400e-003		1.8400e-003	1.8400e-003	0.0000	7.0651	7.0651	3.4000e-004	0.0000	7.0735
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	4.1400e-003	0.0367	0.0462	8.0000e-005	9.7500e-003	1.8400e-003	0.0116	9.8000e-004	1.8400e-003	2.8300e-003	0.0000	7.1712	7.1712	3.4000e-004	0.0000	7.1796

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail**Construction Phase**

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	7/1/2021	7/7/2021	5	5	
2	Demolition	Demolition	7/8/2021	9/1/2021	5	40	
3	Earthwork	Grading	7/8/2021	9/1/2021	5	40	
4	Planting/Restoration	Building Construction	9/2/2021	9/29/2021	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Excavators	1	3.00	158	0.38
Site Preparation	Graders	0	8.00	187	0.41
Site Preparation	Rubber Tired Dozers	1	1.00	247	0.40
Site Preparation	Skid Steer Loaders	1	3.00	65	0.37
Site Preparation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demolition	Air Compressors	1	0.50	78	0.48
Demolition	Concrete/Industrial Saws	0	8.00	78	0.48
Demolition	Rubber Tired Dozers	0	1.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	0	6.00	97	0.37
Earthwork	Concrete/Industrial Saws	0	8.00	81	0.73
Earthwork	Excavators	2	8.00	158	0.38
Earthwork	Off-Highway Trucks	8	8.00	402	0.38
Earthwork	Other Construction Equipment	2	4.00	402	0.38
Earthwork	Other General Industrial Equipment	1	0.50	88	0.34
Earthwork	Pumps	1	0.50	84	0.74
Earthwork	Rubber Tired Dozers	0	1.00	247	0.40
Earthwork	Rubber Tired Dozers	1	2.00	247	0.40
Earthwork	Rubber Tired Loaders	2	6.00	203	0.36
Earthwork	Skid Steer Loaders	2	6.00	65	0.37
Earthwork	Tractors/Loaders/Backhoes	0	6.00	97	0.37
Planting/Restoration	Cranes	0	4.00	231	0.29
Planting/Restoration	Forklifts	0	6.00	89	0.20
Planting/Restoration	Generator Sets	1	2.00	84	0.74
Planting/Restoration	Off-Highway Trucks	2	2.00	402	0.38
Planting/Restoration	Skid Steer Loaders	1	4.00	65	0.37
Planting/Restoration	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Annual

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	3	14.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	1	0.00	0.00	2.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork	19	52.00	0.00	1,374.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Planting/Restoration	4	16.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Site Preparation - 2021**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.8800e-003	0.0000	1.8800e-003	1.0300e-003	0.0000	1.0300e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.1000e-004	6.3900e-003	5.6300e-003	1.0000e-005		3.0000e-004	3.0000e-004		2.8000e-004	2.8000e-004	0.0000	0.8302	0.8302	2.7000e-004	0.0000	0.8369
Total	6.1000e-004	6.3900e-003	5.6300e-003	1.0000e-005	1.8800e-003	3.0000e-004	2.1800e-003	1.0300e-003	2.8000e-004	1.3100e-003	0.0000	0.8302	0.8302	2.7000e-004	0.0000	0.8369

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3.2 Site Preparation - 2021**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	7.0000e-005	7.9000e-004	0.0000	0.0424	0.0000	0.0424	4.2600e-003	0.0000	4.2600e-003	0.0000	0.2338	0.2338	1.0000e-005	0.0000	0.2339
Total	1.1000e-004	7.0000e-005	7.9000e-004	0.0000	0.0424	0.0000	0.0424	4.2600e-003	0.0000	4.2600e-003	0.0000	0.2338	0.2338	1.0000e-005	0.0000	0.2339

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.8800e-003	0.0000	1.8800e-003	1.0300e-003	0.0000	1.0300e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.1000e-004	6.3900e-003	5.6300e-003	1.0000e-005		3.0000e-004	3.0000e-004		2.8000e-004	2.8000e-004	0.0000	0.8302	0.8302	2.7000e-004	0.0000	0.8369
Total	6.1000e-004	6.3900e-003	5.6300e-003	1.0000e-005	1.8800e-003	3.0000e-004	2.1800e-003	1.0300e-003	2.8000e-004	1.3100e-003	0.0000	0.8302	0.8302	2.7000e-004	0.0000	0.8369

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3.2 Site Preparation - 2021**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	7.0000e-005	7.9000e-004	0.0000	0.0424	0.0000	0.0424	4.2600e-003	0.0000	4.2600e-003	0.0000	0.2338	0.2338	1.0000e-005	0.0000	0.2339
Total	1.1000e-004	7.0000e-005	7.9000e-004	0.0000	0.0424	0.0000	0.0424	4.2600e-003	0.0000	4.2600e-003	0.0000	0.2338	0.2338	1.0000e-005	0.0000	0.2339

3.3 Demolition - 2021**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.1000e-004	0.0000	2.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.6000e-004	2.5400e-003	3.0300e-003	0.0000		1.6000e-004	1.6000e-004		1.6000e-004	1.6000e-004	0.0000	0.4255	0.4255	3.0000e-005	0.0000	0.4263
Total	3.6000e-004	2.5400e-003	3.0300e-003	0.0000	2.1000e-004	1.6000e-004	3.7000e-004	3.0000e-005	1.6000e-004	1.9000e-004	0.0000	0.4255	0.4255	3.0000e-005	0.0000	0.4263

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3.3 Demolition - 2021**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	2.7000e-004	6.0000e-005	0.0000	2.2400e-003	0.0000	2.2400e-003	2.3000e-004	0.0000	2.3000e-004	0.0000	0.0757	0.0757	0.0000	0.0000	0.0758
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	1.0000e-005	2.7000e-004	6.0000e-005	0.0000	2.2400e-003	0.0000	2.2400e-003	2.3000e-004	0.0000	2.3000e-004	0.0000	0.0757	0.0757	0.0000	0.0000	0.0758

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.1000e-004	0.0000	2.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.6000e-004	2.5400e-003	3.0300e-003	0.0000		1.6000e-004	1.6000e-004		1.6000e-004	1.6000e-004	0.0000	0.4255	0.4255	3.0000e-005	0.0000	0.4263
Total	3.6000e-004	2.5400e-003	3.0300e-003	0.0000	2.1000e-004	1.6000e-004	3.7000e-004	3.0000e-005	1.6000e-004	1.9000e-004	0.0000	0.4255	0.4255	3.0000e-005	0.0000	0.4263

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3.3 Demolition - 2021**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	2.7000e-004	6.0000e-005	0.0000	2.2400e-003	0.0000	2.2400e-003	2.3000e-004	0.0000	2.3000e-004	0.0000	0.0757	0.0757	0.0000	0.0000	0.0758
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	1.0000e-005	2.7000e-004	6.0000e-005	0.0000	2.2400e-003	0.0000	2.2400e-003	2.3000e-004	0.0000	2.3000e-004	0.0000	0.0757	0.0757	0.0000	0.0000	0.0758

3.4 Earthwork - 2021**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0307	0.0000	0.0307	0.0167	0.0000	0.0167	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1362	1.2665	0.9107	2.8900e-003		0.0480	0.0480		0.0442	0.0442	0.0000	253.6182	253.6182	0.0818	0.0000	255.6641
Total	0.1362	1.2665	0.9107	2.8900e-003	0.0307	0.0480	0.0788	0.0167	0.0442	0.0609	0.0000	253.6182	253.6182	0.0818	0.0000	255.6641

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3.4 Earthwork - 2021**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.4100e-003	0.1854	0.0395	5.4000e-004	1.5417	5.7000e-004	1.5423	0.1555	5.5000e-004	0.1560	0.0000	51.9745	51.9745	2.6500e-003	0.0000	52.0408
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1900e-003	2.2000e-003	0.0233	8.0000e-005	1.2590	5.0000e-005	1.2591	0.1267	5.0000e-005	0.1267	0.0000	6.9471	6.9471	1.6000e-004	0.0000	6.9510
Total	8.6000e-003	0.1876	0.0628	6.2000e-004	2.8007	6.2000e-004	2.8014	0.2822	6.0000e-004	0.2828	0.0000	58.9216	58.9216	2.8100e-003	0.0000	58.9918

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0307	0.0000	0.0307	0.0167	0.0000	0.0167	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0794	0.6824	1.2080	2.8900e-003		0.0261	0.0261		0.0242	0.0242	0.0000	253.6179	253.6179	0.0818	0.0000	255.6638
Total	0.0794	0.6824	1.2080	2.8900e-003	0.0307	0.0261	0.0568	0.0167	0.0242	0.0409	0.0000	253.6179	253.6179	0.0818	0.0000	255.6638

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3.4 Earthwork - 2021**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.4100e-003	0.1854	0.0395	5.4000e-004	1.5417	5.7000e-004	1.5423	0.1555	5.5000e-004	0.1560	0.0000	51.9745	51.9745	2.6500e-003	0.0000	52.0408
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1900e-003	2.2000e-003	0.0233	8.0000e-005	1.2590	5.0000e-005	1.2591	0.1267	5.0000e-005	0.1267	0.0000	6.9471	6.9471	1.6000e-004	0.0000	6.9510
Total	8.6000e-003	0.1876	0.0628	6.2000e-004	2.8007	6.2000e-004	2.8014	0.2822	6.0000e-004	0.2828	0.0000	58.9216	58.9216	2.8100e-003	0.0000	58.9918

3.5 Planting/Restoration - 2021**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.3000e-003	0.0393	0.0342	9.0000e-005		1.5900e-003	1.5900e-003		1.5000e-003	1.5000e-003	0.0000	8.1204	8.1204	2.2400e-003	0.0000	8.1764
Total	4.3000e-003	0.0393	0.0342	9.0000e-005		1.5900e-003	1.5900e-003		1.5000e-003	1.5000e-003	0.0000	8.1204	8.1204	2.2400e-003	0.0000	8.1764

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3.5 Planting/Restoration - 2021**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.9000e-004	3.4000e-004	3.5900e-003	1.0000e-005	0.1937	1.0000e-005	0.1937	0.0195	1.0000e-005	0.0195	0.0000	1.0688	1.0688	2.0000e-005	0.0000	1.0694
Total	4.9000e-004	3.4000e-004	3.5900e-003	1.0000e-005	0.1937	1.0000e-005	0.1937	0.0195	1.0000e-005	0.0195	0.0000	1.0688	1.0688	2.0000e-005	0.0000	1.0694

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.5200e-003	0.0210	0.0435	9.0000e-005		9.0000e-004	9.0000e-004		8.7000e-004	8.7000e-004	0.0000	8.1204	8.1204	2.2400e-003	0.0000	8.1764
Total	2.5200e-003	0.0210	0.0435	9.0000e-005		9.0000e-004	9.0000e-004		8.7000e-004	8.7000e-004	0.0000	8.1204	8.1204	2.2400e-003	0.0000	8.1764

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3.5 Planting/Restoration - 2021**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.9000e-004	3.4000e-004	3.5900e-003	1.0000e-005	0.1937	1.0000e-005	0.1937	0.0195	1.0000e-005	0.0195	0.0000	1.0688	1.0688	2.0000e-005	0.0000	1.0694
Total	4.9000e-004	3.4000e-004	3.5900e-003	1.0000e-005	0.1937	1.0000e-005	0.1937	0.0195	1.0000e-005	0.0195	0.0000	1.0688	1.0688	2.0000e-005	0.0000	1.0694

4.0 Operational Detail - Mobile**4.1 Mitigation Measures Mobile**

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.0000e-005	1.0000e-004	2.8000e-004	0.0000	9.7500e-003	0.0000	9.7500e-003	9.8000e-004	0.0000	9.9000e-004	0.0000	0.1061	0.1061	0.0000	0.0000	0.1061
Unmitigated	2.0000e-005	1.0000e-004	2.8000e-004	0.0000	9.7500e-003	0.0000	9.7500e-003	9.8000e-004	0.0000	9.9000e-004	0.0000	0.1061	0.1061	0.0000	0.0000	0.1061

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.27	0.00	283	283
Total	0.00	0.27	0.00	283	283

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	20.00	6.60	22.00	93.00	0.00	7.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768

5.0 Energy Detail

Historical Energy Use: N

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5.1 Mitigation Measures Energy

[illegible]

5.2 Energy by Land Use - NaturalGas

Unmitigated

[illegible]

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5.2 Energy by Land Use - NaturalGas**Mitigated**

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.3 Energy by Land Use - Electricity**Unmitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

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5.3 Energy by Land Use - Electricity**Mitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

6.0 Area Detail**6.1 Mitigation Measures Area**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Unmitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

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6.2 Area by SubCategory**Unmitigated**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

7.0 Water Detail

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Annual

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use**Unmitigated**

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Annual

7.2 Water by Land Use**Mitigated**

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

8.0 Waste Detail**8.1 Mitigation Measures Waste****Category/Year**

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Annual

8.2 Waste by Land Use**Unmitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

9.0 Operational Offroad

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Annual

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Generator Sets	2	5.00	20	84	0.74	Diesel

UnMitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Generator Sets	4.1200e-003	0.0366	0.0460	8.0000e-005		1.8400e-003	1.8400e-003		1.8400e-003	1.8400e-003	0.0000	7.0651	7.0651	3.4000e-004	0.0000	7.0735
Total	4.1200e-003	0.0366	0.0460	8.0000e-005		1.8400e-003	1.8400e-003		1.8400e-003	1.8400e-003	0.0000	7.0651	7.0651	3.4000e-004	0.0000	7.0735

10.0 Stationary Equipment**Fire Pumps and Emergency Generators**

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
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Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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User Defined Equipment

Equipment Type	Number
----------------	--------

11.0 Vegetation

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Summer

Vallecitos Channel Maintenance Project

Bay Area AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	64
Climate Zone	4			Operational Year	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MW hr)	206	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Summer

Project Characteristics - Carbon Intensity based on PG&E latest reported value for 2019

https://www.pgecorp.com/corp_responsibility/reports/2019/en02_climate_change.html

Land Use - This is a water channel project with custom construction list, limited operational activities.

Construction Phase - Demolition same time as earthwork to account for concrete removal and fugitive emissions.

Off-road Equipment - Assume air compressor for hydraulic hammer/ jackhammer

Off-road Equipment - Based on data request. Other General Industrial Equipment represents chainsaws. Other Construction Equipment represents 2 pickups with horsepower similar to off-highway trucks as this is horsepower of typical pickup truck.

Off-road Equipment - From Data Request. Generator Set covers any use of power auger assumed at 2 hours per day.

Off-road Equipment - Based on Data Request

Trips and VMT - Based on data request. Assumed 1 worker per equipment plus laborers. Demolition included with earthwork. Haul trips assume not phased and 1 trip per 16 CY.

On-road Fugitive Dust - Assumed 85% unpaved roads to be conservative. Changed Mean Vehicle Speed to 15 for unpaved road speed limit. Average vehicle weight unchanged.

Demolition - Based on 10 CY concrete converted to 20 tons

Grading - From Data Request

4333 CY vegetation + 5129 CY Sediment hauled off site

1524 CY Rock Hauled

10 CY concrete under demolition

Vehicle Trips - Use trip rate of .27 per week to roughly equal 12 trips for workers and 2 hauling trips. Changed default trip lengths

Road Dust - Changed to conservatively assume 85% unpaved and unpaved speed of 15 mph

Energy Use -

Construction Off-road Equipment Mitigation - Assumed Improved Dumptrucks either Tier 4 final or Onroad 2010 or newer

Operational Off-Road Equipment - To cover use of small landscaping equipment up to 100 hours per year.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	0.5
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Summer

tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	0.00	20.00
tblConstructionPhase	NumDays	0.00	40.00
tblConstructionPhase	NumDays	0.00	40.00
tblConstructionPhase	NumDays	0.00	5.00
tblGrading	MaterialExported	0.00	9,462.00
tblGrading	MaterialImported	0.00	1,524.00
tblOffRoadEquipment	HorsePower	81.00	78.00
tblOffRoadEquipment	HorsePower	172.00	402.00
tblOffRoadEquipment	LoadFactor	0.73	0.48
tblOffRoadEquipment	LoadFactor	0.42	0.38
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Summer

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	1.00	2.00
tblOnRoadDust	HaulingPercentPave	100.00	85.00
tblOnRoadDust	HaulingPercentPave	100.00	85.00
tblOnRoadDust	MeanVehicleSpeed	40.00	15.00
tblOnRoadDust	MeanVehicleSpeed	40.00	15.00
tblOnRoadDust	MeanVehicleSpeed	40.00	15.00
tblOnRoadDust	MeanVehicleSpeed	40.00	15.00
tblOnRoadDust	WorkerPercentPave	100.00	85.00
tblOnRoadDust	WorkerPercentPave	100.00	85.00
tblOnRoadDust	WorkerPercentPave	100.00	85.00
tblOnRoadDust	WorkerPercentPave	100.00	85.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	20.00
tblOperationalOffRoadEquipment	OperHoursPerDay	8.00	5.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	2.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	206
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblRoadDust	MeanVehicleSpeed	40	15
tblRoadDust	RoadPercentPave	100	85
tblTripsAndVMT	HaulingTripNumber	1,373.00	1,374.00
tblTripsAndVMT	WorkerTripNumber	8.00	14.00
tblTripsAndVMT	WorkerTripNumber	3.00	0.00

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Summer

tblTripsAndVMT	WorkerTripNumber	48.00	52.00
tblTripsAndVMT	WorkerTripNumber	0.00	16.00
tblVehicleTrips	CNW_TL	6.60	22.00
tblVehicleTrips	CNW_TTP	0.00	7.00
tblVehicleTrips	CW_TL	14.70	20.00
tblVehicleTrips	CW_TTP	0.00	93.00
tblVehicleTrips	PR_TP	0.00	100.00
tblVehicleTrips	ST_TR	0.00	0.27

2.0 Emissions Summary

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Summer

2.1 Overall Construction (Maximum Daily Emission)**Unmitigated Construction**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	7.2650	72.6501	48.8829	0.1758	171.3412	2.4412	173.7824	17.9118	2.2484	20.1602	0.0000	17,302.8752	17,302.8752	4.6646	0.0000	17,419.4899
Maximum	7.2650	72.6501	48.8829	0.1758	171.3412	2.4412	173.7824	17.9118	2.2484	20.1602	0.0000	17,302.8752	17,302.8752	4.6646	0.0000	17,419.4899

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	4.4218	43.4477	63.7497	0.1758	171.3412	1.3435	172.6847	17.9118	1.2497	19.1614	0.0000	17,302.8752	17,302.8752	4.6646	0.0000	17,419.4899
Maximum	4.4218	43.4477	63.7497	0.1758	171.3412	1.3435	172.6847	17.9118	1.2497	19.1614	0.0000	17,302.8752	17,302.8752	4.6646	0.0000	17,419.4899

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	39.14	40.20	-30.41	0.00	0.00	44.96	0.63	0.00	44.42	4.95	0.00	0.00	0.00	0.00	0.00	0.00

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Summer

2.2 Overall Operational**Unmitigated Operational**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	7.1000e-004	3.7200e-003	0.0117	5.0000e-005	0.3753	4.0000e-005	0.3753	0.0379	4.0000e-005	0.0379		4.7621	4.7621	1.4000e-004		4.7657
Offroad	0.4125	3.6603	4.5949	8.2200e-003		0.1836	0.1836		0.1836	0.1836		778.7932	778.7932	0.0370		779.7182
Total	0.4132	3.6640	4.6067	8.2700e-003	0.3753	0.1837	0.5589	0.0379	0.1837	0.2216		783.5555	783.5555	0.0371	0.0000	784.4842

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Summer

2.2 Overall Operational**Mitigated Operational**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	7.1000e-004	3.7200e-003	0.0117	5.0000e-005	0.3753	4.0000e-005	0.3753	0.0379	4.0000e-005	0.0379		4.7621	4.7621	1.4000e-004		4.7657
Offroad	0.4125	3.6603	4.5949	8.2200e-003		0.1836	0.1836		0.1836	0.1836		778.7932	778.7932	0.0370		779.7182
Total	0.4132	3.6640	4.6067	8.2700e-003	0.3753	0.1837	0.5589	0.0379	0.1837	0.2216		783.5555	783.5555	0.0371	0.0000	784.4842

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail**Construction Phase**

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	7/1/2021	7/7/2021	5	5	
2	Demolition	Demolition	7/8/2021	9/1/2021	5	40	
3	Earthwork	Grading	7/8/2021	9/1/2021	5	40	
4	Planting/Restoration	Building Construction	9/2/2021	9/29/2021	5	20	

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Summer

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Summer

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Excavators	1	3.00	158	0.38
Site Preparation	Graders	0	8.00	187	0.41
Site Preparation	Rubber Tired Dozers	1	1.00	247	0.40
Site Preparation	Skid Steer Loaders	1	3.00	65	0.37
Site Preparation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Demolition	Air Compressors	1	0.50	78	0.48
Demolition	Concrete/Industrial Saws	0	8.00	78	0.48
Demolition	Rubber Tired Dozers	0	1.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	0	6.00	97	0.37
Earthwork	Concrete/Industrial Saws	0	8.00	81	0.73
Earthwork	Excavators	2	8.00	158	0.38
Earthwork	Off-Highway Trucks	8	8.00	402	0.38
Earthwork	Other Construction Equipment	2	4.00	402	0.38
Earthwork	Other General Industrial Equipment	1	0.50	88	0.34
Earthwork	Pumps	1	0.50	84	0.74
Earthwork	Rubber Tired Dozers	0	1.00	247	0.40
Earthwork	Rubber Tired Dozers	1	2.00	247	0.40
Earthwork	Rubber Tired Loaders	2	6.00	203	0.36
Earthwork	Skid Steer Loaders	2	6.00	65	0.37
Earthwork	Tractors/Loaders/Backhoes	0	6.00	97	0.37
Planting/Restoration	Cranes	0	4.00	231	0.29
Planting/Restoration	Forklifts	0	6.00	89	0.20
Planting/Restoration	Generator Sets	1	2.00	84	0.74
Planting/Restoration	Off-Highway Trucks	2	2.00	402	0.38
Planting/Restoration	Skid Steer Loaders	1	4.00	65	0.37
Planting/Restoration	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Summer

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	3	14.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	1	0.00	0.00	2.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork	19	52.00	0.00	1,374.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Planting/Restoration	4	16.00	0.00	0.00	10.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Site Preparation - 2021**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.7528	0.0000	0.7528	0.4138	0.0000	0.4138			0.0000			0.0000
Off-Road	0.2451	2.5553	2.2529	3.7800e-003		0.1210	0.1210		0.1114	0.1114		366.0654	366.0654	0.1184		369.0252
Total	0.2451	2.5553	2.2529	3.7800e-003	0.7528	0.1210	0.8738	0.4138	0.1114	0.5251		366.0654	366.0654	0.1184		369.0252

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Summer

3.2 Site Preparation - 2021**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0450	0.0263	0.3439	1.1100e-003	20.5355	7.2000e-004	20.5362	2.0633	6.7000e-004	2.0639		110.8743	110.8743	2.4800e-003		110.9363
Total	0.0450	0.0263	0.3439	1.1100e-003	20.5355	7.2000e-004	20.5362	2.0633	6.7000e-004	2.0639		110.8743	110.8743	2.4800e-003		110.9363

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.7528	0.0000	0.7528	0.4138	0.0000	0.4138			0.0000			0.0000
Off-Road	0.2451	2.5553	2.2529	3.7800e-003		0.1210	0.1210		0.1114	0.1114	0.0000	366.0654	366.0654	0.1184		369.0252
Total	0.2451	2.5553	2.2529	3.7800e-003	0.7528	0.1210	0.8738	0.4138	0.1114	0.5251	0.0000	366.0654	366.0654	0.1184		369.0252

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Summer

3.2 Site Preparation - 2021**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0450	0.0263	0.3439	1.1100e-003	20.5355	7.2000e-004	20.5362	2.0633	6.7000e-004	2.0639		110.8743	110.8743	2.4800e-003		110.9363
Total	0.0450	0.0263	0.3439	1.1100e-003	20.5355	7.2000e-004	20.5362	2.0633	6.7000e-004	2.0639		110.8743	110.8743	2.4800e-003		110.9363

3.3 Demolition - 2021**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0107	0.0000	0.0107	1.6200e-003	0.0000	1.6200e-003			0.0000			0.0000
Off-Road	0.0182	0.1272	0.1515	2.5000e-004		7.8400e-003	7.8400e-003		7.8400e-003	7.8400e-003		23.4540	23.4540	1.6100e-003		23.4942
Total	0.0182	0.1272	0.1515	2.5000e-004	0.0107	7.8400e-003	0.0185	1.6200e-003	7.8400e-003	9.4600e-003		23.4540	23.4540	1.6100e-003		23.4942

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Summer

3.3 Demolition - 2021**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.9000e-004	0.0132	2.7900e-003	4.0000e-005	0.1359	4.0000e-005	0.1360	0.0137	4.0000e-005	0.0137		4.1996	4.1996	2.1000e-004		4.2048
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	3.9000e-004	0.0132	2.7900e-003	4.0000e-005	0.1359	4.0000e-005	0.1360	0.0137	4.0000e-005	0.0137		4.1996	4.1996	2.1000e-004		4.2048

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0107	0.0000	0.0107	1.6200e-003	0.0000	1.6200e-003			0.0000			0.0000
Off-Road	0.0182	0.1272	0.1515	2.5000e-004		7.8400e-003	7.8400e-003		7.8400e-003	7.8400e-003	0.0000	23.4540	23.4540	1.6100e-003		23.4942
Total	0.0182	0.1272	0.1515	2.5000e-004	0.0107	7.8400e-003	0.0185	1.6200e-003	7.8400e-003	9.4600e-003	0.0000	23.4540	23.4540	1.6100e-003		23.4942

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Summer

3.3 Demolition - 2021**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.9000e-004	0.0132	2.7900e-003	4.0000e-005	0.1359	4.0000e-005	0.1360	0.0137	4.0000e-005	0.0137		4.1996	4.1996	2.1000e-004		4.2048
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	3.9000e-004	0.0132	2.7900e-003	4.0000e-005	0.1359	4.0000e-005	0.1360	0.0137	4.0000e-005	0.0137		4.1996	4.1996	2.1000e-004		4.2048

3.4 Earthwork - 2021**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.5366	0.0000	1.5366	0.8323	0.0000	0.8323			0.0000			0.0000
Off-Road	6.8116	63.3229	45.5354	0.1444		2.4021	2.4021		2.2108	2.2108		13,978.3129	13,978.3129	4.5104		14,091.0729
Total	6.8116	63.3229	45.5354	0.1444	1.5366	2.4021	3.9387	0.8323	2.2108	3.0431		13,978.3129	13,978.3129	4.5104		14,091.0729

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Summer

3.4 Earthwork - 2021**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2676	9.0890	1.9160	0.0270	93.3835	0.0285	93.4120	9.4006	0.0273	9.4279		2,885.0899	2,885.0899	0.1432		2,888.6690
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1672	0.0977	1.2773	4.1300e-003	76.2745	2.6900e-003	76.2772	7.6636	2.4800e-003	7.6661		411.8190	411.8190	9.2100e-003		412.0491
Total	0.4348	9.1867	3.1932	0.0311	169.6580	0.0312	169.6892	17.0642	0.0297	17.0939		3,296.9088	3,296.9088	0.1524		3,300.7181

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.5366	0.0000	1.5366	0.8323	0.0000	0.8323			0.0000			0.0000
Off-Road	3.9684	34.1206	60.4022	0.1444		1.3045	1.3045		1.2120	1.2120	0.0000	13,978.3129	13,978.3129	4.5104		14,091.0729
Total	3.9684	34.1206	60.4022	0.1444	1.5366	1.3045	2.8411	0.8323	1.2120	2.0443	0.0000	13,978.3129	13,978.3129	4.5104		14,091.0729

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Summer

3.4 Earthwork - 2021**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2676	9.0890	1.9160	0.0270	93.3835	0.0285	93.4120	9.4006	0.0273	9.4279		2,885.0899	2,885.0899	0.1432		2,888.6690
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1672	0.0977	1.2773	4.1300e-003	76.2745	2.6900e-003	76.2772	7.6636	2.4800e-003	7.6661		411.8190	411.8190	9.2100e-003		412.0491
Total	0.4348	9.1867	3.1932	0.0311	169.6580	0.0312	169.6892	17.0642	0.0297	17.0939		3,296.9088	3,296.9088	0.1524		3,300.7181

3.5 Planting/Restoration - 2021**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4301	3.9250	3.4183	9.2800e-003		0.1589	0.1589		0.1495	0.1495		895.1193	895.1193	0.2471		901.2961
Total	0.4301	3.9250	3.4183	9.2800e-003		0.1589	0.1589		0.1495	0.1495		895.1193	895.1193	0.2471		901.2961

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Summer

3.5 Planting/Restoration - 2021**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0515	0.0301	0.3930	1.2700e-003	23.4691	8.3000e-004	23.4699	2.3580	7.6000e-004	2.3588		126.7135	126.7135	2.8300e-003		126.7843
Total	0.0515	0.0301	0.3930	1.2700e-003	23.4691	8.3000e-004	23.4699	2.3580	7.6000e-004	2.3588		126.7135	126.7135	2.8300e-003		126.7843

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.2524	2.0998	4.3475	9.2800e-003		0.0903	0.0903		0.0871	0.0871	0.0000	895.1193	895.1193	0.2471		901.2961
Total	0.2524	2.0998	4.3475	9.2800e-003		0.0903	0.0903		0.0871	0.0871	0.0000	895.1193	895.1193	0.2471		901.2961

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Summer

3.5 Planting/Restoration - 2021**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0515	0.0301	0.3930	1.2700e-003	23.4691	8.3000e-004	23.4699	2.3580	7.6000e-004	2.3588		126.7135	126.7135	2.8300e-003		126.7843
Total	0.0515	0.0301	0.3930	1.2700e-003	23.4691	8.3000e-004	23.4699	2.3580	7.6000e-004	2.3588		126.7135	126.7135	2.8300e-003		126.7843

4.0 Operational Detail - Mobile**4.1 Mitigation Measures Mobile**

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	7.1000e-004	3.7200e-003	0.0117	5.0000e-005	0.3753	4.0000e-005	0.3753	0.0379	4.0000e-005	0.0379		4.7621	4.7621	1.4000e-004		4.7657
Unmitigated	7.1000e-004	3.7200e-003	0.0117	5.0000e-005	0.3753	4.0000e-005	0.3753	0.0379	4.0000e-005	0.0379		4.7621	4.7621	1.4000e-004		4.7657

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.27	0.00	283	283
Total	0.00	0.27	0.00	283	283

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	20.00	6.60	22.00	93.00	0.00	7.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768

5.0 Energy Detail

Historical Energy Use: N

Vallecitos Channel Maintenance Project - Bay Area AQMD Air District, Summer

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas**Unmitigated**

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

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5.2 Energy by Land Use - NaturalGas**Mitigated**

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

6.0 Area Detail**6.1 Mitigation Measures Area**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Unmitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004

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6.2 Area by SubCategory**Unmitigated**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004

7.0 Water Detail

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7.1 Mitigation Measures Water**8.0 Waste Detail****8.1 Mitigation Measures Waste****9.0 Operational Offroad**

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Generator Sets	2	5.00	20	84	0.74	Diesel

UnMitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	lb/day										lb/day					
Generator Sets	0.4125	3.6603	4.5949	8.2200e-003		0.1836	0.1836		0.1836	0.1836		778.7932	778.7932	0.0370		779.7182
Total	0.4125	3.6603	4.5949	8.2200e-003		0.1836	0.1836		0.1836	0.1836		778.7932	778.7932	0.0370		779.7182

10.0 Stationary Equipment**Fire Pumps and Emergency Generators**

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
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Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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User Defined Equipment

Equipment Type	Number
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11.0 Vegetation

Construction Fuel Consumption	Gasoline	Diesel
Construction On-Road Vehicles	960	4,208
Construction Off-Road Equipment		28,703
Total For Construction	960	32,911

Annual Project Fuel Consumption	Gasoline	Diesel
On-Road Vehicles	8	1
Off-Road Equipment and Stationary Sources		714
Total for Annual Operation	8	715

									Gasoline		Diesel	
	Phase	Vehicle Type	Construction Phase Days	Trips Per Day	Total Trips	Miles Per Trip	Total Miles	Fuel Type	Weighted Fuel Economy (miles/gallon)	Fuel Consumption (gallons)	Weighted Fuel Economy (miles/gallon)	Fuel Consumption (gallons)
Construction On-Road Vehicles	Demolition	Worker	40	0	0	10.8	-	LDA,LDT1, LDT2	27.59571336	-	38.1144679	-
		Vendor	40	0	0	6.6	-	HHDT, MHDT			8.143187453	-
		Hauling			2	20	40	HHDT			6.547970628	6
	Site Preparation	Worker	5	14	70	10.8	756	LDA,LDT1, LDT2	27.59571336	27.21	38.1144679	0.13
		Vendor	5	0	0	6.6	-	HHDT, MHDT			8.143187453	-
		Hauling			0	20	-	HHDT			6.547970628	-
	Earthwork	Worker	40	52	2080	10.8	22,464	LDA,LDT1, LDT2	27.59571336	808.57	38.1144679	3.96
		Vendor	40	0	0	6.6	-	HHDT, MHDT			8.143187453	-
		Hauling			1374	20	27,480	HHDT			6.547970628	4,197
	Planting/Restoration	Worker	20	16	320	10.8	3,456	LDA,LDT1, LDT2	27.59571336	124.40	38.1144679	0.61
		Vendor	20	0	0	6.6	-	HHDT, MHDT			8.143187453	-
		Hauling			0	20	-	HHDT			6.547970628	-
	Total Fuel Consumption (Gallons)									960.18		4,207.53

Notes:

1. Fuel Consumption is total miles multiplied by the percent gasoline or diesel respectively and then divided by fuel economy. It was assumed all MHDT and HHDT are diesel. LDA, LDT1, and LDT2 were assumed to be a mix of gasoline and diesel as ratioed by their VMT.

	LDA,LDT1,LDT2	MHDT	HHDT
Gasoline %	99.33%	0	0
Diesel %	0.67%	1	1

Phase name	Offroad Equipment Type	Amount	Days in Phase	Usage Hours	Horse Power	Load Factor	Fuel Consumption Rate lb/hp-hr	Diesel Fuel Consumption (gallons)
Site Preparation	Excavators	1	5	3	158	0.38	0.367	46
Site Preparation	Rubber Tired Dozers	1	5	1	247	0.4	0.367	26
Site Preparation	Skid Steer Loaders	1	5	3	65	0.37	0.408	21
Demolition	Air Compressors	1	40	0.5	78	0.48	0.408	43
Earthwork	Excavators	2	40	8	158	0.38	0.367	1,984
Earthwork	Off-Highway Trucks	8	40	8	402	0.38	0.367	20,189
Earthwork	Other Construction Equipment	2	40	4	402	0.38	0.367	2,524
Earthwork	Other General Industrial Equipment	1	40	0.5	88	0.34	0.408	34
Earthwork	Pumps	1	40	0.5	84	0.74	0.408	71
Earthwork	Rubber Tired Dozers	1	40	2	247	0.4	0.367	408
Earthwork	Rubber Tired Loaders	2	40	6	203	0.36	0.367	1,811
Earthwork	Skid Steer Loaders	2	40	6	65	0.37	0.408	663
Planting/Restoration	Generator Sets	1	20	2	84	0.74	0.408	143
Planting/Restoration	Off-Highway Trucks	2	20	2	402	0.38	0.367	631
Planting/Restoration	Skid Steer Loaders	1	20	4	65	0.37	0.408	110
Total Diesel Fuel Use from Construction Off-Road								28,703

1. Equipment list is from CalEEMod.

2. Fuel Consumption is 0.408 for less than 100 hp and .367 if greater than or equal to 100 hp based on CARB Off-Road Diesel Engine Emission Factors

3. To convert to gallons the conversion factor of 7.1089 lb/gallon is used

4. Fuel consumption is amount multiplied by usage hours, days in phase, horsepower, loadfactor, and fuel consumption rate divided by conversion factor.

	12	15	18	25	20	22	29	10	31	35	24	33	27	
	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD1	OBUS	UBUS	MCY	SBUS	MH	
Fleet Mix	0.576985	0.039376	0.193723	0.112069	0.016317	0.005358	0.017943	0.025814	0.002614	0.002274	0.005874	0.000887	0.000768	
Gaoline VMT	33,105,373.649	3,371,807,815	11,149,003,499	-	-	-	-	1,140,459	-	-	-	-	-	
Diesel VMT	370,483.637	1,131,392	84,040,633	-	-	-	-	1,335,657,942	-	-	-	-	-	
Gasoline Fuel Consumption	1,065,299.17	126,104.20	454,690.05	-	-	-	-	281.33	-	-	-	-	-	
Diesel Fuel Consumption	7,799.41	47.70	2,409.95	-	-	-	-	212,287.83	-	-	-	-	-	
Gasoline Fuel Economy	31.08	26.74	24.52					4.05						
Diesel Fuel Economy	47.50	23.72	34.87					6.29						
Gasoline %	98.89%	99.97%	99.25%					0.09%						
Diesel %	1.11%	0.03%	0.75%					99.91%						
Gasoline Annual Project Miles	161	11	54					0						
Diesel Annual Project Miles	2	0	0					7						
Project Gasoline Consumption	5	0	2					0						Total
Project Diesel Consumption	0	0	0					1						8
														1

Notes:

1. The fleet mix was the default for the area from CalEEMod.
2. The VMT is the total VMT in miles from EMFAC and the Fuel Consumption is the total Fuel Consumption from EMFAC in 1000 gallons.
3. Fuel Economy is the Total VMT divided Fuel Consumption and 100 unit conversion and is miles per gallon.
4. The total Project VMT per year as estimated in CalEEMod is: 283 miles.

						Fuel Consump tion Rate lb/hp-hr	Diesel Fuel Consump tion (gallons)
Offroad E	Amount	Days in Phase	Usage Hours	Horse Power	Load Factor		
Generator	2	20	5	84	0.74	0.408	714
Total Diesel Fuel Use from Equipment							714

1. Equipment list is from CalEEMod.
2. Fuel Consumption is 0.408 for less than 100 hp and .367 if greater than or equal to 100 hp based on CARB Off-Road Diesel Engine Emission Factors
3. To convert to gallons the conversion factor of 7.1089 lb/fallon is used
4. Fuel consumption is amount multiplied by usage hours, days in phase, horsepower, loadfactor, and fuel consumption rate divided by conversion factor.

		Weighting					Fuel Economy					Weighted Fuel Economy Miles per Gallon
		LDA	LDT1	LDT2	MHDT	HHDT	LDA	LDT1	LDT2	MHDT	HHDT	
Gasoline	Worker	LDA, LDT1,LDT2	0.5	0.25	0.25	0	0	30.3369	25.90543	23.80362		27.59571336
	Vendor	HHDT,MHDT	0	0	0	0.5	0.5					0
	Hauling	HHDT	0	0	0	0	1					0
	Worker	LDA, LDT1,LDT2	0.5	0.25	0.25	0	0	47.3773	22.82111	34.88216	9.738404	38.1144679
	Vendor	HHDT,MHDT	0	0	0	0.5	0.5				9.738404	8.143187453
Diesel	Hauling	HHDT	0	0	0	0	1				9.738404	6.547970628

Notes:

1. It was assumed all MHDT and HHDT are diesel. LDA, LDT1, and LDT2 were assumed to be a mix of gasoline and diesel as ratioed by their VMT.
2. EMFAC 2014 was used to estimate fuel economy based on VMT and fuel consumption.

Appendix D.

Biological Resources Information



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Sacramento Fish And Wildlife Office

Federal Building

2800 Cottage Way, Room W-2605

Sacramento, CA 95825-1846

Phone: (916) 414-6600 Fax: (916) 414-6713



In Reply Refer To:

January 05, 2021

Consultation Code: 08ESMF00-2021-SLI-0672

Event Code: 08ESMF00-2021-E-01920

Project Name: Vallecitos Channel Evaluation and Restoration Project

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to

utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at:

<http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>;

<http://www.towerkill.com>; and

www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

[http://](http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html)

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
-

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office

Federal Building

2800 Cottage Way, Room W-2605

Sacramento, CA 95825-1846

(916) 414-6600

Project Summary

Consultation Code: 08ESMF00-2021-SLI-0672

Event Code: 08ESMF00-2021-E-01920

Project Name: Vallecitos Channel Evaluation and Restoration Project

Project Type: WATER SUPPLY / DELIVERY

Project Description: Sunol, CA. Water infrastructure maintenance.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@37.597401950000005,-121.83589206737176,14z>



Counties: Alameda County, California

Endangered Species Act Species

There is a total of 9 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
San Joaquin Kit Fox <i>Vulpes macrotis mutica</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2873	Endangered

Birds

NAME	STATUS
California Least Tern <i>Sterna antillarum browni</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8104	Endangered

Reptiles

NAME	STATUS
Alameda Whipsnake (=striped Racer) <i>Masticophis lateralis euryxanthus</i> There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/5524	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog <i>Rana draytonii</i> There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander <i>Ambystoma californiense</i> Population: U.S.A. (Central CA DPS) There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS
Delta Smelt <i>Hypomesus transpacificus</i> There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened

Insects

NAME	STATUS
Bay Checkerspot Butterfly <i>Euphydryas editha bayensis</i> There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2320	Threatened
San Bruno Elfin Butterfly <i>Callophrys mossii bayensis</i> There is proposed critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3394	Endangered

Crustaceans

NAME	STATUS
Vernal Pool Fairy Shrimp <i>Branchinecta lynchi</i> There is final critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

CALIFORNIA DEPARTMENT OF
FISH and WILDLIFE *RareFind*

Query Summary:Quad **IS** (La Costa Valley (3712157) **OR** Niles (3712158) **OR** Dublin (3712168) **OR** Livermore (3712167) **OR** Mendenhall Springs (3712156))

Print

Close

CNDDB Element Query Results

Scientific Name	Common Name	Taxonomic Group	Element Code	Total Occs	Returned Occs	Federal Status	State Status	Global Rank	State Rank	CA Rare Plant Rank	Other Status	Habitats
Accipiter cooperii	Cooper's hawk	Birds	ABNKC12040	118	4	None	None	G5	S4	null	CDFW_WL-Watch List, IUCN_LC-Least Concern	Cismontane woodland, Riparian forest, Riparian woodland, Upper montane coniferous forest
Accipiter striatus	sharp-shinned hawk	Birds	ABNKC12020	22	1	None	None	G5	S4	null	CDFW_WL-Watch List, IUCN_LC-Least Concern	Cismontane woodland, Lower montane coniferous forest, Riparian forest, Riparian woodland
Agelaius tricolor	tricolored blackbird	Birds	ABPBXB0020	955	9	None	Threatened	G2G3	S1S2	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_EN-Endangered, NABCI_RWL-Red Watch List, USFWS_BCC-Birds of Conservation Concern	Freshwater marsh, Marsh & swamp, Swamp, Wetland
Ambystoma californiense	California tiger salamander	Amphibians	AAAAA01180	1333	126	Threatened	Threatened	G2G3	S2S3	null	CDFW_WL-Watch List, IUCN_VU-Vulnerable	Cismontane woodland, Meadow & seep, Riparian woodland, Valley & foothill grassland, Vernal pool, Wetland
Antrozous pallidus	pallid bat	Mammals	AMACC10010	420	4	None	None	G5	S3	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFS_S-Sensitive, WBWG_H-High Priority	Chaparral, Coastal scrub, Desert wash, Great Basin grassland, Great Basin scrub, Mojavean desert scrub, Riparian woodland, Sonoran desert scrub, Upper montane coniferous forest, Valley & foothill grassland
Aquila chrysaetos	golden eagle	Birds	ABNKC22010	323	5	None	None	G5	S3	null	BLM_S-Sensitive, CDF_S-Sensitive, CDFW_FP-Fully Protected, CDFW_WL-Watch List, IUCN_LC-Least Concern, USFWS_BCC-Birds of Conservation Concern	Broadleaved upland forest, Cismontane woodland, Coastal prairie, Great Basin grassland, Great Basin scrub, Lower montane coniferous forest, Pinon & juniper woodlands, Upper montane coniferous

												forest, Valley & foothill grassland
Ardea herodias	great blue heron	Birds	ABNGA04010	156	2	None	None	G5	S4	null	CDF_S-Sensitive, IUCN_LC-Least Concern	Brackish marsh, Estuary, Freshwater marsh, Marsh & swamp, Riparian forest, Wetland
Athene cunicularia	burrowing owl	Birds	ABNSB10010	2011	31	None	None	G4	S3	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFWS_BCC-Birds of Conservation Concern	Coastal prairie, Coastal scrub, Great Basin grassland, Great Basin scrub, Mojavean desert scrub, Sonoran desert scrub, Valley & foothill grassland
Atriplex depressa	brittlescale	Dicots	PDCHE042L0	60	1	None	None	G2	S2	1B.2	null	Alkali playa, Chenopod scrub, Meadow & seep, Valley & foothill grassland, Vernal pool, Wetland
Atriplex minuscule	lesser saltscare	Dicots	PDCHE042M0	52	1	None	None	G2	S2	1B.1	null	Alkali playa, Chenopod scrub, Valley & foothill grassland
Bombus crotchii	Crotch bumble bee	Insects	IIHYM24480	437	1	None	Candidate Endangered	G3G4	S1S2	null	null	null
Bombus occidentalis	western bumble bee	Insects	IIHYM24250	306	4	None	Candidate Endangered	G2G3	S1	null	USFS_S-Sensitive	null
Branchinecta lynchi	vernal pool fairy shrimp	Crustaceans	ICBRA03030	791	1	Threatened	None	G3	S3	null	IUCN_VU-Vulnerable	Valley & foothill grassland, Vernal pool, Wetland
Buteo regalis	ferruginous hawk	Birds	ABNKC19120	107	1	None	None	G4	S3S4	null	CDFW_WL-Watch List, IUCN_LC-Least Concern, USFWS_BCC-Birds of Conservation Concern	Great Basin grassland, Great Basin scrub, Pinon & juniper woodlands, Valley & foothill grassland
Campanula exigua	chaparral harebell	Dicots	PDCAM020A0	50	1	None	None	G2	S2	1B.2	BLM_S-Sensitive, SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Chaparral, Ultramafic
Centromadia parryi ssp. congdonii	Congdon's tarplant	Dicots	PDAST4R0P1	98	13	None	None	G3T1T2	S1S2	1B.1	BLM_S-Sensitive, SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Valley & foothill grassland
Chloropyron palmatum	palmate-bracted bird's-beak	Dicots	PDSCR0J0J0	25	1	Endangered	Endangered	G1	S1	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Chenopod scrub, Meadow & seep, Valley & foothill grassland, Wetland
Clarkia concinna ssp. automixa	Santa Clara red ribbons	Dicots	PDONA050A1	20	1	None	None	G5?T3	S3	4.3	null	Chaparral, Cismontane woodland
Corynorhinus townsendii	Townsend's big-eared bat	Mammals	AMACC08010	635	4	None	None	G3G4	S2	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFS_S-Sensitive, WBWG_H-High Priority	Broadleaved upland forest, Chaparral, Chenopod scrub, Great Basin grassland, Great Basin scrub, Joshua tree woodland, Lower montane coniferous forest, Meadow & seep, Mojavean desert

												scrub, Riparian forest, Riparian woodland, Sonoran desert scrub, Sonoran thorn woodland, Upper montane coniferous forest, Valley & foothill grassland
<i>Delphinium californicum</i> ssp. <i>interius</i>	Hospital Canyon larkspur	Dicots	PDRAN0B0A2	28	7	None	None	G3T3	S3	1B.2	BLM_S-Sensitive, SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Chaparral, Cismontane woodland, Coastal scrub, Meadow & seep
<i>Dipodomys heermanni</i> <i>berkeleyensis</i>	Berkeley kangaroo rat	Mammals	AMAFD03061	8	1	None	None	G3G4T1	S1	null	null	Chaparral, Cismontane woodland
<i>Elanus leucurus</i>	white-tailed kite	Birds	ABNKC06010	180	2	None	None	G5	S3S4	null	BLM_S-Sensitive, CDFW_FP-Fully Protected, IUCN_LC-Least Concern	Cismontane woodland, Marsh & swamp, Riparian woodland, Valley & foothill grassland, Wetland
<i>Emys marmorata</i>	western pond turtle	Reptiles	ARAAD02030	1398	35	None	None	G3G4	S3	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_VU-Vulnerable, USFS_S-Sensitive	Aquatic, Artificial flowing waters, Klamath/North coast flowing waters, Klamath/North coast standing waters, Marsh & swamp, Sacramento/San Joaquin flowing waters, Sacramento/San Joaquin standing waters, South coast flowing waters, South coast standing waters, Wetland
<i>Eremophila alpestris</i> <i>actia</i>	California horned lark	Birds	ABPAT02011	94	1	None	None	G5T4Q	S4	null	CDFW_WL-Watch List, IUCN_LC-Least Concern	Marine intertidal & splash zone communities, Meadow & seep
<i>Extriplex joaquinana</i>	San Joaquin spearscale	Dicots	PDCHE041F3	127	10	None	None	G2	S2	1B.2	BLM_S-Sensitive, SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Alkali playa, Chenopod scrub, Meadow & seep, Valley & foothill grassland
<i>Falco mexicanus</i>	prairie falcon	Birds	ABNKD06090	455	3	None	None	G5	S4	null	CDFW_WL-Watch List, IUCN_LC-Least Concern, USFWS_BCC-Birds of Conservation Concern	Great Basin grassland, Great Basin scrub, Mojavean desert scrub, Sonoran desert scrub, Valley & foothill grassland
<i>Falco peregrinus</i> <i>anatum</i>	American peregrine falcon	Birds	ABNKD06071	58	3	Delisted	Delisted	G4T4	S3S4	null	CDF_S-Sensitive, CDFW_FP-Fully Protected, USFWS_BCC-Birds of Conservation Concern	null
<i>Gonidea angulata</i>	western ridged mussel	Mollusks	IMBIV19010	157	1	None	None	G3	S1S2	null	null	Aquatic
<i>Haliaeetus leucocephalus</i>	bald eagle	Birds	ABNKC10010	329	1	Delisted	Endangered	G5	S3	null	BLM_S-Sensitive, CDF_S-Sensitive, CDFW_FP-Fully Protected, IUCN_LC-Least Concern, USFS_S-Sensitive, USFWS_BCC-Birds of	Lower montane coniferous forest, Oldgrowth

