

**RECLAMATION DISTRICT NO. 1601
TWITCHELL ISLAND
BOARD OF TRUSTEES MEETING
TUESDAY, OCTOBER 21, 2025
9:00 AM
ENGINEER'S REPORT**

I. PROJECT FUNDING AGREEMENT TW – 21 - 1.2 TIMES/TWERP PROJECT

- A. Contractor for the Irrigation/Planting contract is mobilizing and will be harvesting tule from the East End Project, weather depending.

II. PROJECT FUNDING AGREEMENT TW – 24 - 1.0 - SP PHASE II OF DISTRICT MULTI-BENEFIT PROJECT

- A. The Phase 1 Berm Bidding Documents will be released in the week of 10/20/2025.
B. **Bid Date is 11/20/2025.**
C. Will seek the Board of Trustees authority to award the Phase 1 Berm contract at the December 16, 2025 meeting.
D. Compensatory mitigation strategy:

Habitat Type	Agency	Needed Credits (acres)	Notes
Waters of the U.S.	USACE	0.90	We are currently processing through Westervelt. The Agreement is before the Board today for approval.
FM	CDFW	0.10	
RF/SS	CDFW	0.29	
GGs	USFWS	2.70	Working with USFWS and DWR to purchase “credits” from DWR related to the TWERP site.

- E. The documentation to support the DSC Consistency Determination is under internal review, and we expect to post in late October 2025.
F. Construction is still anticipated to start in May 2026.
G. Review DRAFT Geotechnical Instrumentation Plan related to control the rate of filling on the project.

EXHIBIT A: DRAFT Levee Instrumentation Plan for control of berm fill progress.

III. DISTRICT PUMP STATION SOLAR ARRAY

A. PGE Interconnection

a) Transformer: – **PG&E has engaged in this conversation**

1. We have requested a site meeting to discuss layout challenges at the site. PGE has rejected invite to on-site meeting.
 - a. Only sub-surface transformers and constructed as watertight and cannot be installed above ground. The ground water at this location is very shallow, making installation in a vault sub-surface challenging.
 - b. Pad mount transformers cannot be installed on an elevated platform.
2. PGE has referred this matter to their standards department seeking a variance. **The standards division has refused to consider any additional arguments regarding switchgear location and requests for meetings on site.**

IV. SYSTEMWIDE MULTI BENEFIT PROJECT SEVENMILE SLOUGH EROSION REPAIRS.

A. Pre-Construction: Project Design and Permitting

a) Schedule

1. Survey – Complete.
2. Archaeological survey Complete.
3. Biological Assessment to resume once update plan set is complete.

B. Construction

a) Schedule

1. Tentative Construction September 2026
 - a. Permitting requirements and project footprint revision has pushed anticipated construction to next season.

EXHIBIT A

ALL LOCATIONS ARE APPROXIMATE

S12	VIBRATING WIRE SETTLEMENT CELL
PZ18	VIBRATING WIRE PIEZOMETER
IN3	INCLINOMETER
DL3	DATA LOGGER
	SETTLEMENT PLATES (SEE CIVIL PLANS FOR DETAILS)

INSTRUMENTATION PLAN
RECLAMATION DISTRICT NO. 1601
SAN JOAQUIN RIVER SETBACK LEVEE, REACH 6, PHASE 1
BETWEEN STATION 479+50 AND 509+00
TWITCHELL ISLAND
SACRAMENTO COUNTY, CALIFORNIA

E 1

DRAFT

SHEET INDEX

SHEET NUMBER	TITLE
G-1	COVER SHEET
G-2	NOTES AND DETAILS
G-3	INSTRUMENTATION PLAN STATION 482+00 TO 492+00
G-4	INSTRUMENTATION PLAN STATION 492+00 TO 503+00
G-5	INSTRUMENTATION PLAN STATION 503+00 TO 508+00