											Conservation Concern	
<i>Helianthella castanea</i>	Diablo helianthella	Dicots	PDAST4M020	107	1	None	None	G2	S2	1B.2	null	Broadleaved upland forest, Chaparral, Cismontane woodland, Coastal scrub, Valley & foothill grassland
<i>Lasiurus cinereus</i>	hoary bat	Mammals	AMACC05030	238	1	None	None	G5	S4	null	IUCN_LC-Least Concern, WBWG_M-Medium Priority	Broadleaved upland forest, Cismontane woodland, Lower montane coniferous forest, North coast coniferous forest
<i>Laterallus jamaicensis coturniculus</i>	California black rail	Birds	ABNME03041	303	1	None	Threatened	G3G4T1	S1	null	BLM_S-Sensitive, CDFW_FP-Fully Protected, IUCN_NT-Near Threatened, NABCI_RWL-Red Watch List, USFWS_BCC-Birds of Conservation Concern	Brackish marsh, Freshwater marsh, Marsh & swamp, Salt marsh, Wetland
<i>Legenere limosa</i>	legenere	Dicots	PDCAM0C010	83	1	None	None	G2	S2	1B.1	BLM_S-Sensitive, SB_UCBG-UC Botanical Garden at Berkeley	Vernal pool, Wetland
<i>Lepidurus packardii</i>	vernal pool tadpole shrimp	Crustaceans	ICBRA10010	324	1	Endangered	None	G4	S3S4	null	IUCN_EN-Endangered	Valley & foothill grassland, Vernal pool, Wetland
<i>Linderiella occidentalis</i>	California linderiella	Crustaceans	ICBRA06010	508	7	None	None	G2G3	S2S3	null	IUCN_NT-Near Threatened	Vernal pool
<i>Masticophis lateralis euryxanthus</i>	Alameda whipsnake	Reptiles	ARADB21031	167	28	Threatened	Threatened	G4T2	S2	null	null	Chaparral, Cismontane woodland, Coastal scrub, Valley & foothill grassland
<i>Melospiza melodia pusillula</i>	Alameda song sparrow	Birds	ABPBXA301S	38	1	None	None	G5T2?	S2S3	null	CDFW_SSC-Species of Special Concern, USFWS_BCC-Birds of Conservation Concern	Salt marsh
<i>Myotis yumanensis</i>	Yuma myotis	Mammals	AMACC01020	265	2	None	None	G5	S4	null	BLM_S-Sensitive, IUCN_LC-Least Concern, WBWG_LM-Low-Medium Priority	Lower montane coniferous forest, Riparian woodland, Upper montane coniferous forest
<i>Navarretia prostrata</i>	prostrate vernal pool navarretia	Dicots	PDPLM0C0Q0	61	1	None	None	G2	S2	1B.2	null	Coastal scrub, Meadow & seep, Valley & foothill grassland, Vernal pool, Wetland
<i>Neotoma fuscipes annectens</i>	San Francisco dusky-footed woodrat	Mammals	AMAFF08082	42	3	None	None	G5T2T3	S2S3	null	CDFW_SSC-Species of Special Concern	Chaparral, Redwood
<i>Oncorhynchus mykiss irideus</i> pop. 8	steelhead - central California coast DPS	Fish	AFCHA0209G	44	1	Threatened	None	G5T2T3Q	S2S3	null	AFS_TH-Threatened	Aquatic, Sacramento/San Joaquin flowing waters
<i>Phrynosoma blainvillii</i>	coast horned lizard	Reptiles	ARACF12100	784	2	None	None	G3G4	S3S4	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_LC-	Chaparral, Cismontane woodland, Coastal bluff

											Least Concern	scrub, Coastal scrub, Desert wash, Pinon & juniper woodlands, Riparian scrub, Riparian woodland, Valley & foothill grassland
Plagiobothrys glaber	hairless popcornflower	Dicots	PDBOR0V0B0	9	2	None	None	GX	SX	1A	null	Marsh & swamp, Salt marsh, Vernal pool, Wetland
Polemonium carneum	Oregon polemonium	Dicots	PDPLM0E050	16	1	None	None	G3G4	S2	2B.2	null	Coastal prairie, Coastal scrub, Lower montane coniferous forest
Puccinellia simplex	California alkali grass	Monocots	PMPOA53110	80	1	None	None	G3	S2	1B.2	BLM_S-Sensitive	Chenopod scrub, Meadow & seep, Valley & foothill grassland, Vernal pool
Rana boylei	foothill yellow-legged frog	Amphibians	AAABH01050	2468	9	None	Endangered	G3	S3	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_NT-Near Threatened, USFS_S-Sensitive	Aquatic, Chaparral, Cismontane woodland, Coastal scrub, Klamath/North coast flowing waters, Lower montane coniferous forest, Meadow & seep, Riparian forest, Riparian woodland, Sacramento/San Joaquin flowing waters
Rana draytonii	California red-legged frog	Amphibians	AAABH01022	1637	99	Threatened	None	G2G3	S2S3	null	CDFW_SSC-Species of Special Concern, IUCN_VU-Vulnerable	Aquatic, Artificial flowing waters, Artificial standing waters, Freshwater marsh, Marsh & swamp, Riparian forest, Riparian scrub, Riparian woodland, Sacramento/San Joaquin flowing waters, Sacramento/San Joaquin standing waters, South coast flowing waters, South coast standing waters, Wetland
Spergularia macrotheca var. longistyla	long-styled sand-spurrey	Dicots	PDCAR0W062	22	3	None	None	G5T2	S2	1B.2	null	Marsh & swamp, Meadow & seep
Streptanthus filiformis ssp. peramoenus	most beautiful jewelflower	Dicots	PDBRA2G012	103	9	None	None	G2T2	S2	1B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, SB_UCBG-UC Botanical Garden at Berkeley, USFS_S-Sensitive	Chaparral, Cismontane woodland, Ultramafic, Valley & foothill grassland
Stuckenia filiformis ssp. alpina	slender-leaved pondweed	Monocots	PMPOT03091	21	1	None	None	G5T5	S2S3	2B.2	null	Marsh & swamp, Wetland
Suaeda californica	California seablite	Dicots	PDCHE0P020	18	1	Endangered	None	G1	S1	1B.1	null	Freshwater marsh, Marsh & swamp, Wetland
Sycamore Alluvial Woodland	Sycamore Alluvial Woodland	Riparian	CTT62100CA	17	4	None	None	G1	S1.1	null	null	Riparian woodland

Taxidea taxus	American badger	Mammals	AMAJF04010	594	6	None	None	G5	S3	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern	Alkali marsh, Alkali playa, Alpine, Alpine dwarf scrub, Bog & fen, Brackish marsh, Broadleaved upland forest, Chaparral, Chenopod scrub, Cismontane woodland, Closed-cone coniferous forest, Coastal bluff scrub, Coastal dunes, Coastal prairie, Coastal scrub, Desert dunes, Desert wash, Freshwater marsh, Great Basin grassland, Great Basin scrub, Interior dunes, lone formation, Joshua tree woodland, Limestone, Lower montane coniferous forest, Marsh & swamp, Meadow & seep, Mojavean desert scrub, Montane dwarf scrub, North coast coniferous forest, Oldgrowth, Pavement plain, Redwood, Riparian forest, Riparian scrub, Riparian woodland, Salt marsh, Sonoran desert scrub, Sonoran thorn woodland, Ultramafic, Upper montane coniferous forest, Upper Sonoran scrub, Valley & foothill grassland
Trifolium hydrophilum	saline clover	Dicots	PDFAB400R5	56	1	None	None	G2	S2	1B.2	null	Marsh & swamp, Valley & foothill grassland, Vernal pool, Wetland
Tropidocarpum capparideum	caper-fruited tropidocarpum	Dicots	PDBRA2R010	18	1	None	None	G1	S1	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, USFS_S-Sensitive	Valley & foothill grassland
Valley Sink Scrub	Valley Sink Scrub	Scrub	CTT36210CA	29	1	None	None	G1	S1.1	null	null	Chenopod scrub
Vulpes macrotis mutica	San Joaquin kit fox	Mammals	AMAJA03041	1018	1	Endangered	Threatened	G4T2	S2	null	null	Chenopod scrub, Valley & foothill grassland



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51 matches found. *Click on scientific name for details*

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Scientific Name	Common Name	Family	Lifeform	Blooming Period	CA Rare Plant Rank	State Rank	Global Rank
Acanthomintha lanceolata	Santa Clara thorn-mint	Lamiaceae	annual herb	Mar-Jun	4.2	S4	G4
Amsinckia lunaris	bent-flowered fiddleneck	Boraginaceae	annual herb	Mar-Jun	1B.2	S3	G3
Androsace elongata ssp. acuta	California androsace	Primulaceae	annual herb	Mar-Jun	4.2	S3S4	G5?T3T4
Astragalus tener var. tener	alkali milk-vetch	Fabaceae	annual herb	Mar-Jun	1B.2	S1	G2T1
Atriplex cordulata var. cordulata	heartscale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G3T2
Atriplex coronata var. coronata	crownscale	Chenopodiaceae	annual herb	Mar-Oct	4.2	S3	G4T3
Atriplex depressa	brittlescale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G2
Atriplex minuscula	lesser saltscale	Chenopodiaceae	annual herb	May-Oct	1B.1	S2	G2
Balsamorhiza macrolepis	big-scale balsamroot	Asteraceae	perennial herb	Mar-Jun	1B.2	S2	G2
Blepharizonia plumosa	big tarplant	Asteraceae	annual herb	Jul-Oct	1B.1	S1S2	G1G2
Boechera rubicundula	Mt. Day rockcress	Brassicaceae	perennial herb	Apr-May	1B.1	S1	G1
Calochortus umbellatus	Oakland star-tulip	Liliaceae	perennial bulbiferous herb	Mar-May	4.2	S3?	G3?
Calyptridium parryi var. hesseae	Santa Cruz Mountains pussypaws	Montiaceae	annual herb	May-Aug	1B.1	S2	G3G4T2
Campanula exigua	chaparral harebell	Campanulaceae	annual herb	May-Jun	1B.2	S2	G2

<u>Centromadia parryi ssp. congdonii</u>	Congdon's tarplant	Asteraceae	annual herb	May-Oct(Nov)	1B.1	S1S2	G3T1T2
<u>Chloropyron maritimum ssp. palustre</u>	Point Reyes bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	Jun-Oct	1B.2	S2	G4?T2
<u>Chloropyron molle ssp. hispidum</u>	hispid bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	Jun-Sep	1B.1	S1	G2T1
<u>Chloropyron palmatum</u>	palmate-bracted bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	May-Oct	1B.1	S1	G1
<u>Clarkia breweri</u>	Brewer's clarkia	Onagraceae	annual herb	Apr-Jun	4.2	S4	G4
<u>Clarkia concinna ssp. automixa</u>	Santa Clara red ribbons	Onagraceae	annual herb	(Apr)May-Jun(Jul)	4.3	S3	G5?T3
<u>Deinandra bacigalupii</u>	Livermore tarplant	Asteraceae	annual herb	Jun-Oct	1B.1	S1	G1
<u>Delphinium californicum ssp. interius</u>	Hospital Canyon larkspur	Ranunculaceae	perennial herb	Apr-Jun	1B.2	S3	G3T3
<u>Eriophyllum jepsonii</u>	Jepson's woolly sunflower	Asteraceae	perennial herb	Apr-Jun	4.3	S3	G3
<u>Eryngium aristulatum var. hooveri</u>	Hoover's button-celery	Apiaceae	annual / perennial herb	(Jun)Jul(Aug)	1B.1	S1	G5T1
<u>Extriplex joaquinana</u>	San Joaquin spearscale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G2
<u>Fritillaria agrestis</u>	stinkbells	Liliaceae	perennial bulbiferous herb	Mar-Jun	4.2	S3	G3
<u>Fritillaria liliacea</u>	fragrant fritillary	Liliaceae	perennial bulbiferous herb	Feb-Apr	1B.2	S2	G2
<u>Helianthella castanea</u>	Diablo helianthella	Asteraceae	perennial herb	Mar-Jun	1B.2	S2	G2
<u>Lasthenia conjugens</u>	Contra Costa goldfields	Asteraceae	annual herb	Mar-Jun	1B.1	S1	G1
<u>Legenere limosa</u>	legenere	Campanulaceae	annual herb	Apr-Jun	1B.1	S2	G2
<u>Leptosiphon acicularis</u>	bristly leptosiphon	Polemoniaceae	annual herb	Apr-Jul	4.2	S4?	G4?
<u>Leptosiphon ambiguus</u>	serpentine leptosiphon	Polemoniaceae	annual herb	Mar-Jun	4.2	S4	G4
<u>Leptosyne hamiltonii</u>	Mt. Hamilton coreopsis	Asteraceae	annual herb	Mar-May	1B.2	S2	G2
<u>Lessingia hololeuca</u>	woolly-headed lessingia	Asteraceae	annual herb	Jun-Oct	3	S2S3	G3?
<u>Malacothamnus arcuatus</u>	arcuate bush-mallow	Malvaceae	perennial evergreen shrub	Apr-Sep	1B.2	S2	G2Q
<u>Malacothamnus hallii</u>	Hall's bush-mallow	Malvaceae	perennial evergreen shrub	(Apr)May-Sep(Oct)	1B.2	S2	G2
<u>Mielichhoferia elongata</u>	elongate copper moss	Mielichhoferiaceae	moss		4.3	S4	G5
<u>Monardella antonina ssp. antonina</u>	San Antonio Hills monardella	Lamiaceae	perennial rhizomatous herb	Jun-Aug	3	S1S3	G4T1T3Q

<u>Myosurus minimus ssp. apus</u>	little mousetail	Ranunculaceae	annual herb	Mar-Jun	3.1	S2	G5T2Q
<u>Navarretia nigelliformis ssp. nigelliformis</u>	adobe navarretia	Polemoniaceae	annual herb	Apr-Jun	4.2	S3	G4T3
<u>Navarretia prostrata</u>	prostrate vernal pool navarretia	Polemoniaceae	annual herb	Apr-Jul	1B.1	S2	G2
<u>Plagiobothrys glaber</u>	hairless popcornflower	Boraginaceae	annual herb	Mar-May	1A	SH	GH
<u>Polemonium carneum</u>	Oregon polemonium	Polemoniaceae	perennial herb	Apr-Sep	2B.2	S2	G3G4
<u>Puccinellia simplex</u>	California alkali grass	Poaceae	annual herb	Mar-May	1B.2	S2	G3
<u>Sidalcea malachroides</u>	maple-leaved checkerbloom	Malvaceae	perennial herb	(Mar)Apr-Aug	4.2	S3	G3
<u>Spergularia macrotheca var. longistyla</u>	long-styled sand-spurrey	Caryophyllaceae	perennial herb	Feb-May(Jun)	1B.2	S2	G5T2
<u>Streptanthus albidus ssp. peramoenus</u>	most beautiful jewelflower	Brassicaceae	annual herb	(Mar)Apr-Sep(Oct)	1B.2	S2	G2T2
<u>Stuckenia filiformis ssp. alpina</u>	slender-leaved pondweed	Potamogetonaceae	perennial rhizomatous herb (aquatic)	May-Jul	2B.2	S2S3	G5T5
<u>Suaeda californica</u>	California seablite	Chenopodiaceae	perennial evergreen shrub	Jul-Oct	1B.1	S1	G1
<u>Trifolium hydrophilum</u>	saline clover	Fabaceae	annual herb	Apr-Jun	1B.2	S2	G2
<u>Tropidocarpum capparideum</u>	caper-fruited tropidocarpum	Brassicaceae	annual herb	Mar-Apr	1B.1	S1	G1

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Questions and Comments

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Appendix D. Special-Status Animal Species Considered

Name	*Status	Habitat	Potential for Occurrence in the Project Site
Invertebrates			
Crotch bumble bee (<i>Bombus crotchii</i>)	SC	Nests in rodent burrows and occasionally brush piles. Requires wildflowers for nectar. Sensitive to herbicides and pesticides.	Absent. There is 1 CNDDDB occurrence record within 5 miles of the Project site from Pleasanton, but the Project site is located outside of the species current extent of occurrence range (Xerces Society 2018).
Western bumble bee (<i>Bombus occidentalis</i>)	SC	Nests in rodent burrows and occasionally brush piles. Requires wildflowers for nectar. Sensitive to herbicides and pesticides.	Absent. There is 1 CNDDDB occurrence record within 5 miles of the Project site from the eastern edge of Fremont, but the Project site is located outside of the species current extent of occurrence range (Xerces Society 2018).
Longhorn fairy shrimp (<i>Branchinecta longiantenna</i>)	FE	Vernal pools, playa pools, and rock outcrop pools.	Absent. No suitable habitat is present in or immediately adjacent to Project site, and the site is outside the species' range. The closest record of occurrence is located 10 miles to the northeast at Brushy Peak Preserve.
Vernal pool fairy shrimp (<i>Branchinecta lynchi</i>)	FT	Vernal pools, ponds, and seasonal wetlands in the Central Valley and interior Coast Range.	Absent. No suitable habitat is present in or immediately adjacent to Project site, and the site is outside the species' range. The closest record of occurrence is located 10 miles to the northeast. EACCS mapping of this species' potential distribution indicates that no mapped habitat occurs within the Project vicinity.
San Bruno Elfin butterfly (<i>Callophrys mossii bayensis</i>)	FE	Local range includes San Mateo Peninsula, Mount Diablo, and Marin County (near Alpine Lake and Dillon Beach). Associated with rocky outcrops, cliffs, and coastal scrub typically on north-facing slopes within conglomerations of its host plant, broadleaf stonecrop (<i>Sedum spathulifolium</i>).	Absent. The Project is located outside of the species known range and suitable habitat is absent from the Project site. No CNDDDB records occur within 5 miles of the Project site (2021).
Monarch butterfly (<i>Danaus plexippus</i>)	FC	In California, from Mendocino County south to Baja, typically from Santa Cruz to Santa Barbara counties. Require eucalyptus and native trees protected from wind forces for overwintering sites.	Not expected. Suitable host plant (milkweed) and overwintering tree clusters are absent from the Project site and no CNDDDB records are known from within 5 miles of the Project site (2021). Occasional individual adults may enter the site, but they are not expected to breed or overwinter.

Bay checkerspot butterfly (<i>Euphydryas editha bayensis</i>)	FT	Current range includes San Francisco Peninsula, San Mateo County, and Santa Clara County. Formerly San Francisco Bay area to Mount Diablo and Hollister. Native grasslands on serpentine soils. Larval host plants are <i>Plantago erecta</i> and/or <i>Castilleja exserta</i> ssp. <i>exserta</i> .	Absent. Serpentine soils are absent from the Project site and no CNDDDB records are known from within 5 miles of the Project site (2021). The Project site is outside of the species current known range.
Vernal pool tadpole shrimp (<i>Lepidurus packardii</i>)	FE	California Central Valley from Shasta County to Merced County, with isolated populations in Fresno, Alameda, and Tulare counties. Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water.	Absent. No suitable habitat is present in or immediately adjacent to Project site. No CNDDDB records occur within 5 miles of the Project site (2021).
Callippe silverspot butterfly (<i>Speyeria callippe</i>)	FE	Grasslands and chaparral supporting the larval host plant, Johnny jump-up. Adults feed on a variety of flower nectar sources and use hilltops to locate mates.	May be Present. Known to occur in the region (ICF 2010), and suitable grassland habitat supporting Johnny jump-up is present in the Project site. During protocol-level rare plant surveys, focused surveys for Johnny jump-up detected an occurrence of approximately 25 individual plants on a north-facing, steep slope above the south bank of the Vallecitos Channel, near the Channel's western end. The EACCS maps potential habitat for this species within the upper reaches of the Project site (ICF 2010).
Amphibians			
California tiger salamander (<i>Ambystoma californiense</i>)	FT, ST	Vernal or temporary pools in annual grasslands or open woodlands.	May be Present. This species is known to occur in the Project vicinity, and suitable foraging, dispersal, and refugial habitat for this species is present in the non-native annual grassland within and near the Project site. No suitable breeding habitat is present on or immediately adjacent to the site; however, suitable breeding ponds are present within 500 ft of the Project site and a known historic breeding site is located 2,500 ft south of the site. The EACCS maps potential upland habitat for this species within the Project site (ICF 2010).
Foothill yellow-legged frog (<i>Rana boylei</i>)	SE, CSSC	Partially shaded shallow streams and riffles with a rocky substrate. Occurs in a variety of habitats in coast ranges.	Absent. The EACCS maps potential habitat for this species within the Project vicinity upstream of the Project site. There are 3 CNDDDB occurrence records within 5 miles of the Project Site (2021); however, suitable habitat for this species is not present on the Project site.

California red-legged frog (<i>Rana draytonii</i>)	FT, CSSC	Streams, freshwater pools, and ponds with emergent or overhanging vegetation.	May be Present. This species is known to occur in the Project vicinity and suitable foraging, dispersal, and refugial habitat is present in the non-native annual grassland habitats within the Project site. Aquatic habitat within the channel may provide breeding, foraging, and dispersal habitat for this species under low-flow conditions during the winter and spring. Large number of American bullfrogs have been observed in the channel, which reduce the likelihood that California red-legged frog would successfully breed in Vallecitos Channel. The EACCS maps potential habitat for this species and the Project site is located within mapped upland/movement habitat (ICF 2010).
Reptiles			
Western pond turtle (<i>Actinemys marmorata</i>)	CSSC	Permanent or nearly permanent water in a variety of habitats.	May be Present. This species occurs in the Project vicinity and was observed during surveys near the access road located to the south of the Vallecitos Channel. During the dry season, this species would be confined to deep pools directly downstream of the drop structures.
Alameda whipsnake (<i>Masticophis lateralis euryxanthus</i>)	FT, ST	Shrubland, oak woodland, and riparian zones interspersed with grassland and rock outcrops	Low Likelihood. Habitats on the Project site do not provide several essential habitat elements for Alameda whipsnake, such as sage scrub or rock outcrops. The site therefore does not provide high-quality habitat and is unlikely to support a resident or breeding population of this species. This species has been recorded as close as 2.75 miles to the southeast and 8.75 miles to the northwest of the Project site (ICF 2010). The nearest high-quality habitat for the species is located approximately 2.0 miles northwest of the Project site, in Pleasanton Ridge Regional Park, and 2.5 miles southeast of the Project site, near San Antonio Reservoir and the Sunol Regional Wilderness. Between those locations and the Project site, San Antonio Reservoir and Interstate 680 represent substantial barriers to whipsnake dispersal onto the site, reducing the potential for individuals to disperse through the Project site. Nevertheless, the potential for whipsnakes from higher-quality habitat offsite to disperse onto the site occasionally cannot be eliminated (although dispersing individuals would occur on the site very infrequently and in low numbers). The Project site is isolated by open habitats from other areas providing suitable cover, and there is a low likelihood of whipsnake occurrence. The Vallecitos Channel is within a USFWS-designated recovery unit for this species, and critical habitat has been designated within the Project vicinity. In addition, the EACCS maps

			dispersal habitat for this species along the historic Vallecitos Creek channel, including portions of the Project site (ICF 2010).
coast horned lizard (<i>Phrynosoma blainvillii</i>)	CSSC	Uses a variety of habitats, most commonly sandy washes with low bushes. It needs open areas for sunning, bushes for cover, patches of loose soil for burial, & abundant supply of ants & other insects.	Absent. The species has not been documented within 5 miles of the Project site (CNDDDB 2021) and suitable habitat is absent from the Project site.
Western spadefoot (<i>Spea hammondi</i>)	CSSC	Valley and foothill grasslands, chaparral, and woodlands with sandy or gravelly soils. Breeds in vernal pools and alkali flats.	Absent. No suitable breeding habitat is present on the Project site, and the site is outside the species' range. The closest record of occurrence is located approximately 10 miles to the northeast.
San Joaquin whipsnake (<i>Masticophis flagellum ruddocki</i>)	CSSC	Open, dry areas in grassland, scrub, and chaparral habitats.	Absent. This species is not known to occur in the Project vicinity, which is outside the species' range. The closest record of occurrence is located approximately 11 miles to the northeast.
Fish			
Delta smelt (<i>Hypomesus transpacificus</i>)	FT, SE	San Francisco Bay to Sacramento-San Joaquin Delta. Freshwater streams to tidally influenced sloughs and channels.	Absent. The species has not been documented in the study area and suitable habitat is not present in the Vallecitos Channel. The Project is located outside of the species' known range and no CNDDDB records occur within 5 miles of the Project.
Central California Coast steelhead (<i>Oncorhynchus mykiss</i>)	FT	Cool streams with suitable spawning habitat and conditions allowing migration between spawning and marine habitats.	Absent. The species has not been documented in the study area and suitable spawning habitat is not present in the Vallecitos Channel. Although small numbers of steelhead occur in the lower reaches of Alameda Creek, fish migration into the Project vicinity is blocked downstream at the Interstate 680 crossing of Vallecitos Creek, at a water diversion weir on Arroyo de la Laguna located in Sunol north of Niles Canyon Road, and at the BART weir in Fremont.
Central Valley fall-run Chinook salmon (<i>Oncorhynchus tshawytscha</i>)	CSSC	Cool rivers and large streams that reach the ocean and that have shallow, partly shaded pools, riffles, and runs.	Absent. Salmon have not been documented in the Project site and suitable spawning or rearing habitat is not present. Fish migration into the Project vicinity is blocked downstream at the Interstate 680 crossing of Vallecitos Creek, at a water diversion weir on Arroyo de la Laguna located in Sunol north of Niles Canyon Road, and at the BART weir in Fremont.

Birds			
Tricolored blackbird (<i>Agelaius tricolor</i>)	ST, CSSC	Nests near fresh water in dense emergent vegetation.	Present. This species has been observed foraging in the Vallecitos Channel. The EACCS maps foraging habitat for this species within the Project site and breeding habitat is mapped approximately 1,000 ft south of the site (ICF 2010). The perennial marsh vegetation within the Project site may provide suitable nesting habitat.
Grasshopper sparrow (<i>Ammodramus savannarum</i>)	CSSC (nesting)	Nests in open grasslands.	May be Present. Ruderal grassland habitat on the Project site provides suitable foraging and nesting habitat. This species is most likely to nest in low-lying vegetation in grasslands adjacent to the site but nesting individuals may occasionally nest or forage on the Project site.
Burrowing owl (<i>Athene cunicularia</i>)	CSSC	Nests and roosts in open grasslands and ruderal habitats with suitable burrows, usually those made by California ground squirrels	May be Present. Suitable nesting habitat is present in the Project site, as numerous California ground squirrels and their burrows were observed during surveys. In addition, an adult burrowing owl was observed near the access road located south of the Project site. Therefore, breeding, dispersing, and wintering individuals may occur in the Project site, although only in small numbers due to the limited extent of suitable habitat. The EACCS maps potential habitat for this species and the Project site is located within mapped breeding, wintering, and dispersal habitat (ICF 2010).
Golden eagle (<i>Aquila chrysaetos</i>)	SP	Breeds on cliffs or in large trees (rarely on electrical towers), forages in open areas.	Absent as Breeder. Adult and juvenile golden eagles were observed foraging in the Project vicinity during surveys in February 2016. In addition, several nesting territories have been documented in the upper Alameda Creek Watershed (CNDDDB 2021). Individuals of this species may occur on the Project site as foragers. However, no golden eagle nests were observed within 0.5 mile of the Project site during focused surveys. The EACCS maps potential habitat for this species and the Project site is located within mapped foraging habitat (ICF 2010).
Northern harrier (<i>Circus hudsonius</i>)	CSSC (nesting)	Nests in marshes and moist fields, forages over open areas.	Absent as Breeder. Suitable nesting habitat is not present on the Project site, although wintering or migrating individuals have been observed foraging on the Project site and adjacent open grassland areas.
White-tailed kite (<i>Elanus leucurus</i>)	SP	Nests in tall shrubs and trees, forages in grasslands, marshes, and ruderal habitats.	May be Present. Suitable nesting and foraging habitat are present in and adjacent to the Project site and the species is known to nest in eastern Alameda County (CNDDDB 2021). This species may nest in trees adjacent to the site and forage in open habitats within and surrounding the site.
American peregrine falcon	SP	Forages in many habitats; nests on cliffs and tall bridges and buildings.	Absent as Breeder. Peregrine falcons are expected to occur as occasional foragers in the Project site and adjacent open areas;

(<i>Falco peregrinus anatum</i>)			however, there is no suitable nesting habitat present within the Project site.
Bald eagle (<i>Haliaeetus leucocephalus</i>)	SE, SP	Nests in live trees near large bodies of water.	Absent as Breeder. This species occurs in the Project vicinity and a single pair may nest near San Antonio Reservoir. Individuals of this species may occasionally occur on the Project site as foragers; however, no suitable nesting habitat is present on the Project site (and no nests were observed in the site vicinity during surveys), and the Project site provides low-quality habitat for the species owing to limited aquatic habitat.
Loggerhead shrike (<i>Lanius ludovicianus</i>)	CSSC (nesting)	Nests in tall shrubs and dense trees; forages in grasslands, marshes, and ruderal habitats.	Present. This species occurs in the Project vicinity and evidence of shrike (i.e. cached prey items) was observed in the Project site. Suitable nesting habitat occurs in the Project site where live oak trees, valley oak trees, and scattered coyote brush occur adjacent to open grassland. Therefore, individuals may occur in the Project site as breeders, migrants, or foragers.
California black rail (<i>Laterallus jamaicensis coturniculus</i>)	ST, SP	Inhabits freshwater marshes, wetland meadows, and the shallow margins of saltwater marshes bordering larger bays. Needs water depths of about 1 inch that do not fluctuate during the year & dense vegetation for nesting habitat.	Absent. This species is not known to occur within 5 miles of the Project site (CNDDDB 2021) and suitable habitat (marsh with stable water depth) is not present.
Alameda song sparrow (<i>Melospiza melodia pusillula</i>)	CSSC	Resident of tidal salt marshes in south San Francisco Bay. Found in pickleweed marshes. Nests in Grindelia along channels.	Absent. This species typically occurs along the tidal fringes of San Francisco Bay and tidal marsh habitat is absent from the Project site. No CNDDDB occurrences are known within 5 miles of the Project site (2021).
Bank swallow (<i>Riparia riparia</i>)	ST	Colonial nester on vertical banks or cliffs with fine-textured soils near water.	Absent. No suitable nesting habitat is present on the Project site, and the site is outside this species' breeding range.
Yellow warbler (<i>Setophaga petechia</i>)	CSSC (nesting)	Nests in riparian woodlands.	Not expected. Mature riparian woodland habitat downstream of the Project site provides suitable nesting habitat. Individuals may occur in the Project site as migrants, or foragers, although likely in low numbers due to the limited extent of habitat in the Project site.
California Least Tern (<i>Sterna antillarum browni</i>)	FE, SE, SP	Nests along the California coast. Colonial breeder on bare or sparsely vegetated, flat substrates: sand beaches, alkali flats, landfills, or paved areas.	Absent. This species typically occurs along the San Francisco Bay and suitable nesting substrate and marine foraging habitat are absent from the Project site. No CNDDDB occurrences are known within 5 miles of the Project site (2021).

Mammals			
Pallid bat (<i>Antrozous pallidus</i>)	CSSC	Forages over many habitats; roosts in caves, rock outcrops, buildings, and hollow trees.	Absent as Breeder. There is 1 CNDDDB record of the species known within 5 miles of the Project site (2021) and this species could potentially forage within the Project site in or over open habitats on rare occasions. However, focused surveys for trees providing large cavities capable of supporting a large roost or maternity roost did not detect any such cavities, and therefore this species is only expected to occur on the site as a nonbreeding forager.
Townsend's big-eared bat (<i>Corynorhinus townsendii</i>)	CSSC	Roosts in caves and mine tunnels, and occasionally in deep crevices in trees such as redwoods or in abandoned buildings.	Absent as Breeder. There is 1 CNDDDB record known from the eastern edge of Fremont within 5 miles of the Project site (2021), but no suitable roosting habitat is present on or near the Project site.
Western red bat (<i>Lasiurus blossevillii</i>)	CSSC	Forages over many habitats; roosts in foliage in forest or woodlands, especially in or near riparian habitat.	Absent as Breeder. This species could potentially occur in the Project vicinity as a migrant and winter resident, roosting in the foliage of trees, although only occasionally and in low numbers due to the limited extent of habitat; however, it does not breed in the Project region.
San Francisco dusky-footed woodrat (<i>Neotoma fuscipes annectens</i>)	CSSC	Nests in a variety of habitats including riparian areas, coast live oak woodlands, and scrub.	Not Expected. Suitable habitat for this species is present in riparian woodland areas along the downstream 4,500 ft of the channel, outside of the Project site. Multiple (18) woodrat nests were observed were observed in mixed riparian woodland habitat and two woodrat nests were observed in mixed oak woodland habitat in this area during the February 2016 reconnaissance-level survey. However, no woodrat nests were observed within the Project construction and staging areas and sufficient riparian or oak woodland habitat is absent from the Project site.
American badger (<i>Taxidea taxus</i>)	CSSC	Open areas with grasslands.	Present. This species occurs in the Project vicinity and may use open grassland habitats to the east and south of the Project site for breeding, foraging, and dispersal habitat.
San Joaquin kit fox (<i>Vulpes macrotis mutica</i>)	FE, ST	Open valley and foothill grassland, scrub, and desert habitats.	Absent. Although the Project site is within the historic range of this species, the species has not been reported in the Project vicinity in the last 40 years (Weslar 1987, CNDDDB 2021). Likely absent from the vicinity today due to habitat loss from urbanization and isolation from extant kit fox populations. The EACCS maps potential habitat for this species and the western edge of mapped core habitat includes the upper reaches of the Project site (ICF 2010).

Ringtail	SP	Forests and shrublands, often in close association with rocky areas or riparian systems; nests in rock recesses, hollow trees, logs, and burrows.	Absent. Suitable forest habitat is not present on the Project site and the small patch of coyote brush shrubland on the Project site does not provide suitable habitat for this species due to the limited size and extent. The closest suitable forest habitat for this species is located approximately 3.5 miles northwest of the Project site on Pleasanton Ridge, and 4.0 miles southeast near the Ohlone Regional Wilderness.
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SPECIAL-STATUS SPECIES CODE DESIGNATIONS

FE = Federally Endangered

FT = Federally Threatened

SE = State listed Endangered

ST = State listed Threatened

SC = State Candidate for listing

CSSC = California Species of Special Concern

SP = State Fully Protected Species

Appendix E.

Biological Resources Existing Conditions Report



H. T. HARVEY & ASSOCIATES

Ecological Consultants



Vallecitos Channel Programmatic Maintenance Project Biological Resources Report

Project #3812-01

Prepared for:

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Prepared by:

H. T. Harvey & Associates



September 2016

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Section 1. Introduction

This report presents the regulatory setting and existing environmental conditions related to biological resources for the Vallecitos Channel Programmatic Maintenance Project (“Project”). The Alameda County Water District is proposing to increase flow capacity and efficiency of the Vallecitos Channel. These improvements will occur through water management operations within the existing channel corridor and associated access roads, and through construction of channel improvements in high-priority locations where bank erosion and/or sediment aggradation have constrained or threaten to constrain functional channel capacity. Therefore, the Project site has two defined portions: (1) the Vallecitos Channel operations and water management area (“channel”), including the existing fenced corridor and existing access roads, and (2) the proposed construction areas (“work areas”) and associated staging areas.

1.1 Project Location

The 19.53-acre (ac) Project site is located in an unincorporated area of Alameda County (Figure 1). The Project site is located in the *La Costa Valley, California* USGS 7.5-minute quadrangle (Figure 2). The site is south of State Route (SR) 84 and east of Interstate 680 in the foothills of the Diablo Mountains. Neighboring properties to the north of the Project site include the Vallecitos Nuclear Center (VNC); Crystal Image Farms, a horse breeding facility; and Sunol Paintball Outdoor Park. Areas immediately south and east of the Project site are undeveloped, and include both private agriculture lands and approximately 16,000 ac of public open space, including the San Antonio Reservoir and James H. Turner Dam, the Sunol Regional Wilderness Area, and the Ohlone Regional Wilderness Area within the East Bay Regional Park District.

The Project alignment follows Vallecitos Creek, a freshwater stream, for approximately 2.5 miles (mi). Vallecitos Creek is a small tributary in the Lower Alameda Creek Watershed that drains the western slopes of the Diablo Mountains. The natural channel has been altered substantially to allow for the conveyance of water from the South Bay Aqueduct downstream to the ACWD service area, including Fremont, Newark, and Union City. The channel has managed flows; water from the Bethany Reservoir, located along the western edge of the San Joaquin Valley, is pumped via the South Bay Aqueduct to the head of the Vallecitos Channel. The water is then released from the aqueduct to the Vallecitos Channel and moves through the Project site from east to west through the open and vegetated Vallecitos Creek channel, several constructed channels with engineered levees, and four segments in underground pipes. Water is released into the Vallecitos Channel both for water supply purposes, which typically occurs during dry periods, and the management of overflow and pipe pressure from the South Bay Aqueduct, which can occur periodically at any time of the year. Water from the channel eventually reaches Arroyo de la Laguna and Alameda Creek, and ultimately empties into the San Francisco Bay. Water supply releases from the South Bay Aqueduct account for much of the dry-season flow in the channel. The native ephemeral stream flows, local runoff, and groundwater accounts for the majority of wet-season flow in the channel, and overflow releases from the aqueduct contribute to these flows periodically in both the wet and dry seasons. An access road, which is shared with the San Francisco Public Utilities Commission (SFPUC),

runs from the downstream end of the Project alignment to the upstream end of the alignment. This access road is a gravel and paved road that runs through the hills to the south of the Vallecitos Channel through open space managed by the SFPUC (Figure 2).

1.2 Surveys Conducted

To assist with the assessment of existing biological resources on the Project site, H. T. Harvey & Associates ecologists reviewed current and historic aerial images (Nationwide Environmental Title Research 2016, Google Inc. 2016) and various maps, including those from the USGS and National Resource Conservation Service's (NRCS's) soil survey (NRCS 2016). Information on the previously recorded distribution of special-status species and sensitive habitats in the general vicinity of the Vallecitos Channel Project site was determined through review of the California Department of Fish and Wildlife's (CDFW's) California Natural Diversity Database (CNDDDB 2016), the East Alameda County Conservation Strategy (EACCS) (ICF 2010), the U. S. Fish and Wildlife Service's (USFWS's) Information for Planning and Conservation (IPaC) online resource, and information from previous biological resource studies. For the purposes of this report, the general vicinity of the site is defined as the area within a 5 mi radius of the Project site. For special-status plant species, our review also included species on current California Native Plant Society (CNPS) California Rare Plant Rank (CRPR) 1A, 1B, 2A, and 2B lists occurring in the Project region (CNPS 2016), which is defined as the *La Costa Valley, California* USGS quadrangle and surrounding eight quadrangles (*Altamont, Calaveras Reservoir, Dublin, Livermore, Mendenhall Springs, Milpitas, Mount Day, and Niles*). Quadrangle-level results are not maintained for CRPR 3 and 4 species, so we also conducted a search of the CNPS *Inventory of Rare and Endangered Plants* (CNPS 2016) for these species occurring in the County. In addition, we queried the CNDDDB (2016) for natural communities of special concern that occur within the Project region.

H. T. Harvey & Associates plant ecologists Ethan Barnes, M.S., and Elan Alford, Ph.D. conducted habitat reconnaissance surveys and wetland delineation surveys of the Project site on February 10-11, 2016. Ms. Alford conducted focused surveys for Johnny jump-up (*Viola pedunculata*), the larval host plant of the Callippe silverspot (*Speyeria callippe callippe*), on February 26, 2016. Protocol-level surveys for rare plants were conducted by Ms. Alford on February 26, 2016 for early-spring-flowering plants and by Mr. Barnes on April 28, 2016 for mid-spring-flowering plants and July 9, 2016 for summer-flowering plants. An additional site visit was also conducted on July 22, 2016 by senior ecologist Patrick Stone, B.S., to relocate and identify several annual tarweed populations that were not in bloom during the July 9 site visit.

Mr. Stone conducted reconnaissance-level surveys to assess wildlife habitat and sensitive natural resources on February 9-10, 2016. The surveys included inspections of the entire Project site, including the Vallecitos Channel Project area, work areas, and adjoining staging areas. Also during the reconnaissance-level surveys, the ecologist assessed the potential for adjacent habitats to support special-status species, including searching for suitable bat roosting habitat (i.e., large tree cavities, buildings, or caves within 100 feet (ft) of the Project site), potential raptor nests within 300 ft of the site, and San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*) nests within 10 ft of the site that could be disturbed by Project activities occurring on the Project site.

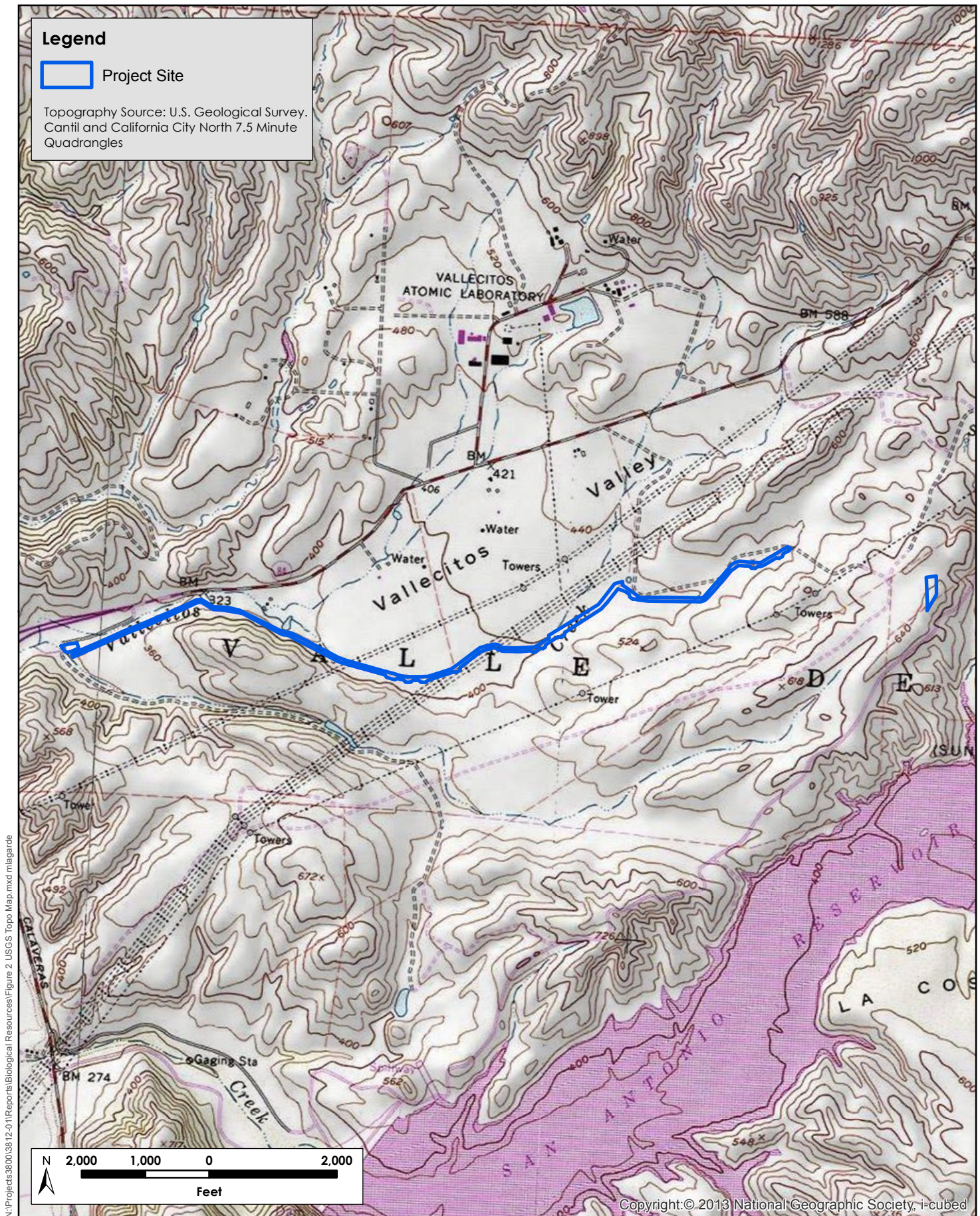


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Figure 1. Vicinity Map
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N:\Projects\38000\3812-0\1\Reports\Biological Resources\Figure 2 USGS Topo Map.mxd miagade

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Figure 2. USGS Topographic Map

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(these distances corresponding to typical buffers necessary to minimize disturbance). The developed access road through SFPUC lands was not included in the habitat mapping and wetland delineation surveys; however, observations of special-status species on or immediately adjacent to the access road were recorded during reconnaissance-level surveys to help assess biological resources that could be potentially disturbed during the Project's use of this access road. Mr. Stone also conducted focused surveys for nesting golden eagles (*Aquila chrysaetos*) and other raptors on February 23, 2016. H. T. Harvey & Associates senior herpetologist Jeff Wilkinson, Ph.D. conducted a focused habitat survey on February 25, 2016 to assess the suitability of habitat on the Project site for use by Alameda whipsnakes (*Masticophis lateralis euryxanthus*) and breeding California red-legged frogs (*Rana draytonii*). The purpose of all these surveys was to identify the existing biological resources on the site to aid in a future impact assessment for the proposed Project. Specifically, these surveys were conducted to assess existing biotic habitats and general wildlife communities on the site, and to assess the site for its potential to support special-status species and sensitive habitats, such as wetlands, streams, and riparian areas. Geographic Position System (GPS) units were used to record observations and habitat boundaries in the field, and habitat mapping was finalized using aerial vegetation signatures in Google Earth (Google Inc. 2016).

Section 2. Regulatory Setting

2.1 Federal Regulations

2.1.1 Clean Water Act

Areas meeting the regulatory definition of “waters of the U.S.” are subject to the jurisdiction of the USACE under provisions of Section 404 of the 1972 Clean Water Act (CWA). These waters may include all waters used, or potentially used, for interstate commerce, including all waters subject to the ebb and flow of the tide, all interstate waters, all other waters (intrastate lakes, rivers, streams, mudflats, sandflats, natural ponds, etc.), territorial seas, and wetlands adjacent to waters of the U.S. (33 CFR, Part 328). Wetlands on non-agricultural lands are identified using the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) approach that relies on identification of three parameters: hydrophytic vegetation, hydric soils, and wetland hydrology indicators. Areas typically not considered to be jurisdictional waters include non-tidal drainage and irrigation ditches excavated in uplands, artificially irrigated areas, artificial lakes or ponds used for irrigation or stock watering, small artificial water bodies such as swimming pools, and water-filled depressions (33 CFR, Part 328).

In nontidal, freshwater systems, USACE jurisdiction extends to the ordinary high water (OHW) mark, which is defined in Title 33, Code of Federal Regulations (CFR), Part 328.3 as “the line on the shore established by the fluctuations of water and indicated by physical characteristics, such as a clear, natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation or the presence of litter and debris.” This guidance is based on the identification of the OHW mark by examining physical evidence of surface flow in the stream channel; there is no hydrologic definition of the OHW mark.

Construction activities within jurisdictional waters are regulated by the USACE. The placement of fill into such waters must comply with permit requirements of the USACE. No USACE permit will be effective in the absence of Section 401 Water Quality Certification. The State Water Resources Control Board (SWRCB) is the state agency (together with the Regional Water Quality Control Boards [RWQCBs]) charged with implementing water quality certification in California.

Project Applicability. Potentially jurisdictional waters of the U.S. occur on the Project site. Jurisdictional other waters subject to Section 404 of the CWA include aquatic habitat within the Vallecitos Channel. The lateral limits of jurisdictional other waters in the channel are demarcated by the elevation of the OHW mark. The Project site also has potentially jurisdictional wetlands in the perennial freshwater marsh associated with the channel and seasonal wetlands that occur above top of bank. H. T. Harvey & Associates conducted a wetland delineation at the site on February 10 and 11, 2016; results are provided in a separate report (H. T. Harvey & Associates 2016) and are subject to verification by the USACE. A Section 404 permit from the USACE, with

an associated Section 401 Water Quality Certification from the RWQCB, would be required for impacts to waters of the U.S.

2.1.2 Federal Endangered Species Act

The federal Endangered Species Act (FESA) protects listed wildlife species from harm or “take” which is broadly defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct. Take can also include habitat modification or degradation that directly results in death or injury of a listed wildlife species. An activity can be defined as “take” even if it is unintentional or accidental. Listed plant species are provided less protection than listed wildlife species. Listed plant species are legally protected from take under the FESA only if they occur on federal lands or if the project requires a federal action, such as a Clean Water Act Section 404 fill permit from the USACE.

The USFWS has jurisdiction over federally listed threatened and endangered wildlife species (and some fish) under the FESA, while the National Marine Fisheries Service (NMFS) has jurisdiction over federally listed, threatened and endangered, marine species and anadromous fish.

Project Applicability. Based on a review of background information and a field assessment, federally listed animal species that occur, or could potentially occur, on the Project site are Callippe silverspot, California red-legged frog, California tiger salamander (*Ambystoma californiense*), and Alameda whipsnake. The current hydrologic conditions and unnatural flow regime in the channel, the limited extent of the Vallecitos Channel corridor, the ruderal and developed conditions along the levees and access roads, and the small size of the work areas limit the potential for these species to occur on the Project site to varying degrees. Nevertheless, incidental take approval from the USFWS would be needed before any take of such species from Project activities could occur. Anadromous fish under the jurisdiction of NMFS are absent from the Project site due to the presence of several barriers to fish passage downstream of the Vallecitos Channel confluence with Vallecitos Creek, including barriers at the Interstate 680 crossing of Vallecitos Creek, at a water diversion weir on Arroyo de la Laguna located in Sunol north of Niles Canyon Road, and at the BART weir in Fremont. No federally listed plant species were detected on the site during comprehensive protocol-level surveys in 2016.

2.1.3 Federal Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA; 16 U.S.C., §703, Supp. I, 1989) prohibits killing, possessing, or trading of migratory birds except in accordance with regulations prescribed by the Secretary of the Interior. The trustee agency that addresses issues related to the MBTA is the USFWS. Migratory birds protected under this law include all native birds and certain game birds (e.g., turkeys and pheasants; USFWS 2005a). This act encompasses whole birds, parts of birds, and bird nests and eggs. The MBTA protects active nests from destruction and all nests of species protected by the MBTA, whether active or not, cannot be possessed. An active nest under the MBTA, as described by the Department of the Interior in its April 16, 2003 Migratory Bird Permit Memorandum, is a nest that contains eggs or young. Nest starts, prior to egg laying, are not protected from destruction.

Project Applicability. All native bird species occurring in the Project site are protected by the MBTA.

2.1.4 Bald Eagle and Golden Eagle Protection Act

The federal Bald and Golden Eagle Protection Act of 1940 (BGPA) (16 U.S.C. 668-668c), as amended, prohibits the taking of bald eagles or golden eagles, including their parts, nests, or eggs. Under the BGPA, it is a criminal violation to “take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or in any manner, any bald eagle commonly known as the American eagle, or golden eagle, alive or dead, or any part, nest, or egg, thereof.” Take is defined to include pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, and disturb. Disturb is defined in 50 CFR Part 22 as “to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.” A violation of the BGPA can result in a fine of \$100,000 (\$200,000 for organizations), imprisonment for one year, or both, for a first offense. Penalties increase substantially for additional offenses, and a second violation of the BGPA is a felony.

Recent revisions to the BGPA authorize take of bald eagles and golden eagles under the following conditions: (1) where the take is compatible with the preservation of the bald eagle and golden eagle; (2) where the take is necessary to protect an interest in a particular locality; (3) where take is associated with but not the purpose of an otherwise lawful activity; and (4) for individual instances of take, the take cannot be avoided; or (5) for programmatic take, the take is unavoidable even though advanced conservation practices are being implemented (50 CFR 22.26).

Project Applicability. Bald eagle and golden eagle occur in the Project vicinity, and individuals may occasionally forage on or adjacent to the Project site; however, no bald eagle or golden eagle nests were observed during Project surveys on the Project site or within 0.5 mi of the site.

2.2 State Regulations

2.2.1 Porter-Cologne Water Quality Control Act

The SWRCB works in coordination with the nine RWQCBs to preserve, protect, enhance, and restore water quality. Each RWQCB makes decisions related to water quality for its region, and may approve, with or without conditions, or deny projects that could affect waters of the state. Their authority to regulate activities that could result in a discharge of dredged or fill material comes from the CWA and the Porter-Cologne Water Quality Control Act (Porter Cologne).

Porter-Cologne broadly defines waters of the state as “any surface water or groundwater, including saline waters, within the boundaries of the state.” Because Porter-Cologne applies to any water, whereas the CWA applies only to certain waters, California’s jurisdictional reach overlaps and may exceed the boundaries of waters

of the U.S. For example, Water Quality Order No. 2004-0004-DWQ states that “shallow” waters of the state include headwaters, wetlands, and riparian areas. Moreover, the San Francisco Bay Region RWQCB’s Assistant Executive Director has stated that, in practice, the RWQCBs claim jurisdiction over riparian areas. Where riparian habitat is not present, such as may be the case at headwaters, jurisdiction is taken to the top of bank. The SWRCB has recently developed a *Preliminary Draft Water Quality Control Policy* that addresses numerous policy elements including development of a wetland definition and description of methodology to be used in defining wetlands as part of waters of the state (SWRCB 2013).

Pursuant to Section 401 of the CWA, projects that are regulated by the USACE must obtain a Water Quality Certification permit from the RWQCB. This certification ensures that the proposed project will uphold state water quality standards. Because California’s jurisdiction to regulate its water resources is much broader than that of the federal government, proposed impacts on waters of the state require Water Quality Certification even if the area occurs outside of USACE jurisdiction. Moreover, the RWQCB may impose mitigation requirements even if the USACE does not. Under the Porter-Cologne, the SWRCB and the nine regional boards also have the responsibility of granting CWA National Pollutant Discharge Elimination System (NPDES) permits and Waste Discharge Requirements for certain point-source and non-point discharges to waters. These regulations limit impacts on aquatic and riparian habitats from a variety of urban sources.

Project Applicability. At the Project site, waters of the state include all waters of the U.S., such as Vallecitos Channel, perennial marsh, and seasonal wetlands. In addition to potentially jurisdictional wetlands and other waters subject to Section 404 of the CWA, the RWQCB is likely to claim the area along the Vallecitos Channel up to the “top of bank” and associated riparian areas. Along Vallecitos Channel, the top of bank is a topographic break point in bank slope located above the OHW and near the shoulder slope that demarcates the bankfull capacity of the channel. In areas where the riparian tree canopy extends above the top of bank, the landward canopy edge of the trees overhanging or rooted close enough to the channel to contribute deadfall and woody debris to the channel will demarcate the likely lateral limit of RWQCB jurisdiction. A Section 401 Water Quality Certification from the RWQCB would be needed for impacts to waters of the state.

2.2.2 California Endangered Species Act

The California Endangered Species Act (CESA; Fish and Game Code of California, Chapter 1.5, Sections 2050-2116) prohibits the take of any plant or animal listed or proposed for listing as rare (plants only), threatened, or endangered. In accordance with CESA, the California Department of Fish and Wildlife (CDFW) has jurisdiction over state-listed species. The CDFW regulates activities that may result in “take” of individuals listed under the Act (i.e., “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill”). Habitat degradation or modification is not expressly included in the definition of “take” under the California Fish and Game Code. The CDFW, however, has interpreted “take” to include the “killing of a member of a species which is the proximate result of habitat modification.”

Project Applicability. Based on a review of background information and a field assessment, state-listed animal species occurring or potentially occurring on the Project site are the California tiger salamander, Alameda

whipsnake, and bald eagle. An incidental take permit from the CDFW would be needed prior to any take of state-listed species as a result of Project activities. In addition, the tricolored blackbird (*Agelaius tricolor*) is considered a candidate for listing under CESA, and this species could potentially occur on the Project site. No state-listed plant species were detected on the site during comprehensive protocol-level surveys in 2016.

2.2.3 California Environmental Quality Act

The CEQA and the CEQA Guidelines provide guidance in evaluating impacts of projects on biological resources and determining which impacts will be significant. CEQA defines “significant effect on the environment” as “a substantial adverse change in the physical conditions which exist in the area affected by the proposed project.” Under CEQA Guidelines Section 15065, a project's effects on biotic resources are deemed significant where the project would:

- “substantially reduce the habitat of a fish or wildlife species”
- “cause a fish or wildlife population to drop below self-sustaining levels”
- “threaten to eliminate a plant or animal community”
- “reduce the number or restrict the range of a rare or endangered plant or animal”

In addition to the Section 15065 criteria that trigger mandatory findings of significance, Appendix G of the CEQA Guidelines provides a checklist of other potential impacts to consider when analyzing the significance of project effects. The impacts listed in Appendix G may or may not be significant, depending on the level of the impact. For biological resources, these impacts include whether the project would:

- “have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife and or U.S. Fish and Wildlife Service”
- “have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service”
- “have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA”
- “interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites”
- “conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance”
- “conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan”

Section 15380(b) of the CEQA Guidelines provides that a species not listed on the federal or state lists of protected species may be considered rare if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definitions in the FESA and the CESA and the section of the California Fish and Game Code dealing with rare or endangered plants or animals. This section was included in the guidelines primarily to deal with situations in which a public agency is reviewing a project that may have a significant effect on a species that has not yet been listed by either the USFWS or CDFW or species that are locally or regionally rare.

The CDFW has produced three lists (amphibians and reptiles, birds, and mammals) of “species of special concern” that serve as “watch lists”. Species on these lists are of limited distribution or the extent of their habitats has been reduced substantially, such that threat to their populations may be imminent. Thus, their populations should be monitored. They may receive special attention during environmental review as potential rare species, but do not have specific statutory protection. All potentially rare or sensitive species, or habitats capable of supporting rare species, are considered for environmental review per CEQA Section 15380(b).

The CNPS, a non-governmental conservation organization, has developed rankings for plant species of concern in California in the CNPS Inventory of Rare and Endangered Plants. Lichens, vascular, and non-vascular plants included in these rankings are defined as follows:

- Rank 1A Plants considered extinct.
- Rank 1B Plants rare, threatened, or endangered in California and elsewhere.
- Rank 2A Plants considered extinct in California but more common elsewhere.
- Rank 2B Plants rare, threatened, or endangered in California but more common elsewhere.
- Rank 3 Plants about which more information is needed - review list.
- Rank 4 Plants of limited distribution-watch list.

These CNPS rankings are further described by the following threat code extensions:

- .1—seriously endangered in California;
- .2—fairly endangered in California;
- .3—not very endangered in California.

Although the CNPS is not a regulatory agency and plants on these lists have no formal regulatory protection, plants appearing in Rank 1 or 2 are, in general, considered to meet CEQA’s Section 15380 criteria, and adverse effects on these species may be considered significant. Impacts on plants that are listed by the CNPS in Rank 3 or 4 are also considered during CEQA review, although because these species are typically not as rare as those in Rank 1 or 2, impacts on them are less frequently considered significant.

Compliance with CEQA Guidelines Section 15065(a) requires consideration of natural communities of special concern, in addition to plant and wildlife species. Vegetation types of “special concern” are tracked in the

CNDDDB (2016). Further, the CDFW ranks sensitive vegetation alliances based on their global (G) and state (S) rankings analogous to those provided in the CNDDDB and using NatureServe's (2016) standard heritage program methodology (also see California Department of Fish and Game [CDFG] 2010). Global rankings (G1–G5) of natural communities reflect the overall condition (rarity and endangerment) of a habitat throughout its range, whereas state rankings (S) are a reflection of the condition of a habitat within California. If an alliance is marked as a G1–G3, all of the associations within it would also be of high priority. The CDFW provides the Vegetation Classification and Mapping Program's (VegCAMP's) currently accepted list of vegetation alliances and associations (CDFG 2010).

Project Applicability. All potential impacts on biological resources will be considered during CEQA review of the Project in the context of the CEQA compliance document to be prepared for the Project.

2.2.4 California Fish and Game Code

The California Fish and Game Code includes regulations governing the use of, or impacts on, many of the state's fish, wildlife, and sensitive habitats. The CDFW exerts jurisdiction over the bed and banks of rivers, lakes, and streams according to provisions of Sections 1601–1603 of the Fish and Game Code. Ephemeral and intermittent streams, rivers, creeks, dry washes, sloughs, blue line streams on USGS maps, and watercourses with subsurface flows fall under CDFW jurisdiction. Canals, aqueducts, irrigation ditches, and other means of water conveyance may also be considered streams if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife. Streams and riparian habitat are defined in Title 14, California Code of Regulations, Section 1.72, and Fish and Game Code Section 2786; respectively. Using these definitions, the lateral extent of a stream and associated riparian habitat would fall under the jurisdiction of CDFW. These areas can be measured in several ways, depending on the particular situation and the type of fish or wildlife at risk. At minimum, CDFW would claim jurisdiction over a stream's bed and bank.

Pursuant to Fish and Game Code Section 1603, the CDFW regulates any project proposed by any person that will “substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated by the department, or use any material from the streambeds.” Fish and Game Code Section 1602 requires an entity to notify CDFW of any proposed activity that may modify a river, stream, or lake. If CDFW determines that proposed activities may substantially adversely affect fish and wildlife resources, a Streambed Alteration Agreement must be prepared. This permit sets reasonable conditions necessary to protect fish and wildlife, and must comply with CEQA. The applicant may then proceed with the activity in accordance with the final permit.

Certain sections of the Fish and Game Code describe regulations pertaining to certain wildlife species. For example, Fish and Game Code Sections 3503, 2513, and 3800 (and other sections and subsections) protect native birds, including their nests and eggs, from all forms of take. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered “take” by the CDFW. Raptors (i.e., eagles, falcons, hawks, and owls) and their nests are specifically protected in California under Fish and Game Code Section 3503.5. Section 3503.5 states that it is “unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes

(birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto.” Non-game mammals are protected by Fish and Game Code Section 4150, and other sections of the Code protect other taxa.

Project Applicability. Along Vallecitos Channel, CDFW riparian jurisdiction under Section 1602 of the California Fish and Game Code extends up to top of bank. In areas where the riparian tree canopy extends above the top of bank, the landward canopy edge will demarcate the likely lateral limit of CDFW jurisdiction. Impacts on these areas would require a Section 1602 Lake and Streambed Alteration Agreement. Seasonal wetlands outside of the channel alignment that lack defined bed and bank are not subject to CDFW jurisdiction. All native bird species, as well as most other native vertebrates, that occur on the Project site are protected by the California Fish and Game Code.

2.2.5 State Senate Concurrent Resolution No. 17-Oak Woodland Protection

State Senate Concurrent Resolution No. 17 requires that all state agencies having land use planning duties to assess and determine the effects of their land use decisions or actions within any oak woodland containing blue, Engelman, valley or coast live oak that may be affected by their decisions or actions. For purposes of this measure, the term “oak woodlands” means a 5-acre circular area containing five or more oak trees per acre. The state agencies are required to preserve and protect native oak woodlands to the maximum extent feasible or provide replacement plantings where any of the oak trees listed above are removed from oak woodlands.

Project Applicability. Oak tree density in the mixed oak woodland and mixed riparian woodland is of sufficient density and size (when the woodlands both inside and adjacent to the Project site are considered) to meet the State standard for oak woodland protection and impact mitigation.

2.2.6 California Native Plant Protection Act

The California Native Plant Protection Act (NPPA) was enacted in 1977 and allows the Fish and Game Commission to designate plants as rare or endangered. There are 64 species, subspecies, and varieties of plants that are protected as rare under the NPPA. The NPPA prohibits take of endangered or rare native plants, but includes some exceptions for agricultural and nursery operations; emergencies; and after properly notifying CDFW for vegetation removal from canals, roads, and other sites, changes in land use, and in certain other situations.

Project Applicability. No plant species protected by the NPPA were detected on the site during comprehensive protocol-level surveys in 2016.

2.3 Local Regulations

2.3.1 East Alameda County Conservation Strategy

The EACCS was created with the intention to provide a framework to protect, enhance, and restore natural resources in East Alameda County while streamlining the environmental permitting process for development and infrastructure projects. The EACCS was prepared in partnership with the various County agencies, such as the Congestion Management Agency, Waste Management Authority, and Resource Conservation District; the CDFW; Cities of Dublin, Livermore, and Pleasanton; East Bay Regional Park District; San Francisco RWQCB; National Resource Conservation Service (NRCS); USFWS; and the Zone 7 Water Agency. The study area encompasses 271,485 ac and overlaps with that of the future Alameda Watershed Habitat Conservation Plan (HCP). The EACCS provides an inventory of biological resources in the study area; and describes the requirements of environmental compliance with the FESA, CESA, CEQA, NEPA, and other applicable laws. It presents mitigation standards that include avoidance and minimization measures and a compensation program to offset impacts from projects in the study area. The “focal” special-status species of the EACCS are listed in Table 1-1, and include 13 wildlife species and six plant species. It does not directly provide permits for projects; however, the USFWS has developed a Programmatic Biological Opinion for its listed species. The overarching goals of the EACCS are as follows:

- Coordinate the protection of remaining natural communities where they occur to allow them and associated species to persist within the study area
- Avoid and minimize project-level impacts on species and their habitats
- Preserve major local and regional connections between habitat areas and among existing protected areas
- Restore natural communities that have been degraded or lost over time where possible

Mitigation requirements of the EACCS are outlined for each focal special-status species. A scoresheet has been developed for each focal special-status species using the life history characteristics that make habitat suitable for that species, and allows for a standardized method of assessment for project and mitigations sites by a qualified biologist (see Appendix E of the EACCS [ICF 2010]). In addition, the EACCS requires mitigation for impacts to natural communities be addressed separately in the project’s CEQA document for each affected “land cover”, or habitat type. Generally, land cover types should be replaced at a 3:1 mitigation ratio.

Project Applicability. The Project site occurs in the EACCS study area, within Conservation Zone 15 (Dougherty Hills). As such, conservation strategies described in the EACCS will inform Project planning, implementation, and impact analysis. Land cover types mapped by the EACCS on the Project site include mixed evergreen forest/oak woodland, mixed riparian woodland, California annual grassland, ponds, streams, and perennial freshwater marsh. No EACCS special-status plant species were detected on the site during comprehensive protocol-level surveys in 2016. However, the site potentially supports eight focal wildlife species

addressed by the EACCS: Callippe silverspot, California tiger salamander, California red-legged frog, Alameda whipsnake, golden eagle, burrowing owl (*Athene cunicularia*), tricolored blackbird, and American badger (*Taxidea taxus*). The Project will incorporate the EACCS goals, project impact assessment methodology, and mitigation standards related to focal special-status species, sensitive habitats (such as aquatic, wetland, and riparian habitat types), and land cover types.

2.3.2 East County Area Plan

The state of California requires each city and county to adopt a long-term, general plan to address goals, objectives, standards, and proposals for development (Government Code Section 65300 et. seq.). At a minimum, each plan is required to consider land use, circulation, housing, conservation, open space, noise and safety. Three separate “area plans” were prepared for unincorporated areas of the County. The East County Area Plan, adopted in 1994, covers the Project site, and presents a clear statement of the County’s intentions concerning development on unincorporated lands that extend from the Pleasanton/Dublin Ridgeline to the western edge of San Joaquin County. The plan has policies related to open space lands, watersheds, and biological resources

Project Applicability. The Project site is located in “Water Management” and “Resource Management” zones of the East County area. The Project would need to remain consistent with all the goals, policies, and programs set forth by the East County Area Plan.

2.3.3 Tree Ordinance

The Alameda County Tree Ordinance (County Code, Chapter 12.11, Ordinance 0-2004-23) requires that pruning, removal, or planting of trees in a County Right-of-Way must be authorized by obtaining an Encroachment Permit from the County Director. The County Right-of-Way is defined as land, which by deed, conveyance, agreement, dedication, usage or process of law is reserved for use by the County or any other public entity or by licensees or agents of the County or any other public agency. A tree is defined as any woody perennial plant with a single or multiple trunk structure at least 10 ft tall with a major trunk at least 2 inches diameter at 4.5 ft above ground. Unless excepted by the Director in writing in the permit or otherwise, the activities that will directly impact these trees shall be performed by a contractor holding a valid license of the appropriate classification as described by the California Business and Professions Code. All maintenance work on trees located in the County right-of-way (including but not limited to pruning) shall be in compliance with the *International Society of Arboriculture Tree Pruning Guidelines* and the *Standard Practices for Tree Care Operations: Tree, Shrub, and other Woody Plant Maintenance*. All maintenance work on trees for purposes of providing clearance for overhead utility facilities shall also be in accordance with the *Specification for Utility Line Clearance Pruning and the Preferred Pruning Technique of Alameda County*, copies of which are available from the Director. Prior to beginning such work, a written plan prepared by a certified arborist showing the nature and extent of the proposed activities must be submitted to the Director. The Director has the authority to approve or deny maintenance activities, and will generally require the planting of replacement trees for those removed at a 1:1 mitigation ratio.

Project Applicability. The Project site is located within the Alameda County Right-of-Way because it is used by a public agency. Removal of protected trees will require a permit or approval from the Alameda County Director.

Section 3. Environmental Setting

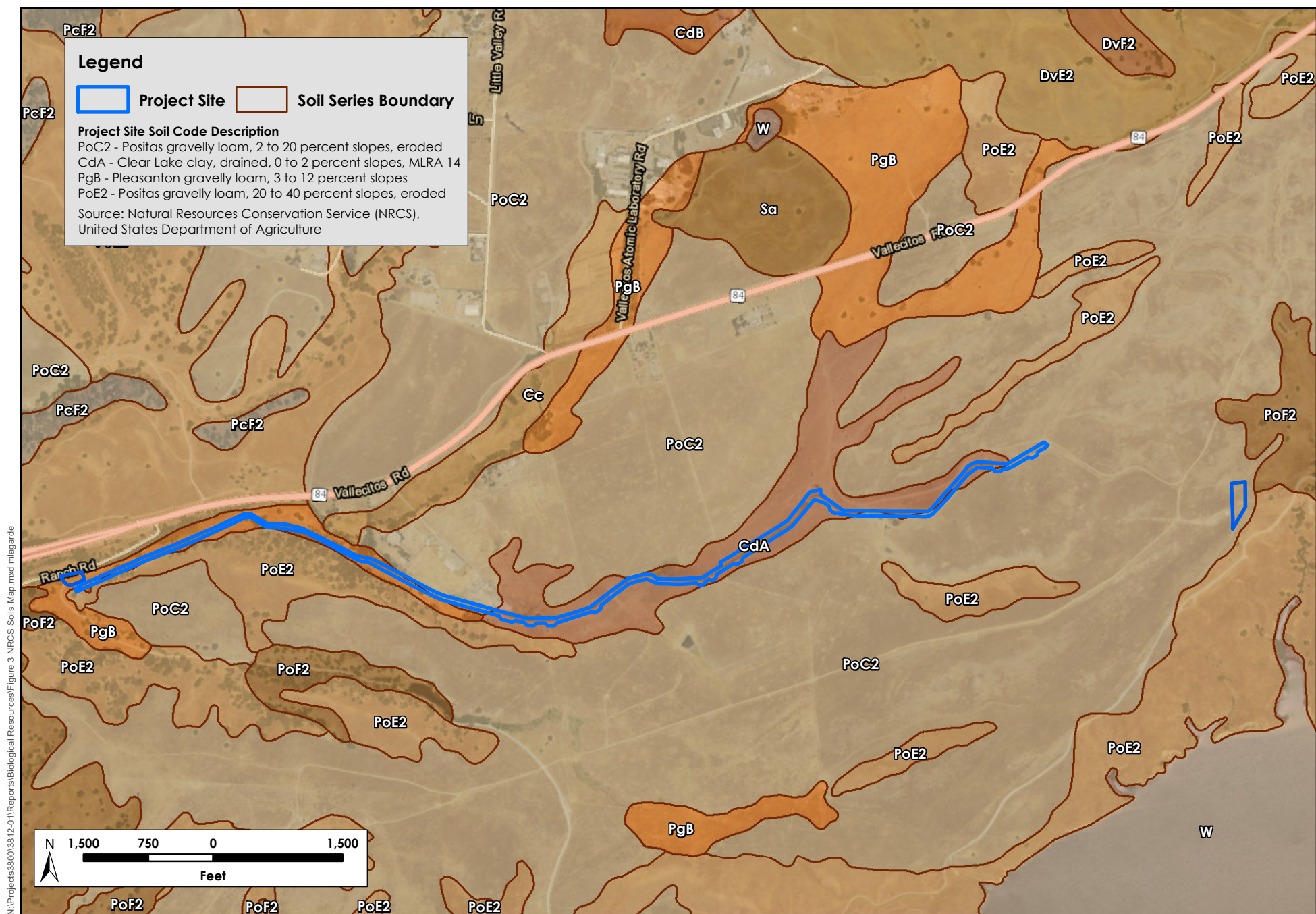
3.1 Climate, Soils, and Topography

In a similar fashion that the animal species present in any given community are often determined by the plant assemblages present, so too the plant species present are generally a response to abiotic (non-living) factors such as climate, soils, and topography. Thus, the climate, soils, and topography of the Project site are discussed herein in addition to the natural communities (Section 3.2) and special-status species (Section 3.3) present.

The Project region experiences a Mediterranean climate, characterized by dry, hot summers and wet, mild winters. Temperatures range from 48.7 to 71.5 degrees Fahrenheit, and annual precipitation is approximately 19.0 inches, the majority of which falls during the wet season between the months of October and April (PRISM Climate Group 2016). The site is underlain by four soil types: Clear Lake clay, drained, 0 to 2% slopes; Pleasanton gravelly loam, 3 to 12% slopes; Positas gravelly loam, 3 to 12% slopes; and Positas gravelly loam, 20 to 40% (NRCS 2016) (Figure 3). Clear Lake clay is a fine textured clay soil that is poorly drained neutral to slightly basic and derived from basin alluvium from igneous, metamorphic, or sedimentary rocks. Clear Lake clay is a hydric soil type. Pleasanton gravelly loam soils are well drained, neutral soils derived from alluvium from sedimentary rocks. Positas gravelly loams are well drained and slightly acidic soils from alluvium derived from sedimentary rocks. The topography of the Project site is a gradual sloped valley located between hills with elevations ranging from approximately 485 ft in the upstream location and approximately 320 ft at the downstream section (Google Earth 2016).

3.2 Existing Biotic Habitats

Nine general habitat/land-use types were identified within the 19.53-ac Project site, which includes the Vallecitos Channel operations and water management area, proposed construction and staging areas, and two potential laydown areas that may be used during construction: mixed riparian woodland, mixed oak woodland, coyote brush shrubland, non-native/ruderal grassland, developed, intermittent stream with managed flows, ephemeral stream, perennial marsh, and seasonal wetland. Table 1 provides a summary of the habitat acreages on the site, and Figure 4 shows their distribution and extent. Culverts, totaling approximately 0.10 ac of jurisdictional waters of the U.S./state, are present within various habitat types, but Table 1 and Figure 4 convey the overlying habitat types in those areas.



N:\Projects\38000\3812-01\Reports\Biological Resources\Figure 3 NRCS Soils Map.mxd miagard



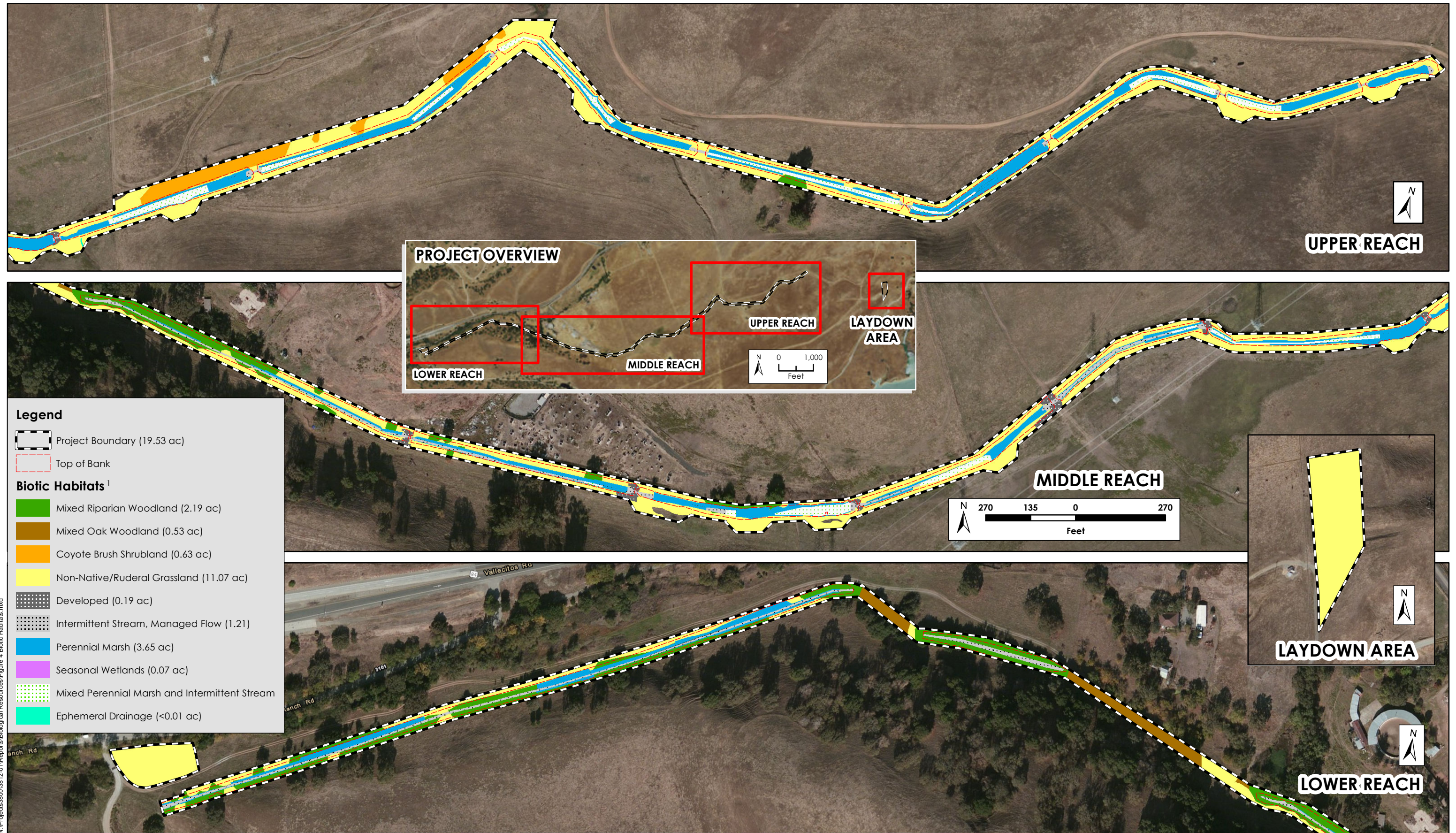
H. T. HARVEY & ASSOCIATES

Ecological Consultants

Figure 3. NRCS Soils Map

Vallecitos Channel Biological Resources Report (3812-01)

September 2016



N:\Projects\3812-01\Reports\Biological Resources\Figure 4 Biotic Habitats.mxd

¹ Culverts totaling approximately 0.10 ac of jurisdictional waters are present within various habitat types, but this figure depicts the overlying habitat types in those areas."

Table 1. Habitat Acreages on the Project Site

Habitat	Area (acres)*
Non-native/ruderal grassland	11.07
Perennial marsh	3.65
Mixed riparian woodland	2.19
Intermittent stream, managed flow	1.21
Coyote brush shrubland	0.63
Mixed oak woodland	0.53
Developed	0.19
Seasonal wetlands	0.07
Ephemeral drainage	<0.01
Total	19.53

* Approximately 0.10 ac of jurisdictional waters are present within culverts in some of these habitat types, but the overlying habitat type is reported here. The acreages of individual habitat types do not sum to the total due to rounding error.

3.2.1 Mixed Riparian Woodland

Vegetation. Mixed riparian woodland on the Project site supports mature trees (Photograph 1, Appendix A). The woodland occupies 2.19 ac and is contiguous with surrounding mixed oak woodlands in the lower reaches of the Project site (Figure 4). The dominant species is coast live oak (*Quercus agrifolia*), but valley oak (*Quercus lobata*) also occurs frequently. These mixed oaks are found throughout the downstream areas. Occasional occurrences of arroyo willow (*Salix lasiolepis*), red willow (*Salix laevigata*), and blue gum (*Eucalyptus globulus*) are located in isolated patches in the middle and upper reaches. In the downstream reaches the tree canopy is patchy to closed and casts extensive shade over Vallecitos Channel. Understory vegetation is limited in the dense canopy areas. In places where there are canopy gaps, especially at shoulder and mid-slope locations, the herbaceous vegetation includes upland vegetation from the surrounding upland grasslands, such as annual grasses and mustard (*Brassica nigra*). Near toe slope locations, the understory is more characteristic of plants that prefer wetter conditions, such as poison hemlock (*Conium maculatum*) or blackberry (*Rubus* sp.). In the middle and upper reaches the canopy is patchy to open and creates much less shade in the channel. Here the understory vegetation is much more common yet the overstory species composition is similar to locations with denser canopy.

Wildlife. The riparian woodland associated with Vallecitos Creek and the Vallecitos Channel supports moderate to high wildlife diversity and provides the highest-quality breeding and foraging habitat for songbirds in the Project site. Chestnut-backed chickadees (*Poecile rufescens*), acorn woodpeckers (*Melanerpes formicivorus*), Bewick's wrens (*Thryomanes bewickii*), Anna's hummingbirds (*Calypte anna*), American robins (*Turdus migratorius*), black phoebes (*Sayornis nigricans*), ash-throated flycatchers (*Myiarchus cinerascens*), bushtits (*Psaltiriparus minimus*), house finches (*Haemorhous mexicanus*), and other birds may nest in the willow trees and dense patches of coast live oak trees, which support fairly large numbers of foraging birds throughout the year. During migration, the

riparian trees provide foraging habitat for migrants, including a number of species of warblers, vireos, flycatchers, and sparrows. Mallards (*Anas platyrhynchos*) forage in and along the channel year-round, and may breed here, but occur in highest densities during winter and migration. Other regular foragers in this habitat include the great blue heron (*Ardea herodias*) and great egret (*Ardea alba*). Large valley oak trees and blue gum trees within the Project site, together with surrounding open grasslands, provide suitable nesting and foraging habitat for a variety of raptors. During reconnaissance-level biological surveys, multiple pairs of red-tailed hawks (*Buteo jamaicensis*) were observed near the Project site and an old raptor nest was observed in riparian woodland habitat on the Project site.

Common reptile species such as western fence lizard (*Sceloporus occidentalis*) and western terrestrial garter snake (*Thamnophis elegans*) are likely to occur in riparian woodland habitat within the Project site. Insects with aquatic larvae, such as dragonflies (Odonata) and chironomid midges (Chironomidae) occur in and above the channel, providing food for aerial foragers such as swallows and bats. Medium-sized mammals such as raccoons (*Procyon lotor*), striped skunks (*Mephitis mephitis*), and Virginia opossums (*Didelphis virginiana*) are also expected to frequent this habitat type. Several species of bats, including the California myotis (*Myotis californicus*) and Mexican free-tailed bat (*Tadarida brasiliensis*), may roost in small numbers in the larger trees within the Project site, but no trees with large cavities capable of supporting large day roosts, or evidence of a substantial day roost or maternity colony, were observed during the site visits. The riparian woodland habitat provides cover for upland wildlife species dispersing through the otherwise open grasslands in the vicinity. During reconnaissance-level surveys, a large group of wild turkeys (*Meleagris gallopavo*) and a herd of black-tailed deer (*Odocoileus hemionus*) were observed moving through riparian woodland areas within the Project site.

This habitat type also provides nesting and foraging habitat for San Francisco dusky-footed woodrats, a California species of special concern, and 18 woodrat nests were observed on the Project site within this habitat type during the reconnaissance-level biological resource surveys.

3.2.2 Mixed Oak Woodland

Vegetation. The mixed oak woodland occupies 0.53 ac and supports coast live oak and valley oak in an upland setting (Photograph 2, Appendix A; Table 1). Vallecitos Channel is directed through underground pipes at two sections within the lower reaches and thus the stream and riparian banks that might otherwise support mixed riparian woodland are not present (Figure 4). Rather this woodland is typical of a hillside oak woodland. It has a patchy canopy. The understory is grassy and partially shaded by the dominant evergreen coast live oak overstory. The habitat is mature based upon the wide tree trunk diameters observed.

Wildlife. Woodlands dominated by oaks typically support diverse animal communities in California. Both valley oaks and coast live oaks can provide substantial shelter through complex branching growth, and abundant food resources in the form of acorns and invertebrates. A variety of common wildlife species is expected to use this habitat, although the mixed oak woodlands within the Project site are very limited in extent and likely do not support large numbers of woodland-associated species. Common reptiles such as the western fence lizard and southern alligator lizard (*Elgaria multicarinata*) utilize this habitat, as leaf litter and fallen logs in the mixed

woodland provide cover and foraging habitat. A number of common bird species use woodland habitats in the Project site; these include Anna's hummingbirds, Nuttall's woodpeckers (*Picoides nuttalli*), acorn woodpeckers, black phoebes, western scrub-jays (*Apelocoma californica*), chestnut-backed chickadees, bushtits, dark-eyed juncos, house finches, and lesser goldfinches (*Spinus psaltria*). Large valley oak trees within the Project site, together with surrounding open grasslands, provide suitable nesting and foraging habitat for a variety of raptors. During reconnaissance-level biological surveys, multiple pairs of red-tailed hawks were observed on and near the Project site and three old raptor nests were observed in large valley oak trees within 300 ft of the Project site. As is the case for riparian woodlands, raccoons, striped skunks, and Virginia opossums frequent this habitat type. Several large trees within the Project site may provide suitable roosting habitat for a small number of bats, but no trees with large cavities capable of supporting large day roosts, or evidence of a substantial day roost or maternity colony were observed during the site visits. This habitat type within the Project site also provides nesting and foraging habitat for San Francisco dusky-footed woodrats, and two woodrat nests were observed on the Project site within this habitat type during the reconnaissance-level biological resource surveys.

3.2.3 Coyote Brush Shrubland

Vegetation. Coyote brush (*Baccharis pilularis*) shrubland occurs in the upper-middle reach of the Vallecitos Channel Project site and occupied 0.63 ac (Photograph 3, Appendix A). The shrublands are restricted to the northern side of the channel and form a dense stand. The oldest shrubs are approximately 7 ft tall and occur along the fenceline. The majority of the shrubs are approximately 3 ft tall and occur above the top of bank in a dense thicket. Scattered young shrubs occur in grassy openings and indicate that the immediate surrounding grasslands are in slow transition to shrubland.

Wildlife. The coyote brush shrubland in the Project site, although very limited in extent, provides food and cover for a number of wildlife species, including those occupying the surrounding grassland and woodland areas. The coyote brush dominating this habitat provides cover for common reptiles and numerous bird species occurring in the vicinity, including sparrows, Anna's hummingbirds, and California towhees (*Melospiza crissalis*). The shrubs punctuating this habitat also offer suitable nesting habitat for a small number of shrub-nesting species. Mammals that may occur in shrubland within the Project site include black-tailed deer, striped skunk, California vole (*Microtus californicus*), and deer mouse (*Peromyscus maniculatus*).

3.2.4 Non-Native/Ruderal Grassland

Vegetation. Ruderal grassland (11.07 ac) is present throughout the middle and upper reaches of the Project site along the maintenance roads at and above top of bank, and in the two potential laydown areas (Photograph 4, Appendix A; Figure 4; Table 1). These areas are dominated by non-native grasses, such as wild oats (*Avena* sp.), barley (*Hordeum* sp.) and Medusa head (*Elymus caput-medusae*), and non-native forbs such as black mustard and red stem filaree (*Erodium cicutarium*). Other common species present include milk thistle (*Silybum marianum*), cut leaf geranium (*Geranium dissectum*), bull thistle (*Cirsium vulgare*), bristly ox-tongue (*Helminthotheca eichbioides*), and poison hemlock. Many of the species in this habitat are rated as "moderately" invasive by the California Invasive

Plant Council (Cal-IPC 2016) and have substantial, but not severe, ecological impacts. Medusa head is rated as “highly” invasive by the Cal-IPC and has severe ecological impacts.

This grassland habitat is common above top of bank, and in the middle and upper reaches at shoulder and midslope locations along the channel banks. The grassland occurs along the existing maintenance access road located alongside the southeastern bank in the Project site. In most locations the road is compacted and supports stunted vegetation. Some areas have loose gravel surfaces supporting a sparse cover of grassland community species. Portions of the road are unvegetated in areas where compacted two-track trails occur.

Additionally, small areas of native bunchgrass intergrade between the non-native grassland/ruderal habitat and the oak woodland habitat on the southeastern side of the downstream reach. At the time of the survey the bunchgrass was not in flower and was not identifiable. This grass is likely to be a native perennial bunchgrass that is contiguous with hillside bunchgrass communities that occur outside the Project site.

Wildlife. Wildlife use of grasslands within the Project site is limited by the limited extent of grassland areas on the site. However, the abundance of extensive open grassland habitats in the vicinity may allow some wildlife species associated with extensive grasslands in the South Bay, such as the western meadowlark (*Sturnella neglecta*), loggerhead shrike (*Lanius ludovicianus*), and burrowing owl, to occasionally use this habitat type within the Project site. Many of the species that occur in the small grassland areas along the channel are generalist species that occur in a variety of habitats and use non-native grasslands for foraging. Such species include the Brewer’s blackbird (*Euphagus cyanocephalus*), American crow (*Corvus brachyrhynchos*), black phoebe, mourning dove (*Zenaida macroura*), house finch, bushtit, and California towhee.

California ground squirrels (*Spermophilus beecheyi*) occur in grassland habitats both within and adjacent to the Project site. Ground squirrels are an important component of grassland communities, providing a prey base for diurnal raptors and terrestrial predators, as well as excavating burrows that provide nesting and roosting habitat for burrowing owls. Other rodent species that occur in the ruderal/non-native grassland habitat in the Project site include the California vole, valley pocket gopher (*Thomomys bottae*), and deer mouse. Diurnal raptors such as red-tailed hawks and northern harriers (*Circus cyaneus*) forage for these small mammals over grasslands during the day, and at night nocturnal raptors, such as barn owls (*Tyto alba*) and great horned owls (*Bubo virginianus*), will forage for nocturnal rodents, such as deer mice.

Mammals such as the black-tailed jackrabbit (*Lepus californicus*), striped skunk, and American badger may utilize grasslands and ruderal habitats on the Project site for foraging. Western fence lizards were observed in ruderal grasslands during reconnaissance-level surveys of the Project site and other reptiles, such as western skinks (*Plestiodon skiltonianus*), racers (*Coluber constrictor*), common kingsnakes (*Lampropeltis getula*), and southern alligator lizards are also expected to frequent grassland habitats on the Project site.

3.2.5 Developed

Vegetation. Developed areas in the Project site include roadway above top of bank, engineered drop structures in the channel, and culverts, occupying 0.19 ac (Photograph 5, Appendix A; Figure 4). The maintenance access road is located on the southeastern side of Vallecitos Channel. Small portions of the road are paved with asphalt and do not support vegetation. These paved sections are considered developed habitats. The remaining access road that is unpaved and largely vegetated is considered to be non-native/ruderal grassland. In addition to the paved road, numerous drop structures are located in Vallecitos Channel. These structures are concrete forms that allow stepped elevation changes in the channel at specific locations. The drop structures often have grouted rock in and above the top of bank surrounding the drop location. The drop structure concrete and grouted rock surfaces are unvegetated and underlain by hardscape. Numerous culverts of varying diameter (12-36 inch) empty into Vallecitos Channel.

Wildlife. Graveled, unvegetated areas do not provide high-quality wildlife habitat due to the lack of cover and the limited foraging opportunities; however, a variety of wildlife likely move along the access road while dispersing between other areas, and species that occur in the adjacent grassland habitats may forage within this land cover type. Similarly, developed sections of the channel and its tributaries that flow through underground pipes do not provide high-quality aquatic habitat for fish, amphibians, or invertebrates; however aquatic wildlife may move through these sections of the channel when flow conditions are suitable.

3.2.6 Aquatic Features

Four aquatic habitats occur within the Project site, including the intermittent stream with managed flows within Vallecitos Channel, an unnamed ephemeral drainage, perennial marsh wetlands, and seasonal wetlands. A wetland delineation was conducted for the entire Project site in February 2016 (H. T. Harvey & Associates 2016). As a result of the habitat complexity within the channel, some areas with intermixed open waters and small patches of perennial marsh wetlands were mapped as one mixed perennial marsh/intermittent stream habitat unit (Figure 4).

3.2.6.1 Intermittent Stream, Managed Flow

Within the Project site, intermittent stream with managed flow comprises approximately 1.21 ac situated at or below the OHW marks of Vallecitos Channel (Photograph 6, Appendix A; Figure 4; Table 1). In some areas the intermittent stream reaches support perennial marsh vegetation. The intermittent stream contained water at varied depths between approximately 2 inches and several ft deep at the time of the surveys. Within the Project site, the channel width varies between approximately 6 and 14 ft. Thirteen concrete drop structures maintain a mild gradient, and portions are culverted underground in two downstream sections. Water flows in the channel are a combination of natural flows and augmented flows controlled by the California Department of Water Resources (DWR).

The channel is an unlined, engineered conveyance channel constructed in 1965. The base flow in Vallecitos Channel is supplied through culverted flows from the naturally occurring stream, which is directly upstream of

the Project site, and various tributaries and drainages that drain from adjacent parcels. This flow feeds into the upstream portion of Vallecitos Channel from the South Bay Aqueduct via a pipe at the east end of the Project alignment. Managed flows are released to Vallecitos Channel both to provide water supply to Alameda County downstream and to manage water capacity and pressure in the South Bay Aqueduct through the release of overflow, referred to as “blowout operations.” Typically, the District requests water supply releases from DWR into the channel throughout the dry season, such that the channel does not experience a natural summer dry down period.

Wildlife. Mallards, great blue herons, and great egrets forage in and along the channel year-round. Insects with aquatic larvae occur in the wet portions of the channel, providing food for aerial foragers such as swallows and bats.

Very few fish species are expected to occur in the modified stream channel within the Project site, due to the shallow nature of water throughout most of the channel and the managed flow regime. However, species such as California roach (*Lavinia symmetricus*) and Sacramento sucker (*Catostomus occidentalis*) may occasionally be present in the channel when sufficient water depth and flow are present. During reconnaissance-level surveys of the channel, a large number of California roach were observed in the channel in a pool downstream of one of the underground sections of the channel.

3.2.6.2 Ephemeral Drainage

An ephemeral drainage that collects water from the surrounding hillsides is present in the central portion of the Project site, occupying <0.01 ac (Figure 4; Table 1). It connects to Vallecitos Channel, but no flowing water was observed at the time of the survey. Slight incision indicates that recurring flows occur. The ephemeral drainage runs through non-native/ruderal grassland and is vegetated with species typical of the surrounding grassland. The habitat values of this drainage are similar to those described above for “Non-Native/Ruderal Grassland.” Although the drainage apparently conveys water during and immediately after rain events, the portion of this ephemeral drainage within the Project site does not support aquatic habitat values for wildlife.

3.2.6.3 Perennial Marsh

Within the Project site, approximately 3.65 ac of perennial marsh wetlands are associated with the intermittent stream with managed flow features (Photograph 7, Appendix A; Figure 4; Table 1). The wetlands line the channel and in some locations fill the streambed (H. T. Harvey & Associates 2016). Vegetation in this habitat is dominated by perennial aquatic emergent vegetation, such as cattails (*Typha angustifolia* and *Typha latifolia*), and hard-stem club-rush (*Schoenoplectus acutus* var. *occidentalis*), and shoreline plants that grow at the edge of the streams, such as false waterpepper (*Persicaria (hydropiperoides)*), tall flatsedge (*Cyperus eragrostis*), and poison hemlock. The perennial marsh wetland habitat is restricted to the channel.

Freshwater perennial marshes in Alameda County can provide habitat for numerous wildlife species. The marsh vegetation in the Project site is limited in extent, is subject to perturbation by fluctuations in water flow, and

provides only limited habitat for marsh-specialist species. However, large stands of perennial marsh habitat are located adjacent to the Project site, and wildlife species that use large, continuous areas of marsh habitat may occasionally use the perennial marsh habitat on the site for foraging and cover. Mallards and American coots (*Fulica americana*) will take cover and forage in freshwater marsh vegetation. Common amphibians such as the native Sierran chorus frog (*Pseudacris sierrae*) and western toad (*Anaxyrus boreas*), as well as the non-native bullfrog (*Lithobates catesbeianus*), also occur in the small areas of freshwater marsh vegetation on the Project site. Terrestrial species that occur in adjacent habitats, such as house finches, bushtits, black phoebes, and sparrows, will occasionally forage in marsh vegetation on the Project site.

3.2.6.4 Seasonal Wetlands

Within the Project site, approximately 0.07 ac of seasonal wetlands occur above top of bank, south of Vallecitos Channel (Photograph 8, Appendix A; Figure 4; Table 1). These wetlands are depressional and fed by seasonally high, localized groundwater and surface runoff. Mexican rush (*Juncus mexicanus*) is the dominant plant species in this wetland type. Fine-textured soils with cow punch and algal mats indicate sustained saturation in these features. Seasonal wetlands within the Project site lack sufficient depth or ponding duration to provide suitable breeding habitat for the vernal pool fairy shrimp (*Branchinecta lynchi*), California tiger salamander, or California red-legged frog. However, amphibians such as Sierran chorus frogs, and waterfowl such as mallards, may occasionally occur in these wetlands as foragers in during the winter and spring months. During the dry seasons, the habitat values of these features are similar to those described above for “Non-Native/Ruderal Grassland.”

3.3 Special-Status Plant and Animal Species

3.3.1 Special-Status Plants

The CNPS (2016) and CNDDB (2016) identify 66 special-status plant species as potentially occurring in the nine 7.5-minute USGS quadrangles containing and/or surrounding the Project site for CRPR 1A, 1B, 2A, 2B, 3 plants, and in Alameda County for CRPR 4 plants. Six of these 66 special-status plant species have been documented by the CNDDB in the Project vicinity: chaparral harebell (*Campanula exigua*), Congdon’s tarplant (*Centromadia parryi* ssp. *congdonii*), Santa Clara red ribbons (*Clarkia concinna* ssp. *automixa*), Hospital Canyon larkspur (*Delphinium californicum* ssp. *interius*), California alkali grass (*Puccinellia simplex*), and caper-fruited tropidocarpum (*Tropidocarpum capparideum*) (Figure 5).

Forty-four of the 66 special-status plant species identified during the background review were determined to be absent from the Project site due to one or more of the following reasons (Appendix B):

- A lack of specific habitat (e.g., chaparral)
- Absence of specific edaphic requirements for the species in question (e.g., serpentine soils)
- The elevation range of the species is outside of the range in the Project site
- The study area is outside the endemic range of the species in question
- The species is considered to be extirpated from the site vicinity

A total of 22 special-status plant species were initially determined to have some potential to occur on the Project site (Table 2). Potentially suitable habitat for these 22 species occurs in the alkaline clay soils in grasslands, seasonal wetlands, mixed riparian woodland, mixed oak woodland, and coyote brush shrubland. Expanded descriptions of all 22 species with potential to occur are provided in Appendix C. The Project site is considered to provide potentially suitable habitat for four of the six species documented from CNDDB records in the site vicinity. However, chaparral harebell is not known from elevations and habitats found in the Project site, and caper-fruited tropidocarpum is considered extirpated from Alameda County, so neither of these species is expected to occur on the site.

Protocol-level rare plant surveys conducted over the entire Project area on February 26, April 28, and July 9, 2016, with a follow-up visit on July 22, detected no rare plant species. Although the target species list of 22 focal species was used to focus the surveyors' efforts, the focused surveys were floristic in nature, and aimed to identify every plant found to the level necessary to determine its exact identity and status (typically the species, variety, or subspecies level). As a result, even a non-target special-status plant would have been detected during such surveys. Based on the negative survey results, special-status plants are determined to be absent from the Project site.

Table 2. Special-status Plant Species Initially Thought to Have Potential to Occur on the Project Site

Common Name	Scientific Name	Regulatory Status	EACCS Covered?
Bent-flowered fiddleneck	<i>Amsinckia lunaris</i>	CRPR 1B.2	No
California androsace	<i>Androsace elongata ssp. acuta</i>	CRPR 4.2	No
Alkali milk-vetch	<i>Astragalus tener var. tener</i>	CRPR 1B.2	No
Big tarplant	<i>Blepharizonia plumosa</i>	CRPR 1B.1	Yes
Round-leaved filaree	<i>California macrophylla</i>	CRPR 1B.2	No
Congdon's tarplant	<i>Centromadia parryi ssp. congdonii</i>	CRPR 1B.1	Yes
Santa Clara red ribbons	<i>Clarkia concinna ssp. automixa</i>	CRPR 4.3	No
Livermore tarplant	<i>Deinandra bacigalupii</i>	SC; CRPR 1B.2	Yes
Hospital Canyon larkspur	<i>Delphinium californicum ssp. interius</i>	CRPR 1B.2	No
San Joaquin spearscale	<i>Extriplex joaquinana</i>	CRPR 1B.2	Yes
Stinkbells	<i>Fritillaria agrestis</i>	CRPR 4.2	No
Diablo Helianthella	<i>Helianthella castanea</i>	CRPR 1B.2	No
Contra Costa goldfields	<i>Lasthenia conjugens</i>	FE; CRPR 1B.1	No
Bristly leptosiphon	<i>Leptosiphon acicularis</i>	CRPR 4.2	No
Woolly-headed lessingia	<i>Lessingia hololeuca</i>	CRPR 3	No
Sylvan microseris	<i>Microseris sylvatica</i>	CRPR 4.2	No
Little mousetail	<i>Myosurus minimus ssp. apus</i>	CRPR 3.1	No
Cotula navarretia	<i>Navarretia cotulifolia</i>	CRPR 4.2	No
Prostrate vernal pool navarretia	<i>Navarretia prostrata</i>	CRPR 1B.1	No
Michael's rein orchid	<i>Piperia michaelii</i>	CRPR 4.2	No
California alkali grass	<i>Puccinellia simplex</i>	CRPR 1B.2	No
Saline clover	<i>Trifolium hydrophilum</i>	CRPR 1B.2	No

Key to Status Abbreviations: Federally Listed as Endangered (FE); State Listed as Threatened (ST); State Candidate for Listing (SC); California Native Plant Society California Rare Plant Rank (CRPR):

CRPR 1B = Plants rare, threatened, or endangered in California and elsewhere

CRPR 3 = Plants about which information is needed – a review list

CRPR 4 = Plants of limited distribution – a watch list

.1 = seriously endangered in California

.2 = fairly endangered in California

.3 = not very endangered in California

3.3.2 Special-Status Animals

For purposes of this report, “special-status” animals are animal species that are:

- Listed under the FESA as threatened, endangered, proposed threatened, proposed endangered, or a candidate species.
- Listed under the CESA as threatened, endangered or a candidate species.
- Designated by the CDFW as a California species of special concern.
- Listed in the California Fish and Game Code as a fully protected species (birds at §3511, mammals at §4700, reptiles and amphibians at §5050, and fish at §5515).

The legal status and potential for occurrence of special-status animal species known to occur or potentially occur in the general vicinity of the Project site are given in Table 3. Expanded descriptions are included in Appendix D for those species that are known to occur on the Project site; for which potentially suitable habitat occurs within or in the general vicinity of the Project site; for which the site is accessible to animals from known populations; for which the EACCS maps suitable habitat within the Project site; for which resource agencies have expressed particular concern such that more expanded discussion is required. Species that are listed in Table 3 but not discussed in detail in Appendix D have no reasonable expectation of occurrence on the Project site.

Special-status animal species absent from the Project site due to a lack of suitable habitat or barriers to dispersal, and/or because the Project site is outside the species’ range, include the longhorn fairy shrimp (*Branchinecta longiantenna*), vernal pool fairy shrimp, Central California coastal steelhead (*Oncorhynchus mykiss*), Central Valley fall-run Chinook salmon (*Oncorhynchus tshawytscha*), western spadefoot (*Spea hammondi*), foothill yellow-legged frog (*Rana boylei*), coast horned lizard (*Phrynosoma blainvillii*), San Joaquin whipsnake (*Masticophis flagellum ruddocki*), bank swallow (*Riparia riparia*), Townsend’s big-eared bat (*Corynorhinus townsendii*), ringtail (*Bassariscus astutus*), and San Joaquin kit fox (*Vulpes macrotis mutica*). The pallid bat (*Antrozous pallidus*) may occasionally forage on the site; however, there are no suitable roost sites on or within 100 ft of the Project site. Similarly, the northern harrier (*Circus cyaneus*) may occasionally forage on the site, and the western red bat (*Lasiurus blossevillei*) may occasionally occur as a migrant and winter visitor, but neither species nests on the site owing to the lack of suitable nesting habitat and, for the western red bat, because the site is outside the species’ breeding range.

A number of other special-status animal species are addressed in greater detail below because they are known to breed or could potentially breed on the Project site or its vicinity; because they may occur fairly commonly as non-breeders on the Project site (and thus could potentially be substantially affected by activities that occur under the proposed Project); and/or because they are of particular concern to regulatory agencies. These are the Callippe silverspot butterfly, California tiger salamander, California red-legged frog, Alameda whipsnake, western pond turtle (*Actinemys marmorata*), golden eagle, bald eagle, white-tailed kite (*Elanus leucurus*), burrowing owl, loggerhead shrike, tricolored blackbird, yellow warbler (*Setophaga petechia*), grasshopper sparrow (*Ammodramus savannarum*), San Francisco dusky-footed woodrat, and American badger.

Table 3. Special-status Animal Species, Their Status, and Potential Occurrence on the Project Site

Name	*Status	Habitat	Potential for Occurrence on the Project Site
Federal or State Endangered, Rare, or Threatened Species			
Longhorn fairy shrimp (<i>Branchinecta longiantenna</i>)	FE	Vernal pools, playa pools, and rock outcrop pools.	Absent. No suitable habitat is present in or immediately adjacent to Project site, and the site is outside the species' range. The closest record of occurrence is located 10 miles to the northeast at Brushy Peak Preserve. EACCS mapping of this species' potential distribution indicates that no mapped habitat occurs within the Project vicinity.
Vernal pool fairy shrimp (<i>Branchinecta lynchi</i>)	FT	Vernal pools, ponds, and seasonal wetlands in the Central Valley and interior Coast Range.	Absent. No suitable habitat is present in or immediately adjacent to Project site, and the site is outside the species' range. The closest record of occurrence is located 10 miles to the northeast. EACCS mapping of this species' potential distribution indicates that no mapped habitat occurs within the Project vicinity.
Calippe silverspot butterfly (<i>Speyeria calippe</i>)	FE	Grasslands and chaparral supporting the larval host plant, Johnny jump-up. Adults feed on a variety of flower nectar sources and use hilltops to locate mates.	May be Present. Known to occur in the region (ICF 2010), and suitable grassland habitat supporting Johnny jump-up is present in the Project site. During protocol-level rare plant surveys, focused surveys for Johnny jump-up detected an occurrence of approximately 25 individuals on a north-facing, steep slope above the south bank of the Vallecitos Channel, near the Channel's western end. The EACCS maps potential habitat for this species within the upper reaches of the Project site (ICF 2010).
Central California Coast steelhead (<i>Oncorhynchus mykiss</i>)	FT	Cool streams with suitable spawning habitat and conditions allowing migration between spawning and marine habitats.	Absent. The species has not been documented in the study area and suitable spawning habitat is not present in the Vallecitos Channel. Although small numbers of steelhead occur in the lower reaches of Alameda Creek, barriers to upstream fish passage to the Project site are located at the Interstate 680 crossing of Vallecitos Creek, at a water diversion weir on Arroyo de la Laguna located in Sunol north of Niles Canyon Road, and at the BART weir in Fremont, which prevent migrating individuals from traveling as far upstream as Vallecitos Creek or the channel. Because fish migration into the Project vicinity is blocked downstream, this species is absent from the Project site. EACCS mapping of this species' potential distribution indicates that Vallecitos Creek is not considered potential habitat for this species (ICF 2010).

Name	*Status	Habitat	Potential for Occurrence on the Project Site
California tiger salamander (<i>Ambystoma californiense</i>)	FT, ST	Vernal or temporary pools in annual grasslands or open woodlands.	May be Present. This species is known to occur in the Project vicinity, and suitable foraging, dispersal, and refugial habitat for this species is present in the woodland, non-native annual grassland, and seasonal wetland habitats within the Project site. No suitable breeding habitat is present on or immediately adjacent to the site; however, suitable breeding ponds are present within 500 ft of the Project site and a known historic breeding site is located 2,500 ft south of the site. The EACCS maps potential upland habitat for this species within the Project site (ICF 2010).

Name	*Status	Habitat	Potential for Occurrence on the Project Site
California red-legged frog (<i>Rana draytonii</i>)	FT, CSSC	Streams, freshwater pools, and ponds with emergent or overhanging vegetation.	May be Present. This species is known to occur in the Project vicinity and suitable foraging, dispersal, and refugial habitat for this species is present in the woodland and non-native annual grassland habitats within the Project site. In addition, aquatic habitat within the channel may provide breeding, foraging, and dispersal habitat for this species under typical low-flow conditions during the winter and spring. The EACCS maps potential habitat for this species and the Project site is located within mapped upland/movement habitat (ICF 2010).
Alameda whipsnake (<i>Masticophis lateralis euryxanthus</i>)	FT, ST	Shrubland, oak woodland, and riparian zones interspersed with grassland and rock outcrops	May be Present. Habitats on the Project site do not provide several essential habitat elements for Alameda whipsnake, such as sage scrub or rock outcrops. The site therefore does not provide high-quality habitat and is unlikely to support a resident or breeding population of this species. This species has been recorded as close as 2.75 miles to the southeast and 8.75 miles to the northwest of the Project site (ICF 2010). The nearest high-quality habitat for the species is located approximately 2.0 miles northwest of the Project site, in Pleasanton Ridge Regional Park, and 2.5 miles southeast of the Project site, near San Antonio Reservoir and the Sunol Regional Wilderness. Between those locations and the Project site, San Antonio Reservoir and Interstate 680 represent substantial barriers to whipsnake dispersal onto the site, reducing the potential for individuals to disperse through the Project site. Nevertheless, the potential for whipsnakes from higher-quality habitat offsite to disperse onto the site occasionally cannot be eliminated, and woodland and riparian habitat on the Project site may provide cover for dispersing individuals (although they would occur on the site very infrequently and in low numbers). Coyote brush shrubland also provides ostensibly suitable habitat, although it is isolated by open habitats from other areas providing suitable cover, and there is a low likelihood of whipsnake occurrence in the coyote brush shrubland. The Vallecitos Channel is within a USFWS-designated recovery unit for this species, and critical habitat has been designated within the Project vicinity. In addition, the EACCS maps dispersal habitat for this species along the historic Vallecitos Creek channel, including portions of the Project site (ICF 2010).

Name	*Status	Habitat	Potential for Occurrence on the Project Site
Bald eagle (<i>Haliaeetus leucocephalus</i>)	SE, FP	Nests in live trees near large bodies of water.	May be Present. This species occurs in the Project vicinity and a single pair may nest near San Antonio Reservoir. Individuals of this species may occasionally occur on the Project site as foragers; however, no suitable nesting habitat is present on the Project site (and no nests were observed in the site vicinity during surveys), and the Project site provides low-quality habitat for the species owing to limited aquatic habitat.
Bank swallow (<i>Riparia riparia</i>)	ST	Colonial nester on vertical banks or cliffs with fine-textured soils near water.	Absent. No suitable nesting habitat is present on the Project site, and the site is outside this species' breeding range.
Tricolored blackbird (<i>Agelaius tricolor</i>)	SC	Nests near fresh water in dense emergent vegetation.	May be Present. This species occurs in the Project vicinity and typically nests in extensive stands of tall emergent herbaceous vegetation in non-tidal freshwater marshes and ponds. The perennial marsh vegetation within the Project site may provide marginally suitable nesting habitat for this species (although its limited extent limits suitability for nesting); more suitable marsh habitat is present in close proximity to the Project site. The EACCS maps foraging habitat for this species within the Project site and breeding habitat is mapped approximately 1,000 ft south of the site (ICF 2010). Therefore, this species may nest on or in close proximity to the Project site.
San Joaquin kit fox (<i>Vulpes macrotis mutica</i>)	FE, ST	Open valley and foothill grassland, scrub, and desert habitats.	Absent. Although the Project site is within the historic range of this species, the species has not been reported in the Project vicinity in the last 40 years (Weslar 1987, CNDDDB 2016). Likely absent from the vicinity today due to habitat loss from urbanization and isolation from extant kit fox populations. The EACCS maps potential habitat for this species and the western edge of mapped core habitat includes the upper reaches of the Project site (ICF 2010).
Townsend's big-eared bat (<i>Corynorhinus townsendii</i>)	CSSC, SC	Roosts in caves and mine tunnels, and occasionally in deep crevices in trees such as redwoods or in abandoned buildings, in a variety of habitats.	Absent. No suitable roosting habitat is present on or near the Project site.

Name	*Status	Habitat	Potential for Occurrence on the Project Site
California Species of Special Concern			
Central Valley fall-run Chinook salmon (<i>Oncorhynchus tshawytscha</i>)	CSSC	Cool rivers and large streams that reach the ocean and that have shallow, partly shaded pools, riffles, and runs.	Absent. Salmon have not been documented in the Project site and suitable spawning or rearing habitat is not present. Although small numbers of Chinook salmon may occur in the South San Francisco Bay and individuals may wander into the lower reaches of Alameda Creek, barriers to upstream fish passage are located at the Interstate 680 crossing of Vallecitos Creek, at a water diversion weir on Arroyo de la Laguna located in Sunol north of Niles Canyon Road, and at the BART weir in Fremont, which prevent migrating individuals from traveling as far upstream as Vallecitos Creek or the channel. Because fish migration into the Project vicinity is blocked downstream, this species is absent from the Project site.
Western spadefoot (<i>Spea hammondi</i>)	CSSC	Valley and foothill grasslands, chaparral, and woodlands with sandy or gravelly soils. Breeds in vernal pools and alkali flats.	Absent. No suitable breeding habitat is present on the Project site, and the site is outside the species' range. The closest record of occurrence is located approximately 10 miles to the northeast.
Foothill yellow-legged frog (<i>Rana boylei</i>)	CSSC	Partially shaded shallow streams and riffles with a rocky substrate. Occurs in a variety of habitats in coast ranges.	Absent. The EACCS maps potential habitat for this species within the Project vicinity upstream of the Project site. However, suitable habitat for this species is not present on the Project site, and the closest reported occurrence of this species is located approximately 10 miles to the northeast of the site (CNDDDB 2016).
Western pond turtle (<i>Actinemys marmorata</i>)	CSSC	Permanent or nearly permanent water in a variety of habitats.	Present. This species occurs in the Project vicinity and was observed during surveys near the access road located to the south of the Project site. Small numbers of pond turtles occur near the Project site, and nesting could potentially occur in upland areas along the channel within the Project site.
San Joaquin whipsnake (<i>Masticophis flagellum ruddocki</i>)	CSSC	Open, dry areas in grassland, scrub, and chaparral habitats.	Absent. This species is not known to occur in the Project vicinity, which is outside the species' range. The closest record of occurrence is located approximately 11 miles to the northeast.
Northern harrier (<i>Circus cyaneus</i>)	CSSC (nesting)	Nests in marshes and moist fields, forages over open areas.	Absent as Breeder. Suitable nesting habitat is not present on the Project site, although wintering or migrating individuals have been observed foraging on the Project site and adjacent open grassland areas.

Name	*Status	Habitat	Potential for Occurrence on the Project Site
Burrowing owl (<i>Athene cunicularia</i>)	CSSC	Nests and roosts in open grasslands and ruderal habitats with suitable burrows, usually those made by California ground squirrels.	May be Present. Suitable nesting habitat is present in the Project site, as numerous California ground squirrels and their burrows were observed during reconnaissance-level biological resource surveys. In addition, an adult burrowing owl was observed near the access road located south of the Project site during reconnaissance-level surveys. Therefore, breeding, dispersing, and wintering individuals may occur in the Project site, although only in small numbers due to the limited extent of suitable habitat. The EACCS maps potential habitat for this species and the Project site is located within mapped breeding, wintering, and dispersal habitat (ICF 2010).
Loggerhead shrike (<i>Lanius ludovicianus</i>)	CSSC (nesting)	Nests in tall shrubs and dense trees; forages in grasslands, marshes, and ruderal habitats.	Present. This species occurs in the Project vicinity and evidence of shrike (i.e. cached prey items) was observed in the Project site during reconnaissance-level surveys. Suitable nesting habitat occurs in the Project site where live oak trees, valley oak trees, and scattered coyote brush occur adjacent to open grassland. Therefore, individuals may occur in the Project site as breeders, migrants, or foragers.
Yellow warbler (<i>Setophaga petechia</i>)	CSSC (nesting)	Nests in riparian woodlands.	May be Present. Mature riparian woodland habitat on the Project site provides suitable nesting habitat for yellow warbler. Therefore, individuals may occur in the Project site as breeders, migrants, or foragers, although likely in low numbers due to the limited extent of habitat in the Project site.
Grasshopper sparrow (<i>Ammodramus savannarum</i>)	CSSC (nesting)	Nests in open grasslands.	May be Present. Ruderal grassland habitat on the Project site provides suitable foraging and nesting habitat. This species is most likely to nest in low-lying vegetation in grasslands adjacent to the site but nesting individuals may occasionally nest or forage on the Project site.
Pallid bat (<i>Antrozous pallidus</i>)	CSSC	Forages over many habitats; roosts in caves, rock outcrops, buildings, and hollow trees.	Absent as Breeder. This species could potentially forage within the Project site in or over open habitats on rare occasions. However, focused surveys for trees providing large cavities capable of supporting a large roost or maternity roost did not detect any such cavities, and therefore this species is only expected to occur on the site as a nonbreeding forager.
Western red bat (<i>Lasiurus blossevillii</i>)	CSSC	Forages over many habitats; roosts in foliage in forest or woodlands, especially in or near riparian habitat.	Absent as Breeder. This species could potentially occur in the Project vicinity as a migrant and winter resident, roosting in the foliage of trees, although only occasionally and in low numbers due to the limited extent of habitat; however, it does not breed in the Project region.

Name	*Status	Habitat	Potential for Occurrence on the Project Site
San Francisco dusky-footed woodrat (<i>Neotoma fuscipes annectens</i>)	CSSC	Nests in a variety of habitats including riparian areas, coast live oak woodlands, and scrub.	Present. Suitable habitat for this species is present in riparian woodland areas along the downstream 4,500 ft of the channel. Multiple woodrat nests were observed in trees and on the ground within the Project site during the February 2016 reconnaissance-level survey. No woodrat nests were observed within the proposed construction and staging areas; however, 18 woodrat nests were observed in mixed riparian woodland habitat and two woodrat nests were observed in mixed oak woodland habitat on the Project site.
American badger (<i>Taxidea taxus</i>)	CSSC	Open areas with grasslands.	May be Present. This species occurs in the Project vicinity and may use open grassland habitats to the east and south of the Project site for breeding, foraging, and dispersal habitat. Therefore, individuals of this species may occasionally occur in ruderal grasslands on the Project site as foragers, although likely only occasionally and in low numbers due to the limited extent of suitable habitat.
State Fully Protected Species			
American peregrine falcon (<i>Falco peregrinus anatum</i>)	SP	Forages in many habitats; nests on cliffs and tall bridges and buildings.	May be Present. Peregrine falcons are expected to occur as occasional foragers in the Project site and adjacent open areas; however, there is no suitable nesting habitat present within the Project site.
Golden eagle (<i>Aquila chrysaetos</i>)	SP	Breeds on cliffs or in large trees (rarely on electrical towers), forages in open areas.	Present. Adult and juvenile golden eagles were observed foraging in the Project vicinity during surveys in February 2016. In addition, several nesting territories have been documented in the upper Alameda Creek Watershed (CNDDDB 2016). Individuals of this species may occur on the Project site as foragers. However, no golden eagle nests were observed within 0.5 mile of the Project site during focused surveys. The EACCS maps potential habitat for this species and the Project site is located within mapped foraging habitat (ICF 2010).
White-tailed kite (<i>Elanus leucurus</i>)	SP	Nests in tall shrubs and trees, forages in grasslands, marshes, and ruderal habitats.	May be Present. Suitable nesting and foraging habitat is present in and adjacent to the Project site and the species is known to nest in eastern Alameda County (CNDDDB 2016). This species may nest in trees on and adjacent to the site and forage in open habitats within and surrounding the site.

Name	*Status	Habitat	Potential for Occurrence on the Project Site
Ringtail	SP	Forests and shrublands, often in close association with rocky areas or riparian systems; nests in rock recesses, hollow trees, logs, and burrows.	Absent. Suitable forest habitat is not present on the Project site and the small patch of coyote brush shrubland on the Project site does not provide suitable habitat for this species due to the limited size and extent. The closest suitable forest habitat for this species is located approximately 3.5 miles northwest of the Project site on Pleasanton Ridge, and 4.0 miles southeast near the Ohlone Regional Wilderness.

SPECIAL-STATUS SPECIES CODE DESIGNATIONS

FE = Federally listed Endangered

FT = Federally listed Threatened

SE = State listed Endangered

ST = State listed Threatened

SC = State Candidate for listing

CSSC = California Species of Special Concern

SP = State Fully Protected Species

3.4 Sensitive Natural Communities, Habitats, and Vegetation Alliances

Natural communities have been considered part of the Natural Heritage Conservation triad, along with plants and animals of conservation significance, since the state inception of the Natural Heritage Program in 1979. The CDFW determines the level of rarity and imperilment of vegetation types, and tracks sensitive communities in the CNDDB (2016). In addition to tracking sensitive natural communities, the CDFW also ranks vegetation alliances, defined by repeating patterns of plants across a landscape that reflect climate, soil, water, disturbance, and other environmental factors (Sawyer et al. 2009). Global (G) rankings of natural communities and vegetation alliances reflect the overall condition (rarity and endangerment) of a habitat throughout its range, whereas state (S) rankings are a reflection of conditions within California. Natural communities and vegetation alliances are defined using NatureServe's standard heritage program methodology (2016) as follows:

- G1/S1: Less than 6 viable occurrences or less than 2000 ac.
- G2/S2: Between 6 and 20 occurrences or 2000 to 10,000 ac.
- G3/S3: Between 21 and 100 occurrences or 10,000 to 50,000 ac.
- G4/S4: The community is apparently secure, but factors and threats exist to cause some concern.
- G5/S4: The community is demonstrably secure to ineradicable due to being common throughout the world (for G rank) or the state of California (for S rank).

State rankings are further described by the following threat code extensions:

- S1.1: Very threatened
- S1.2: Threatened
- S1.3: No current threats known

As mentioned above under the Regulatory Settings Section (2.2.3), if an alliance is marked G1-G3, all of the vegetation associations within it will also be of high priority (CDFG 2010). Impacts on CDFW sensitive natural communities, vegetation alliances/associations, or any such community identified in local or regional plans, policies, or regulations, must be considered and evaluated under CEQA (Title 14, Division 6, Chapter 3, Appendix G of the California Code of Regulations). Furthermore, aquatic, wetland and riparian habitats are also protected under applicable federal, state, or local regulations, and are generally subject to regulation, protection, or consideration by the USACE, RWQCB, CDFW, and/or the USFWS.

CDFW Natural Communities of Special Concern. A query of natural communities of special concern in the CNDDB (2016) identified three as occurring within the nine 7.5-minute USGS quadrangles containing or surrounding the Project site: northern coastal salt marsh (Rank G3/S3.2), sycamore alluvial woodland (Rank G1/S1.1), and valley sink scrub (Rank G1/S1.1).

Northern coastal salt marsh is characterized by Holland (1986) as being regularly to periodically flooded with saline water, typically occurring along bay margins, sandbars, mudflats, streambanks, and berms. The wetland plant community is typically dominated by halophytes such as various species of pickleweed (*Salicornia sp.*), cordgrass (*Spartina spp.*), salt marsh bulrushes (*Bolboschoenus spp.*), and salt grass (*Distichlis spicata*). Saline water sources were not observed in the freshwater channel system and no pickleweed or salt marsh bulrush plants were observed, therefore no northern coastal salt marsh habitat occurs in the Vallecitos Channel Project site. Sycamore alluvial woodland is defined as an open to closed canopy riparian woodland on braided depositional channels from intermittent streams with water input from rainfall rather than snowmelt. The characteristic species is western sycamore (*Platanus racemosa*), which exhibits vegetative reproduction causing a clumped vegetation pattern in the habitat (Holland 1986). No braided stream channels or western sycamore were observed within the Project site, so sycamore alluvial woodland is not present in the Project site. Valley sink scrub is found in lakebeds or playas with saline or alkaline heavy clays. It is a shrubland community characterized by an open to densely spaced, low growing shrubs, typically iodine bush (*Allenrolfea occidentalis*) or bush seepweed (*Suaeda nigra*). No indicator species of this habitat were observed, therefore no valley sink scrub is located in the Project site.

Also described above under the Regulatory Settings Section (2.2.4), the CDFW also considers streams and riparian habitat as sensitive. Along Vallecitos Channel, the CDFW may consider areas below the top of bank as sensitive. In areas where the tree canopy in mixed riparian woodland extends above the top of bank, the landward canopy edge demarcates the lateral limit of CDFW jurisdiction.

CDFW Sensitive Vegetation Alliances. Two sensitive vegetation alliances occur in the Project site based on the dominant species in mixed riparian woodland and the bunchgrass portion of the grasslands. Mixed riparian areas can be characterized as the central coast live oak riparian forest vegetation alliance (G3/S3.2), which is considered sensitive according to its G and S rankings. The non-native/ruderal grassland can be characterized as non-native grassland (G4/S4) in most locations, however the small areas that support unidentified bunchgrasses may be characterized as native grassland (G3/S3.1), which is sensitive; however, these areas are very limited within the Project site, too limited for mapping.

The remainder of the alliances on the Project site are not considered sensitive. The mixed oak woodland can be characterized as a mixed oak forest alliance (G4/S4). Coyote brush shrubland can be characterized as a coyote brush scrub alliance (G5/S5) and is not considered sensitive. The developed habitat is not naturally occurring, supports no vegetation, and is thus not categorized as a vegetation alliance. The perennial marsh habitat can be categorized as cattail marsh alliance (G5/S5) or hardstem bulrush marsh alliance (G5/S4). The seasonal wetland can be characterized as Baltic and Mexican rush marshes (G5/S4), which is not considered sensitive.

Waters of the U.S./State. As described above under Section 2.1.1, potentially jurisdictional waters of the U.S. occur on the Project site. Jurisdictional other waters include aquatic habitats within the Vallecitos Channel up to the OHW mark (intermittent stream). Jurisdictional wetlands include the channel-associated wetlands

(perennial marsh) in and above the channel ordinary high water mark. Jurisdictional wetlands also include the seasonal wetlands located outside the channel. As also described above under Section 2.2.1, waters of the state include all waters of the U.S., but in addition, the RWQCB is likely to claim the channel area up to the top of bank and associated tree canopy that may contribute deadfall to the channel.

3.5 Non-Native and Invasive Plant Species

Several non-native plant species occur on the Project site that are rated as highly invasive by the Cal-IPC (2016), and may have severe ecological impacts. These plants are often located in the non-native/ruderal grassland habitat and grassy understory in woodlands. Yellow starthistle (*Centaurea solstitialis*), fennel (*Foeniculum vulgare*), Himalayan blackberry (*Rubus armeniacus*), and medusa head were identified during the February 2016 reconnaissance site survey. In addition, several moderately invasive species, which may have substantial ecological impacts, dominate ruderal grassland habitat in the Project site. These species included commonly observed species such as wild oats, black mustard, Italian thistle (*Carduus pycnocephalus*), bull thistle, poison hemlock, barley, and Bermuda buttercup (*Oxalis pes-caprae*). Poison hemlock and Himalayan blackberry occur on the riparian banks in the channel in a number of locations.

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Appendix A. Photographs



Photograph 1. Mixed Riparian Woodland.



Photograph 2. Mixed Oak Woodland.



Photograph 3. Coyote Brush Shrubland.



Photo 4. Non-native/Ruderal Grassland.



Photograph 5. Developed.



Photo 6. Intermittent Stream, Managed Flows.



Photo 7. Perennial Marsh.



Photo 8. Seasonal Wetland.

Appendix B. Special-Status Plant Species Rejected for Potential to Occur in the Project Site

Scientific Name	Common Name	Habitat not present.	Lack of Serpentine Soils or Other Edaphic Factors.	Outside Elevation Range for Species	Outside Floristic Province or Known Range	Considered Extirpated from local area
<i>Acanthomintha lanceolata</i>	Santa Clara thorn-mint		X			
<i>Aspidotis carlotta-halliae</i>	Carlotta Hall's lace fern		X			
<i>Astragalus nuttallii</i> var. <i>nuttallii</i>	ocean bluff milkvetch	X				
<i>Atriplex cordulata</i> var. <i>cordulata</i>	heartscale		X		X	
<i>Atriplex coronata</i> var. <i>coronata</i>	crownscale				X	
<i>Atriplex depressa</i>	brittlescale				X	
<i>Atriplex minuscula</i>	lesser saltscale		X			
<i>Balsamorhiza macrolepis</i>	Big-scale balsamroot		X			
<i>Boechera rubicundula</i>	Mt. Day rockcress	X		X		
<i>Calochortus umbellatus</i>	Oakland star-tulip		X			
<i>Calyptridium parryi</i> var. <i>hesseae</i>	Santa Cruz Mountains pussypaws			X		
<i>Campanula exigua</i>	chaparral harebell	X	X	X		
<i>Castilleja ambigua</i> ssp. <i>ambigua</i>	johnny-nip				X	
<i>Chloropyron maritimum</i> ssp. <i>palustre</i>	Point Reyes bird's-beak	X				X
<i>Chloropyron molle</i> ssp. <i>hispidum</i>	hispid bird's-beak				X	
<i>Chloropyron palmatum</i>	palmate-bracted bird's-beak				X	
<i>Chorizanthe robusta</i> var. <i>robusta</i>	robust spineflower					X
<i>Clarkia breweri</i>	Brewer's clarkia			X		
<i>Eriogonum umbellatum</i> var. <i>bahiiforme</i>	bay buckwheat			X		
<i>Eriophyllum jepsonii</i>	Jepson's woolly sunflower		X			

Scientific Name	Common Name	Habitat not present.	Lack of Serpentine Soils or Other Edaphic Factors.	Outside Elevation Range for Species	Outside Floristic Province or Known Range	Considered Extirpated from local area
<i>Eryngium aristulatum</i> var. <i>hooveri</i>	Hoover's button-celery	X				
<i>Fritillaria liliacea</i>	Fragrant fritillary		X			
<i>Galium andrewsii</i> ssp. <i>gatense</i>	phlox-leaf serpentine bedstraw		X			
<i>Hesperervax caulescens</i>	hogwallow starfish				X	
<i>Iris longipetala</i>	Coast iris	X				
<i>Lasthenia ferrisiae</i>	Ferris' goldfields	X				
<i>Legenere limosa</i>	legenere	X				
<i>Leptosiphon ambiguus</i>	serpentine leptosiphon		X			
<i>Leptosiphon grandiflorus</i>	large-flowered leptosiphon		X			
<i>Leptosyne hamiltonii</i>	Mt. Hamilton coreopsis			X		
<i>Lessingia tenuis</i>	spring lessingia			X		
<i>Malacothamnus arcuatus</i>	arcuate bush-mallow				X	
<i>Malacothamnus hallii</i>	Hall's bush-mallow	X			X	
<i>Monardella antonina</i> ssp. <i>antonina</i>	San Antonio Hills monardella			X		
<i>Navarretia nigelliformis</i> ssp. <i>nigelliformis</i>	adobe navarretia				X	
<i>Plagiobothrys glaber</i>	hairless popcorn-flower					X
<i>Polemonium carneum</i>	Oregon polemonium	X				
<i>Psilocarphus brevissimus</i> var. <i>multiflorus</i>	Delta woolly-marbles	X				
<i>Ranunculus lobbii</i>	Lobb's aquatic buttercup		X			
<i>Sidalcea malachroides</i>	maple-leaved checkerbloom				X	
<i>Streptanthus albidus</i> ssp. <i>peramoenus</i>	most beautiful jewel-flower		X			

Scientific Name	Common Name	Habitat not present.	Lack of Serpentine Soils or Other Edaphic Factors.	Outside Elevation Range for Species	Outside Floristic Province or Known Range	Considered Extirpated from local area
<i>Stuckenia filiformis</i>	slender-leaved pondweed			X		
<i>Suaeda californica</i>	California seablite	X		X		X
<i>Tropidocarpum capparideum</i>	caper-fruited tropidocarpum		X			X

Appendix C. Special-Status Plant Species Initially Thought to Have Some Potential for Occurrence

The following 22 special-status plant species were initially thought to have some potential to occur on the Project site (or, at least, their occurrence could not be eliminated based on absence of potentially suitable habitat). However, protocol-level rare plant surveys conducted over the entire Project area on February 26, April 28, and July 9, 2016, with a follow-up visit on July 22, detected no rare plant species. Thus, the plant species described below are determined to be absent from the Project site.

Bent-flowered Fiddleneck (*Amsinckia lunaris*). Federal Listing Status: None; State Listing Status: None; CNPS List: 1B.2. Bent-flowered fiddleneck is an annual herb in the borage family (Boraginaceae) that blooms from March to June. It inhabits cismontane woodland, coastal bluff scrub, and valley and foothill grassland habitat at elevations from 10 to 1640 ft. Bent-flowered fiddleneck occurs or has been known to occur in Alameda, Contra Costa, Colusa, Lake, Marin, Napa, San Benito, Santa Clara, Santa Cruz, San Mateo, Sonoma, and Yolo counties. It is known from 39 occurrences in the North and Central Coast Ranges that have been observed in the most recent 20 years and an additional 25 occurrences that are older than 20 years (CNPS 2016).

California Androsace (*Androsace elongata* ssp. *acuta*). Federal Listing Status: None; State Listing Status: None; CNPS List: 4.2. California androsace is an annual herb in the primrose family (Primulaceae) blooms from March through June. It occurs on dry, grassy slopes (Baldwin et al. 2012) in chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland habitats at elevations from 492 to 3937 ft. California androsace is a widespread species found in several counties including Alameda, Contra Costa, Colusa, Fresno, Glenn, Kern, Los Angeles, Merced, Riverside, San Bernardino, San Benito, Santa Clara, San Diego, Siskiyou, San Joaquin, San Luis Obispo, San Mateo, Stanislaus, and Tehama counties (CNPS 2016).

Alkali Milk-vetch (*Astragalus tener* var. *tener*). Federal Listing Status: None; State Listing Status: None; CNPS List: 1B.2. Alkali milk-vetch is an annual herb in the pea family (Fabaceae) that blooms from March to June. It occurs in alkaline soils in playas, valley and foothill grasslands underlain by adobe clay, and vernal pool habitats at elevations between 3 and 197 ft. Alkali milk-vetch is a California endemic found in 16 USGS quadrangles in Alameda, Merced, Napa, Solano, and Yolo counties, and is presumed extirpated from its historical range in Contra Costa, Monterey, San Benito, Santa Clara, San Francisco, San Joaquin, Sonoma, and Stanislaus counties.

Big Tarplant (*Blepharizonia plumosa*). Federal Listing Status: None; State Listing Status: None; CNPS List: 1B.1, EACCS Covered. Big tarplant is an annual herb in the sunflower family (Asteraceae) that blooms from July to October. This plant grows on valley and foothill grassland habitat in clay soils at elevations between 98 and 1657 ft (CNPS 2016). Big tarplant is known from 46 extant occurrences in Alameda, Contra

Costa, San Joaquin, and Stanislaus counties. It is extirpated from its historic range in Solano County. Agriculture and non-native plants probably extirpated most historic occurrences.

Round-leaved Filaree (*California macrophylla*). Federal Listing Status: None; State Listing Status: None; CNPS List: 1B.2. Round-leaved filaree is an annual herb in the geranium (Geraniaceae) family that blooms from March to May. This species occurs on clay soils in valley and foothill grassland or open cismontane woodland habitats at elevations from 49 to 3937 ft. It is known from 153 extant occurrences throughout the state in Alameda, Contra Costa, Colusa, Fresno, Glenn, Kings, Kern, Lake, Los Angeles, Merced, Monterey, Napa, Riverside, Santa Barbara, San Benito, Santa Clara, Santa Catalina Island, San Diego, San Joaquin, San Luis Obispo, San Mateo, Solano, Sonoma, Stanislaus, Tehama, Tulare, Ventura, and Yolo counties. It is considered extirpated from Butte County and from Santa Cruz Island. Many collections of the species are historic.

Congdon's Tarplant (*Centromadia parryi* ssp. *congdonii*). Federal Listing Status: None; State Listing Status: None; CNPS List: 1B.1, EACCS Covered. Congdon's tarplant is an annual herb that occurs in valley and foothill grasslands, particularly those with alkaline substrates, and in slumps or disturbed areas where water collects. It is restricted to lower-elevation wetlands below approximately 760 ft. Congdon's tarplant, which is in the sunflower family (Asteraceae), has a variable blooming period that extends from June through November. The range of this species has been reduced to 78 extant occurrences in remaining alkaline grasslands in Alameda, Contra Costa, Monterey, Santa Clara, and San Luis Obispo, and San Mateo counties. It is presumed to be extirpated from its historical range in Solano and Santa Cruz counties (CNPS 2016).

Santa Clara Red Ribbons (*Clarkia concinna* ssp. *automixa*). Federal Listing Status: None; State Listing Status: None; CNPS List: 4.3. Santa Clara red ribbons is an annual herb in the evening-primrose family (Onagraceae) that blooms from May to June, and rarely as early as April or as late as July, depending on the microsite and annual climatic conditions. This species occurs in chaparral and cismontane woodland habitats in San Francisco Bay Area foothills at an elevational range of approximately 295 to 4950 ft. It is known from 20 extant occurrences in Alameda, Santa Clara, and Santa Cruz counties (CNPS 2016).

Livermore Tarplant (*Deinandra bacigalupi*). Federal Listing Status: None; State Listing Status: Candidate Endangered; CNPS List: 1B.2, EACCS Covered. Livermore tarplant is an annual herb in the sunflower family (Asteraceae) and can bloom from June to October (CNPS 2016). It occurs in alkaline meadows and seeps at elevations from approximately 490 to 610 ft. Currently, it is known from four occurrences and has a very small endemic range centered in one USGS quadrangle (Altamont) in Alameda County. However, Livermore tarplant was only discovered outside of Livermore in the late 1990s and may occur in a wider range of elevations and/or alkaline habitats (such as sinks), and could reasonably be expected to occur in similar habitats in neighboring Contra Costa County.

Hospital Canyon Larkspur (*Delphinium californicum* ssp. *interius*). Federal Listing Status: None; State Listing Status: None; CNPS List: 1B.2. Hospital Canyon larkspur is a perennial herb in the buttercup

(Ranunculaceae) family and blooms from April to June. The species is found in chaparral openings and mesic cismontane woodland habitats, and coastal scrub at elevations of approximately 640 - 3600 ft. Hospital Canyon larkspur inhabits a small endemic range covering the mid- and upper elevations of the inner Coast Ranges along the San Francisco Bay Area and south towards Mount Hamilton. Twenty-eight extant occurrences are known from Alameda, Contra Costa, Merced, Monterey, San Benito, Santa Clara, San Joaquin, and Stanislaus counties (CNPS 2016).

San Joaquin Spearscale (*Extriplex joaquiniana*). **Federal Listing Status: None; State Listing Status: None; CNPS List: 1B.2, EACCS Covered.** San Joaquin spearscale is an annual herb in the goosefoot family (Chenopodiaceae) that blooms from April to October. It is found in alkaline soils in chenopod shrublands, meadows and seeps, playas, and valley and foothill grasslands from 3 to 2740 ft elevation. Records of the species are documented in 96 extant occurrences in Alameda, Contra Costa, Colusa, Fresno, Glenn, Merced, Monterey, Napa, San Benito, Solano, and Yolo counties. It is presumed extirpated from its historical range in Santa Clara, San Joaquin, San Luis Obispo, and Tulare counties.

Stinkbells (*Fritillaria agrestis*). **Federal Listing Status: None; State Listing Status: None; CNPS List: 4.2.** This perennial bulbiferous herb in the lily (Liliaceae) family blooms from March to June. Stinkbells require clay soils in chaparral, cismontane woodland, pinyon and juniper woodland, and valley and foothill grassland at elevations of 33-5102 ft. It is sometimes associated with serpentinite features. Stinkbells are known from in 30 extant occurrences in Alameda, Contra Costa, Fresno, Kern, Mendocino, Merced, Monterey, Mariposa, Placer, Sacramento, Santa Barbara, San Benito, Santa Clara, San Luis Obispo, Stanislaus, Tuolumne, Ventura, and Yuba counties. The species is considered to be extirpated from Santa Cruz and San Mateo counties.

Diablo Helianthella (*Helianthella castanea*). **Federal Listing Status: None; State Listing Status: None; CNPS List: 1B.2.** Diablo helianthella is a perennial herb in the sunflower family (Asteraceae) that blooms from March to June. This species occurs in rocky, azonal soils often in partial shade in broadleafed upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, and valley and foothill grassland habitats from 197 to 4265 ft elevation. It is a California endemic known from 106 extant occurrences in Alameda, Contra Costa, and San Mateo counties. It is believed to be extirpated in Marin and San Francisco counties.

Contra Costa Goldfields (*Lasthenia conjugens*). **Federal Listing Status: Endangered; State Listing Status: None; CNPS List: 1B.1.** Contra Costa goldfields is an annual herb in the sunflower family (Asteraceae) that blooms from March to June. It occurs in mesic cismontane woodlands, alkaline playas, valley and foothill grasslands and vernal pools at elevations from 0 to 1542 ft. The range of this California endemic is documented in 23 extant occurrences in Alameda, Contra Costa, Monterey, Marin, Napa, Solano, and Sonoma counties. It is presumed extirpated from its historic range in Mendocino, Santa Barbara, and Santa Clara counties.

Bristly Leptosiphon (*Leptosiphon acicularis*). Federal Listing Status: None; State Listing Status: None; CNPS List: 4.2. Bristly leptosiphon is an annual herb in the phlox family (Polemoniaceae) that blooms from April to July. This species occurs in chaparral, cismontane woodland, coastal prairie, and valley and foothill grassland habitats at elevations from 180 to 4921 ft. It is a California endemic known from 14 USGS quadrangles in Alameda, Butte, Fresno, Humboldt, Lake, Mendocino, Marin, Napa, Santa Clara, San Mateo, and Sonoma counties. Occurrences in Contra Costa County are unconfirmed.

Woolly-headed Lessingia (*Lessingia hololeuca*). Federal Listing Status: None; State Listing Status: None; CNPS List: 3. Woolly-headed lessingia is an annual herb in the sunflower family (Asteraceae) that blooms from June to October. This species occurs in clay and serpentinite soils in broadleafed upland forest, coastal scrub, lower montane coniferous forest, and valley and foothill grassland habitats from 49 to 1000 ft. This California endemic is documented in 27 USGS quadrangles in Alameda, Monterey, Marin, Napa, Santa Clara, San Mateo, Solano, Sonoma, and Yolo counties. The species is under consideration to be moved to CRPR 4, but more study is needed to verify range (CNPS 2016).

Sylvan Microseris (*Microseris sylvatica*). Federal Listing Status: None; State Listing Status: None; CNPS List: 4.2. Sylvan microseris is a perennial herb belonging to the sunflower family (Asteraceae) that blooms from March to June. This species occurs in cismontane woodland, chaparral, Great Basin scrub, pinyon and juniper woodland, and on serpentine soils in valley and foothill grassland communities at elevations ranging from 148 to 4921 ft. This California endemic species is known from 12 USGS quadrangles in Alameda, Amador, Butte, Contra Costa, Colusa, Fresno, Glenn, Kern, Lassen, Merced, Napa, Nevada, Placer, San Benito, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne and Yolo counties. It is considered extirpated from Los Angeles and Santa Clara counties.

Little Mousetail (*Myosurus minimus* ssp. *apus*). Federal Listing Status: None; State Listing Status: None; CNPS List: 3.1. Little mousetail is an annual herb in the buttercup family (Ranunculaceae) that blooms from March to June. This subspecies occurs in mesic valley and foothill grassland or alkaline vernal pools at elevations from 66 to 2100 ft. The known range of little mousetail in California is from 24 extant occurrences in Alameda, Contra Costa, Colusa, Lake, Merced, Riverside, San Bernardino, San Diego Solano, Tulare, and Yolo counties. The species is under consideration for CNPS List: 1B due to loss of vernal pool habitat. There are several issues with taxonomy in this genus; several related species are difficult to separate and may all be rare.

Cotula Navarretia (*Navarretia cotulifolia*). Federal Listing Status: None; State Listing Status: None; CNPS List: 4.2. Cotula navarretia is an annual herb in the phlox family (Polemoniaceae) that blooms from May to June. It occurs in adobe clay soils in chaparral, cismontane woodlands, and valley and foothill grasslands habitats at elevations of 13 to 6004 ft (CNPS 2016). This California endemic occurs in Alameda, Butte, Contra Costa, Colusa, Glenn, Lake, Mendocino, Marin, Napa, San Benito, Santa Clara, Siskiyou, Solano, Sonoma, Sutter, and Yolo counties.

Prostrate Vernal Pool Navarretia (*Navarretia prostrata*). **Federal Listing Status: None; State Listing Status: None; CNPS List: 1B.1.** Prostrate vernal pool navarretia is an annual herb in the phlox family (Polemoniaceae) that blooms from April to July. This plant grows in mesic settings in vernal pools (often alkaline) in coastal scrub, meadows and seeps, and alkaline valley and foothill grassland communities, at elevations between 10 and 3970 ft (CNPS 2016). Prostrate vernal pool navarretia is known to occur at 51 extant occurrences in Alameda, Fresno, Los Angeles, Merced, Monterey, Orange, Riverside, San Bernardino (possibly extirpated), San Benito, Santa Clara, San Diego, and San Luis Obispo counties.

Michael's Rein Orchid (*Piperia michaelii*). **Federal Listing Status: None; State Listing Status: None; CNPS List: 4.2.** Michael's rein orchid is a perennial herb belonging to the orchid family (Orchidaceae) that blooms from April to August. This species occurs in cismontane woodland, coastal scrub, closed bluff scrub, closed-cone coniferous forest, chaparral, and lower montane coniferous forest at elevations ranging from 10 to 3002 ft. This California endemic species is known from 16 USGS quadrangles in Alameda, Amador, Butte, Contra Costa, Fresno, Humboldt, Monterey, Marin, Santa Barbara, San Benito, Santa Clara, Santa Cruz, Santa Cruz Island, San Francisco, San Luis Obispo, San Mateo, Stanislaus, Tulare, Tuolumne, and Yuba counties. The Santa Cruz Island occurrence is known only from a single collection, and the species may be extirpated from Ventura and Los Angeles counties.

California Alkali Grass (*Puccinellia simplex*). **Federal Listing Status: None; State Listing Status: None; CNPS List: 1B.2.** California alkali grass is an annual species in the grass family (Poaceae). The species blooms from March to May (CNPS 2016). This grass prefers alkaline and vernal moist areas in sinks, flats, and lake margins at elevations from 7 to 3050 ft in elevation. Specific habitat preferences of this species are chenopod scrub, meadows and seeps, valley and foothill grassland, and vernal pools. The Central Valley and San Francisco Bay region are the geographic regions where this plant occurs. It is known from 56 extant occurrences in Alameda, Butte, Contra Costa, Colusa, Fresno, Glenn, Kern, Lake, Los Angeles, Madera, Merced, Napa, San Bernardino, Santa Clara, Santa Cruz, San Luis Obispo, Solano, Stanislaus, Tulara, and Yolo counties. It is considered extirpated from Kings County.

Saline Clover (*Trifolium hydrophilum*). **Federal Listing Status: None; State Listing Status: None; CNPS List: 1B.2.** Saline clover is an annual herb in the legume family (Fabaceae) that occurs in marshes and swamps, mesic, alkaline sites in valley and foothill grassland habitat, and vernal pool habitat at elevations from 0 to 984 ft. The blooming period extends from April through June. The range of this species has been reduced to remaining 40 extant occurrences in alkaline grasslands in Alameda, Contra Costa, Colusa, Lake, Monterey, Napa, Sacramento, San Benito, Santa Clara, Santa Cruz, San Joaquin, San Luis Obispo, San Mateo, Solano, Sonoma, and Yolo counties. Many occurrences of the species have likely been extirpated (CNPS 2016).

Appendix D. Special-Status Wildlife Species and their Potential for Occurrence

Federal or State Endangered and Threatened Species

Callippe Silverspot Butterfly (*Speyeria callippe callippe*). **Federal status: Endangered; State status: None.** The USFWS listed callippe silverspot as federally endangered in December 1997 (USFWS 1997). Critical habitat for this species has not been designated. The callippe silverspot is a medium-sized butterfly with a wingspan of about 5.5 centimeters (2.2 inches). This butterfly has one flight of adults per year. Typically, adults are seen from mid-May to mid-July and the period of adult flight ranges from 46 to 95 days. (USFWS 2009). The subspecies was known historically to occur in grassland habitat in the seven counties bordering San Francisco Bay in California, including the inner coast range on the eastern shore of San Francisco Bay from northwestern Contra Costa County south to Alameda County. Today, the callippe silverspot is known from only four colonies: in the Pleasanton hills north of the Project vicinity (Alameda County), at San Bruno Mountain and Sign Hill near South San Francisco (San Mateo County), at Sears Point (Sonoma County), and in the hills between Vallejo and Cordelia (Solano County). The four extant colonies, including the colony in Alameda County, exist on mostly privately-owned land.

Adult callippe silverspots feed on flower nectar from a variety of plant species and lay their eggs on the larval host plant, *Viola pedunculata*. This plant is a low-growing, yellow-flowered violet that blooms from early January through April. The larvae hatch following a 1-week developmental period and take shelter in ground litter, where they enter diapause (i.e., a period of reduced activity and development). Most larvae remain in diapause from early summer until the following spring. After diapause, the larvae eat the foliage of their host plant, develop through five instars, and attempt to form a pupa. Pupae mature after 2 weeks and adult butterflies emerge to repeat the life cycle (USFWS 2009).

The EACCS maps potential habitat for this species within the upper reaches of the Project site (ICF 2010). During protocol-level rare plant surveys, focused surveys for Johnny jump-up were also conducted throughout the Project site. These surveys detected an occurrence of approximately 25 individuals on a north-facing, steep slope above the south bank of the Vallecitos Channel, near the Channel's western end. In addition, Johnny jump-up was observed in several locations on hilltops along the access road located south of the Project site. Therefore, individual callippe silverspots may occasionally occur on the Project site, and may reproduce within the limited portion of the site where host plants were observed; individuals may occur in several locations along the access road.

California Tiger Salamander (*Ambystoma californiense*). **Federal status: Threatened (Central Population); State status: Threatened.** The California tiger salamander was federally listed as threatened in August 2004 (USFWS 2004), and critical habitat was designated in August 2005 (USFWS 2005b). The range of the California tiger salamander is restricted to the Central Valley and the South Coast Range of California from

Butte County south to Santa Barbara County. Tiger salamanders have disappeared from a substantial portion of their range due to habitat loss from agriculture and urbanization and the introduction of non-native aquatic predators.

The species' preferred breeding habitat consists of temporary (minimum of 3 to 4 months), ponded environments (e.g., vernal pools, ephemeral pools, or human-made ponds) surrounded by uplands that support small mammal burrows. They will also utilize permanent ponds provided aquatic vertebrate predators such as fish are not present. Such ponds provide breeding and larval habitat, while burrows of small mammals such as California ground squirrels and valley pocket gophers in upland habitats provide refugia for juvenile and adult salamanders during the dry season.

Several records of occurrence for California tiger salamander have been reported from the Project vicinity. Numerous adult salamanders have been observed dead along SR 84 and larval salamanders were observed in 2005 in a seasonal pool located approximately 0.5 mi south of the Project site. As recently as 2011, larvae were observed in two stock ponds located approximately 1 mi to the east of the Project site (CNDDDB 2016). The EACCS maps potential upland habitat for this species within the Project site (ICF 2010). Although suitable breeding habitat for this species is not present within the Project site, ponds as close as 500 ft from the site provide ostensibly suitable breeding habitat, and a historic breeding pond has been reported approximately 2,500 ft south of the Project site. Therefore, the entire Project site is within the documented dispersal distance for this species (1.3 miles) of known and potential breeding ponds, adult salamanders may move through the site, and a small number of individuals likely use ruderal grasslands on the site as foraging, dispersal, and refugial habitat.

California Red-legged Frog. (*Rana draytonii*). Federal status: Threatened; State status: Species of Special Concern. The California red-legged frog was listed as threatened in June 1996 (USFWS 1996) based largely on a significant range reduction and continued threats to surviving populations. Critical habitat was most recently designated in March 2010 (USFWS 2010). Designated critical habitat is not present in the Project site. The historical distribution of the California red-legged frog extended from the city of Redding in the Central Valley and Point Reyes National Seashore along the coast, south to Baja California, Mexico. The species' current distribution includes isolated locations in the Sierra Nevada and the San Francisco Bay area, and along the central coast (USFWS 2002).

The California red-legged frog inhabits perennial freshwater pools, streams, and ponds throughout the Central California Coast Range and isolated portions of the western slope of the Sierra Nevada (Fellers 2005). Its preferred breeding habitat consists of deep perennial pools with emergent vegetation for attaching egg clusters (Fellers 2005), as well as shallow benches to act as nurseries for juveniles (Jennings and Hayes 1994). Non-breeding frogs may be found adjacent to streams and ponds in grasslands and woodlands, and may travel over 2 mi from their breeding locations across a variety of upland habitats to suitable nonbreeding habitats (Bulger et al. 2003, Fellers and Kleeman 2007). However, the distance moved is highly site-dependent, as influenced by the local landscape (Fellers and Kleeman 2007).

A record of occurrence for California red-legged frog was reported from in the Project vicinity in 2003, when an adult frog was observed at a stock pond located approximately 950 ft south of Vallecitos Channel (CNDDB 2016). The EACCS maps potential upland/movement habitat for this species within the Project site (ICF 2010). Suitable foraging and dispersal habitat is present throughout freshwater marsh and stream habitats within the channel and several deep pools in the channel may provide suitable breeding habitat when flow conditions in the channel are low. However, high flow conditions in the channel, such as is frequently the case in late spring and summer when drinking water is needed downstream, severely reduce the suitability of potential breeding habitat in the channel and likely washes amphibian egg masses, and potentially tadpoles, downstream. Therefore, a limited amount of suitable breeding habitat for red-legged frog occurs within the Project site, and then only during times when water operations in the channel are conducive and water flows are consistently low, such as when the channel is not in use for water transfer or management purposes. Whether or not red-legged frogs breed within Vallecitos Channel, the entire site is within dispersal distance of potential breeding habitat in off-site ponds, and thus, this species may use virtually the entire site during dispersal or refugia.

Alameda Whipsnake (*Masticophis lateralis euryxanthus*). Federal Listing Status: Threatened; State Listing Status: Threatened. On December 5, 1997, the Alameda whipsnake was listed as a Threatened species under the FESA (USFWS 1997). The Alameda whipsnake has a limited distribution and occurs primarily in the inner Coast Range of western and central Contra Costa and Alameda counties (Jennings 1983). The USFWS proposed critical habitat for the Alameda whipsnake on March 8, 2000 (USFWS 2000). Unit 3 of the Critical Habitat (the Hayward-Pleasanton Ridge Unit) includes lands within Alameda County to the north of SR 84 and west of Interstate 680. The Project site is located approximately 1.0 mile southeast of Critical Habitat Unit 3, 3.0 miles north of Critical Habitat Unit 5B, and within the Niles Canyon/Sunol Corridor Recovery Unit (USFWS 2002). The Draft Recovery Plan and the EACCS identify the riparian habitat corridor along Vallecitos Creek, including the portion of Vallecitos Channel that lies within the historic creek bed, as dispersal habitat for this species (USFWS 2002; ICF 2010).

The Alameda whipsnake inhabits foothills containing shrubland, oak woodland, and riparian zones interspersed with grassland and rock outcrops. The snake is highly mobile and actively hunts prey among the scrub edges. Suitable habitat for the Alameda whipsnake consists of scrub communities, including mixed chaparral, chamise-redshank chaparral, and coastal scrub, and annual grassland and oak woodlands that lie adjacent to scrub habitats. Additionally, small mammal burrows, rock outcrops, and talus are other habitat features that provide a source of cover for the whipsnake during dispersal or are near scrub habitats and contain habitat features that support adequate prey populations.

As recently as 2009, the Alameda whipsnake has been detected approximately 2.75 miles to the southeast and 8.0 miles to the northwest of the Project site (CNDDB 2016, EACCS 2010). In addition, a Critical Habitat Unit for this species is located approximately 1.0 mile to the northwest of the Project site and the site lies within the Sunol Corridor recovery unit (USFWS 2002b). In addition, the EACCS maps dispersal habitat for this species along the historic Vallecitos Creek channel, including portions of the Project site (ICF 2010).

Habitats on the Project site do not provide several essential habitat elements for Alameda whipsnake, such as sage scrub or rock outcrops. The site therefore does not provide high-quality habitat and is unlikely to support a resident or breeding population of this species. The nearest high-quality habitat for the species is located approximately 2.0 miles northwest of the Project site, in Pleasanton Ridge Regional Park, and 2.5 miles southeast of the Project site, near San Antonio Reservoir and the Sunol Regional Wilderness. Between those locations and the Project site, San Antonio Reservoir and Interstate 680 represent substantial barriers to whipsnake dispersal onto the site, reducing the potential for individuals to disperse through the Project site. Nevertheless, the potential for whipsnakes from higher-quality habitat offsite to disperse onto the site occasionally cannot be eliminated, and woodland and riparian habitat on the Project site may provide cover for dispersing individuals (although they would occur on the site very infrequently and in low numbers). Coyote brush shrubland also provides ostensibly suitable habitat, although it is isolated by open habitats from other areas providing suitable cover, and there is a low likelihood of whipsnake occurrence in the coyote brush shrubland.

Bald Eagle (*Haliaeetus leucocephalus*). **Federal status: None; State status: Endangered, Fully Protected.** Bald eagle populations exhibited precipitous declines in the early part of the 20th century primarily as a result of pesticide poisoning, which severely impacted reproductive rates (Buehler 2000). DDT was the most debilitating of these chemicals, and since its use was banned in the United States in 1972, eagle populations have recovered rapidly (Buehler 2000). The bald eagle was removed from the federal endangered species list in 2008 but remains listed as both endangered and fully protected by the State of California.

Ideal habitat for bald eagles is composed of remote areas with old-growth or mature trees and easy access to an extensive and diverse prey base. Bald eagles forage in fresh and salt water where fish and waterfowl are abundant and diverse. They build nests in tall, sturdy trees at sites that are in relatively close proximity to aquatic foraging areas and usually isolated from intensive human activities. The eagle breeding season extends from January through August (Buehler 2000).

Bald eagles occur in the Project vicinity as wintering and breeding individuals, and high-quality foraging habitat for this species is located to the southeast at San Antonio Reservoir and Calaveras Reservoir; however, no bald eagle nests were observed on the Project site or within areas of potential disturbance during focused surveys for nesting eagles conducted on February 23, 2016. Individual bald eagles may occur on or over the Project site as foragers, although only infrequently and in low numbers because suitable foraging habitat for this species occurs only in very limited amounts within the Project site.

Tricolored Blackbird (*Agelaius tricolor*). **Federal Listing Status: None; State Listing Status: Candidate for Listing.** Tricolored blackbirds are found primarily in the Central Valley and in central and southern coastal areas of California. This species is considered a California species of special concern (at its nesting colonies) due to concerns over the loss of wetland habitats in the state. The tricolored blackbird is highly colonial in its nesting habits, and forms dense breeding colonies that, in some parts of the Central Valley, may consist of up to tens of thousands of pairs. This species typically nests in tall, dense, stands of cattails or tules, but also nests

in blackberry, wild rose bushes, and tall herbs. Nesting colonies are usually located near fresh water. Tricolored blackbirds form large, often multi-species flocks during the non-breeding period and range more widely than during the breeding season.

Tricolored blackbirds occur in the Project vicinity (CNDDDB 2016) and could nest in marsh habitat on the Project site. The EACCS maps foraging habitat within the Project site and breeding habitat approximately 1,000 ft south of the site over a small ridge (ICF 2010). Although the perennial marsh habitat on the Project site provides only a narrow strip of marsh vegetation, primarily cattails in the channel, more extensive stands of marsh vegetation are located adjacent to the Project site. Therefore, a nesting colony of tricolored blackbird could occur in marsh habitat on the Project site and/or adjacent to the Project site.

California Species of Special Concern

Western Pond Turtle (*Actinemys marmorata*). Federal Listing Status: None; State Listing Status: Species of Special Concern. The western pond turtle occurs in ponds, streams, and other wetland habitats in the Pacific slope drainages of California and northern Baja California, Mexico (Bury and Germano 2008). The central California population was historically present in most drainages on the Pacific slope (Jennings and Hayes 1994), but streambed alterations and other sources of habitat destruction, exacerbated by frequent drought events, have caused substantial population declines throughout most of the species' range (Stebbins 2003). Ponds or slack-water pools with suitable basking sites (such as logs) are an important habitat component for this species, and western pond turtles do not occur commonly along high-gradient streams. Females lay eggs in upland habitats, in clay or silty soils in unshaded (often south-facing) areas up to 0.25 mi from aquatic habitat (Jennings and Hayes 1994). Juveniles feed and grow in shallow aquatic habitats (often creeks) with emergent vegetation and ample invertebrate prey. Nesting habitat is typically found within 600 ft of aquatic habitat (Jennings and Hayes 1994), but if no suitable nesting habitat can be found close by, adults may travel overland considerable distances to nest.

The cumulative stressors of urbanization, including release of non-native turtles, predation and harassment by pets and non-native mammals, capture by humans, degradation of water quality, loss of upland nesting habitat due to development, and the construction of barriers between creeks and nesting areas, have reduced western pond turtle populations, and breeding populations have been extirpated from most agricultural and urbanized areas in the Project region. However, individuals of this long-lived species still occur in streams and ponds in Alameda County.

Western pond turtle occurs in a perennial pond located approximately 1,000 ft south of the Project site and adjacent to the access road, where turtles were observed several times during the reconnaissance-level surveys conducted in February 2016. There are no barriers to dispersal between that pond and Vallecitos Channel, and therefore pond turtles could move between the pond and the Project site. Western pond turtles could occur on the Project site, in which case nesting could potentially occur on the upland areas located along the channel. However, the aquatic habitats in the Project site do not provide high-quality habitat for this species, due to insufficient water depth and the lack of large pools with basking sites.

Burrowing Owl (*Athene cunicularia*). **Federal Listing Status: None; State Listing Status: Species of Special Concern.** The burrowing owl is a small, terrestrial owl of open country. These owls prefer annual and perennial grasslands, typically with sparse or nonexistent tree or shrub canopies. In California, burrowing owls are found in close association with California ground squirrels; owls use the abandoned burrows of ground squirrels for shelter and nesting. The nesting season as recognized by the CDFG (2012) runs from February 1 through August 31. After nesting is completed, adult owls may remain in their nesting burrows or in nearby burrows, or they may migrate (Rosenberg et al. 2007); young birds disperse across the landscape from 0.1 mi to 35 mi from their natal burrows (Rosier et al. 2006). Burrowing owl populations have declined substantially in the San Francisco Bay area in recent years, with declines estimated at 4-6% annually (Rosenberg et al. 2007).

Burrowing owls occur year-round in the San Francisco Bay Area (Trulio 2007), and are commonly present in open, agricultural or grassland areas with active squirrel burrows. Burrowing owls also exhibit strong site fidelity, and may return to a nesting site and attempt to nest even after the site has been developed. During reconnaissance-level surveys, a burrowing owl was observed using a burrow located adjacent to the access road, approximately 1,200 ft south of the Project site. Suitable habitat for burrowing owls occurs in ruderal grassland areas on the Project site, where numerous California ground squirrel burrows occur in upland areas along the channel. Therefore, burrowing owls could breed and roost on the Project site in low numbers, and individuals likely also occur on the site as foragers.

Loggerhead Shrike (*Lanius ludovicianus*). **Federal Listing Status: None; State Listing Status: Species of Special Concern (Nesting).** The loggerhead shrike is a predatory songbird associated with open habitats interspersed with shrubs, trees, poles, fences, or other perches from which it can hunt (Yosef 1996). Nests are built in densely foliated shrubs or trees, often containing thorns, which offer protection from predators and upon which prey items are impaled. The breeding season for loggerhead shrikes may begin as early as mid-February and lasts through July (Yosef 1996). Nationwide, loggerhead shrike populations have declined significantly over the last 20 years. Loggerhead shrikes are still fairly common in parts of the San Francisco Bay area, but urbanization has reduced available habitat, and local populations are likely declining (Cade and Woods 1997, Humple 2008).

Loggerhead shrikes breed in a number of locations in the Project region where open grassland, ruderal, or agricultural habitat with scattered brush, chaparral, or trees that provide perches and nesting sites occurs (CNDDDB 2016). The Project site provides suitable habitat in the form of trees and shrubs that provide potential nesting sites interspersed with, and adjacent to, extensive open foraging habitat. Evidence of shrike occurrence (i.e., prey items cached on a barb wire fence) was observed during reconnaissance-level surveys, and it is possible that one or two pairs may nest and forage on or adjacent to the site.

Yellow Warbler (*Dendroica petechia*). **Federal Listing Status: None; State Listing Status: Species of Special Concern (Nesting).** The yellow warbler is a widespread Neotropical migrant that inhabits wet deciduous forests throughout North America (Lowther et al. 1999). In California, yellow warblers occupy wooded riparian habitats along the coast, on both eastern and western slopes of the Sierra Nevada up to

approximately 1,700 ft, and throughout the northern portion of the state (Heath 2008). Their range has remained relatively stable over time, but populations have declined substantially in many localities due to habitat loss (Cain et al. 2003, Heath 2008) and expansion of the brood-parasitic brown-headed cowbird (*Molothrus ater*). As a result, breeding yellow warblers have been largely extirpated from the Santa Clara Valley (Heath 2008). Ideal breeding habitat for yellow warblers consists of riparian corridors with dense, shrubby understory and open canopy (Lowther et al. 1999, Cain et al. 2003, Heath 2008). Yellow warblers breed from early May through early August and construct open cup nests in upright forks of shrubs or trees in dense willow thickets or other dense vegetation (Lowther et al. 1999).

Yellow warblers occur in the Project vicinity, and a few pairs could breed in riparian habitats on the Project site. Suitable breeding habitat consisting of riparian trees with substantial shrub understory is present in the lower reaches of the Project alignment, although limited in width and extent within the site. Riparian areas with reduced understory due to grazing or disturbance are generally not used by this species, and riparian corridors lacking open ruderal or herbaceous vegetation along the edges of the corridors or with development up to the corridor edge are often avoided as well.

Grasshopper sparrow (*Ammodramus savannarum*). **Federal status: None; State status: Species of Special Concern (Nesting).** In California, the distribution of breeding grasshopper sparrows includes the Coast Ranges, the northern Central Valley, and areas west of the southeastern deserts (Lyon 2000, Unitt 2008). The grasshopper sparrow breeds in open, short grasslands with scattered clumps of shrubby vegetation, constructing domed ground nests with grasses in patches of dense vegetation (Vickery 1996, Unitt 2008). Prime breeding habitat features very large, unfragmented areas of grassland with patches of bare ground, and clumps of shrubby vegetation surrounded by denser grass cover for singing perches and nest sites (Vickery 1996, Lyon 2000). Grasshopper sparrows breed from mid-March to August in California, after which they migrate to wintering grounds that are presumed to be in Mexico and Central America (Vickery 1996, Unitt 2008).

Nesting grasshopper sparrows likely occur in open grassland habitats in the Project vicinity and may occasionally occur in the Project site. Short, low-growing vegetation on the Project site may provide suitable nesting habitat for this species, particularly in the upper reaches of the Project alignment. However, it is more likely that nesting grasshopper sparrows use the large and unfragmented grassland habitats located to the east and south of the Project site, and occasionally forage in the Project site in low numbers.

San Francisco Dusky-footed Woodrat (*Neotoma fuscipes annectens*). **Federal status: None; State status: Species of Special Concern.** The San Francisco dusky-footed woodrat occurs in a variety of woodland and scrub habitats throughout the South Bay and the adjacent Central Coast Range, south to the Pajaro River in Monterey County (Hall 1981, Zeiner et al. 1990a). It prefers riparian and oak woodland forests with dense understory cover, or thick chaparral habitat (Lee and Tietje 2005). Dusky-footed woodrats build large, complex nests of sticks and other woody debris, which may be maintained by a series of occupants for several years (Carraway and Verts 1991). Woodrats also are very adept at making use of human-made structures, and can nest in electrical boxes, pipes, wooden pallets, and even portable storage containers. Woodrat nest densities

increase with canopy density and with the presence of poison oak (Carraway and Verts 1991). Although the San Francisco dusky-footed woodrat is described as a generalist omnivore, individuals may specialize on local plants that are available for forage (Haynie et al. 2007). The breeding season for dusky-footed woodrat begins in February and sometimes continues through September, with females bearing a single brood of one to four young per year (Carraway and Verts 1991).

San Francisco dusky-footed woodrat occurs in riparian woodland and mixed woodland habitats on the Project site. Approximately 20 woodrat nests were observed in these habitats during reconnaissance-level surveys, the majority of which were observed in riparian woodland near the channel. However, suitable conditions for this species are confined to the lower-middle reaches (downstream-most 4,500 ft of the channel), and this species likely does not occur within the upstream portions of the Project alignment where woody vegetation is more sparse. No woodrat nests were observed in the proposed construction and staging areas.

American Badger (*Taxidea taxus*). Federal status: None; State status: Species of Special Concern. The American badger is a stocky, burrowing mammal that occurs in grassland habitats throughout the western United States. Badgers can have large territories, up to 21,000 acres in size, with territory size varying by sex and by season. They are strong diggers and feed primarily on other burrowing mammals, such as ground squirrels. In central California, American badgers typically occur in annual grasslands, oak woodland savannas, semi-arid shrub/shrublands, and any habitats with stable ground squirrel populations or other fossorial rodents (i.e., ground squirrels, gophers, kangaroo rats, and chipmunks [Zeiner et al. 1990a]). They occur to a lesser extent in agricultural areas, where intensive cultivation inhibits den establishment and reduces prey abundance. Badgers are primarily nocturnal, although they are often active during the day. They breed during late summer, and females give birth to a litter of young the following spring.

American badgers occur in open grassland and chaparral habitats located to the south and east of the Project site. Suitable foraging habitat for this species is present in ruderal grassland habitat on the Project site, although very limited in extent. Suitable denning habitat for this species is not present on the Project site, due to the limited extent of grassland and regular human presence associated with operation of the channel. More extensive foraging habitat and suitable denning habitat for this species are present in adjacent grassland areas. Therefore, individuals of this species may occur as foragers on the Project site occasionally and in very low numbers, although they are not expected to den or breed on the site.

State Fully Protected Species

American Peregrine Falcon (*Falco peregrinus anatum*). Federal Listing Status: None; State Listing Status: Fully Protected. The American peregrine falcon occurs throughout much of the world, and is known as one of the fastest flying birds of prey. Peregrine falcons prey almost entirely on birds, which they kill while in flight. These falcons nest on ledges and caves on steep cliffs, as well as on human-made structures such as buildings, bridges, and electrical transmission towers. In California, they are known to nest along the entire coastline, the northern Coast, and the Cascade Ranges and Sierra Nevada.

A severe decline in populations of the widespread North American subspecies *anatum* began in the late 1940s. This decline was attributed to the accumulation of DDE, a metabolite of the organochlorine pesticide DDT, in aquatic food chains. When concentrated in the bodies of predatory birds such as the peregrine falcon, this contaminant led to reproductive effects, such as the thinning of eggshells. The American peregrine falcon was listed as endangered by the USFWS in 1970 (USFWS 1970) and by the State of California in 1971. Recovery efforts included the banning of DDT in North America, and captive breeding programs to help bolster populations. The USFWS removed the American peregrine falcon from the endangered Species List in 1999 (USFWS 1999), and although the State of California still lists the species as endangered, delisting under the CESA has also been proposed. The American peregrine falcon could occur in the Project site occasionally, while foraging, but is not expected to occur regularly. Suitable nesting habitat is not present on or very near the site.

Golden Eagle (*Aquila chrysaetos*). Federal Listing Status: None; State Listing Status: Fully Protected.

The golden eagle is an uncommon permanent resident and migrant throughout the state. The species' breeding range in California excludes only the Central Valley, the immediate coast in the far north, and the southeastern corner of the state (Zeiner et al. 1990b). The golden eagle nests in a range of open habitats, including desert scrub, foothill cismontane woodlands, and annual or perennial grasslands. Nesting habitat is characterized by large, remote patches of grassland or open woodland; a hilly topography that generates lift; an abundance of small mammal prey; and tall structures that serve as nest platforms and hunting perches. Once a breeding pair establishes a territory, they may build a number of nests in tall structures such as tall trees or snags, cliffs, or utility towers (Zeiner et al. 1990b, Kochert et al. 2002), only one of which is used in any given year. The nesting season begins in late January and continues through August. Following nesting, adult eagles usually remain in or near their breeding territory (Zeiner et al. 1990b). Young birds in California tend to be sedentary, remaining in or near their parental home ranges (Kochert et al. 2002).

In the Project vicinity, golden eagles have been reported nesting near San Antonio Reservoir, within approximately 1.0 mile of the eastern end of the Project alignment, and this is one of several nesting territories documented in the watershed (CNDDB 2010). Focused surveys for nesting golden eagles conducted in February 2016 detected several large trees in or adjacent to the lower reaches of the site, and electrical towers in the middle reaches, that provide suitable nesting substrates for this species. However, no golden eagle nests (old or active) were observed on the Project site or in areas of potential Project disturbance. Therefore, the golden eagle is not expected to breed on the Project site, due to a lack of active nests or nesting activity, but individuals of this species are known to breed in the vicinity and are expected to occasionally occur on the Project site while foraging.

White-tailed Kite (*Elanus leucurus*). Federal Listing Status: None; State Listing Status: Fully Protected. In California, white-tailed kites can be found in the Central Valley and along the coast, in grasslands, agricultural fields, cismontane woodlands, and other open habitats (Zeiner et al. 1990b, Dunk 1995, Erichsen et al. 1996). White-tailed kites are year-round residents of the state, establishing breeding territories that encompass open areas with healthy prey populations, and snags, shrubs, trees, or other nesting substrates (Dunk

1995). Non-breeding birds typically remain in the same area over the winter, although some movements do occur (Polite 1990). The presence of white-tailed kites is closely tied to the presence of prey species, particularly voles, and prey base may be the most important factor in determining habitat quality for white-tailed kites (Dunk and Cooper 1994, Skonieczny and Dunk 1997). Although the species recovered after population declines during the early 20th century, its populations may be exhibiting new declines as a result of recent increases in habitat loss and disturbance (Dunk 1995, Erichsen et al. 1996).

White-tailed kites occur in the Project vicinity (CNDDB 2010) and suitable habitat for this species occurs on the Project site. White-tailed kites could nest in trees or shrubs within woodland habitats on the Project site, and the extensive open grasslands located adjacent to the site, particularly to the south and east, provide high quality foraging habitat. Therefore, individuals may occasionally occur on the Project site as foragers or breeders. However, only one or two pairs of this species, at most, could nest on the Project site due to the narrow width of the Project site and the species' territorial nature.

Appendix F.

Cultural Resources Report

Technical Report

CULTURAL RESOURCES ASSESSMENT REPORT

Vallecitos Channel Maintenance Project Alameda County, California

January 2021

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Limitations

This report contains confidential cultural resources location information; report distribution should be restricted to those with a need to know. Cultural resources are non-renewable, and their scientific, cultural and aesthetic values can be significantly impaired by disturbance. To deter vandalism, artifact hunting, and other activities that can damage cultural resources, the locations of cultural resources should be kept confidential. The legal authority to restrict cultural resources information is in California Government Code 6254.1 and the National Historic Preservation Act of 1966, as amended, Section 304.

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List of Acronyms

AB	Assembly Bill
ACWD	Alameda County Water District
APE	area of potential effects
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CHRIS	California Historical Resources Information System
CRHR	California Register of Historical Resources
Horizon	Horizon Water and Environment, LLC
mm	millimeters
NAHC	Native American Heritage Commission
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
NWIC	Northwest Information Center
PRC	Public Resources Code
RSP	rock slope projection
SR	State Route
TCR	tribal cultural resource
RPA	Registered Professional Archaeologist
USC	United States Code
USGS	United State Geological Survey

Executive Summary

The Alameda County Water District (ACWD or “District”) is proposing to improve water conveyance through the Vallecitos Channel, an engineered, unlined channel used to convey water approximately 2.5 miles from the South Bay Aqueduct to Vallecitos Creek in southern Alameda County. This document reports the findings of an archaeological investigation for the Vallecitos Channel Evaluation and Restoration Project (“project” or “proposed project”). The ACWD retained Horizon Water and Environment, LLC (Horizon) to complete the archaeological survey in support of the proposed project.

This report documents archaeological inventory methods and results as required for compliance with federal and California regulations. The archaeological study consisted of a literature review to identify any previously recorded archaeological sites that could be affected by the proposed project, and a field survey to locate recorded sites and any other sites that may exist but have not yet been recorded. One isolated chert flake was identified during the survey. Isolated artifacts attest to use of the area by California Native Americans, but such items generally contain limited data potential and are not considered eligible for listing in the National Register of Historic Places (NRHP) or the California Register of Historical Resources (CRHR).

The Vallecitos Channel was also recorded as a cultural resource, as it is an engineered channel constructed in 1965. The channel was constructed by the ACWD to receive water from the South Bay Aqueduct, an arm of the State Water Project. The channel is unlined, and largely uses the natural drainage of Vallecitos Creek to transport the South Bay Aqueduct water. An evaluation of the Vallecitos Channel indicates that it does not appear to meet any of the criteria for NRHP/CRHR eligibility. Because neither of the cultural resources recorded during the archaeological survey appear significant, the proposed project will not have an effect on NRHP/CRHR-eligible resources.

This report has been prepared based on certain key assumptions made by Horizon that substantially affect its conclusions and recommendations. These assumptions are that the information gathered during the record search is up to date and accurate, and that the field survey results accurately identified the presence or absence of archaeological resources visible on the ground surface. These assumptions, although thought to be reasonable and appropriate, may not prove to be true in the future. Horizon’s conclusions and recommendations are conditioned upon these assumptions.

The archaeological inventory was performed based on information obtained at the Northwest Information Center (NWIC) of the California Historical Resources Information System (CHRIS), as well as on direct observation of site conditions and other information generally applicable as of November 2020. The conclusions and recommendations herein are therefore based on information available up to that point in time. Further information may come to light in the future that could substantially change the conclusions found herein.

Information obtained from these sources in this timeframe is assumed to be correct and complete. Horizon does not assume any liability for findings or lack of findings based upon misrepresentation of information presented to Horizon or for items that are not visible, made visible, accessible, or present at the time of the project area inventory.

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1 Introduction

1.1 Location and Setting

The Vallecitos Channel is located in Vallecitos Valley, which is tucked among the rolling hills that characterize the east flank of the Diablo Range in unincorporated Alameda County. The channel is located in unincorporated Alameda County, south of State Route (SR) 84 (Vallecitos Road), and north of San Antonio Reservoir. The 2.25-mile-long channel flows from east to west, ultimately draining into Vallecitos Creek. San Antonio Reservoir is located about 1.25 miles to the south. The Vallecitos Channel is south of State Route (SR) 84, and about 300 feet east of the intersection of SR 84 and Interstate 680 (**Figure 1**).

The project study area is depicted within Sections 10 and 11, Township 4 South, Range 1 East on the La Costa Valley United States Geological Survey (USGS) 7.5' topographic quadrangle (**Figure 2**). Elevation of the channel ranges from 485 feet above mean sea level on the east to 320 feet above mean sea level at the west end. The area immediately adjacent to the project is primarily rural, with the exception of a paintball park along the north bank at one location and sparsely scattered single-family homes located further from the bank of the channel. Land use primarily focuses on cattle grazing. An unpaved access road is present along the left (south) bank of the channel, and two power lines cross over the Vallecitos Channel near the center of the project area.

Vegetation immediately adjacent to the Vallecitos Channel and the surrounding hills is primarily composed of grasslands. However, mixed riparian woodland and perennial marsh habitats are also present, primarily along the natural, though channelized, portions of Vallecitos Creek. Mixed oak woodland and coyote brush shrubland communities are also present (H. T. Harvey & Associates 2016; Figure 4).

1.2 Project Description and Area of Potential Effects

The Vallecitos Channel is a critical component in the ACWD's water supply system. The channel is an engineered, unlined, earthen trapezoidal channel that extends nearly 2.5 miles from the California Department of Water Resources South Bay Aqueduct turnout in the upper watershed to Vallecitos Creek near Vallecitos Lane in the lower watershed. The Vallecitos Channel Maintenance Project area extends from the head of the channel where the South Bay Aqueduct emergency culvert outlet is located and extends downstream 1.5 miles (7,980 feet) (**Figure 3**), between drop structures #1 and #13.

Built in 1965, the Vallecitos Channel plays a key role in this overall water delivery system that provides potable water for ACWD customers. In addition to conveying South Bay Aqueduct water to for water supply purposes, the Vallecitos Channel also serves as an "emergency release" discharge location for California Department of Water Resources in its operation of the South Bay Aqueduct. The channel within the project area consists of the incised channel, constructed elevated banks, and 13 concrete drop structures to regulate water flow. A maintenance access road runs along the south side of the channel; the ACWD right of way along the channel is fenced. Although originally designed for peak flows at 120 cubic feet per second (cfs) from the South Bay Aqueduct emergency discharge events, the existing channel has reportedly overtopped in some areas at flows of approximately 20 cfs. This reduced capacity is largely due to the presence of excess vegetation in the channel.

Bank erosion and sloughing have been an ongoing issue for the Vallecitos Channel. From 1980 to 1998, the ACWD completed a series of bank repair and stabilization projects of varying size within the project area to address severe erosion and to stabilize bank sloughing where it threatened the access road along the south bank. In 2010, the crossings at Drop Structures #5 and #10 were replaced to allow light vehicle traffic and cattle to traverse the channel at those locations. In 2014, the District addressed a bank failure on the south bank by installing an approximately 220-foot-long willow wall. In October 2020, vegetation trimming activities were conducted throughout a portion of the channel to allow conveyance of water supplies from the South Bay Aqueduct to meet the District's supply needs that winter.

Under current conditions, the Vallecitos Channel requires additional maintenance. Several locations have experienced severe streambank erosion and bank shearing, thereby reducing the right-of-way width and rendering the maintenance road along the top of the south bank impassable. In addition, dense emergent vegetation obstructs flow in several sections of the channel (e.g., directly downstream of Drop Structure #8 and Drop Structure #11) deflecting flow horizontally, exacerbating bank erosion and resulting in localized flooding.

The proposed project objectives include:

- Restore channel cross-sectional area to increase channel capacity and convey South Bay Aqueduct emergency discharge events up to 120 cfs.
- Stabilize and restore areas of severe streambank erosion.
- Attenuate flood impacts to private properties adjacent to the channel.
- Repair the access road to allow for channel safety inspections and maintenance.
- Improve water quality by reducing streambank erosion and sediment loading to the channel.
- Improve existing riparian habitat by creating several instream bench areas.

The project objectives will largely be accomplished by removal of emergent vegetation (and associated root masses and sediment deposits) from the channel's center and right (north) bank margin. Where feasible, vegetation along the left bank would be avoided to help dissipate flow energy along the left bank and to provide riparian habitat. Sediment removal and bank stabilization, via rock slope projection (RSP) and the insertion of live willow stakes, are also primary elements of the project.

Grouted RSP is proposed where bank erosion sites abut concrete drop structures. Where erosion has undercut the concrete inlet to drop structures, threatening structural damage, grout would be pumped under the exposed concrete slope to fill existing voids. At other drop structure locations where no bank erosion is evident, typically at the downstream side of the drop structures, grouted RSP could also be used to replace failed gabions.

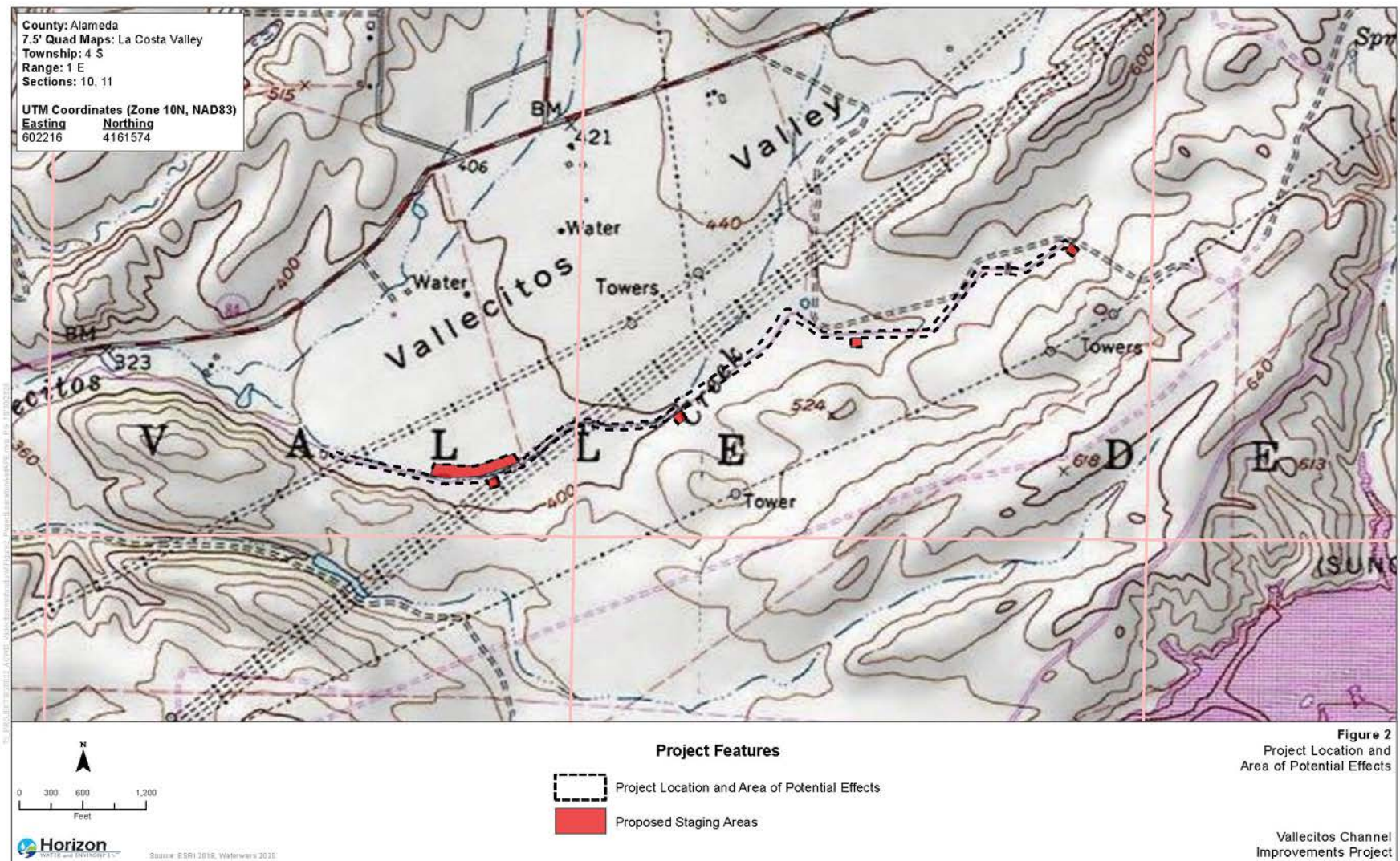
Many segments of the access road slope are out-sloped away from the channel. As a result, the access road would be in-sloped toward the channel using a grader. This treatment would also include minor road improvements, such as culvert repair or replacement, removal of previous concrete or grout road repairs, backfilling of rodent burrows or subsurface voids, and repairing gullies and minor slope failures at the top of bank.

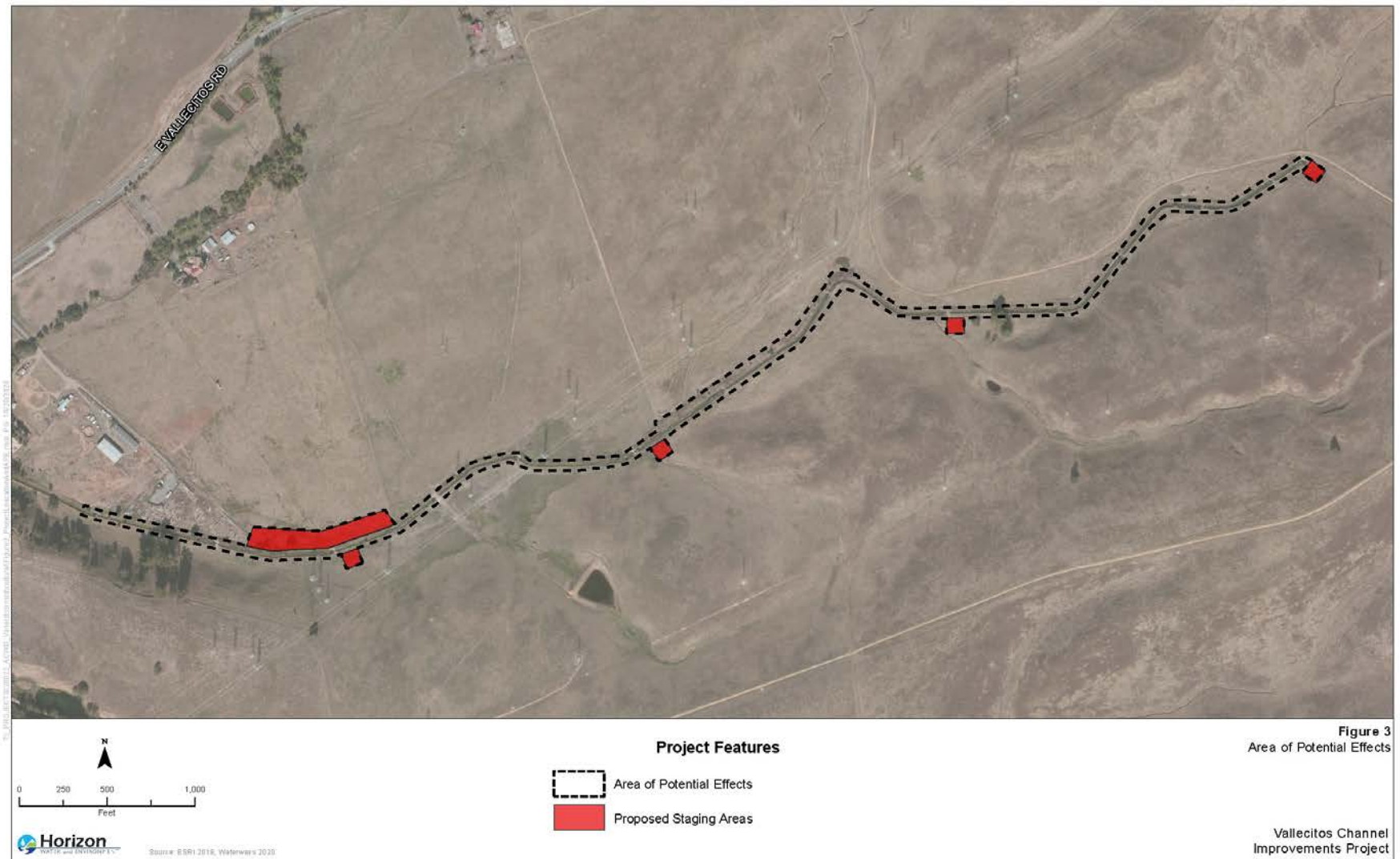
Lastly, the project includes construction of a series of vegetated in-channel benches by excavating upland areas along the right bank. Benches would be excavated to an elevation just above the ordinary high water mark near the center of the channel. The proposed in-channel benching would convert approximately 0.5 acre of upland habitat to riparian habitat. This activity may also help attenuate downstream flooding and support groundwater recharge.

Area of Potential Effects

The area of potential effects (APE) extends along the Vallecitos Channel for approximately 1.5 miles, between drop structures #1 and #13. It consists of the fenced ACWD right-of-way, which includes easements and property owned by ACWD and varies between 60 and 80 feet wide, along with all staging areas located immediately adjacent to the ACWD right-of-way. All project-related activities will be confined to the APE of about 14.76 acres, of which 2.85 acres are within the staging areas (Figure 3). The maximum vertical depth of the APE is 5.5 feet to accommodate removal of vegetation and sediment in the channel. Access to the project site and staging areas will be via a road entering the very western end of the channel and two existing roads that run perpendicular to the channel from SR 84. None of these roads will be modified and, therefore, are not within the project APE.







1.3 Regulatory Setting and Need for Study

1.3.1 State of California Regulations

CEQA and State CEQA Guidelines

The proposed project must comply with California Environmental Quality Act (CEQA) (Public Resources Code [PRC] 21000 et seq. and the CEQA Guidelines (California Code of Regulations [CCR], Title 14, Chapter 3), which determine, in part, whether the project has a significant effect on a unique archaeological resource (per PRC 21083.2) or a historical resource (per PRC 21084.1).

CEQA Guidelines CCR 15064.5 notes that “a project with an effect that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment.” Lead agencies are required to identify potentially feasible measures or alternatives to avoid or mitigate significant adverse changes in the significance of a historical resource before such projects are approved. According to the CEQA guidelines, historical resources are:

- Listed in, or determined to be eligible for listing in, the California Register of Historical Resources (per PRC 5024.1(k));
- Included in a local register of historical resources (per PRC 5020.1) or identified as significant in a historical resource survey meeting the requirements of PRC 5024.1(g); or
- Determined by a lead state agency to be historically significant.

CEQA Guidelines CCR 15064.5 also applies to unique archaeological resources as defined in PRC 21084.1.

Assembly Bill (AB) 52 requires, per PRC 21080.3.1, that CEQA lead agencies consult with a California Native American tribe that is traditionally and culturally affiliated with the geographic area of a proposed project, if so requested by the tribe, and if the agency intends to release a negative declaration, mitigated negative declaration, or environmental impact report for a project. The bill also specifies, under PRC 21084.2, that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource (TCR) is considered a project that may have a significant effect on the environment. This latter language will be added to the CEQA checklist on or before July 1, 2016. ACWD, as the project’s CEQA lead agency, will consult with Native American tribes pursuant to PRC 21080.3.1.

As defined in Section 21074(a) of the PRC, TCRs are:

- (1) Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:
 - a. Included or determined to be eligible for inclusion in the CRHR; or
 - b. Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.

- (2) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.

TCRs are further defined under Section 21074(b) and (c) as follows:

- (b) A cultural landscape that meets the criteria of subdivision (a) is a TCR to the extent that the landscape is geographically defined in terms of the size and scope of the landscape; and
- (c) A historical resource described in Section 21084.1, a unique archaeological resource as defined in subdivision (g) of Section 21083.2, or a “nonunique archaeological resource” as defined in subdivision (h) of Section 21083.2 may also be a tribal cultural resource if it conforms to the criteria of subdivision (a).

Mitigation measures for TCRs must be developed in consultation with the affected California Native American tribe pursuant to the newly chaptered Section 21080.3.2, or according to Section 21084.3. Section 21084.3 identifies mitigation measures that include avoidance and preservation of TCRs and treating TCRs with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource.

California Register of Historical Resources

PRC Section 5024.1 establishes the California Register of Historical Resources. This register lists all California properties considered to be significant historical resources. The CRHR includes all properties listed, or determined to be eligible for listing, in the NRHP, including properties evaluated under Section 106 of the National Historic Preservation Act. The criteria for listing are similar to those of the NRHP. Criteria for listing in the CRHR include resources that:

- 1) Are associated with the events that have made a significant contribution to the broad patterns of California’s history and cultural heritage;
- 2) Are associated with the lives of persons important in our past;
- 3) Embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual, or possess high artistic values; or
- 4) Have yielded, or may be likely to yield, information important in prehistory or history.

The regulations set forth the criteria for eligibility as well as guidelines for assessing historical integrity and resources that have special considerations.

1.3.2 Federal Regulations

Construction of the proposed project by ACWD will require a Clean Water Act Section 404 permit from the U.S. Army Corps of Engineers. As a result, the project constitutes a federal undertaking as defined by Title 54 United States Code (USC) Section 300101 of the National Historic Preservation Act (NHPA) and mandates compliance with 54 USC Section 306108, commonly known as Section 106 of the NHPA and its implementing regulations found under Title 36 of the Code of Federal Regulations

(CFR) Section 800, as amended in 2001. To comply with Section 106 of the NHPA, the project proponent must “take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register.”

The implementing regulations of the NHPA require that cultural resources be evaluated for NRHP eligibility if they cannot be avoided by an undertaking (proposed project). To determine site significance through application of NRHP criteria, several levels of potential significance that reflect different (although not necessarily mutually exclusive) values must be considered. As provided in Title 36 CFR Section 60.4, “the quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association” and must be considered within the historic context. Resources must also be at least 50 years old, except in rare cases, and, to meet eligibility criteria of the NRHP, must:

- (A) Be associated with events that have made a significant contribution to the broad patterns of our history; or
- (B) Be associated with the lives of persons significant in our past; or
- (C) Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- (D) Have yielded, or may be likely to yield, information important in prehistory or history.

For archaeological sites evaluated under criterion (D) above, integrity requires that the site remain sufficiently intact to convey the expected information to address specific important research questions.

Cultural resources also may be considered separately under the National Environmental Protection Act per Title 42 USC Sections 4321 through 4327. These sections require federal agencies to consider potential environmental impacts and appropriate mitigation measures for projects with federal involvement.

1.4 Personnel

Field work, analysis, and reporting were carried out by the below-listed professionals who meet the Secretary of the Interior’s Standards and Guidelines for Archaeology and Historic Preservation (per Title 48 of the CFR, Section 44716, as amended in 1983). Procedures complied with NHPA Section 106 as set forth in Title 36 of the CFR, Section 800.

- Janis Offermann (Horizon), MA, Registered Professional Archaeologist (RPA), was principal investigator for the project and prepared this report. She also conducted survey of the staging areas identified for the project. She has a bachelor’s degree in anthropology from Sonoma State University in California and a master’s degree in anthropology from the University of California at Davis. She has over 40 years of experience in California archaeology and cultural resource management. Ms. Offermann is the cultural resources practice leader with Horizon.

- Kara Brunzell, MA, completed recordation and evaluated the Vallecitos Channel for NRHP/CRHR eligibility. She has a bachelor's degree in history from the University of California at Los Angeles and a master's degree in history/public history from California State University, Sacramento. She has 15 years of experience in architectural history and history, and has worked throughout California.
- Ryan Gross, MA, coordinated the field survey of the Vallecitos Channel and assisted with the preparation of this report. He has a bachelor's degree in anthropology from the California State University, Chico, and a master's degree in museum studies from San Francisco State University in California. He has 13 years of experience in archaeology and museum management in California, Hawaii, Illinois, and North Carolina.
- Christopher Simon, BA, assisted with the field efforts. He has a bachelor's degree in anthropology from the University of California, Santa Cruz, and has 10 years of archaeological experience in California, Nevada, Idaho, Alaska, and Utah.

2 Project Context

2.1 Environmental Setting

The Vallecitos Channel is located in the Vallecitos Valley, a small valley tucked in among the rolling hills on the east flank of the Diablo Range, which borders the San Francisco Bay on the east. The Pleasanton Ridge rises to the west of Vallecitos Valley. The area remains distinctly rural despite its close proximity to urban centers. The city of Pleasanton is located approximately 4 miles to the north, while Fremont and the Silicon Valley are only 5 miles to the southwest. The interchange of Interstate Highway 680 and SR 84 is about 0.25 miles west of the west end of Vallecitos Channel, while SR 84 (also known as Vallecitos Road) closely parallels the westernmost 0.5 miles of the channel. San Antonio Reservoir, which was constructed by the City and County of San Francisco in 1964, is about 1.25 miles to the south.

Drainages on the east side of the mountains, including Vallecitos Creek, are ephemeral. Even Alameda Creek, a dominant drainage within the ACWD system, lacks a natural flow by late summer.

The Vallecitos Channel is an engineered channel that was largely, but not entirely, constructed in Vallecitos Creek, which runs from east to west. Vallecitos Creek ultimately flows into Alameda Creek west of the project area.

2.2 Prehistoric Context

The prehistory of the project area reflects information known about the indigenous population from the time the region was first populated with humans until the arrival of the first Europeans, who visited and recorded their journeys through the written record. The prehistoric record is derived from over a century of archaeological research, and while much has been gleaned from these studies, large gaps in the data record remain. The following prehistoric culture sequence, derived from Milliken et al. (2010:114-118), briefly outlines the prehistory of the San Francisco Bay region.

The Early Holocene (Lower Archaic; 8000 to 3500 B.C.) is considered a time when populations continued to be very mobile as they practiced a foraging subsistence pattern around the region. Artifacts that characterize this period include the millingslab and handstone to process seeds, as well as large wide-stemmed and leaf-shaped projectile points.

The Early Period (Middle Archaic; 3500 to 500 B.C.) is marked by the appearance of cut shell beads in the archaeological record, as well as the presence of the mortar and pestle for processing acorns. House floors with postholes indicate substantial living structures, which suggests a move toward establishing a more sedentary lifestyle and an increasing population.

The Middle Period, which includes the Lower Middle Period (Initial Upper Archaic; 500 B.C. to A.D. 430), and Upper Middle Period (Late Upper Archaic; A.D. 430 to 1050), appears to be a time when geographic mobility may have continued, although groups began to establish longer-term base camps in localities from which a more diverse range of resources could be exploited. The first rich black middens are recorded from this period. The addition of milling tools, obsidian and chert concave-base projectile points, and the occurrence of sites in a wider range of environments, suggest that the economic base was more diverse. By the Upper Middle Period, mobility was being replaced by the

development of numerous small villages. Around A.D. 430 a “dramatic cultural disruption” occurred, as evidenced by the sudden collapse of the Olivella saucer bead trade network.

The Initial Late Period (Lower Emergent; A.D. 1050 to 1550), reflects a social complexity that had developed toward lifeways of large, central villages with resident political leaders and specialized activity sites. Artifacts associated with the period include the bow and arrow, small corner-notched projectile points, and a diversity of beads and ornaments.

The Terminal Late Period (Upper Emergent; A.D. 1550 to circa 1750) generally represents the indigenous cultures that were encountered by the Spanish when they first arrived in San Francisco Bay.

2.3 Ethnohistoric Context

The population indigenous to the project area spoke a language referred to as Costanoan, a derivative from a Spanish term for “coast people.” Costanoan, which consisted of six known languages and various dialects within those languages, was spoken over a broad territory that included all of the San Francisco Peninsula and all lands along the east and south of San Francisco Bay, as well as lands that extended south to include Monterey Bay, Salinas Valley, and the area around Hollister. Those residing in the project area likely spoke the Causen dialect of San Francisco Bay Costanoan (Milliken et al. 2009:33-35).

The Costanoan peoples, who are referred to as the Ohlone, Mutsun, or Rumsen, depending on geography, were not a united cultural or political entity (Milliken et al. 2009:2-4). Rather, there were strong differences, not only in language but also in culture, between the San Francisco and Monterey Bay occupants, and political affinity was based on the tribelet, which comprised one or more villages within a specific geographic territory (Levy 1978:487).

Tribelet territory had a range of 10 to 12 miles in diameter, and contained a population that consisted of 200 to 400 people living among four or five villages (Milliken et al. 2010:99). Those living in the project area resided in large villages along permanent streams in locations that allowed access to the diverse resources found in the tidal marshlands, the valley floor, and the hills. (Milliken et al. 2010:106; Moratto 2004:225).

The Ohlone of the south and east San Francisco Bay area were among the first in the region to feel the impact created by the arrival of the Spanish. Mission Santa Clara, in the town of Santa Clara, was established in 1777. Mission San Jose, in present-day Fremont, was established in 1797 and was located at the Alson Ohlone village of *Oroysom* (Milliken et al. 2009:147).

Most of the Alson population, along with the Tuibun Ohlone from Coyote Hills and Causen Ohlone from the Sunol area, had already been moved to Mission Santa Clara by the time Mission San Jose was settled. However, they were moved back to their ancestral lands to help establish Mission San Jose. By 1806, the remainder of these tribes, as well as the Livermore Valley Ohlone tribes, had been brought into the mission (Milliken et al. 2009:147-148).

After the secularization of the missions, many of the Ohlone became employed by the *Californios*, the owners of vast acreages referred to as ranchos. Others chose to move beyond the sphere of Mexican, and later American, influence and established Native American communities in otherwise unpopulated areas, such as the Livermore Valley. One such community was the Alisal Rancheria

south of Pleasanton and near the project area. Alisal was established on land provided to the community by the Bernal family, who owned the Rancho el Valle de San Jose. The community, which included Yokuts and Miwok members, as well as Ohlone, continued into the early twentieth century, even as the surrounding lands originally within Rancho el Valle de San Jose changed hands. Unfortunately, the economic base of Alisal could not support the community and it began to falter; as a result, families began to leave for established towns in the area. Also, during this time, the population of the Livermore Valley began to grow, such that Alisal became surrounded by Anglo-American establishments. Perhaps the final demise of Alisal was the loss of the claim to the land in a “paper shuffle” in Washington, D.C. (Leventhal et al. 1994:309-310). The Muwekma Ohlone tribe of today comprises the descendants of the Alisal community.

2.4 Historic-Era Context

The historic era began in the San Francisco Bay area and Alameda County when Spanish explorers arrived in the late 1760s and 1770s. Members of the Portola expedition were the first to arrive in November of 1769, reaching San Francisco Bay before returning to Monterey. Pedro Fages followed in 1770, and made a return trip in 1772. The latter visit was chronicled by Father Crespi as Fages’ group followed up the east side of the bay and eventually into the Sacramento Valley; upon their return, they travelled what is essentially the Interstate 680 corridor near to the current project site and passed through what was to become known as Mission Pass, and later Sunol Grade. The Sunol Grade later was used by the Spanish to settle the region (Kyle 2002:8).

Mission Santa Clara de Assis was founded in 1777 on the banks of the Guadalupe River in Santa Clara Valley at the south end of San Francisco Bay. Later that same year the Pueblo of San Jose de Guadalupe was established along the Guadalupe River, approximately 2.25 miles from the mission, in order to grow food for the clerics and their neophytes. The town, now known as San Jose, was the first civilian settlement in Alta California (Kyle 2002:422-424).

It was not until 1797 that the Spanish settled in the eastern portion of the San Francisco Bay area. At this time, Father Fermin Francisco de Lasuen founded the Mission San Jose at the Ohlone village of *Orisom* (or *Oroyson*), in what is now Fremont in southern Alameda County (Historic Mission San Jose 2016). By the early 1800s, the mission-controlled land north to Oakland and east into Livermore Valley. The mission grew to become one of the most populated Spanish missions in the system. It also contained large numbers of livestock that roamed throughout its land holdings. According to Kyle et al., “for the entire decade of the 1830s [Mission San Jose] maintained a remarkable record and was probably the most prosperous of all the California missions both before and after secularization” (2002:7-8). The mission was secularized in November of 1836; only one other mission was secularized at a later date.

After Mexico ceded from Spain and the missions were secularized, many of the Native Americans who worked on mission lands in the rich valleys east of the Diablo range, such as the Amador and Livermore valleys, continued to live in the area. Governor Juan Alvarado, however, granted 48,436 acres, which came to be known as Rancho el Valle de San Jose, to Antonio Maria Pico, Agustín Bernal, Juan Pablo Bernal, and María Dolores Bernal de Suñol in 1839. The grant encompassed present-day Sunol and Pleasanton (previously called Alisal), along with the land that contains the Vallecitos Channel. The rancho was patented in 1865 to the Bernals and Antonio Maria Sunol (Kyle et al. 2002:15). As previously described, although the Amador and Livermore valleys have experienced significant development over the past 25 years, the land around the Vallecitos Channel remains very rural in character, and continues to support livestock, much as it has for the past 175 years.

The ACWD came into being in 1914 through an effort on the part of the local population of Washington Township in Alameda (the current cities of Fremont, Newark, and Union City) to prevent their local water supply, in Alameda Creek, from being shipped to San Francisco and Oakland to support the booming populations at those locations. It took 17 years for the ACWD to secure the water rights for Alameda Creek and to acquire the Alvarado Pumping Station. In the 1930s, the District entered into an agreement with the San Francisco Water Department for the rights to purchase water from Hetch Hetchy. The need for water grew as the population exploded in the East Bay after World War II, and the ACWD enacted policies to encourage groundwater percolation and flood control. The ACWD was the first water district to receive water from the State Water Project when the South Bay Aqueduct was completed in 1962 (ACWD 2016). Vallecitos Channel was constructed in 1965 in order to receive the water from the aqueduct.

3 Native American Consultation and Archival Research

In accordance with the Secretary of the Interior's Standards and the Guidelines for Archaeology and Historic Preservation (Title 48 CFR Section 44716 [amended 1983]), the goals of this archaeological inventory were to identify and completely document the location, qualities, and condition of any potential historic properties in the project's APE. Methods employed to achieve these goals follow.

3.1 Native American Consultation

The Native American Heritage Commission (NAHC) was contacted via email on November 5, 2020, for a search of the sacred lands files for the APE and a list of individuals who might have additional knowledge about tribal resources in the project area. The NAHC responded on November 16, 2020, stating that sacred land files failed to identify any Native American cultural resources in the project area and providing a list of knowledgeable Native Americans in the region.

The ten individuals identified by the NAHC were contacted by letter mailed December 17, 2020 (**Table 1**). The letters were intended to inform the individuals and organizations about the project, to inquire whether they knew of any unrecorded Native American tribal cultural resources or other areas of concern within or adjacent to the study area, and to solicit comments, questions, or concerns with regard to the project. A project location map was included with each letter. Copies of this correspondence are in **Appendix A**.

Table 1. Native American Consultation

Organization/Tribe	Name of Contact	Letter Date	Comments (as of January 26, 2021)
Ms. Charlene Nijmeh, Chairperson	Muwekma Ohlone Indian Tribe of the SF Bay Area	December 17, 2020	No response to date.
Ms. Monica Arellano	Muwekma Ohlone Indian Tribe of the SF Bay Area	December 17, 2020	No response to date.
Mr. Tony Cerda, Chairperson	Costanoan Rumsen Carmel Tribe	December 17, 2020	No response to date.
Mr. Andrew Galvin	Ohlone Indian Tribe	December 17, 2020	No response to date.
Ms. Corrina Gould, Chairperson	The Confederated Villages of Lisjan	December 17, 2020	Ms. Gould requested an electronic copy of the letter via email dated January 21, 2021. It was sent the next day.
Ms. Katherine Erolinda Perez, Chairperson	North Valley Yokuts Tribe	December 17, 2020	No response to date.
Mr. Timothy Perez	North Valley Yokuts Tribe	December 17, 2020	No response to date.

Organization/Tribe	Name of Contact	Letter Date	Comments (as of January 26, 2021)
Ms. Ann Marie Sayers, Chairperson	Indian Canyon Mutsun Band of Costanoan	December 17, 2020	No response to date.
Ms. Kanyon Sayers-Roods, MLD Contact	Indian Canyon Mutsun Band of Costanoan	December 17, 2020	No response to date.
Ms. Irene Zwierlein, Chairperson	Amah Mutsun Tribal Band	December 17, 2020	No response to date.

3.2 Archival Research

Cultural resources include prehistoric archaeological sites, historic-era archaeological sites, TCRs, and historic buildings, structures, landscapes, districts, and linear features.

A record search was conducted in February 2016 by the NWIC of the CHRIS at Sonoma State University in Rohnert Park (NWIC File No. 15-1098). The purpose of the record search was to identify the presence of any previously recorded cultural resources within the project's APE, and to determine if any portions of the project site had previously been surveyed for cultural resources. The records search encompassed the project APE as well as a 0.25-mile study radius around the project area. The NWIC CHRIS record search results are presented in **Appendix B**.

The records search indicated that four previous cultural resource investigations had been completed entirely or partially within the project area (**Table 2**). An additional 11 studies had been conducted within a 0.25-mile radius of the project area. The record search also found that 13 "other" studies had been conducted within or encompassing project area.

Table 2. Cultural Studies Previously Conducted Entirely or Partially in the Project Area

NWIC Report No.	Author	Date	Title
17993	Brian Hatoff, Barb Voss, Sharon Waechter, Stephen Wee, and Vance Bente	1995	Cultural Resources Inventory Report for the Proposed Mohave Northward Expansion Project
23915	William Self	2001	Phase I Cultural Resource Report, South Bay Aqueduct Alignment, Alameda and Santa Clara Counties, California
30199	Kyle Brown and William Self	2003	Cultural Resources Assessment Report, San Antonio Reservoir Pipeline Replacement Project, Alameda County, California
44653	Jennifer Thomas and John Berg	2014	Cultural Resources Study of the PG&E Line 107 (MP 13.08 to 26.01) Deactivation Project, Alameda County California

All of the studies that intersect the Vallecitos Channel are linear surveys for water or power distribution. As a result, only about 1,000 feet of the 2.5-mile-long channel had previously been investigated for archaeological sites. Similarly, most of the reports in the 0.25-mile records search radius are linear studies for water, power, or transportation facilities, or for resources evaluations related to those studies. The one exception was a large study for a habitat reserve program. **Appendix B** provides additional details about these studies.

No cultural resources were previously identified within the project study area by the records search, although one slightly modified cobble isolate, P-01-011503, has been recorded in a dirt access road just north of the channel. One prehistoric site, CA-ALA-656 (P-01-011396), has been recorded adjacent to SR 84, about 325 feet north of the Vallecitos Channel. Site records for these resources are included in Appendix B.

The Office of Historic Preservation Historic Properties Directory, the California Inventory of Historic Resources, historical maps, and rancho plat maps were also reviewed for the NWIC record search (Appendix B). The record search provided a land grant map that indicated the Vallecitos Channel passes through lands included in the Rancho Valle de San Jose.

Aerial photographs from 1948 through 1966 (NETR Online 2016) and USGS topographic maps from 1906 through 1968 (USGS 2016) were also examined. The aerials and the topographic maps indicated that the project area has remained rural with minimal development since the early 1900s. Three power transmission lines, two of which cross Vallecitos Creek, appear in the 1941 topographic map. The Vallecitos Channel is visible in an aerial from 1966 and is depicted in the 1968 USGS La Costa Valley 7.5' topographic quadrangle.

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4 Inventory Methods and Results

4.1 Pedestrian Survey

Horizon archaeologists conducted an intensive pedestrian inventory of the Vallecitos Channel on March 15, 2016. Transect intervals of 5 meters were employed where possible within the narrow ACWD right-of-way. Ground surface visibility ranged from fair to poor, as dense vegetation lines portions of the Vallecitos Channel, some of which extends onto the bordering levees. Grasses and forbs cover the tops of the levees. Trowels were used to scrape the ground surface of vegetation to examine the soils, where necessary; ground rodent burrows and back dirt were also inspected for cultural materials. A second survey was conducted on October 16, 2020 of the proposed staging areas located directly adjacent to the ACWD right-of-way, as depicted in Figure 3. As with the survey of the right-of-way, pedestrian transects were at intervals of 5 meters or less. Ground surface visibility was generally good to excellent due to the sparse ground cover present. Rodent burrows and back dirt were also examined.

4.2 Survey Results

Two cultural resources, an isolated prehistoric artifact and the Vallecitos Channel, were identified within the project study area. Department of Parks and Recreation 523 record forms were prepared for each resource and are presented in **Appendix C**.

The isolated prehistoric artifact was identified during survey of the Vallecitos Channel. It is an olive green chert flake/possible exhausted core with several flake scars, measuring approximately 58 x 43 millimeters (mm) and 17 mm thick. An extant site (CA-ALA-656) consisting of fire-affected rock, battered cobbles, and faunal and human remains, was exposed during unrelated trenching activities in 2013 approximately 325 feet to the north and adjacent to SR 84. The flake is possibly related to the CA-ALA-656 deposit. Individual items, such as a flake or core, generally have very limited information potential and are, therefore, not considered potentially eligible resources under the NRHP or CRHR.

The Vallecitos Channel was recorded as a cultural resource and evaluated for NRHP/CRHR eligibility. The channel was constructed in 1965 to transfer water from the South Bay Aqueduct to Alameda Creek. Dimensions of the channel are 2.5 miles long, 20 feet wide from levee top to levee top, 1.5-horizontal-to-1-vertical (1.5H:1V) side slopes, and 6 feet wide at the bottom with a variable depth ranging from 5 to 8 feet. For the most part, Vallecitos Channel was created by using natural drainages. The channel uses the natural drainage of Vallecitos Creek for approximately 0.9 miles, while the easternmost portion of the channel flows through a minor unnamed drainage; only the westernmost 0.7 miles of the channel is entirely human-made. These natural drainages were widened and deepened to create the existing Vallecitos Channel. The Vallecitos Channel also contains 17 concrete drop structures, or weirs, along its entire length to control the channel slope (grade control) and help regulate flow velocity.

The Vallecitos Channel does not appear eligible for listing in the NRHP or CRHR for the following reasons:

- Criterion A/1: The Vallecitos Channel is not associated with events that have made a significant contribution to the broad patterns of our history. It was constructed within the

general context of twentieth century population growth in Washington Township and the associated expansion of the ACWD's water infrastructure, but research has revealed no significant association with that or any other important historic context. Research has revealed no lasting impact of the water conveyance feature on the region. Therefore, the property is recommended not eligible to the NRHP or CRHR under Criterion A/1.

- Criterion B/2: The Vallecitos Channel is not associated with the life of a person important to our history. Research has revealed no significant association with any particular individual, nor any significant association with important historical figures. Therefore, the property is not recommended eligible to the NRHP or CRHR under Criterion B/2.
- Criterion C/3: The Vallecitos Channel is not eligible for its engineering or design. It is a simple example of a water conveyance system and displays no groundbreaking or unusual design features. Research did not reveal any important structures designed or constructed by Grading Unlimited or Power Construction. For these reasons, the property is not recommended eligible to the NRHP and CRHR under Criterion C/3.
- Criterion D/4: In rare instances, structures themselves can serve as sources of important information about historic construction materials or technologies and be significant under Criterion D/4. Earthen channels and concrete drop structures are common and well-understood structure types, and therefore, the Vallecitos Channel does not appear to be a principal source of important information in this regard.

The Vallecitos Channel is recommended ineligible for listing on the NRHP and CRHR. It does not qualify as a historic resource under CEQA.

5 Summary and Recommendations

The ACWD is proposing to improve the flow capacity of Vallecitos Channel in southeastern Alameda County. Qualified personnel completed an archaeological inventory of the project APE. Resources identified in the APE were limited to an isolated chert flake or possible core, and the Vallecitos Channel itself.

Although no archaeological sites were identified by the archaeological inventory, archaeological sites may be buried with no surface manifestation. If prehistoric or historic-era materials are encountered, all work in the vicinity should halt until a qualified archaeologist can evaluate the discovery and make recommendations pursuant to 36 CFR Section 800.13(b). Prehistoric materials will most likely include obsidian and chert flaked-stone tools (e.g., projectile points, knives, choppers), tool-making debris, or milling equipment, such as mortars and pestles. Historic materials might include remains of agricultural implements, stone or concrete footings and walls, and deposits of metal, glass, and/or ceramic refuse.

The possibility of encountering human remains cannot be discounted. Section 7050.5 of the California Health and Safety Code states that it is a misdemeanor to knowingly disturb a human burial. If human remains are encountered, work should halt in the vicinity of the remains and, as required by law, the Alameda County coroner should be notified immediately. An archaeologist should also be contacted to evaluate the find. If human remains are of Native American origin, the coroner must notify the NAHC within 24 hours of that determination. Pursuant to California Public Resources Code Section 5097.98, the NAHC, in turn, will immediately contact an individual who is most likely descended from the remains (the “Most Likely Descendant”). The Most Likely Descendant has 48 hours to inspect the site and recommend treatment of the remains. The landowner is obligated to work with the Most Likely Descendant in good faith to find a respectful resolution to the situation and entertain all reasonable options regarding the Most Likely Descendant’s preferences for treatment.

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Appendix A

Native American Correspondence

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Local Government Tribal Consultation List Request

Native American Heritage Commission

1550 Harbor Blvd, Suite 100
West Sacramento, CA 95691
916-373-3710
916-373-5471 – Fax
nahc@nahc.ca.gov

Type of List Requested

- ☐ CEQA Tribal Consultation List (AB 52) – *Per Public Resources Code § 21080.3.1, subs. (b), (d), (e) and 21080.3.2*
- ☐ General Plan (SB 18) - *Per Government Code § 65352.3.*

Local Action Type:

___ General Plan ___ General Plan Element ___ General Plan Amendment
___ Specific Plan ___ Specific Plan Amendment ___ Pre-planning Outreach Activity

Required Information

Project Title: _____

Local Government/Lead Agency: _____

Contact Person: _____

Street Address: _____

City: _____ Zip: _____

Phone: _____ Fax: _____

Email: _____

Specific Area Subject to Proposed Action

County: _____ City/Community: _____

Project Description:

Additional Request

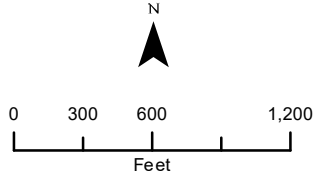
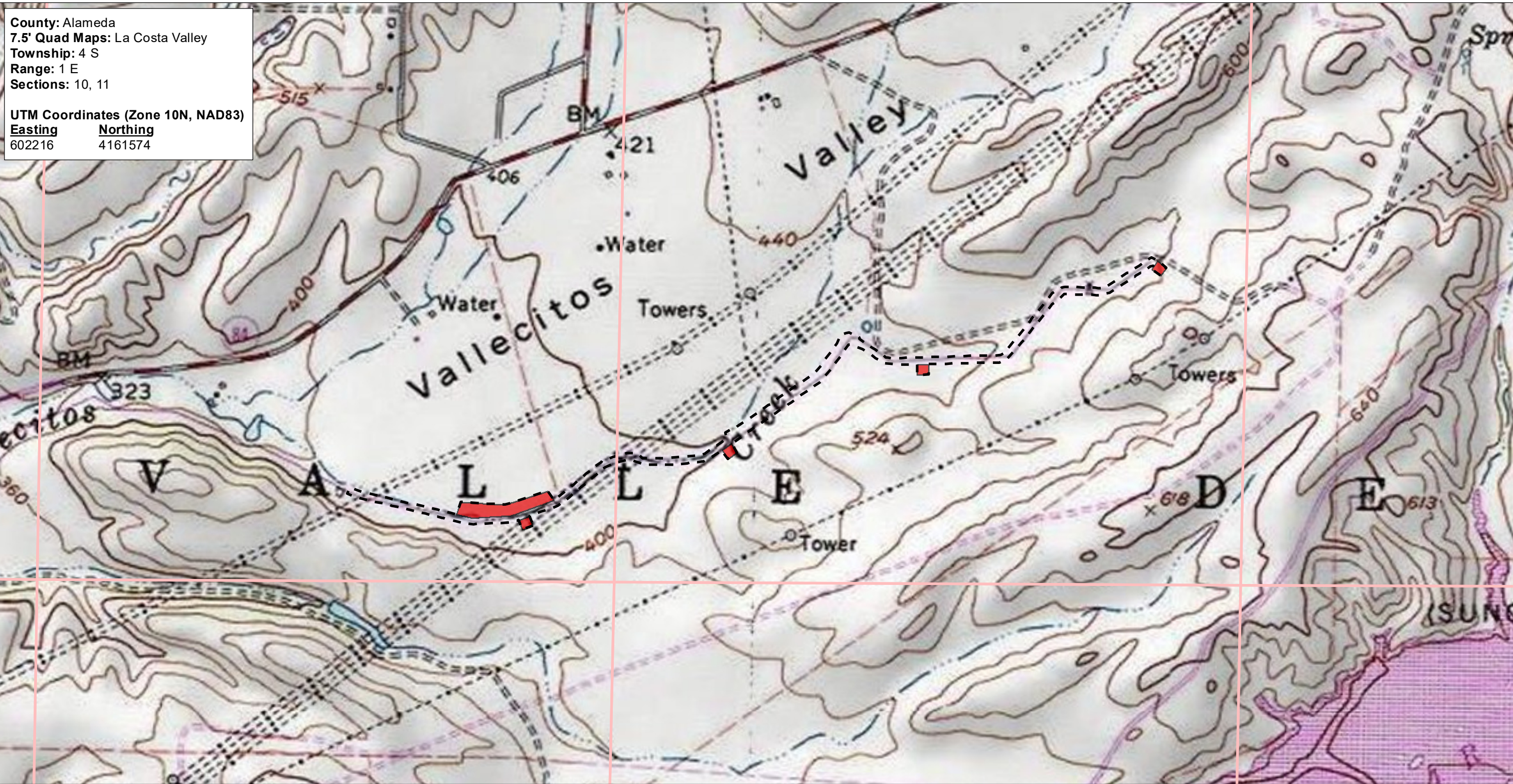
- ☐ Sacred Lands File Search - *Required Information:*

USGS Quadrangle Name(s): _____


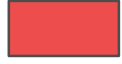
Township: _____ Range: _____ Section(s): _____

County: Alameda
7.5' Quad Maps: La Costa Valley
Township: 4 S
Range: 1 E
Sections: 10, 11

UTM Coordinates (Zone 10N, NAD83)
Easting Northing
602216 4161574



Project Features

-  Project Location and Area of Potential Effects
-  Proposed Staging Areas

Project Location



Source: ESRI 2018, Waterways 2020

Vallecitos Channel
Maintenance Project

**NATIVE AMERICAN HERITAGE COMMISSION**

November 16, 2020

CHAIRPERSON
Laura Miranda
Luiseño

VICE CHAIRPERSON
Reginald Pagaling
Chumash

SECRETARY
Merri Lopez-Keifer
Luiseño

PARLIAMENTARIAN
Russell Attebery
Karuk

COMMISSIONER
Marshall McKay
Wintun

COMMISSIONER
William Mungary
Paiute/White Mountain
Apache

COMMISSIONER
Julie Tumamait-Stenslie
Chumash

COMMISSIONER
[Vacant]

COMMISSIONER
[Vacant]

EXECUTIVE SECRETARY
Christina Snider
Pomo

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

Rehka Ippagunta, Project Engineer Manager
Alameda County Water District

Via Email to: rehka.ippagunta@acwd.com

Re: Native American Tribal Consultation, Pursuant to the Assembly Bill 52 (AB 52), Amendments to the California Environmental Quality Act (CEQA) (Chapter 532, Statutes of 2014), Public Resources Code Sections 5097.94 (m), 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2 and 21084.3, Vallecitos Channel Maintenance Project, Alameda County

Dear Ms. Ippagunta:

Pursuant to Public Resources Code section 21080.3.1 (c), attached is a consultation list of tribes that are traditionally and culturally affiliated with the geographic area of the above-listed project. Please note that the intent of the AB 52 amendments to CEQA is to avoid and/or mitigate impacts to tribal cultural resources, (Pub. Resources Code §21084.3 (a)) ("Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource.")

Public Resources Code sections 21080.3.1 and 21084.3(c) require CEQA lead agencies to consult with California Native American tribes that have requested notice from such agencies of proposed projects in the geographic area that are traditionally and culturally affiliated with the tribes on projects for which a Notice of Preparation or Notice of Negative Declaration or Mitigated Negative Declaration has been filed on or after July 1, 2015. Specifically, Public Resources Code section 21080.3.1 (d) provides:

Within 14 days of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section.

The AB 52 amendments to CEQA law does not preclude initiating consultation with the tribes that are culturally and traditionally affiliated within your jurisdiction prior to receiving requests for notification of projects in the tribe's areas of traditional and cultural affiliation. The Native American Heritage Commission (NAHC) recommends, but does not require, early consultation as a best practice to ensure that lead agencies receive sufficient information about cultural resources in a project area to avoid damaging effects to tribal cultural resources.

The NAHC also recommends, but does not require that agencies should also include with their notification letters, information regarding any cultural resources assessment that has been completed on the area of potential effect (APE), such as:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:

- A listing of any and all known cultural resources that have already been recorded on or adjacent to the APE, such as known archaeological sites;
- Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response;
- Whether the records search indicates a low, moderate, or high probability that unrecorded cultural resources are located in the APE; and
- If a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present.

2. The results of any archaeological inventory survey that was conducted, including:

- Any report that may contain site forms, site significance, and suggested mitigation measures.

All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure in accordance with Government Code section 6254.10.

3. The result of any Sacred Lands File (SLF) check conducted through the Native American Heritage Commission was negative.

4. Any ethnographic studies conducted for any area including all or part of the APE; and

5. Any geotechnical reports regarding all or part of the APE.

Lead agencies should be aware that records maintained by the NAHC and CHRIS are not exhaustive and a negative response to these searches does not preclude the existence of a tribal cultural resource. A tribe may be the only source of information regarding the existence of a tribal cultural resource.

This information will aid tribes in determining whether to request formal consultation. In the event that they do, having the information beforehand will help to facilitate the consultation process.

If you receive notification of change of addresses and phone numbers from tribes, please notify the NAHC. With your assistance, we can assure that our consultation list remains current.

If you have any questions, please contact me at my email address: Sarah.Fonseca@nahc.ac.gov.

Sincerely,



Sarah Fonseca
Cultural Resources Analyst

Attachment

**Native American Heritage Commission
Tribal Consultation List
Alameda County
11/16/2020**

***Amah Mutsun Tribal Band of
Mission San Juan Bautista***

Irenne Zwiernie, Chairperson
789 Canada Road
Woodside, CA, 94062
Phone: (650) 851 - 7489
Fax: (650) 332-1526
amahmutsuntribal@gmail.com
Costanoan

***Costanoan Rumsen Carmel
Tribe***

Tony Cerda, Chairperson
244 E. 1st Street
Pomona, CA, 91766
Phone: (909) 629 - 6081
Fax: (909) 524-8041
rumsen@aol.com
Costanoan

***Indian Canyon Mutsun Band of
Costanoan***

Ann Marie Sayers, Chairperson
P.O. Box 28
Hollister, CA, 95024
Phone: (831) 637 - 4238
ams@indiancanyon.org
Costanoan

***Indian Canyon Mutsun Band of
Costanoan***

Kanyon Sayers-Roods, MLD
Contact
1615 Pearson Court
San Jose, CA, 95122
Phone: (408) 673 - 0626
kanyon@kanyonconsulting.com
Costanoan

***Muwekma Ohlone Indian Tribe
of the SF Bay Area***

Charlene Nijmeh, Chairperson
20885 Redwood Road, Suite 232
Castro Valley, CA, 94546
Phone: (408) 464 - 2892
cnijmeh@muwekma.org
Costanoan

***Muwekma Ohlone Indian Tribe
of the SF Bay Area***

Monica Arellano,
20885 Redwood Road, Suite 232
Castro Valley, CA, 94546
Phone: (408) 205 - 9714
marellano@muwekma.org
Costanoan

North Valley Yokuts Tribe

Katherine Perez, Chairperson
P.O. Box 717
Linden, CA, 95236
Phone: (209) 887 - 3415
canutes@verizon.net
Costanoan
Northern Valley
Yokut

North Valley Yokuts Tribe

Timothy Perez, MLD Contact
P.O. Box 717
Linden, CA, 95236
Phone: (209) 662 - 2788
huskanam@gmail.com
Costanoan
Northern Valley
Yokut

The Ohlone Indian Tribe

Andrew Galvan,
P.O. Box 3388
Fremont, CA, 94539
Phone: (510) 882 - 0527
Fax: (510) 687-9393
chochenyo@AOL.com
Bay Miwok
Ohlone
Patwin
Plains Miwok

***The Confederated Villages of
Lisjan***

Corrina Gould, Chairperson
10926 Edes Avenue
Oakland, CA, 94603
Phone: (510) 575 - 8408
cvltribe@gmail.com
Bay Miwok
Ohlone
Delta Yokut

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and section 5097.98 of the Public Resources Code.

This list is only applicable for consultation with Native American tribes under Public Resources Code Sections 21080.3.1 for the proposed Vallecitos Channel Maintenance Project, Alameda County.



DIRECTORS

AZIZ AKBARI
JAMES G. GUNTHER
JUDY C. HUANG
PAUL SETHY
JOHN H. WEED

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General Manager
KURT ARENDS
Operations and Maintenance
LAURA J. HIDAS
Water Resources
ED STEVENSON
Engineering and Technology Services
JONATHAN WUNDERLICH
Finance

December 17, 2020

Corrina Gould, Chairperson
The Confederated Villages of Lisjan
10926 Edes Avenue
Oakland, CA 94603

RE: Assembly Bill 52 Outreach for the Vallecitos Channel Maintenance Project, ACWD Job 21003

Dear Honorable Chairperson Gould:

The Alameda County Water District (ACWD) is proposing to improve water conveyance through the Vallecitos Channel, an engineered, unlined channel used to convey water approximately 2.5 miles from the South Bay Aqueduct to Vallecitos Creek in southern Alameda County. The project study area is depicted within Sections 10 and 11, Township 4 South, Range 1 East on the La Costa Valley United States Geological Survey (USGS) 7.5' topographic quadrangle (see enclosed figure). The project area covers approximately 14.76 acres, of which 2.85 acres are within staging areas for the contractor's use located directly adjacent to the channel.

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December 17, 2020

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A Sacred Lands and Files Search conducted by the Native American Heritage Commission (NAHC) did not identify significant Native American resources in the vicinity of the Vallecitos Channel.

Although your tribe has not formally requested project notification pursuant to PRC 21080.3.1(b) (Assembly Bill 52), ACWD is writing to inform you about the proposed project in order to coordinate with you and request information on known tribal cultural resources (as defined by Public Resources Code 21074) that may be present within the project study area. We are requesting any information that you may have regarding tribal cultural resources so that this information can be incorporated into project planning. Please respond in writing within 30 days, pursuant to PRC § 21080.3.1(d) if you wish to request consultation regarding possible significant effects that the proposed project may have on tribal cultural resources. Please provide a designated lead contact person to continue coordinating correspondence with regarding the proposed project.

Your comments and concerns are important to us and we look forward to hearing from you. If you have any questions or comments regarding the project, please contact Kerri Smyth, ACWD Project Manager, via email at kerri.smyth@acwd.com or by phone at (510) 668-4486.

Sincerely,

Rekha Ippagunta

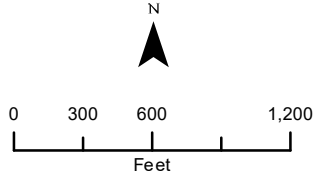
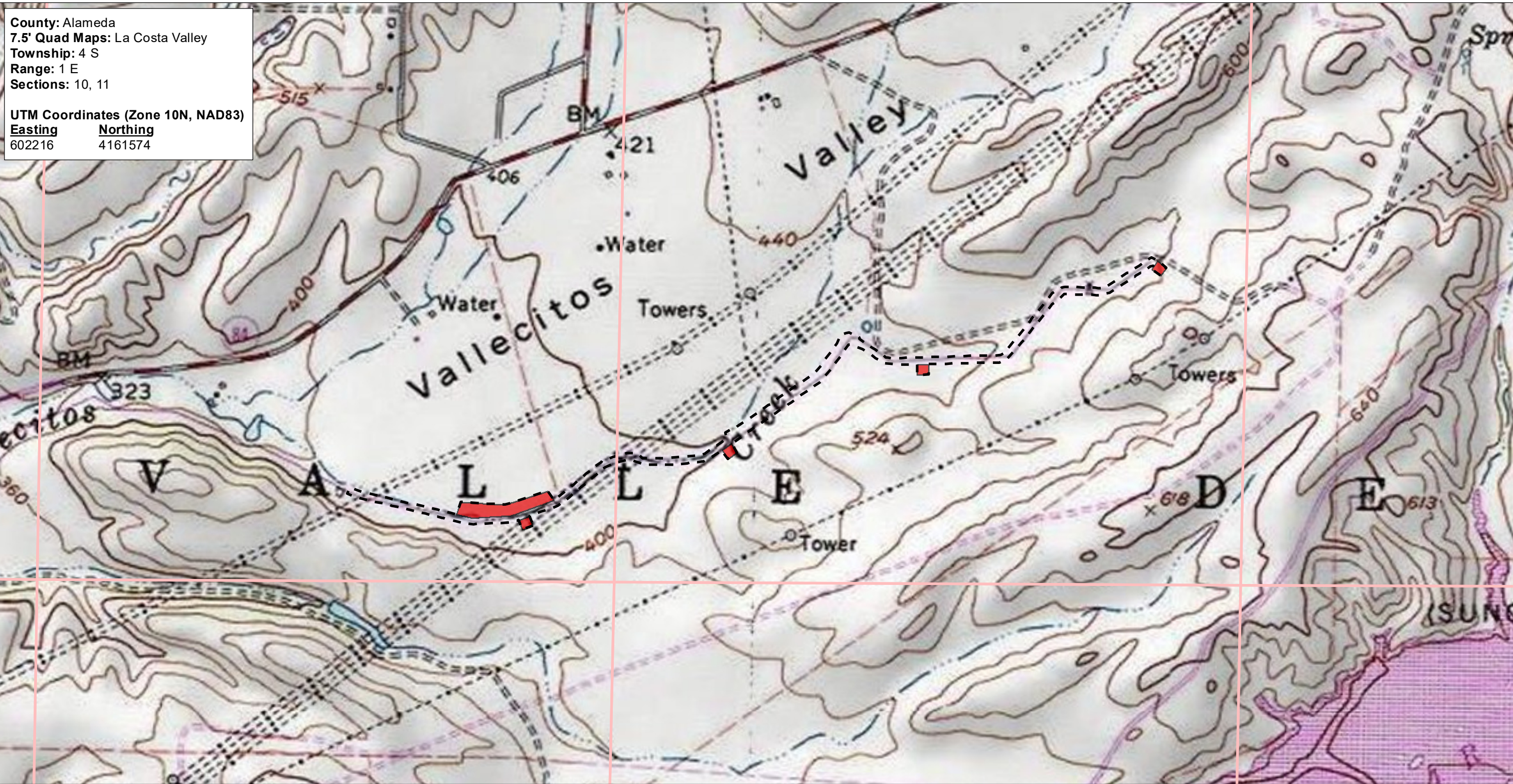
Rekha Ippagunta,
Project Engineer Manager

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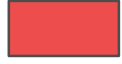
Enclosures: Figure – Project Location
By Certified Mail

County: Alameda
7.5' Quad Maps: La Costa Valley
Township: 4 S
Range: 1 E
Sections: 10, 11

UTM Coordinates (Zone 10N, NAD83)
Easting Northing
602216 4161574



Project Features

-  Project Location and Area of Potential Effects
-  Proposed Staging Areas

Project Location



Source: ESRI 2018, Waterways 2020

Vallecitos Channel
Maintenance Project



DIRECTORS

AZIZ AKBARI
JAMES G. GUNTHER
JUDY C. HUANG
PAUL SETHY
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JONATHAN WUNDERLICH
Finance

December 17, 2020

Andrew Galvin
Ohlone Indian Tribe
P.O. Box 3388
Fremont, CA 94539

RE: Assembly Bill 52 Outreach for the Vallecitos Channel Maintenance Project, ACWD Job 21003

Dear Mr. Galvin:

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Excessive vegetation encroachment in the channel over the decades has significantly reduced capacity of the facility. Originally designed for peak flows at 120 cubic feet per second (cfs) from the South Bay Aqueduct emergency discharge events, the existing channel has reportedly overtopped in some areas at flows of approximately 20 cfs. Bank erosion and sloughing have also been an ongoing issue for the Vallecitos Channel and at several locations, severe bank erosion and bank shearing has deteriorated ACWD's access road and reduced its width.

The proposed project objectives include:

- Restore channel cross-sectional area to recover channel capacity and convey South Bay Aqueduct emergency discharge events up to 120 cfs.

December 17, 2020

- Stabilize and restore areas of severe streambank erosion.
- Attenuate flood impacts to private properties adjacent to the channel.
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Sincerely,



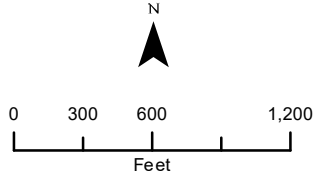
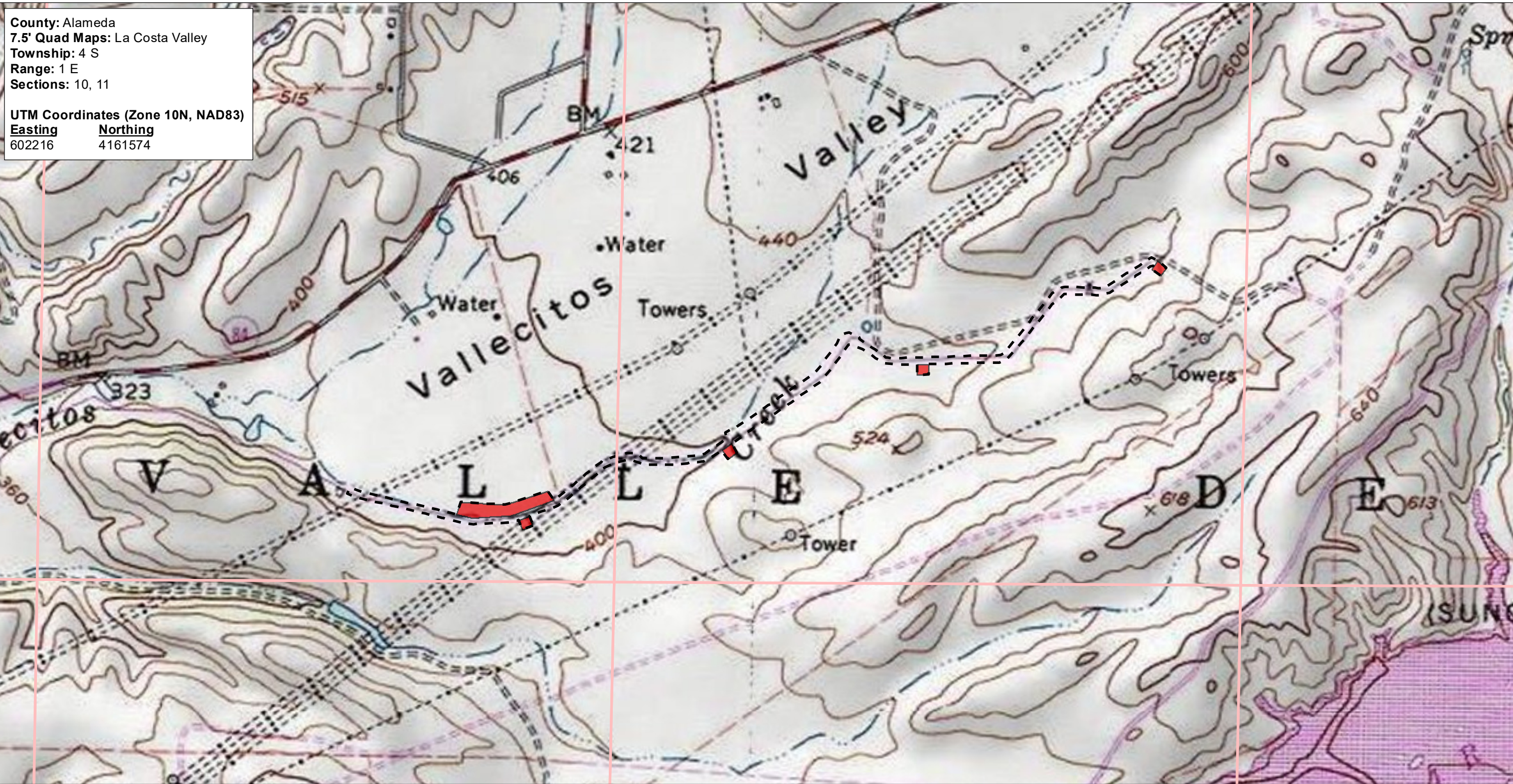
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ks/cs


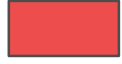
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Project Features

-  Project Location and Area of Potential Effects
-  Proposed Staging Areas

Project Location



Source: ESRI 2018, Waterways 2020

Vallecitos Channel
Maintenance Project

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DIRECTORS

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December 17, 2020

Timothy Perez
North Valley Yokuts Tribe
P.O. Box 717
Linden, CA 95236

RE: Assembly Bill 52 Outreach for the Vallecitos Channel Maintenance Project, ACWD Job 21003

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December 17, 2020

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Sincerely,

Rekha Ippagunta

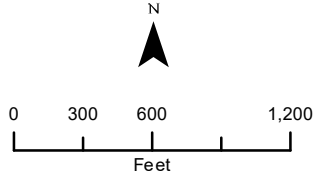
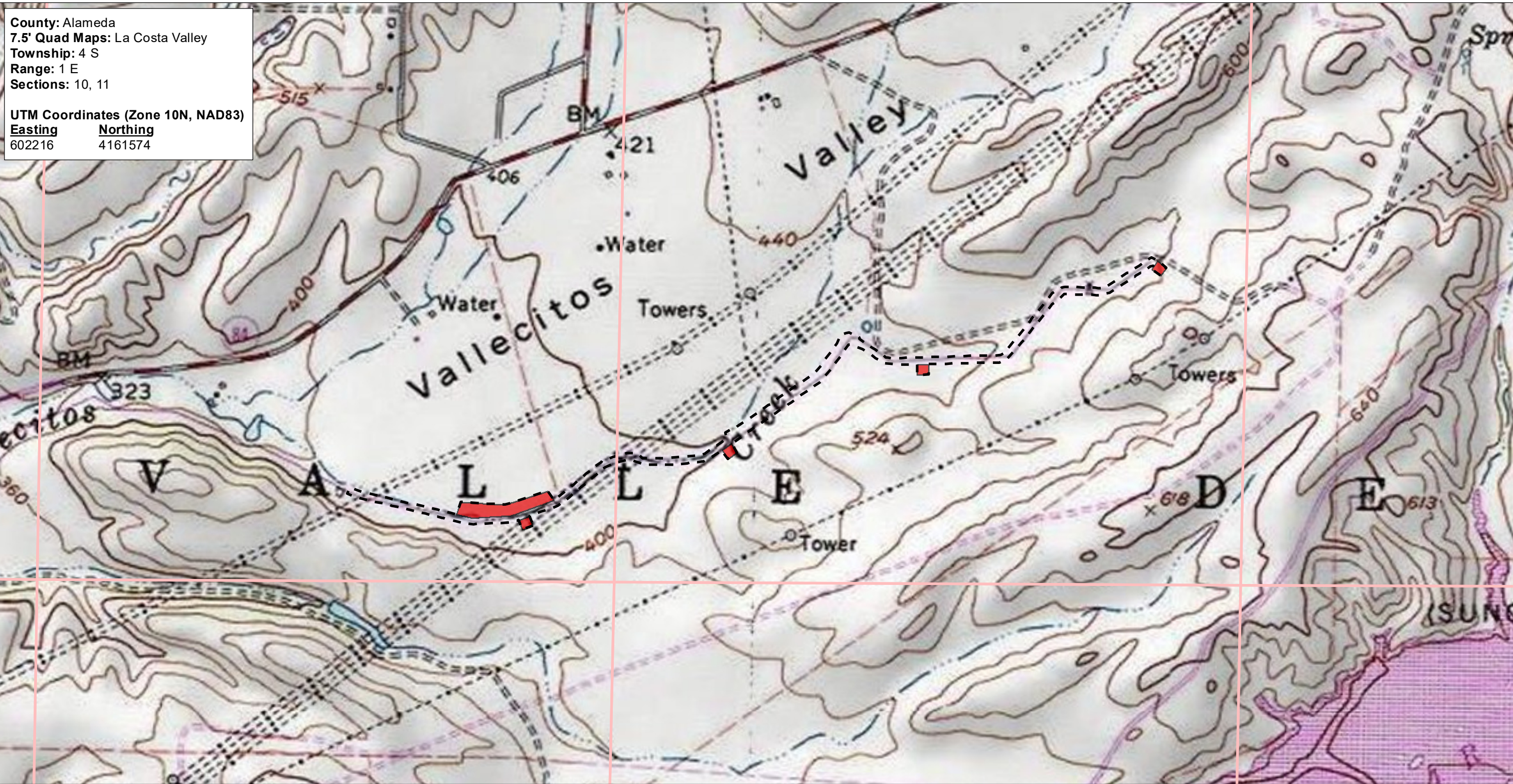
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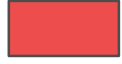
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Source: ESRI 2018, Waterways 2020

Vallecitos Channel
Maintenance Project



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December 17, 2020

Katherine Perez, Chairperson
North Valley Yokuts Tribe
P.O. Box 717
Linden, CA 95236

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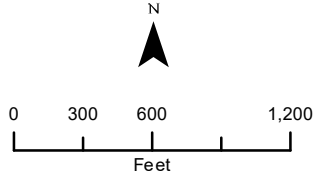
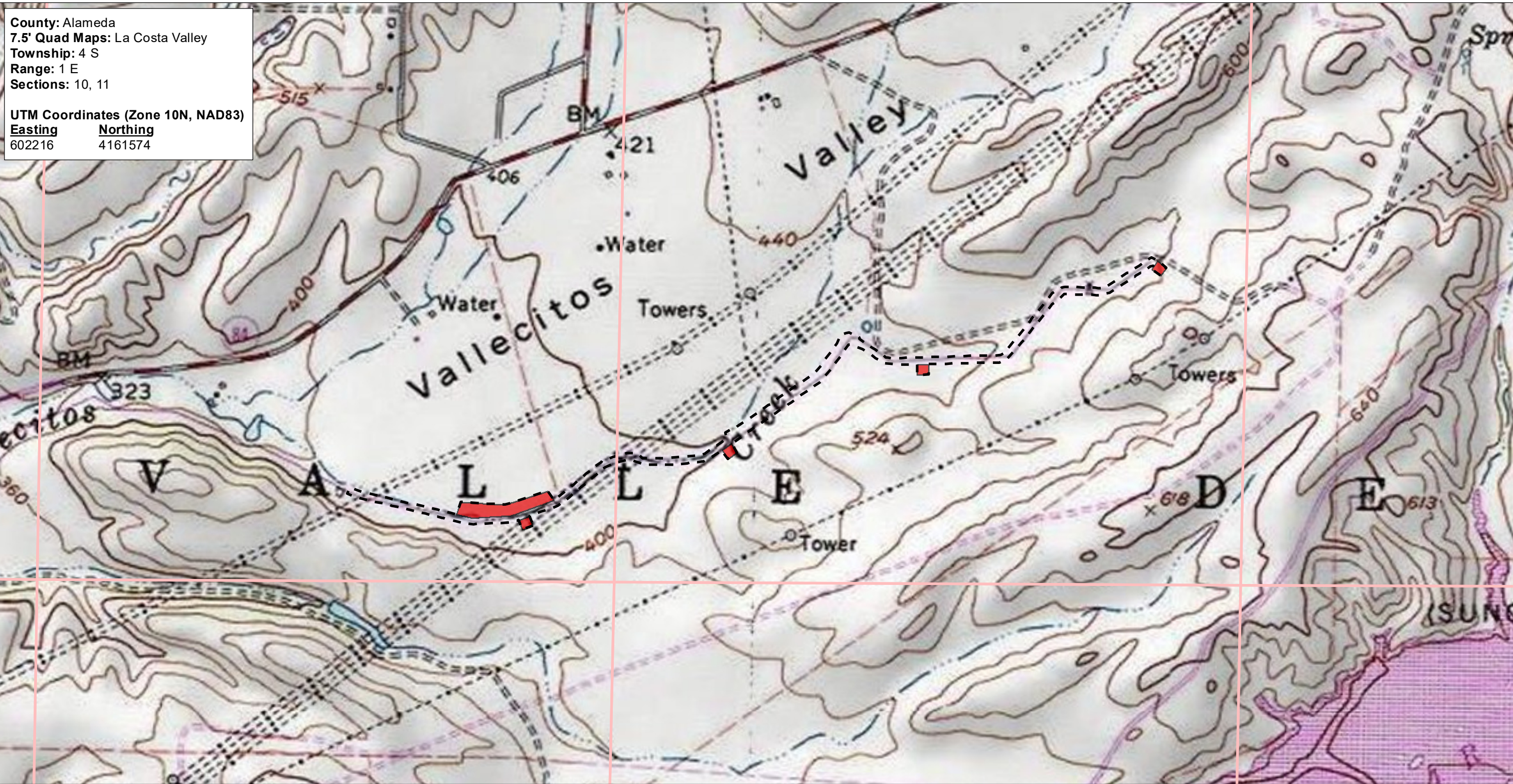
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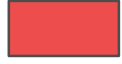
Enclosures: Figure – Project Location
By Certified Mail

County: Alameda
7.5' Quad Maps: La Costa Valley
Township: 4 S
Range: 1 E
Sections: 10, 11

UTM Coordinates (Zone 10N, NAD83)
Easting Northing
602216 4161574



Project Features

-  Project Location and Area of Potential Effects
-  Proposed Staging Areas

Project Location



Source: ESRI 2018, Waterways 2020

Vallecitos Channel
Maintenance Project



DIRECTORS

AZIZ AKBARI
JAMES G. GUNTHER
JUDY C. HUANG
PAUL SETHY
JOHN H. WEED

43885 SOUTH GRIMMER BOULEVARD • FREMONT, CALIFORNIA 94538
(510) 668-4200 • FAX (510) 770-1793 • www.acwd.org

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General Manager
KURT ARENDS
Operations and Maintenance
LAURA J. HIDAS
Water Resources
ED STEVENSON
Engineering and Technology Services
JONATHAN WUNDERLICH
Finance

December 17, 2020

Charlene Nijmeh, Chairperson
Muwekma Ohlone Indian Tribe of the SF Bay Area
20885 Redwood Road, Suite 232
Castro Valley, CA 94546

RE: Assembly Bill 52 Outreach for the Vallecitos Channel Maintenance Project, ACWD Job 21003

Dear Honorable Chairperson Nijmeh:

The Alameda County Water District (ACWD) is proposing to improve water conveyance through the Vallecitos Channel, an engineered, unlined channel used to convey water approximately 2.5 miles from the South Bay Aqueduct to Vallecitos Creek in southern Alameda County. The project study area is depicted within Sections 10 and 11, Township 4 South, Range 1 East on the La Costa Valley United States Geological Survey (USGS) 7.5' topographic quadrangle (see enclosed figure). The project area covers approximately 14.76 acres, of which 2.85 acres are within staging areas for the contractor's use located directly adjacent to the channel.

Built in 1965, the Vallecitos Channel plays a key role in the overall groundwater recharge and water delivery system that provides potable water for ACWD customers. In addition to conveying South Bay Aqueduct water to for water supply purposes, the Vallecitos Channel also serves as an "emergency release" discharge location for California Department of Water Resources in its operation of the South Bay Aqueduct. The existing channel within the project area consists of the engineered, unlined, trapezoidal channel, banks, and 13 existing concrete drop structures positioned along the channel to regulate water flow. An existing access road runs along the south side of the channel.

Excessive vegetation encroachment in the channel over the decades has significantly reduced capacity of the facility. Originally designed for peak flows at 120 cubic feet per second (cfs) from the South Bay Aqueduct emergency discharge events, the existing channel has reportedly overtopped in some areas at flows of approximately 20 cfs. Bank erosion and sloughing have also been an ongoing issue for the Vallecitos Channel and at several locations, severe bank erosion and bank shearing has deteriorated ACWD's access road and reduced its width.

The proposed project objectives include:

- Restore channel cross-sectional area to recover channel capacity and convey South Bay Aqueduct emergency discharge events up to 120 cfs.

December 17, 2020

- Stabilize and restore areas of severe streambank erosion.
- Attenuate flood impacts to private properties adjacent to the channel.
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A Sacred Lands and Files Search conducted by the Native American Heritage Commission (NAHC) did not identify significant Native American resources in the vicinity of the Vallecitos Channel.

Although your tribe has not formally requested project notification pursuant to PRC 21080.3.1(b) (Assembly Bill 52), ACWD is writing to inform you about the proposed project in order to coordinate with you and request information on known tribal cultural resources (as defined by Public Resources Code 21074) that may be present within the project study area. We are requesting any information that you may have regarding tribal cultural resources so that this information can be incorporated into project planning. Please respond in writing within 30 days, pursuant to PRC § 21080.3.1(d) if you wish to request consultation regarding possible significant effects that the proposed project may have on tribal cultural resources. Please provide a designated lead contact person to continue coordinating correspondence with regarding the proposed project.

Your comments and concerns are important to us and we look forward to hearing from you. If you have any questions or comments regarding the project, please contact Kerri Smyth, ACWD Project Manager, via email at kerri.smyth@acwd.com or by phone at (510) 668-4486.

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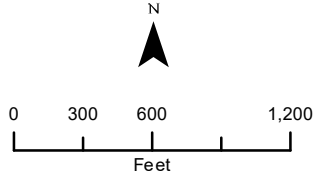
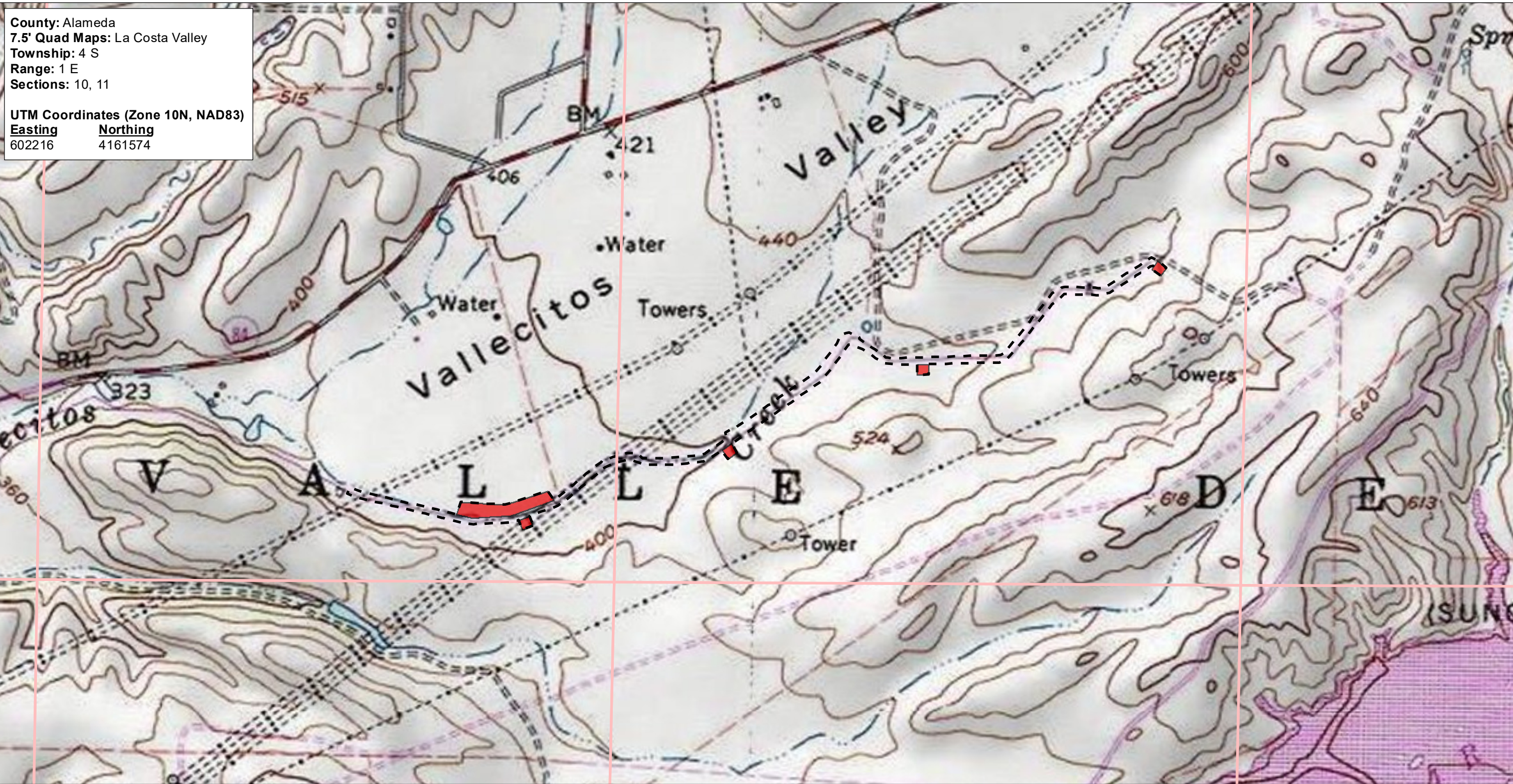
Rekha Ippagunta,
Project Engineer Manager

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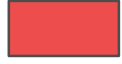
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Project Features

-  Project Location and Area of Potential Effects
-  Proposed Staging Areas

Project Location



Source: ESRI 2018, Waterways 2020

Vallecitos Channel
Maintenance Project



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JONATHAN WUNDERLICH
Finance

December 17, 2020

Monica Arellano
Muwekma Ohlone Indian Tribe of the SF Bay Area
20885 Redwood Road, Suite 232
Castro Valley, CA 94546

RE: Assembly Bill 52 Outreach for the Vallecitos Channel Maintenance Project, ACWD Job 21003

Dear Ms. Arellano:

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The proposed project objectives include:

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December 17, 2020

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Sincerely,

Rekha Ippagunta

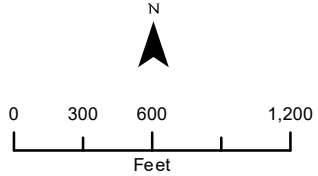
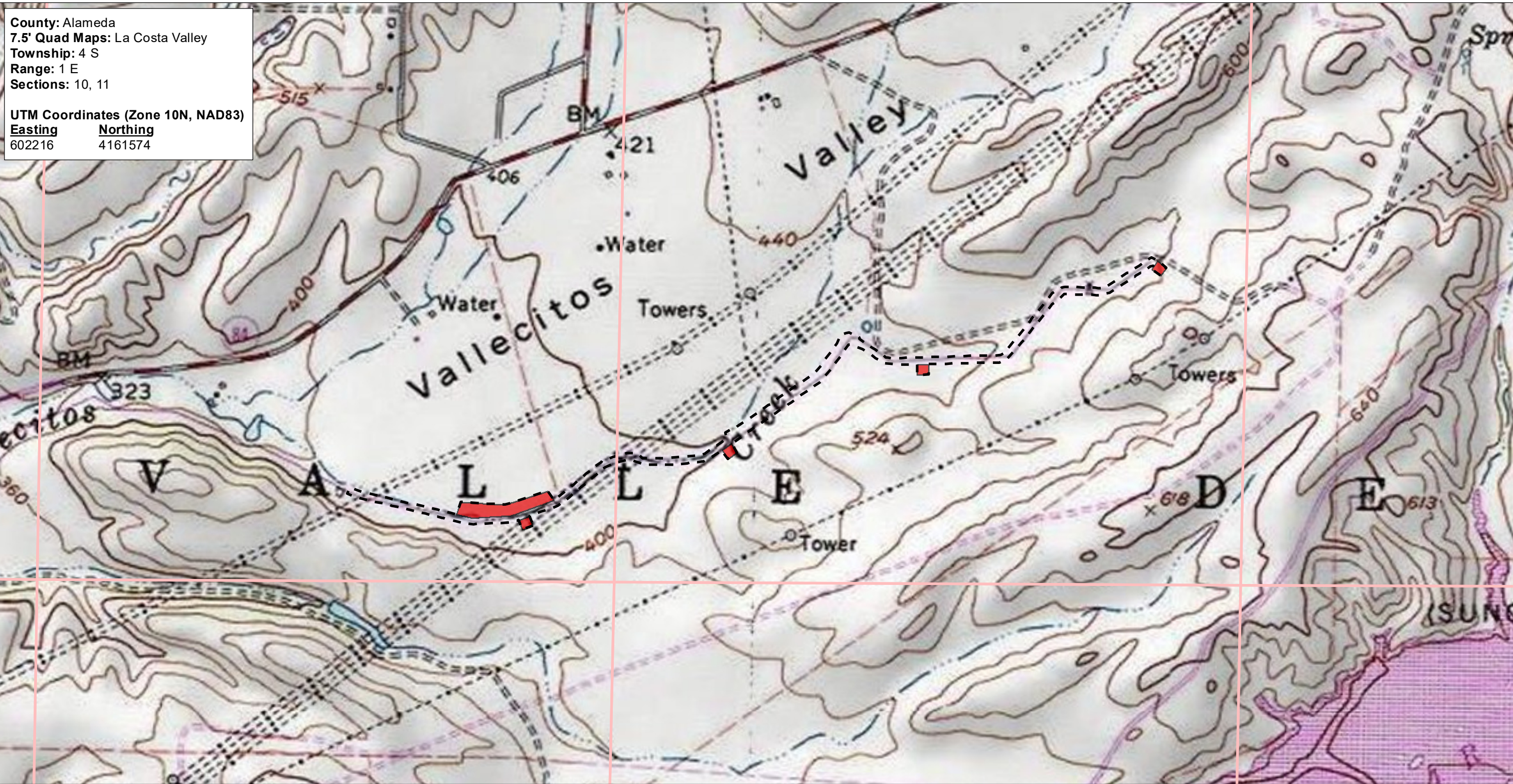
Rekha Ippagunta,
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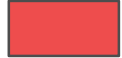
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By Certified Mail

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UTM Coordinates (Zone 10N, NAD83)
Easting Northing
602216 4161574



Project Features

-  Project Location and Area of Potential Effects
-  Proposed Staging Areas

Project Location



Source: ESRI 2018, Waterways 2020

Vallecitos Channel
Maintenance Project



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Finance

December 17, 2020

Kanyon Sayers-Roods
Indian Canyon Mutsun Band of Costanoan
1615 Pearson Court
San Jose, CA 95122

RE: Assembly Bill 52 Outreach for the Vallecitos Channel Maintenance Project, ACWD Job 21003

Dear Ms. Sayers-Roods:

The Alameda County Water District (ACWD) is proposing to improve water conveyance through the Vallecitos Channel, an engineered, unlined channel used to convey water approximately 2.5 miles from the South Bay Aqueduct to Vallecitos Creek in southern Alameda County. The project study area is depicted within Sections 10 and 11, Township 4 South, Range 1 East on the La Costa Valley United States Geological Survey (USGS) 7.5' topographic quadrangle (see enclosed figure). The project area covers approximately 14.76 acres, of which 2.85 acres are within staging areas for the contractor's use located directly adjacent to the channel.

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December 17, 2020

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Sincerely,

Rekha Ippagunta

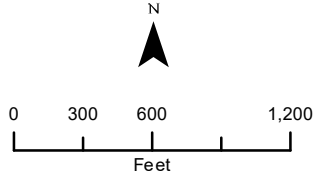
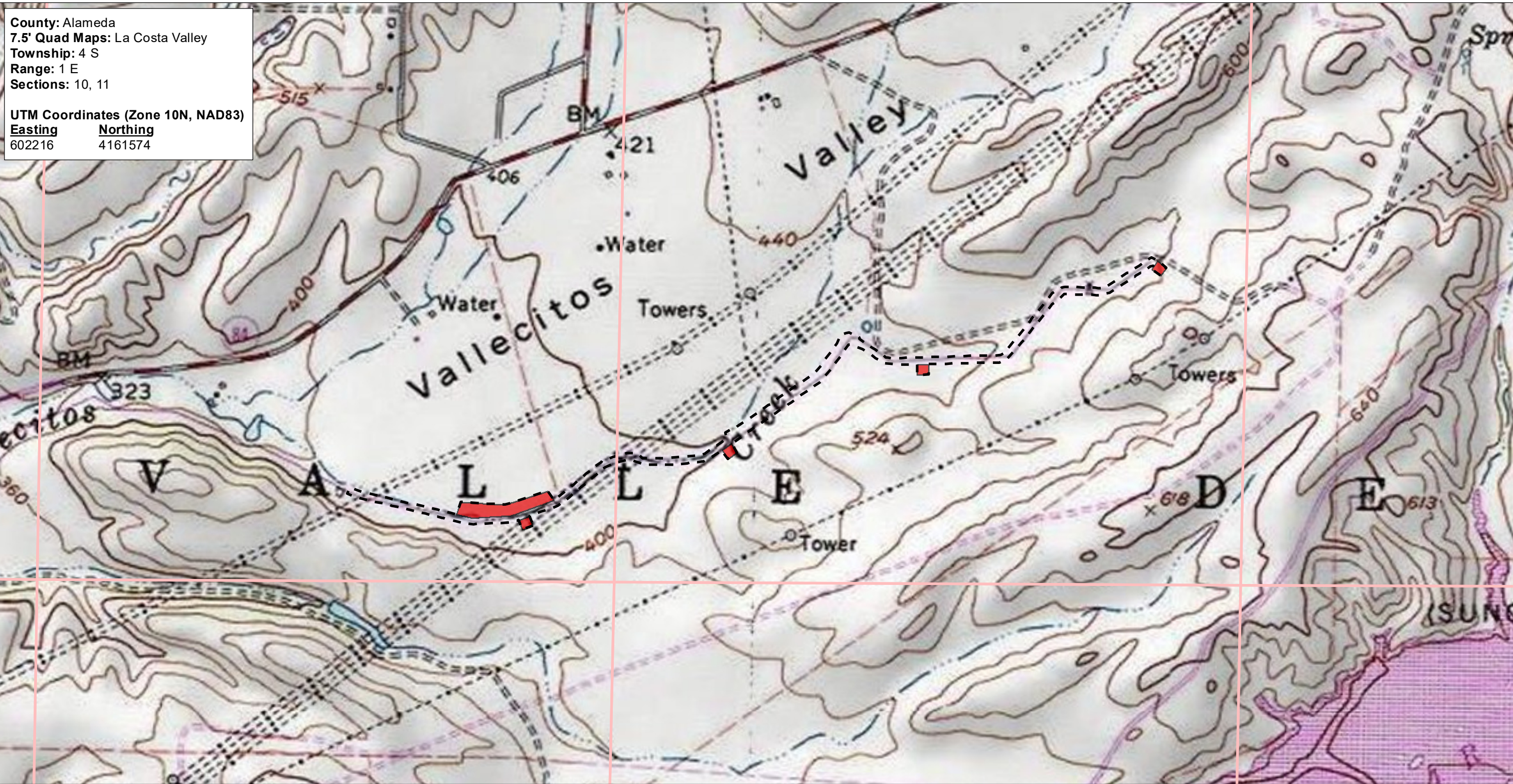
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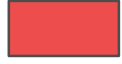
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UTM Coordinates (Zone 10N, NAD83)
Easting Northing
602216 4161574



Project Features

-  Project Location and Area of Potential Effects
-  Proposed Staging Areas

Project Location



Source: ESRI 2018, Waterways 2020

Vallecitos Channel
Maintenance Project



DIRECTORS

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December 17, 2020

Ann Marie Sayers, Chairperson
Indian Canyon Mutsun Band of Costanoan
P.O. Box 28
Hollister, CA 95024

RE: Assembly Bill 52 Outreach for the Vallecitos Channel Maintenance Project, ACWD Job 21003

Dear Honorable Chairperson Sayers:

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December 17, 2020

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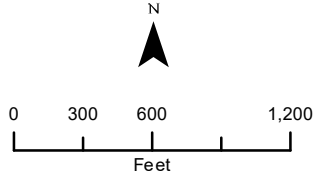
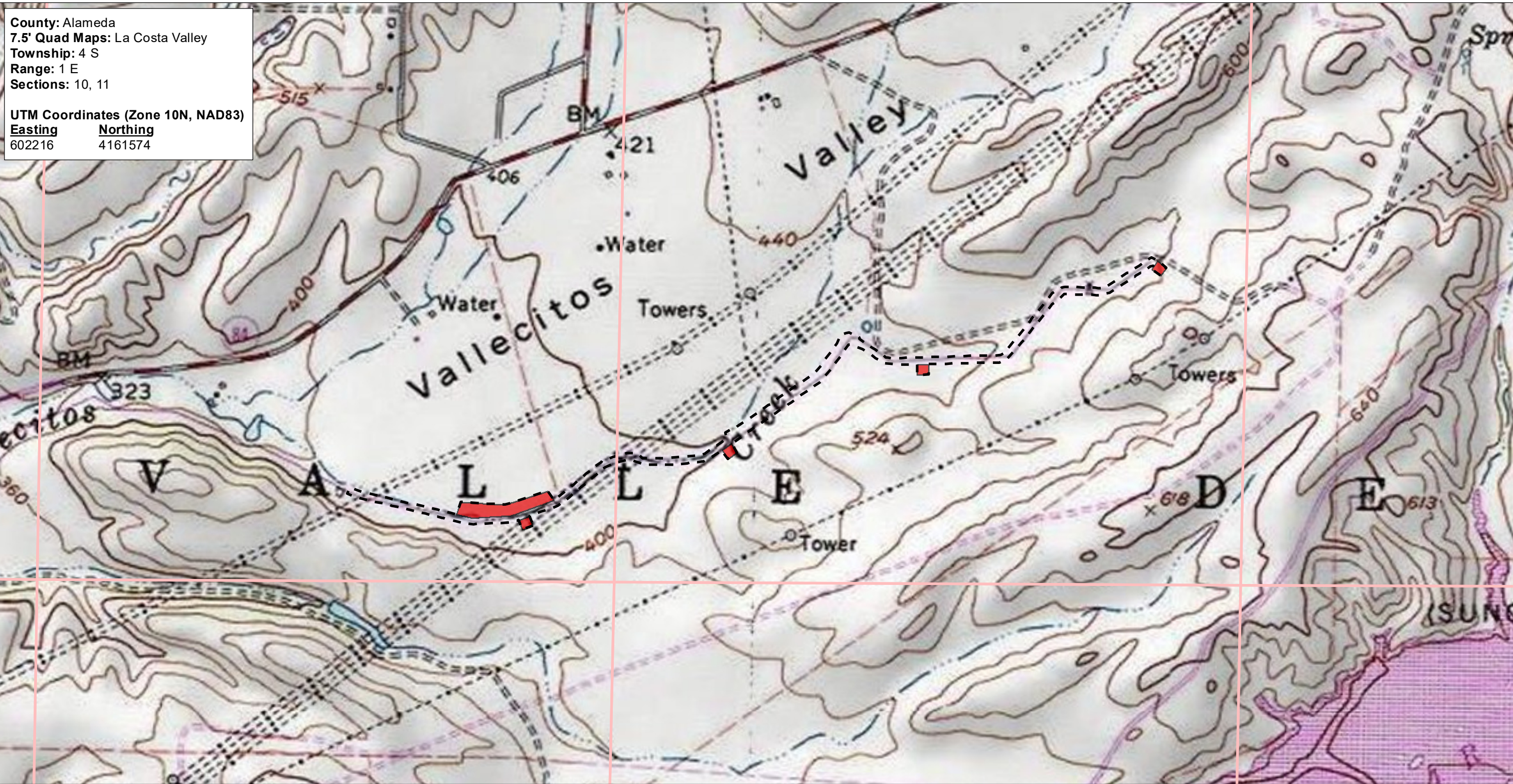
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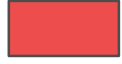
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Project Features

-  Project Location and Area of Potential Effects
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Project Location



Source: ESRI 2018, Waterways 2020

Vallecitos Channel
Maintenance Project



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December 17, 2020

Tony Cerda, Chairperson
Costanoan Rumsen Carmel Tribe
244 E. 1st Street
Pomona, CA 91766

RE: Assembly Bill 52 Outreach for the Vallecitos Channel Maintenance Project, ACWD Job 21003

Dear Honorable Chairperson Cerda:

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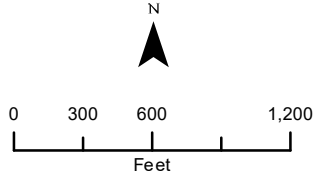
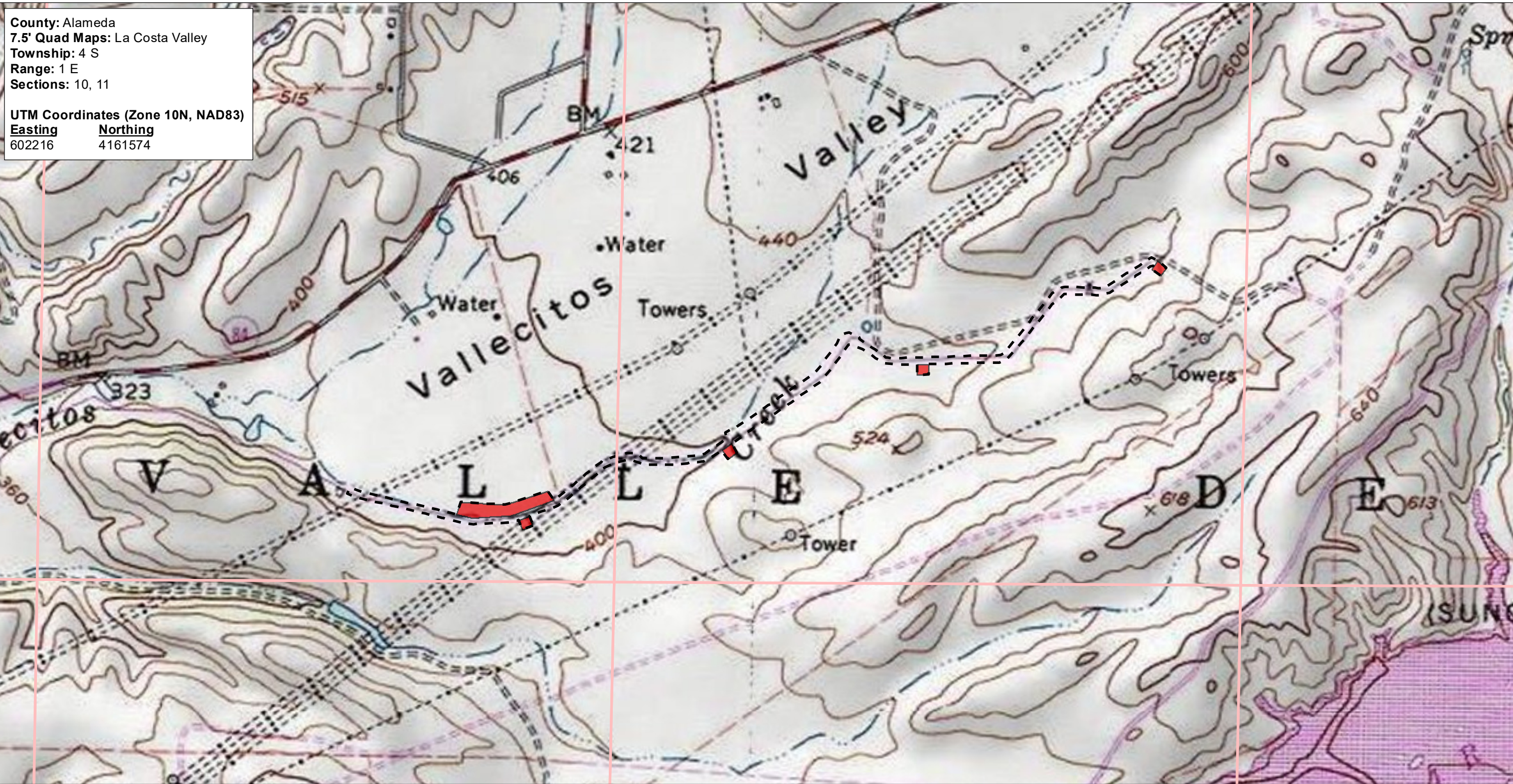
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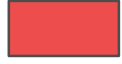
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Source: ESRI 2018, Waterways 2020

Vallecitos Channel
Maintenance Project



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December 17, 2020

Irenne Zwierlein, Chairperson
Amah Mutsun Tribal Band of Mission San Juan Bautista
789 Canada Road
Woodside, CA 94062

RE: Assembly Bill 52 Outreach for the Vallecitos Channel Maintenance Project, ACWD Job 21003

Dear Honorable Chairperson Zwierlein:

The Alameda County Water District (ACWD) is proposing to improve water conveyance through the Vallecitos Channel, an engineered, unlined channel used to convey water approximately 2.5 miles from the South Bay Aqueduct to Vallecitos Creek in southern Alameda County. The project study area is depicted within Sections 10 and 11, Township 4 South, Range 1 East on the La Costa Valley United States Geological Survey (USGS) 7.5' topographic quadrangle (see enclosed figure). The project area covers approximately 14.76 acres, of which 2.85 acres are within staging areas for the contractor's use located directly adjacent to the channel.

Built in 1965, the Vallecitos Channel plays a key role in the overall groundwater recharge and water delivery system that provides potable water for ACWD customers. In addition to conveying South Bay Aqueduct water to for water supply purposes, the Vallecitos Channel also serves as an "emergency release" discharge location for California Department of Water Resources in its operation of the South Bay Aqueduct. The existing channel within the project area consists of the engineered, unlined, trapezoidal channel, banks, and 13 existing concrete drop structures positioned along the channel to regulate water flow. An existing access road runs along the south side of the channel.

Excessive vegetation encroachment in the channel over the decades has significantly reduced capacity of the facility. Originally designed for peak flows at 120 cubic feet per second (cfs) from the South Bay Aqueduct emergency discharge events, the existing channel has reportedly overtopped in some areas at flows of approximately 20 cfs. Bank erosion and sloughing have also been an ongoing issue for the Vallecitos Channel and at several locations, severe bank erosion and bank shearing has deteriorated ACWD's access road and reduced its width.

The proposed project objectives include:

- Restore channel cross-sectional area to recover channel capacity and convey South Bay Aqueduct emergency discharge events up to 120 cfs.

December 17, 2020

- Stabilize and restore areas of severe streambank erosion.
- Attenuate flood impacts to private properties adjacent to the channel.
- Repair the access road to allow for channel safety inspections and maintenance.
- Improve water quality by reducing streambank erosion and sediment loading to the channel.
- Improve existing riparian habitat by creating several instream bench areas.

A record search at the Northwest Information Center of the California Historical Resources Information System at Sonoma State University did not identify any previously recorded Native American sites within the study area, although four previous cultural resource investigations had been completed entirely or partially within the project footprint. A recent pedestrian archaeological survey of the project area also had negative results.

A Sacred Lands and Files Search conducted by the Native American Heritage Commission (NAHC) did not identify significant Native American resources in the vicinity of the Vallecitos Channel.

Although your tribe has not formally requested project notification pursuant to PRC 21080.3.1(b) (Assembly Bill 52), ACWD is writing to inform you about the proposed project in order to coordinate with you and request information on known tribal cultural resources (as defined by Public Resources Code 21074) that may be present within the project study area. We are requesting any information that you may have regarding tribal cultural resources so that this information can be incorporated into project planning. Please respond in writing within 30 days, pursuant to PRC § 21080.3.1(d) if you wish to request consultation regarding possible significant effects that the proposed project may have on tribal cultural resources. Please provide a designated lead contact person to continue coordinating correspondence with regarding the proposed project.

Your comments and concerns are important to us and we look forward to hearing from you. If you have any questions or comments regarding the project, please contact Kerri Smyth, ACWD Project Manager, via email at kerri.smyth@acwd.com or by phone at (510) 668-4486.

Sincerely,

Rekha Ippagunta

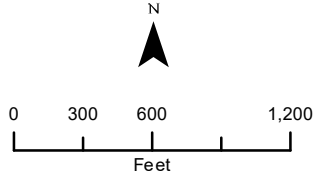
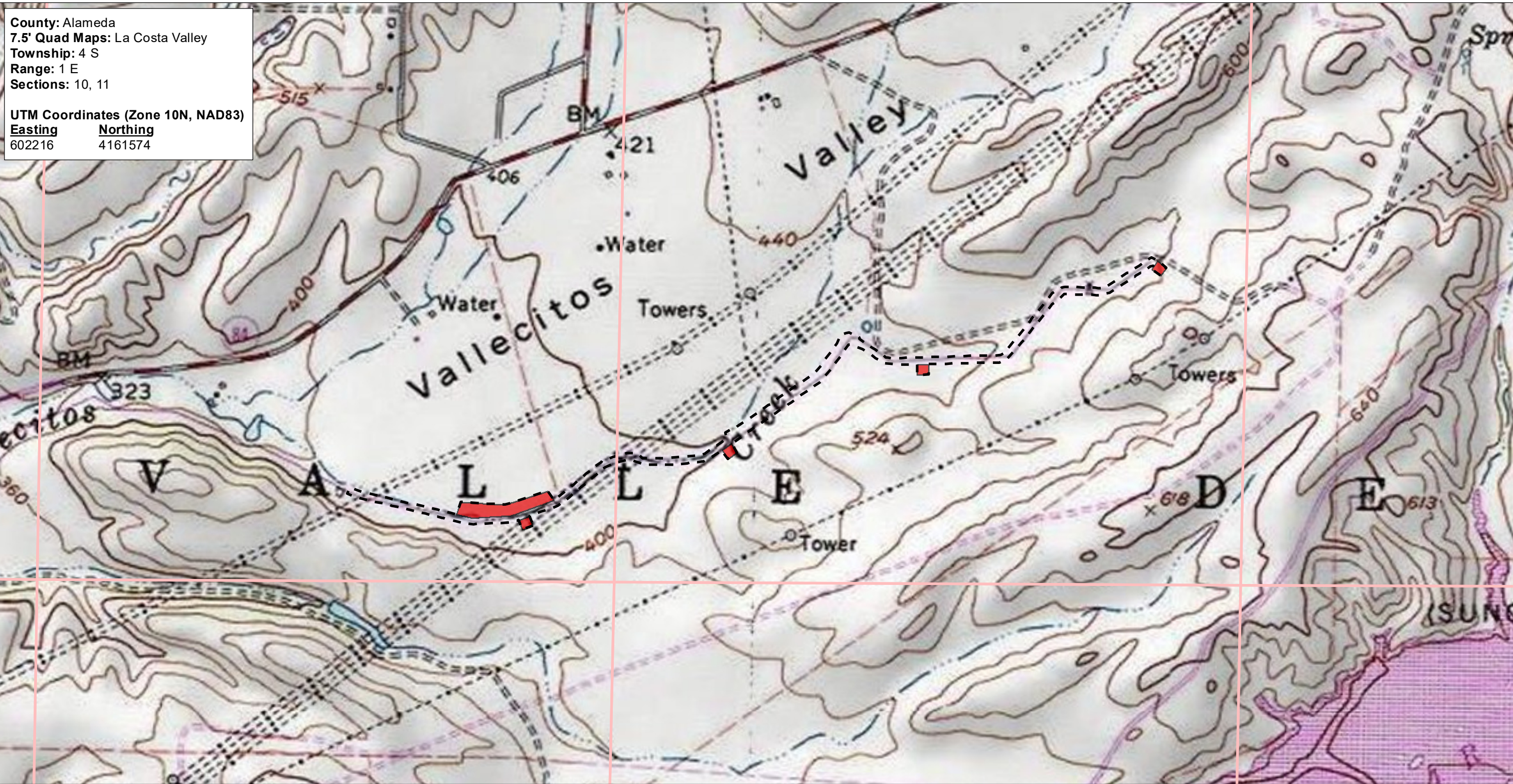
Rekha Ippagunta,
Project Engineer Manager

ks/cs


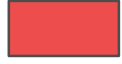
Enclosures: Figure – Project Location
By Certified Mail

County: Alameda
7.5' Quad Maps: La Costa Valley
Township: 4 S
Range: 1 E
Sections: 10, 11

UTM Coordinates (Zone 10N, NAD83)
Easting Northing
602216 4161574



Project Features

-  Project Location and Area of Potential Effects
-  Proposed Staging Areas

Project Location



Source: ESRI 2018, Waterways 2020

Vallecitos Channel
Maintenance Project

Appendix B

CHRIS Northwest Information Center Results

(redacted - contains confidential data)

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Appendix C

Department of Parks and Recreation 523 Forms

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State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____

HRI # _____

Trinomial _____

NRHP Status Code _____

Other Listings _____

Review Code _____ Reviewer _____ Date _____

Page 1 of 10

Resource Name or # (Assigned by recorder) Vallecitos Channel

P1. Other Identifier: Vallecitos Channel

*P2. Location: ☐ Not for Publication ☒ Unrestricted

*a. County Alameda

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

*b. USGS 7.5' Quad La Costa Valley Date 1996 T 4S; R 1E; 1/4 of Sec 9,10,11; MD B.M.

c. Address _____ City Fremont Zip 94537

d. UTM: (give more than one for large and/or linear resources) Zone 10; 666903 mE/ 4161574 mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)

*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

The Vallecitos Channel is a 2.5-mile-long earthen channel constructed by the Alameda County Water District in 1965 to transfer water from the South Bay Aqueduct to Alameda Creek. The channel is 20 feet wide and approximately 6 feet deep and is located south of Highway 84 (Vallecitos Road), and north of San Antonio Reservoir. It is an engineered, unlined, earthen trapezoidal channel that extends nearly 12,000 linear feet from the California Department of Water Resources (DWR) South Bay Aqueduct (SBA) turnout in the upper watershed to Vallecitos Creek near Vallecitos Lane in the lower watershed. The Vallecitos Channel makes use of a portion of the natural Vallecitos Creek drainage, although it has been modified. The Vallecitos Channel also contains seventeen concrete drop structures, or weirs, to control water flow.

*P3b. Resource Attributes: (List attributes and codes) HP20 Canal/Aqueduct, AH6 Water conveyance system

*P4. Resources Present: ☐ Building ☐ Structure ☐ Object ☒ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5b. Description of Photo: (View, date, accession #) Photograph 1: Vallecitos Channel, May 18, 2018; view east.

*P6. Date Constructed/Age and Sources:

☒ Historic ☐ Prehistoric ☐ Both

c1965, Archeological Inventory Report (2016)

*P7. Owner and Address:

Alameda County Water District
43885 South Grimmer Boulevard
Fremont, CA, 94537-5110

*P8. Recorded by: (Name, affiliation, address)

Horizon Water & Environment
266 Grand Ave #210,
Oakland, CA 94610

*P9. Date Recorded: May 19, 2016

*P10. Survey Type: (Describe) Intensive

*P11. Report Citation: (Cite survey report and other sources, or enter "none.") None

*Attachments: None ☒ Location Map ☐ Sketch



Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record

☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record

☐ Other (list) _____

Page 2 of 10

*NRHP Status Code 6Z

*Resource Name or # (Assigned by recorder) Vallecitos Channel

B1. Historic Name: None

B2. Common Name: Vallecitos Channel

B3. Original Use: _____ B4. Present Use: _____

*B5. Architectural Style: _____

*B6. Construction History: (Construction date, alteration, and date of alterations) originally constructed 1965
1980-1998, Series of bank repair and stabilization projects along south bank
2010, Drop Structures #5 and #10 replaced

*B7. Moved? ☒ No ☐ Yes ☐ Unknown Date: _____ Original Location: _____

*B8. Related Features: _____

B9. Architect: N/A b. Builder: Grading Unlimited and Power Construction

*B10. Significance: Theme N/A Area N/A

Period of Significance N/A Property Type N/A Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

B11. Additional Resource Attributes: (List attributes and codes)

*B12. References: _____

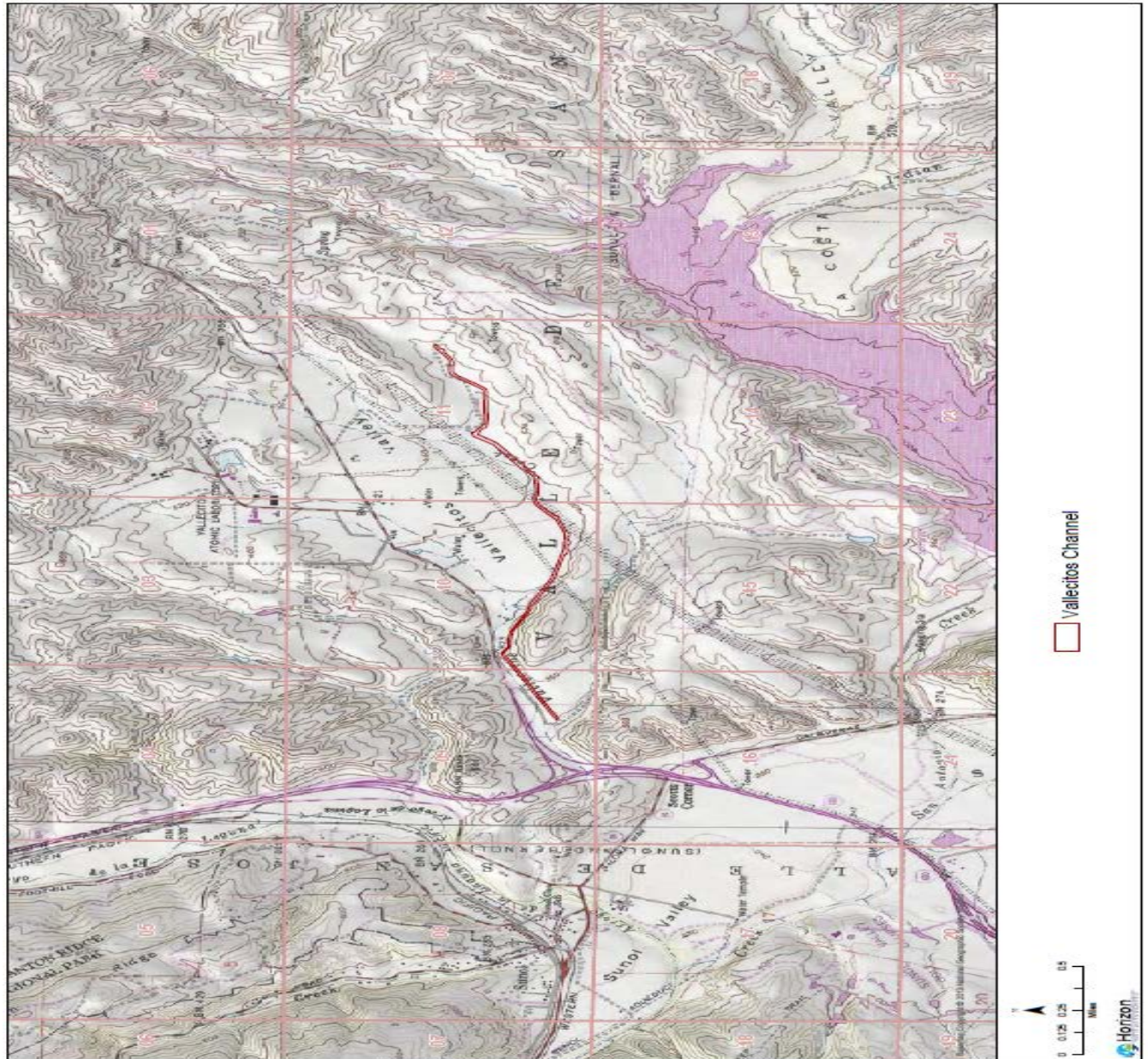
(See Footnotes)

B13. Remarks: _____

*B14. Evaluator: Kara Brunzell

*Date of Evaluation: October 22, 2020

(This space reserved for official comments.)



Page 4 of 10 *Resource Name or # (Assigned by recorder) Vallecitos Channel

*Recorded by Kara Brunzell *Date: 2020 ☒ Continuation ☐ Update

*P5b. Description: (continued):



Photograph 2: Vallecitos Channel, May 18, 2018; view east.



Photograph 3: Vallecitos Channel Drop Structure #1, May 18, 2018; view north.

Page 5 of 10 *Resource Name or # (Assigned by recorder) Vallecitos Channel

*Recorded by Kara Brunzell *Date: 2020 ☒ Continuation ☐ Update



Photograph 4: Vallecitos Channel Drop Structure #2, May 18, 2018; view north.



Photograph 5: Vallecitos Channel Drop Structure #3, May 18, 2018; view north.

Page 6 of 10 *Resource Name or # (Assigned by recorder) Vallecitos Channel

*Recorded by Kara Brunzell *Date: 2020 ☒ Continuation ☐ Update



Photograph 6: Vallecitos Channel, May 18, 2018; view west.



Photograph 7: Vallecitos Channel Drop Structure #5, May 18, 2018, view east.

Page 7 of 10 *Resource Name or # (Assigned by recorder) Vallecitos Channel

*Recorded by Kara Brunzell *Date: 2020 ☒ Continuation ☐ Update



Photograph 8: Vallecitos Channel Drop Structure #7, October 13, 2020; view northwest.



Photograph 9: Vallecitos Channel, May 18, 2018; view east.

Page 8 of 10 *Resource Name or # (Assigned by recorder) Vallecitos Channel

*Recorded by Kara Brunzell *Date: 2020 ☒ Continuation ☐ Update



Photograph 10: Detail, Vallecitos Channel, May 18, 2018.

B10. Significance (continued):

City of Fremont Historic Context

The original inhabitants of the Sunol area were members of the Causen Ohlone tribe. The Causen were among the first in the region to feel the impact created by the arrival of the Spanish, as they were forced to move to Mission Santa Clara, in the town of Santa Clara, after it was established in 1777. In 1797, Mission San José, was established in present-day Fremont under the leadership of Father Fermin Lasuén as the fourteenth mission in California. Many of the Causen Ohlones at Mission Santa Clara were moved to Mission San José where they worked on the vast mission lands. When Mexico seceded from Spain in 1822, California mission lands were split up into private ranchos. In 1836, Governor Juan Alvarado ordered Mission San Jose's property to be divided into four tracts of land. These ranchos later became part of the eight towns that made up the Washington Township, united by Alameda Creek. These towns thrived in the 1860s, attracting pioneers and farmers. Between 1860 and 1890, wheat was the most popular grain crop because it was resilient enough to be shipped long distances. With the development of irrigation and transportation in the late nineteenth century, wheat was replaced by crops such as fruit and vegetables. The increase of fruit crops in the area was aided by the development of the canning industry and Washington Township became a diverse agricultural area. In the 1920s, poultry and dairies were also introduced to the community of Alameda County. The community remained an agricultural hub until the late 1950s when urban development altered the region with highways, suburbs, and commercial developments. Washington Township in 2020 is mostly densely-populated suburbs. ¹

Alameda County Water District

According to *A Water District of Our Own: A Celebration of Alameda County Water District's First 100 Years*, water was abundant during the nineteenth century, part of the reason agricultural production was so significant in the area. However, the transition from crops such as wheat and oats to orchards as well as the growing population impacted the use of water significantly. The Spring Valley Water Works company purchased a reservoir site for a future dam on Calaveras Creek, a tributary of Alameda Creek. They also purchased riparian rights from farmers who owned land along the Alameda Creek, and in the late 1880's, the company laid pipes to pump water from

¹ "City of Fremont- Washington Township- Niles Historic Context," Basin Research Associates (1998), p. 1; "City of Fremont- Washington Township- Farming, Ranching and Domestic Architecture," Basin Research Associates (1998), p. 1-5; Phil Holmes, "A Brief History of Washington Township," *Washington Township Museum of Local History*, museumoflocalhistory.org/resources/a-brief-history-of-washington-township/.

Page 9 of 10 *Resource Name or # (Assigned by recorder) Vallecitos Channel

*Recorded by Kara Brunzell *Date: 2020 ☒ Continuation ☐ Update

Washington Township to San Mateo and San Francisco. Due to the demand this placed on Alameda County's aquifers, the resources could no longer provide water for farmers to irrigate their fields. In 1912, residents of Alameda County held a meeting to try to stop the private water monopolies and created the Washington Township Water Committee. However, unincorporated towns did not have the right to form public water organizations. In 1913, the County Water District Act was passed by the State legislature and the Washington Township's Water petitioned for an Alameda County water district. The residents voted in favor and the Alameda County Water District (ACWD) was formed, the first in the state formed under the County Water District Act.

Beneath the new water district was the Niles Cone Groundwater Basin, which was still being drained. The Spring Valley Water Company built the Calaveras Dam and still owned water rights along the Alameda Creek and refused to recharge the Niles Cone. When Calaveras Dam collapsed in 1918, the Spring Valley Water Company wanted to take more water from Alameda Creek, while the East Bay Water Company started drawing water from the Alvarado wellfield, threatening the Niles Cone. The ACWD sued the East Bay Water Company, and the lawsuits with Spring Valley led to the creation of the Bailey Formula, which determined how much water Spring Valley needed to give to Alameda Creek each year.

In 1930, San Francisco purchased Spring Valley Water Company and added their resources to the Hetch Hetchy project system. The Hetch Hetchy system helped save the ACWD by providing imported water. However, after World War II, Washington Township's population growth put more strain on the water system and the ACWD had to buy wellfields and other water systems. In the 1960s, the State Water Project was born and included the idea of creating the South Bay Aqueduct. Water was then pumped to the San Francisco Bay, and the ACWD built a plant near Mission San José to treat the water and supply it to customers. The ACWD invested in capital projects during the 1960s to improve water quality as well as increase quantity and reliability. In 1976, the ACWD started purchasing percolation pits for a new project. By the 1990s, the ACWD had acquired enough pits to create the East Bay Regional Park recreational resources that would also recharge the district's groundwater. This Park District was made up of 471 acres of land and 350 acres of lakes. Even with these projects, droughts have continued to affect the water supply in Alameda County.²

Vallecitos Channel

Vallecitos Channel lies east of Fremont in an unincorporated area of Alameda County. It was developed in 1965 as part of the era's ACWD infrastructure improvements. The Vallecitos Channel and Turnout Project constructed a four-mile channel for water to travel from the South Bay Aqueduct to Alameda County and the Niles Cone, shortening the route by twenty miles. Historic aerials of the area demonstrate that the Vallecitos Channel was engineered to enhance a pre-existing land formation that branched off of Vallecitos Creek. Matt Whitfield, a mechanical engineer who had grown up in the area, was General Manager of the ACWD during this period and oversaw the project. In June, contracts for creation of the channel were awarded to Grading Unlimited for \$55,786 and to Power Construction for \$167,145. By October 1965 excavation was complete, and the only remaining work was to fence it. The new channel was being "seasoned" with water to allow the channel's walls to be infiltrated in order to prevent erosion. The Vallecitos Channel saved an estimated 3.35 million gallons of water daily by reducing percolation and evaporation. According to the history of ACWD, this channel was meant to deliver up to 78.2 million gallons of water per day to the ACWD's facilities along the Alameda Creek.³

Evaluation:

The National Register of Historic Places (NRHP) and California Register of Historical Resources (CRHR) require that a significance criterion from A-D or 1-4 (respectively) be met for a resource to be eligible.

Criterion A/1: The Vallecitos Channel is not associated with events that have made a significant contribution to the broad patterns of our history. It was constructed within the general context of twentieth century population growth in Washington Township and the associated expansion of the ACWD's water infrastructure, but research has revealed no significant association with that or any other important historic context. Research has revealed no lasting impact of the water conveyance feature on the region. Therefore, the property is recommended not eligible to the NRHP or CRHR under Criterion A/1.

Criterion B/2: The Vallecitos Channel is not associated with the life of a person important to our history. Research has revealed no significant association with any particular individual, nor any significant association with important historical figures. Therefore, the property is not recommended eligible to the NRHP or CRHR under Criterion B/2.

² Penny Hill, *A Water District of Our Own: A Celebration of Alameda County Water District's First 100 Years*, (Paul Baker Printing, 2015), 1-50.

³ "Work Completed on Niles Channel," *The Argus (Fremont, California)* October 20, 1965, 8; "Chapter 2-Project Description," Vallecitos Channel Evaluation and Restoration Project, Alameda County Water District (2019), 2-1; Paul Piraino, *Our First 100 Years: A Comprehensive History of the Alameda County Water District*, (Paul Baker Printing, 2015), 93, 149-150

Page 10 of 10 *Resource Name or # (Assigned by recorder) Vallecitos Channel

*Recorded by Kara Brunzell *Date: 2020 ☒ Continuation ☐ Update

Criterion C/3: The Vallecitos Channel is not eligible for its engineering or design. It is a simple example of a water conveyance system and displays no groundbreaking or unusual design features. Research did not reveal any important structures designed or constructed by Grading Unlimited or Power Construction. For these reasons, the property is not recommended eligible to the NRHP and CRHR under Criterion C/3.

Criterion D/4: In rare instances, structures themselves can serve as sources of important information about historic construction materials or technologies and be significant under Criterion D/4. Earthen channels and concrete drop structures are common and well-understood structure types, and therefore, the Vallecitos Channel does not appear to be a principal source of important information in this regard.

The Vallecitos Channel is recommended ineligible for listing on the NRHP and CRHR. It does not qualify as a historic resource under CEQA.

Appendix G.

Noise Calculations

Noise Calculations for Vallecitos Creek

Mechanical		
Construction Equipment 1 (Jack Hammer)	88	dBA at 50 feet
Construction Equipment 2 (Excavato/Dozerr)	85	dBA at 50 feet
<i>Combined Daytime Noise at 50 feet (Ltotal at 50 feet)</i>	89.8	dBA
$L_{total}=10 \log(10^{L1}/10+10^{L2}/10)$		

Noise Threshold Limits and Distances from Project Sites to those Limits for Construction Equipment by Technique

Noise Threshold	Threshold Level - Leq (dBA)	Distance to Leq Threshold from Middle of Project Site (feet)
		Mechanical
Sensitive Receptors	90	48.7
Source: FTA 2018		

Vibration Source Levels for Construction Equipment (FTA 2018)

Equipment	PPV at 25 feet	VBA
Large Bulldozer	0.089	87
Loaded Truck	0.076	86

Vibration Calculations with Equations for Vibration-Causing Equipment for Project Site

Threshold	Distance to Threshold from Middle of Project Site (feet)	Notes
$PPV=PPV_{ref} * (25/d)^{1.5}$	14.6	Building damage threshold (sensitive buildings)
	42.8	Human Perception (80 VdB)

Appendix H.

Draft Mitigation Monitoring Reporting Program

MITIGATION MONITORING AND REPORTING PROGRAM

This mitigation monitoring and reporting program (MMRP) identifies the mitigation measures identified in Alameda County Water District's (ACWD's or District's) Vallecitos Channel Maintenance Project (Project) Initial Study/Mitigated Negative Declaration (IS/MND). For each mitigation measure, **Table 1** identifies monitoring and reporting actions that will be carried out and the applicable schedule for monitoring activities. Table 1 also includes a column where responsible parties can check off monitoring and reporting actions as they are completed.

As Lead Agency, the District will be responsible for ensuring that mitigation measures identified in this IS/MND are fully implemented. Some mitigation measures will be implemented by the contractor(s) on behalf of the District. Contract documents for the proposed program will identify the obligations of the contractor, including relevant mitigation measures. The District will require that the contractor(s) provide them with documentation that the contractor has adequately implemented all contractual obligations, including applicable mitigation measures. Thus, although the District may be responsible for implementing a mitigation measure (i.e., where the measure states "District will"), this is intended to be inclusive of the contractor's role in implementing certain mitigation measures during maintenance or as part of design.

Acronyms and Abbreviations

ACWD	Alameda County Water District
AMM	avoidance and minimization measure
BAAQMD	Bay Area Air Quality Management District
BMP	Best management practice
Caltrans	California Department of Transportation
CCR	California Code of Regulations
CDFG	California Department of Fish and Game (now California Department of Fish and Wildlife)
CDFW	California Department of Fish and Wildlife
CRHR	California Register of Historical Resources
dBA	decibels (A-weighted)
EACCS	East Alameda County Conservation Strategy
F&G	California Fish and Game
FESA	Federal Endangered Species Act
HMMP	Habitat Mitigation and Management Plan
I-680	Interstate 680
NAHC	Native American Heritage Commission
NOx	nitrous oxides
NPDES	Non-point Source Discharge Elimination System
MBTA	Migratory Bird Treaty Act
MLD	most likely descendent
PBO	Programmatic Biological Opinion
USACE	U.S. Army Corps of Engineers

USFWS	U.S. Fish and Wildlife Service
SWRCB	State Water Resources Control Board
SR	State Route
TCR	tribal cultural resource
Vdb	vibration velocity in decibels

Table 1. Mitigation Measures and Implementation Requirements

Mitigation Measure	Monitoring and Reporting Action	Implementation Schedule	Completion Date and Initials
<i>Aesthetics</i>			
None required.			
<i>Agriculture and Forestry Resources</i>			
None Required.			
<i>Air Quality</i>			
Mitigation Measure AQ-1: Reduce NOx Emissions Prior to construction, ACWD and/or its contractor(s) shall prepare and implement a NOx emissions reduction plan to ensure that NOx daily emissions are below 54 pounds per day. This may be achieved through any combination of the following measures: <ul style="list-style-type: none"> ▪ Use newer model year equipment, such as those classified as Off-Road Tier 4 Final Requirements or Better. ▪ Use newer on-road trucks instead of off-road trucks. ▪ Restrict number of pieces of equipment working per day. ▪ Restrict number of crews working at a time to one. ▪ Extend the construction duration. ▪ Use alternatively fueled equipment. ▪ Any other measure deemed feasible to meet the performance criteria. As part of developing this plan, the District or its contractor(s) will conduct additional air quality modeling to confirm that the NOx emissions threshold will be met using a combination of the measures listed above.	<ol style="list-style-type: none"> 1. Require that construction contract documents include requirement to develop a NOx emissions reduction plan. 2. Develop a NOx emissions reduction plan using a combination of measures identified in Mitigation Measure AQ-1 and revisit the project's air quality model to confirm that the measure(s) reduce NOx emissions below the Bay Area Air Quality Management District's NOx threshold of 54 pounds per day. 3. Implement NOx emissions reduction plan. 	<ol style="list-style-type: none"> 1. Prior to construction 2. Prior to construction 3. During construction 	
<i>Biological Resources</i>			
Mitigation Measure BIO-1. Comply with EACCS Avoidance and Minimization Measures and General Minimization Measures in EACCS Programmatic Biological Opinion	<ol style="list-style-type: none"> 1. Incorporate construction-related EACCS and PBO measures in the contract documents. 	<ol style="list-style-type: none"> 1. Prior to construction 2. Prior to construction 	

Mitigation Measure	Monitoring and Reporting Action	Implementation Schedule	Completion Date and Initials
<p>ACWD and/or its contractor will implement the following measures in the EACCS (ICF 2010) and Programmatic BO (PBO) for the EACCS (USFWS 2012) to avoid and minimize impacts on Alameda whipsnake, Alameda whipsnake, California red-legged frog, and California tiger salamander.</p> <p><i>EACCS Avoidance and Minimization Measures</i></p> <ul style="list-style-type: none"> ▪ EACCS Measure GEN-01. Employees and contractors performing construction activities will receive environmental sensitivity training. Training will include review of environmental laws and AMMs that must be followed by all personnel to reduce or avoid effects on covered species during construction activities. ▪ EACCS Measure GEN-02. Environmental tailboard trainings will take place on an as-needed basis in the field. The environmental tailboard trainings will include a brief review of the biology of the covered species and guidelines that must be followed by all personnel to reduce or avoid negative effects on these species during construction activities. Directors, Managers, Superintendents, and the crew foremen and forewomen will be responsible for ensuring that crewmembers comply with the guidelines. ▪ EACCS Measure GEN-03. Contracts with contractors, construction management firms, and subcontractors will obligate all contractors to comply with these AMMs. ▪ EACCS Measure GEN-04. The following will not be allowed at or near work sites for covered activities: trash dumping, firearms, open fires (such as barbecues) not required by the activity, hunting, and pets (except for safety in remote locations). ▪ EACCS Measure GEN-05. Vehicles and equipment will be parked on pavement, existing roads, and previously disturbed areas to the extent practicable. ▪ EACCS Measure GEN-06. Off-road vehicle travel will be minimized. 	<ol style="list-style-type: none"> 2. Retain a qualified biologist to conduct environmental sensitivity training for construction contractor(s). 3. Retain a qualified biologist(s) to conduct biological monitoring during construction. 4. Send resumes of biological monitor(s) to USFWS at least 15 days before ground disturbing activities. 5. Qualified biologist(s) to conduct pre-construction surveys in accordance with EACCS and PBO measures. 6. Qualified biologist(s) will establish exclusion zones in accordance with EACCS and PBO measures. 7. Qualified biologist(s) will monitor work activities in accordance with EACCS and PBO measures; ensure corrective action as necessary. 	<ol style="list-style-type: none"> 3. Prior to construction 4. 15 days prior to ground disturbing activities. 5. Prior to construction 6. Prior to construction 7. During construction 	

Mitigation Measure	Monitoring and Reporting Action	Implementation Schedule	Completion Date and Initials
<ul style="list-style-type: none"> ▪ EACCS Measure GEN-07. Vehicles will not exceed a speed limit of 15 mi per hour on unpaved roads within natural land-cover types, or during off-road travel. ▪ EACCS Measure GEN-08. Vehicles or equipment will not be refueled within 100 ft of a wetland, stream, or other waterway unless a bermed and lined refueling area is constructed. ▪ EACCS Measure GEN-09. Vehicles shall be washed only at approved areas. No washing of vehicles shall occur at job sites. ▪ EACCS Measure GEN-10. To discourage the introduction and establishment of invasive plant species, seed mixtures/straw used within natural vegetation will be either rice straw or weed-free straw. ▪ EACCS Measure GEN-11. Pipes, culverts, and similar materials greater than 4 inches in diameter will be stored so as to prevent covered wildlife species from using these as temporary refuges, and these materials will be inspected each morning for the presence of animals prior to being moved. ▪ EACCS Measure GEN-12. Erosion control measures will be implemented to reduce sedimentation in wetland habitat occupied by covered animal and plant species when activities are the source of potential erosion problems. Plastic monofilament netting (erosion control matting) or similar material containing netting shall not be used at the Project. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds. ▪ EACCS Measure GEN-13. Stockpiling of material will occur such that direct effects on covered species are avoided. Stockpiling of material in riparian areas will occur outside of the top of bank, and preferably outside of the outer riparian dripline and will not exceed 30 days. ▪ EACCS Measure GEN-14. Grading will be restricted to the minimum area necessary. ▪ EACCS Measure GEN-15. Prior to ground disturbing activities in sensitive habitats, Project construction boundaries and access 			

Mitigation Measure	Monitoring and Reporting Action	Implementation Schedule	Completion Date and Initials
<p>areas will be flagged and temporarily fenced during construction to reduce the potential for vehicles and equipment to stray into adjacent habitats.</p> <ul style="list-style-type: none"> ▪ EACCS Measure GEN-16. Significant earth-moving activities will not be conducted in riparian areas within 24 hours of predicted storms or after major storms (defined as 1 inch of rain or more). ▪ EACCS Measure GEN-17. Trenches will be backfilled as soon as possible. Open trenches will be searched each day prior to construction to ensure no covered species are trapped. Earthen escape ramps will be installed at intervals prescribed by a qualified biologist. <p><i>PBO General Minimization Measures</i></p> <ul style="list-style-type: none"> ▪ PBO General Minimization Measure 1. At least 15 days prior to any ground disturbing activities, the applicant will submit to the USFWS for review and approval the qualifications of the proposed biological monitor(s). A qualified biological monitor means any person who has completed at least 4 years of university training in wildlife biology or a related science and/or has demonstrated field experience in the identification and life history of the listed species. ▪ PBO General Minimization Measure 2. A USFWS-approved biological monitor will remain on-site during all construction activities in or adjacent to habitat for listed species. The USFWS-approved biological monitor(s) will be given the authority to stop any work that may result in the take of listed species. If the USFWS-approved biological monitor(s) exercises this authority, the USFWS will be notified by telephone and electronic mail within one working day. The USFWS-approved biological monitor will be the contact for any employee or contractor who might inadvertently kill or injure a listed species or anyone who finds a dead, injured, or entrapped individual. The USFWS-approved biological monitor will 			

Mitigation Measure	Monitoring and Reporting Action	Implementation Schedule	Completion Date and Initials
<p>possess a working wireless/mobile phone whose number will be provided to the USFWS.</p> <ul style="list-style-type: none"> ▪ PBO General Minimization Measure 3. Prior to construction, a construction employee education program will be conducted in reference to potential listed species on site. At minimum, the program will consist of a brief presentation by persons knowledgeable in endangered species biology and legislative protection (USFWS-approved biologist) to explain concerns to contractors, their employees, and agency personnel involved in the proposed Project. The program will include: a description of the species and their habitat needs; any reports of occurrences in the Project area; an explanation of the status of each listed species and their protection under the Federal Endangered Species Act (FESA); and a list of measures being taken to reduce effects on the species during construction and implementation. Fact sheets conveying this information and an educational brochure containing color photographs of all listed species in the work area(s) will be prepared for distribution to the above-mentioned people and anyone else who may enter the Project area. A list of employees who attend the training sessions will be maintained by the applicant to be made available for review by the USFWS upon request. Contractor training will be incorporated into construction contracts and will be a component of weekly Project meetings. ▪ PBO General Minimization Measure 4. Pre-construction surveys for listed species will be performed immediately prior to groundbreaking activities. Surveys will be conducted by USFWS-approved biologists. If at any point, construction activities cease for more than 5 consecutive days, additional pre-construction surveys will be conducted prior to the resumption of these actions. ▪ PBO General Minimization Measure 5. To prevent the accidental entrapment of listed species during construction, all excavated holes or trenches deeper than 6 inches will be covered at the end of each work day with plywood or similar 			

Mitigation Measure	Monitoring and Reporting Action	Implementation Schedule	Completion Date and Initials
<p>materials. Foundation trenches or larger excavations that cannot easily be covered will be ramped at the end of the work day to allow trapped animals an escape method. Prior to the filling of such holes, these areas will be thoroughly inspected for listed species by USFWS-approved biologists. In the event of a trapped animal is observed, construction will cease until the individual has been relocated to an appropriate location.</p> <ul style="list-style-type: none"> ▪ PBO General Minimization Measure 6. Translocation will be approved on a project specific basis. The applicant will prepare a listed species translocation plan for the proposed Project to be reviewed and approved by the USFWS prior to Project implementation. The plan will include trapping and translocation methods, translocation site, and post translocation monitoring. <i>[Because dewatering will occur as part of the Project, it is possible that California red-legged frogs may be detected during dewatering. If so, they will be captured by a qualified biologist and translocated to suitable habitat outside the impact areas in accordance with the translocation plan described in this measure.]</i> ▪ PBO General Minimization Measure 7. Only USFWS-approved biologists will conduct surveys and move listed species. ▪ PBO General Minimization Measure 8. All trash and debris within the work area will be placed in containers with secure lids before the end of each workday in order to reduce the likelihood of predators being attracted to the site by discarded food wrappers and other rubbish that may be left on-site. Containers will be emptied as necessary to prevent trash overflow onto the site and all rubbish will be disposed of at an appropriate off-site location. ▪ PBO General Minimization Measure 9. All vegetation which obscures the observation of wildlife movement within the affected areas containing or immediately adjacent to aquatic habitats will be completely removed by hand just prior to the initiation of grading to remove cover that might be used by listed species. The USFWS-approved biologist will survey these 			

Mitigation Measure	Monitoring and Reporting Action	Implementation Schedule	Completion Date and Initials
<p>areas immediately prior to vegetation removal to find, capture, and relocate any observed listed species, as approved by the USFWS.</p> <ul style="list-style-type: none"> ▪ PBO General Minimization Measure 10. All construction activities must cease one half hour before sunset and should not begin prior to one half hour after sunrise. There will be no nighttime construction. ▪ PBO General Minimization Measure 11. Grading and construction [along streams] will be limited to the dry season, typically May-October. ▪ PBO General Minimization Measure 12. BMPs will be used to minimize erosion and effects on water quality and effects on aquatic habitat. If necessary, a stormwater pollution prevention plan will be prepared. ▪ PBO General Minimization Measure 13. The applicant will ensure a readily available copy of this PBO is maintained by the construction foreman/manager on the Project site whenever earthmoving and/or construction is taking place. The name and telephone number of the construction foreman/manager will be provided to the USFWS prior to groundbreaking. ▪ PBO General Minimization Measure 14. The construction area shall be delineated with high visibility temporary fencing at least 4 ft in height, flagging, or other barrier to prevent encroachment of construction personnel and equipment outside of the construction area. Such fencing shall be inspected and maintained daily until completion of the Project. The fencing will be removed only when all construction equipment is removed from the site. ▪ PBO General Minimization Measure 16. A USFWS-approved biologist shall ensure that the spread or introduction of invasive exotic plant species shall be avoided to the maximum extent possible. When practicable, invasive exotic plants in the Project areas shall be removed. 			

Mitigation Measure	Monitoring and Reporting Action	Implementation Schedule	Completion Date and Initials
<ul style="list-style-type: none"> ▪ PBO General Minimization Measure 17. Project sites shall be revegetated with an appropriate assemblage of native riparian wetland and upland vegetation suitable for the area. A species list and restoration and monitoring plan shall be included with the Project proposal for review and approval by the USFWS and the USACE. Such a plan must include, but not be limited to, location of the restoration, species to be used, restoration techniques, time of year the work will be done, identifiable success criteria for completion, and remedial actions if the success criteria are not achieved. ▪ PBO General Minimization Measure 18. If a work site is to be temporarily dewatered by pumping, intakes shall be completely screened with wire mesh not larger than 5 millimeters. Water shall be released or pumped downstream at an appropriate rate to maintain downstream flows during construction. Upon completion of construction activities, any barriers to flow shall be removed in a manner that would allow flow to resume with the least disturbance to the substrate. ▪ PBO General Minimization Measure 19. A USFWS-approved biologist shall permanently remove, from within the Project area, any individuals of exotic species, such as bullfrogs (<i>Lithobates catesbeiana</i>), crayfish (<i>Pacifastacus leniusculus</i> and <i>Procambarus clarkia</i>), and centrarchid fishes, to the maximum extent possible. The applicant shall have the responsibility to ensure that their activities are in compliance with the F&G Code. <p><i>EACCS AMMs Pertaining to Alameda whipsnake</i></p> <p>The following measures are the AMMs prescribed by the EACCS that pertain to the Alameda whipsnake. The description of each measure below is verbatim from the EACCS, except for some measures where italicized text is included in square brackets to indicate more specifically how the Project will implement those measures.</p> <ul style="list-style-type: none"> ▪ No monofilament plastic will be used for erosion control. 			

Mitigation Measure	Monitoring and Reporting Action	Implementation Schedule	Completion Date and Initials
<ul style="list-style-type: none"> ▪ Barrier fencing may be used to exclude focal reptiles. Barrier fencing will be removed within 72 hours of completion of work. <i>[Because Project activities will be temporary in nature, occurring over a period of 12 weeks from late summer into the fall in marginal habitat for the Alameda whipsnake, and because barrier fencing over such a long, linear project site would engender considerable ground disturbance, barrier fencing is not proposed for this Project as described previously.]</i> ▪ Construction crews or on-site biological monitor will inspect open trenches in the morning and evening for trapped reptiles. ▪ Ground disturbance in suitable habitat will be minimized. ▪ A USFWS and CDFW-approved biological monitor will be present for all ground disturbing activities in suitable habitat. ▪ A qualified biologist possessing a valid FESA Section 10(a)(1)(A) permit or USFWS approved under an active biological opinion, and approved by CDFW will be contracted to trap and to move reptiles to nearby suitable habitat if listed reptiles are found inside fenced area. <i>[No trapping, such as the use of upland traplines for Alameda whipsnake, is proposed for this Project. However, a biologist approved by the USFWS under the Project's Biological Opinion and by the CDFW under the Project's ITP will survey for and relocate any individuals found within the impact area. The applicant will prepare a relocation plan for the Project to be reviewed and approved by the USFWS and CDFW prior to the onset of construction.]</i> ▪ The following measures are the AMMs prescribed by the EACCS that pertain to the California red-legged frog, and that will be incorporated into the Project. The description of each measure is verbatim from the EACCS, except for some measures where we have added italicized text in square brackets to indicate more specifically how the Project will implement those measures. ▪ If aquatic habitat is present, a qualified biologist <i>[for the California red-legged frog]</i> will stake and flag an exclusion zone 			

Mitigation Measure	Monitoring and Reporting Action	Implementation Schedule	Completion Date and Initials
<p>prior to activities. The exclusion zone will be fenced with orange construction zone and erosion control fencing (to be installed by construction crew). The exclusion zone will encompass the maximum practicable distance from the work site and at least 500 ft from the aquatic feature wet or dry.</p> <ul style="list-style-type: none"> ▪ A qualified biologist <i>[for the California red-legged frog]</i> will conduct pre-construction surveys prior to activities. If individuals are found, work will not begin until they are moved out of the construction zone to a USFWS/CDFW approved relocation site. ▪ A USFWS-approved biologist <i>[for the California red-legged frog]</i> should be present for initial ground disturbing activities. <i>[The USFWS-approved biologist will be present during all maintenance and construction activities.]</i> ▪ If the work site is within the typical dispersal distance (contact USFWS/CDFW for latest research on this distance for species of interest) of potential breeding habitat, barrier fencing will be constructed around the worksite to prevent amphibians from entering the work area. Barrier fencing will be removed within 72 hours of completion of work. <i>[The Project area is known to be within dispersal distance of potential breeding habitat for California red-legged frog. However, because Project activities will be temporary in nature, occurring over a period of 12 weeks from late summer into the fall when frogs are less likely to disperse overland, and be conducted in aquatic dispersal and foraging habitat for the California red-legged frog within the channel (where frogs may already be present), barrier fencing is considered ineffective and unnecessary for this Project.]</i> ▪ No monofilament plastic will be used for erosion control. ▪ Construction personnel will inspect open trenches in the morning and evening for trapped amphibians. ▪ A qualified biologist possessing a valid FESA Section 10(a)(1)(A) permit or USFWS-approved under an active biological opinion, 			

Mitigation Measure	Monitoring and Reporting Action	Implementation Schedule	Completion Date and Initials
<p>will be contracted to trap and to move amphibians to nearby suitable habitat if amphibians are found inside a fenced area. <i>[No trapping, such as the use of upland traplines for California red-legged frogs, is proposed for this Project. However, a biologist approved by the USFWS under the Project's Biological Opinion will survey for and relocate any individuals found within the impact area. The applicant will prepare a relocation plan for the Project to be reviewed and approved by the USFWS prior to the onset of construction.]</i></p> <ul style="list-style-type: none"> ▪ Work will be avoided within suitable habitat from 15 October (or the first measurable fall rain of 1 inch or greater) to 1 May. <p><i>EACCS AMMs Pertaining to California red-legged frog</i></p> <ul style="list-style-type: none"> ▪ The following measures are the AMMs prescribed by the EACCS that pertain to the Alameda whipsnake. The description of each measure below is verbatim from the EACCS, except for some measures where italicized text is included in square brackets to indicate more specifically how the Project will implement those measures. ▪ If aquatic habitat is present, a qualified biologist <i>[for the California red-legged frog]</i> will stake and flag an exclusion zone prior to activities. The exclusion zone will be fenced with orange construction zone and erosion control fencing (to be installed by construction crew). The exclusion zone will encompass the maximum practicable distance from the work site and at least 500 ft from the aquatic feature wet or dry. ▪ A qualified biologist <i>[for the California red-legged frog]</i> will conduct pre-construction surveys prior to activities. If individuals are found, work will not begin until they are moved out of the construction zone to a USFWS/CDFW approved relocation site. ▪ A USFWS-approved biologist <i>[for the California red-legged frog]</i> should be present for initial ground disturbing activities. <i>[The USFWS-approved biologist will be present during all maintenance and construction activities.]</i> 			

Mitigation Measure	Monitoring and Reporting Action	Implementation Schedule	Completion Date and Initials
<ul style="list-style-type: none"> ▪ If the work site is within the typical dispersal distance (contact USFWS/CDFW for latest research on this distance for species of interest) of potential breeding habitat, barrier fencing will be constructed around the worksite to prevent amphibians from entering the work area. Barrier fencing will be removed within 72 hours of completion of work. <i>[The Project area is known to be within dispersal distance of potential breeding habitat for California red-legged frog. However, because Project activities will be temporary in nature, occurring over a period of 12 weeks from late summer into the fall when frogs are less likely to disperse overland, and be conducted in aquatic dispersal and foraging habitat for the California red-legged frog within the channel (where frogs may already be present), barrier fencing is considered ineffective and unnecessary for this Project.]</i> ▪ No monofilament plastic will be used for erosion control. ▪ Construction personnel will inspect open trenches in the morning and evening for trapped amphibians. ▪ A qualified biologist possessing a valid FESA Section 10(a)(1)(A) permit or USFWS-approved under an active biological opinion, will be contracted to trap and to move amphibians to nearby suitable habitat if amphibians are found inside a fenced area. <i>[No trapping, such as the use of upland traplines for California red-legged frogs, is proposed for this Project. However, a biologist approved by the USFWS under the Project's Biological Opinion will survey for and relocate any individuals found within the impact area. The applicant will prepare a relocation plan for the Project to be reviewed and approved by the USFWS prior to the onset of construction.]</i> ▪ Work will be avoided within suitable habitat from 15 October (or the first measurable fall rain of 1 inch or greater) to 1 May. <p><i>EACCS AMMs Pertaining to California tiger salamander</i></p> <p>The AMMs listed above for California red-legged frog will also be followed for California tiger salamander, with the following specific</p>			

Mitigation Measure	Monitoring and Reporting Action	Implementation Schedule	Completion Date and Initials
<p>measures prescribed by the EACCS that pertain to the California tiger salamander, and that will be implemented by ACWD. The description of each measure is verbatim from the EACCS, except for some measures where we have added italicized text in square brackets to indicate more specifically how the Proposed Project will implement those measures.</p> <ul style="list-style-type: none"> ▪ A qualified biologist <i>[for the California tiger salamander]</i> will conduct pre-construction surveys prior to activities. If individuals are found, work will not begin until they are moved out of the construction zone to a USFWS/CDFW approved relocation site. ▪ A USFWS/<i>[CDFW]</i>-approved biologist <i>[for the California tiger salamander]</i> should be present for initial ground disturbing activities. ▪ If the work site is within the typical dispersal distance (contact USFWS/CDFW for latest research on this distance for species of interest) of potential breeding habitat, barrier fencing will be constructed around the worksite to prevent amphibians from entering the work area. Barrier fencing will be removed within 72 hours of completion of work. <i>[The Project area is known to be within dispersal distance of potential breeding habitat for California tiger salamander. However, because Project activities will be temporary in nature, occurring over a period of 12 weeks from late summer into the fall when salamanders are less likely to disperse, barrier fencing is considered unnecessary for this Project.]</i> ▪ A qualified biologist possessing a valid FESA Section 10(a)(1)(A) permit or USFWS-approved under an active biological opinion, will be contracted to trap and to move amphibians to nearby suitable habitat if amphibians are found inside a fenced area. <i>[No trapping, such as the use of upland traplines for California tiger salamanders, is proposed for this Project. However, a biologist approved by the USFWS under the Project's Biological Opinion and by the CDFW under the Project's ITP will survey for and relocate any individuals found within the impact area. The applicant will prepare a relocation plan for the Project to be</i> 			

Mitigation Measure	Monitoring and Reporting Action	Implementation Schedule	Completion Date and Initials
<p><i>reviewed and approved by the USFWS and CDFW prior to the onset of construction.]</i></p> <ul style="list-style-type: none"> Work will be avoided within streams from October 15 (or the first measurable fall rain of 1" or greater), to May 1. 			
<p>Mitigation Measure BIO-2. Pre-construction Survey(s) and Construction Monitoring for Special Status Wildlife Species</p> <p>The following measures shall be implemented to avoid or minimize impacts to special status wildlife species:</p> <p>The District will require that a qualified biologist(s) survey for special status wildlife species (e.g., California red-legged frog, California tiger salamander, Alameda whipsnake, tricolored blackbird, and western pond turtle) within 7 days prior to the start of ground- or vegetation disturbing work within the channel to verify the presence or absence of special-status wildlife, and nesting birds. All wildlife species observed will be recorded. The results of these surveys will be documented and provided to state and federal regulatory agencies upon request.</p> <p>During ground-disturbing and vegetation removal activities, a qualified biologist shall be on-site to ensure no impacts to wildlife occur.</p> <p>If non-sensitive wildlife species are observed within the construction area, wildlife will be allowed to exit the construction area on their own volition or relocated by a qualified biologist to an appropriate site outside the construction area (i.e., upstream or downstream of the activity area).</p> <p>If sensitive wildlife species or active nest or den sites are found within the construction area, the biologist shall have the authority to stop construction activities and establish a non-disturbance buffer until it is determined that the animal would not be harmed. If the potential to harm sensitive wildlife or an active nest/den site remains, the non-disturbance buffer is to remain and the biologist shall contact CDFW for authorization before work resumes.</p>	<ol style="list-style-type: none"> 1. Retain a qualified biologist(s) to conduct pre-construction surveys and construction monitoring. 2. Qualified biologist(s) will conduct surveys within 7 days prior to the start of the Project's ground-disturbing work or vegetation removal activities. 3. Qualified biologist(s) will document survey results. 4. Qualified biologist will conduct construction monitoring for special-status species and will stop construction activities if sensitive wildlife species or active nest or den sites are found in the construction area until a non-disturbance buffer is established. 5. Qualified biologist will contact CDFW if the potential to harm sensitive wildlife or an active nest/den site remains after non-disturbance buffer has been established. 	<ol style="list-style-type: none"> 1. Prior to construction 2. Prior to ground-disturbing work or vegetation removal activities. 3. During construction 4. During construction 5. During construction 	

Mitigation Measure	Monitoring and Reporting Action	Implementation Schedule	Completion Date and Initials
<p>Mitigation Measure BIO-3. Provide Compensatory Mitigation for Impacts to California Tiger Salamander, California Red-legged Frog, and Alameda Whipsnake</p> <p>The Project will provide 2.38 acres of compensatory mitigation for California red-legged frog in the form of 0.60 acre of onsite conversion of upland ruderal grassland to in-channel riparian habitat and 1.78 ac of credit purchase at a conservation bank. The Project will also provide 2.06 ac of compensatory mitigation for the Alameda whipsnake and California tiger salamander in the form of a 1:1 equivalent credit purchase at a conservation/wetland bank within the EACCS study area (i.e., Ohlone Preserve Conservation Bank or Ohlone West Conservation Bank). Multi-species credits can be purchased where species' habitat overlaps within the Project area. Mitigation credits shall be purchased prior to Project impacts to those species' habitats. In the event that mitigation credits are not available at a conservation/wetland bank within the EACCS study area, the District will purchase credits at a regional conservation/wetland bank, upon approval from USFWS.</p>	<ol style="list-style-type: none"> 1. ACWD or its contractor will contact Ohlone Preserve Conservation Bank and/or Ohlone West Conservation Bank to confirm availability of compensatory mitigation credits for California red-legged frog, Alameda whipsnake, and California tiger salamander. 2. If credits are not available at Ohlone Preserve Conservation Bank and/or Ohlone West Conservation Bank, ACWD or its contractor will coordinate with USFWS to confirm appropriate number of credits to purchase at a regional conservation/wetland bank and then purchase credits. 	<ol style="list-style-type: none"> 1. Prior to construction 2. Prior to construction 	
<p>Mitigation Measure BIO-4. Nesting Bird Avoidance and Minimization</p> <p>ACWD will implement the following measures to ensure that project activities comply with the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code (F&G Code):</p> <ul style="list-style-type: none"> ▪ <i>Avoidance.</i> To the extent feasible, construction activities should be scheduled to avoid the nesting season. If construction activities are scheduled to take place outside the nesting season, all impacts on nesting birds protected under the MBTA and F&G Code will be avoided. The nesting season for most birds in Alameda County extends from February 1 through August 31. ▪ <i>Preconstruction/Pre-disturbance Surveys.</i> If it is not possible to schedule construction activities between September 1 and January 31 then preconstruction surveys for nesting birds should be conducted by a qualified ornithologist to ensure that no nests will be disturbed during project implementation. 	<ol style="list-style-type: none"> 1. Aim to conduct construction activities between September 1 and January 31, outside of the nesting season. 2. For work conducted between the nesting season (February 1 through August 31), retain a qualified ornithologist to conduct nesting bird survey. 3. Conduct nesting bird survey. 4. If active nest(s) found, establish construction-free buffer zone(s). 	<ol style="list-style-type: none"> 1. During construction 2. Prior to construction 3. Prior to ground disturbing activities 4. Prior to ground disturbing activities 	

Mitigation Measure	Monitoring and Reporting Action	Implementation Schedule	Completion Date and Initials
<p>These surveys should be conducted no more than seven days prior to the initiation of construction activities. During this survey, the ornithologist will inspect all trees and other potential nesting habitats in and immediately adjacent to the impact area for nests.</p> <ul style="list-style-type: none"> ▪ <i>Buffers.</i> If an active nest is found sufficiently close to work areas to be disturbed by these activities, the ornithologist will determine the extent of a construction-free buffer zone to be established around the nest (typically 300 feet for raptors and 100 feet for other species), to ensure that no nests of species protected by the MBTA and California Fish and Game Code will be disturbed during Project implementation. 			
<p>Mitigation Measure BIO-5. Pre-construction Survey(s) for Burrowing Owl</p> <p>Within 48 hours prior to initiating ground-disturbing activities, a qualified biologist shall conduct a focused pre-activity survey for burrows occupied by migrant or overwintering burrowing owls. The survey shall be conducted in accordance with protocols established in the <i>Staff Report on Burrowing Owl Mitigation</i> (CDFG 2012 or current version). The qualified biologist shall investigate suitable burrows for signs of owl use and to determine whether owls are present in areas where they could be affected by the proposed activities.</p> <p>If burrowing owls are detected, disturbance to burrows shall be avoided during the nesting season (February 1 through August 31). Buffers shall be established around occupied burrows in accordance with guidance provided in the <i>Staff Report on Burrowing Owl Mitigation</i>, and at the discretion of a qualified wildlife biologist. No ground-disturbing activities shall commence within the buffer area until a qualified biologist confirms that the burrow is no longer occupied.</p> <p>If impacts on occupied burrows are unavoidable, passive relocation techniques can be used to evict owls from burrows within the work area prior to initiation of ground-disturbing activities. No owls will be evicted during the breeding season (February 1 through August 31) unless a biologist can determine that owls are not actively nesting.</p>	<ol style="list-style-type: none"> 1. Retain a qualified biologist to conduct pre-construction burrowing owl survey(s). 2. Qualified biologist to conduct burrowing owl survey within 48 hour prior to the start of ground-disturbing activities. Survey will be conducted in accordance with protocols identified in Mitigation Measure BIO-3. 3. If burrows are detected in the work area between February 1 and August 31, the qualified biologist will establish no-disturbance buffers. Work will not commence until qualified biologist confirms that the burrow is no longer occupied. 4. If impacts to occupied burrows are unavoidable, qualified biologist may conduct passive relocation techniques prior to 	<ol style="list-style-type: none"> 1. Prior to construction 2. Within 48 hours prior to the start of ground-disturbing construction activities. 3. During construction (between February 1 and August 31). 4. During construction (between September 1 and January 31). 	

Mitigation Measure	Monitoring and Reporting Action	Implementation Schedule	Completion Date and Initials
	initiation of ground-disturbing activities during the non-breeding season (September 1 through January 31).		
<p>Mitigation Measure BIO-6. Prepare and Implement Habitat Mitigation and Monitoring Plan (HMMP).</p> <p>The District or its contractor will prepare a Habitat Restoration Mitigation and Monitoring Plan (HMMP) to guide the restoration effort for the on-site in-channel riparian/wetland benches. The HMMP will meet the permitting requirements of the USACE, CDFW, and RWQCB and will include the following information, at a minimum:</p> <ul style="list-style-type: none"> ▪ Proposed summary of regulated habitat impacts and proposed restoration and enhancement actions and surface area; ▪ Goal of the restoration to achieve no net loss of habitat functions and values; ▪ Location of restoration site(s) and description of existing site conditions; ▪ Conceptual restoration design; ▪ Soil amendments and other site preparation elements, as appropriate; ▪ Planting and/or seeding plan; ▪ Short-term vegetation maintenance plan (to facilitate habitat establishment) including a conceptual irrigation plan (if needed); ▪ Post-construction ecological monitoring plan for a 5-year duration. The monitoring plan will describe monitoring methods, performance and success criteria, reporting requirements, and remedial measures/adaptive management strategies. At a minimum, success criteria will include the minimum surface area of restored and/or created mixed perennial marsh/intermittent stream and mixed riparian woodland habitats necessary to meet the habitat mitigation goal of no net loss of sensitive habitat functions. This metric 	<ol style="list-style-type: none"> 1. Retain a contractor to prepare a HMMP for the Project. 2. Contractor to prepare the HMMP in accordance with the requirements stated in Mitigation Measure BIO-4. 3. Revise HMMP based on feedback received from USACE, CDFW, and RWQCB during the permitting process. 	<ol style="list-style-type: none"> 1. Project planning and design 2. Project planning and design 3. Permit negotiations (prior to construction) 	

Mitigation Measure	Monitoring and Reporting Action	Implementation Schedule	Completion Date and Initials
<p>will be measured by a qualified ecologist via a wetland delineation using the USACE wetland delineation protocol and mapping of the footprint of restored mixed riparian habitat. The monitoring plan will also include the success criterion of at least 50 percent average vegetation cover of native-dominated wetland indicator plant species within the restored/created perennial marsh and/or mixed perennial marsh/intermittent stream habitat.</p>			
Cultural Resources			
<p>Mitigation Measure CR-1: Immediately Halt Construction If Cultural Resources Are Discovered, Evaluate All Identified Cultural Resources for Eligibility for Inclusion in the NRHP/CRHR, and Implement Appropriate Mitigation Measures for Eligible Resources.</p> <p>The ACWD will include this measure in construction plans and specifications. If any cultural resources, such as structural features, unusual amounts of bone or shell, flaked or ground stone artifacts, historic-era artifacts, human remains, or architectural remains, are encountered during any project construction activities, work shall be suspended immediately at the location of the find and within a radius of at least 50 feet and the ACWD will be contacted.</p> <p>All cultural resources accidentally uncovered during construction within the Project site will be evaluated for eligibility for inclusion in the NRHP/CRHR. Resource evaluations will be conducted by individuals who meet the U.S. Secretary of the Interior's professional standards in archaeology, history, or architectural history, as appropriate. If any of the resources meet the eligibility criteria identified in Pub. Res. Code Section 5024.1 or Pub. Res. Code Section 21083.2(g), mitigation measures will be developed and implemented in accordance with State CEQA Guidelines Section 15126.4(b) before construction resumes.</p> <p>For resources eligible for listing in the NRHP/CRHR that would be rendered ineligible by the effects of project construction, additional mitigation measures will be implemented. Mitigation measures for archaeological resources may include (but are not limited to) avoidance; incorporation of sites within parks, greenspace, or other</p>	<ol style="list-style-type: none"> 1. Confirm that measure is included in the project plans and specifications. 2. Contractor will halt work within a 50-foot radius of any cultural resources encountered during project construction activities. 3. Contractor will retain a cultural resources specialist to evaluate cultural resources accidentally uncovered and determine if the resource meets eligibility criteria identified in Pub. Res. Code Section 5024.1 or 14 CCR Section 21083.2(g). If resources are found eligible for listing in the NRHP/CRHR, cultural resources specialist will identify appropriate mitigation measures in consultation with responsible agencies and, as appropriate, Native American tribes. 	<ol style="list-style-type: none"> 1. During development of construction plans and specifications. 2. During Construction 3. During construction 	

Mitigation Measure	Monitoring and Reporting Action	Implementation Schedule	Completion Date and Initials
open space; capping the site; deeding the site into a permanent conservation easement; or data recovery excavation. Mitigation measures for archaeological resources will be developed in consultation with responsible agencies and, as appropriate, interested parties such as Native American tribes. Native American consultation is required if an archaeological site is determined to be a tribal cultural resource (TCR). Implementation of the approved mitigation would be required before resuming any construction activities with potential to affect identified eligible resources at the site.			
<p>Mitigation Measure CR-2: Immediately Halt Construction if Human Remains Are Discovered and Implement Applicable Provisions of the California Health and Safety Code.</p> <p>The ACWD will include this measure in construction plans and specifications. If human remains are accidentally discovered during project construction activities, the requirements of California Health and Human Safety Code Section 7050.5 will be followed. Potentially damaging excavation will halt in the vicinity of the remains, with a minimum radius of 100 feet, and the Alameda County Coroner will be notified. The Coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or state lands (California Health and Safety Code Section 7050.5[b]). If the Coroner determines that the remains are those of a Native American, they must contact the Native American Heritage Commission (NAHC) by phone within 24 hours of making that determination (California Health and Safety Code Section 7050[c]). Pursuant to the provisions of Pub. Res. Code Section 5097.98, the NAHC will identify a Most Likely Descendent (MLD). The MLD designated by the NAHC will have at least 48 hours to inspect the site, once access is granted, and propose treatment and disposition of the remains and any associated grave goods. The ACWD will work with the MLD to ensure that the remains are removed to a protected location and treated with dignity and respect.</p>	<ol style="list-style-type: none"> 1. Confirm that measure is included in project plans and specifications. 2. In the event that human remains are encountered, halt work and contact the Alameda County Coroner. 3. Confirm that any discoveries of human remains are evaluated and addressed properly. 	<ol style="list-style-type: none"> 1. During preparation of plans and specification 2. During construction 3. During construction 	
Energy			
None required			

Mitigation Measure	Monitoring and Reporting Action	Implementation Schedule	Completion Date and Initials
<i>Geology, Soils, and Seismicity</i>			
See Mitigation Measure HYD-1 below.			
<i>Greenhouse Gas Emissions</i>			
None required			
<i>Hazards and Hazardous Materials</i>			
See Mitigation Measures HYD-1 and TRA-1 below.			
<i>Hydrology and Water Quality</i>			
<p>Mitigation Measure HYD-1: Prepare and Implement SWPPP</p> <p>Consistent with the requirements of the SWRCB's NPDES Construction General Permit, ACWD or its contractor will submit a notice of intent to the SWRCB's Division of Water Quality, develop a Stormwater Pollution and Prevention Plan (SWPPP), and implement BMPs to prevent discharges of non-point source pollutants (including chemicals, fuels, lubricants) in Vallecitos Channel. The San Francisco Bay RWQCB would review the SWPPP to ensure compliance with the general permit.</p> <p>The SWPPP will contain guidelines for cleanup and disposal of spilled and leaked materials at the project site. Recommended BMPs that will be included in the SWPPP are listed below; however the measures may be altered, supplemented or deleted during the RWQCB's review process.</p> <ul style="list-style-type: none"> ▪ Contractor's designated field personnel will be appropriately trained in spill prevention, hazardous material control, and cleanup of accidental spills. ▪ Equipment and materials for cleanup of spills will be available on site, and spills and leaks will be cleaned up immediately and disposed of according to the following guidelines: ▪ For small spills on impervious surfaces, absorbent materials will be used to remove the spill, rather than hosing it down with water. 	<ol style="list-style-type: none"> 1. Prepare and submit a SWRCB NPDES Construction General Permit application and SWPPP. 2. Incorporate approved SWPPP BMPs in construction contract documents. 3. Implement BMPs during construction activities; ensure corrective action as necessary. 	<ol style="list-style-type: none"> 1. Prior preparation of final plans and specifications 2. During preparation of final plans and specifications 3. During construction 	

Mitigation Measure	Monitoring and Reporting Action	Implementation Schedule	Completion Date and Initials
<ul style="list-style-type: none"> For small spills on pervious surfaces such as soil, the spill will be excavated and properly disposed of rather than being buried. Absorbent materials will be collected and disposed of properly and promptly. Field personnel will ensure that hazardous materials are properly handled and natural resources are protected by all reasonable means. Spill response kits will be on hand at all times while hazardous materials are in use (e.g., at crew trucks and other logical locations). All field personnel will be advised of these locations. ACWD staff or subcontractor(s) will routinely inspect the work site to verify that spill prevention and response measures are properly implemented and maintained. 			
Land Use and Planning			
None required			
Mineral Resources			
None required			
Noise			
<p>Mitigation Measure NOI-1: Coordinate Construction Noise with Paintball Facility Use.</p> <p>Prior to construction, ACWD or its contractor(s) will prepare and implement a noise reduction plan to ensure that construction noise levels are below 90 dBA and vibration levels below 80 VdB for users of the paintball facility. This may be achieved through any combination of the following measures:</p> <ul style="list-style-type: none"> Install noise barriers or other noise reduction measures such as using enhanced muffler systems, using sound aprons on equipment, or attaching shields to equipment to ensure that the paintball facility noise levels are below 90 dBA and 80 VdB. 	<ol style="list-style-type: none"> Confirm that measure is included in project plans and specifications. Select appropriate noise reduction measure(s) and coordinate with paintball facility about construction noise issues and reduction measures to be applied. 	<ol style="list-style-type: none"> During preparation of plans and specifications Prior to construction 	

Mitigation Measure	Monitoring and Reporting Action	Implementation Schedule	Completion Date and Initials
<ul style="list-style-type: none"> Coordinate with the paintball facility to ensure that no sensitive receptors are within the 90 dBA and 80 VdB range (or 48.7 feet of the channel work area) during construction of treatments immediately downstream of drop structure #11 (treatments #2 through 11a as shown in Figure 2-5). 			
Population and Housing			
None required			
Public Services and Utilities			
None required			
Recreation			
See Mitigation Measure TRA-1 below.			
Transportation and Traffic			
Mitigation Measure TRA-1: Traffic Control Plan The ACWD or its contractor(s) will prepare and implement a traffic control plan in coordination with Caltrans. Elements of the traffic control plan will include, but not be limited to, the following components: <ul style="list-style-type: none"> Advance warning signs will be installed on SR-84 (to the west and east of the access points) advising motorists and bicyclists of the construction zone ahead in order to minimize hazards associated with construction vehicles turning onto and exiting the access routes. Flaggers, illuminated signs, or flashing yellow lights, or a combination of these methods, may be used on SR-84 to warn motorists, bicyclists and pedestrians, about the construction zone. Bicycle access and circulation will be maintained during project construction where it is safe to do so. 	<ol style="list-style-type: none"> 1. Confirm that measure is included in project plans and specifications. 2. Retain a contractor to develop a traffic control plan in coordination with Caltrans. Ensure that traffic control plan includes elements identified in Mitigation Measure TRA-1. 3. Implement plan. 	<ol style="list-style-type: none"> 1. During preparation of project plans and specifications 2. Prior to construction 3. During construction 	

Mitigation Measure	Monitoring and Reporting Action	Implementation Schedule	Completion Date and Initials
<ul style="list-style-type: none"> ACWD will notify nearby property owners of proposed construction activities. Adequate driving and bicycling conditions on Vallecitos Road will be maintained throughout the construction period. 			
<i>Tribal Cultural Resources</i>			
See Mitigation Measures CR-1 and CR-2 above.			
<i>Wildfire</i>			
See Mitigation Measure TRA-1 above.			
<i>Mandatory Findings of Significance</i>			
<p>Mitigation Measure CUM-1: Coordinate with SR-84 Project Team</p> <p>Prior to construction, ACWD or its contractor will coordinate the Proposed Project's traffic control plan with Caltrans staff managing the SR-84 Expressway Widening and SR-84/I-680 Interchange Improvements Project. As part of this coordination effort, ACWD or its contractor and Caltrans staff will review the traffic control plans and construction activity timelines for both the Proposed Project and the SR-84 Expressway Widening and SR-84/I-680 Interchange Improvements Project to determine where there may be construction activity overlap and, if determined appropriate, whether there is an opportunity to shift project activities associated with either project to minimize traffic safety hazards on SR-84.</p>	<ol style="list-style-type: none"> Confirm that measure is included in project plans and specifications. Retain a contractor to coordinate the Project's traffic control plan (prepared in Mitigation Measure TRA-1) in coordination with Caltrans staff managing the SR-84 Expressway Widening and SR-84/I-680 Interchange Improvements Project. 	<ol style="list-style-type: none"> During preparation of final project plans and specifications Prior to construction 	

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