ENGEO
—Expect Excellence—

1728 GOLDEN VALLEY PARKWAY
LATHROP, CALIFORNIA 95330
(209) 435-1670
(824) 279-2698

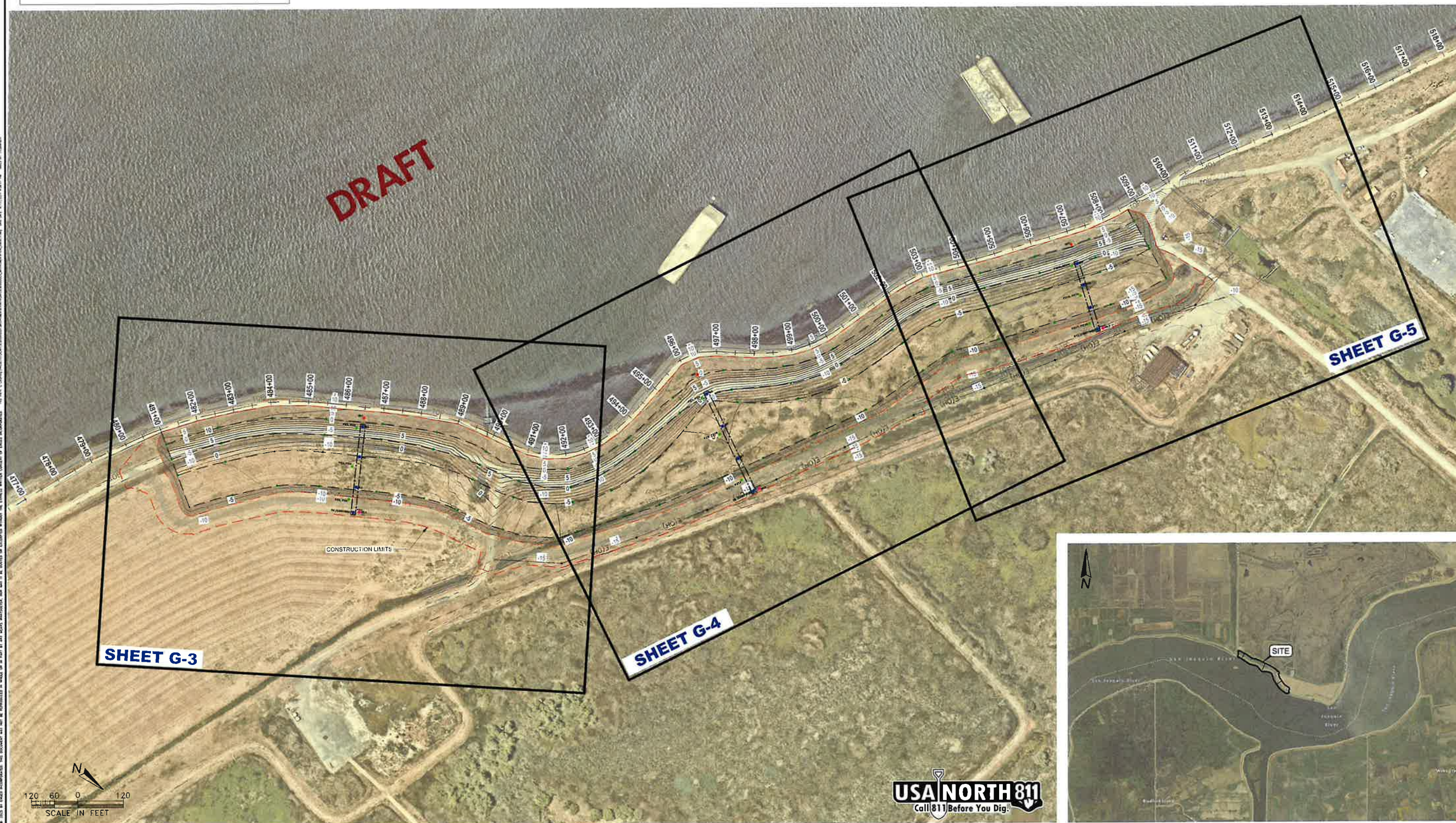
COVER SHEET
TWITCHELL ISLAND
SACRAMENTO COUNTY, CALIFORNIA



DESIGNED BY: PC
DRAWN BY: CC
CHECKED BY: CAC
DATE: SEPT 2025
SCALE:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	4
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SHEET NUMBER
G-1
OF 5 SHEETS
PROJECT NO.
9285.000.003



INDEX MAP
1" = 120'

MAP BASE SOURCE: BING IMAGERY

VICINITY MAP
1"=2000'

BASE PLANS: KSN, RECLAMATION DISTRICT NO. 1601, TWITCHELL ISLAND, SACRAMENTO COUNTY, CALIFORNIA, SAN JOAQUIN RIVER SETBACK LEVEE REACH 6, PHASE 1, BETWEEN STATION 479+50 - 509+00, 05% SUBMITTAL, DATED JULY 21, 2022

[https://doi.org/10.1186/1745-6216-9-1](#)

1. THE CONTRACTOR SHALL PROVIDE AN INSTRUMENTATION EQUIPMENT SUBMITTAL AND INSTALLATION PLAN; THE SUBMITTAL SHALL BE APPROVED PRIOR TO PURCHASE OF EQUIPMENT.
2. CALIBRATION CERTIFICATES FOR INSTRUMENTATION SHALL BE PROVIDED TO ENGeo AT LEAST ONE WEEK PRIOR TO INSTALLATION.
3. ENGeo SHALL PROVIDE FULL-TIME OBSERVATION FOR ALL INSTRUMENT INSTALLATIONS AND WILL CHECK THE FUNCTIONALITY OF SENSORS BEFORE AND AFTER INSTALLATION.
4. WIRE AND TUBING FROM EACH SENSOR SHALL BE CLEARLY LABELED WITH THE SENSOR SERIAL NUMBER AND INSTRUMENT IDENTIFICATION DESIGNATION.
5. ENGeo WILL PROVIDE FINAL CONNECTION OF SIGNAL CABLES AND TUBING TO THE READOUT BOARD PRIOR TO BACKFILLING OF TRENCHES.
6. TRENCHES SHALL BE 12 INCHES WIDE AND 12 TO 24 INCHES DEEP AND WITH A SMOOTH BOTTOM EXCAVATED USING A FLAT BLADED BUCKET (NO TEETH).
7. TUBING AND SIGNAL CABLE ARE TO BE LAID IN THE TRENCHES IN A SINUOUS PATTERN ALLOWING FOR SLACK.
8. BACKFILL SHALL BE COMPACTED NATIVE MATERIAL; CARE SHALL BE TAKEN TO NOT DAMAGE INSTRUMENTS, SIGNAL CABLES, AND TUBING DURING BACKFILL.

1. SETTLEMENT CELLS SHALL BE GEOKON MODEL 4660 VIBRATING WIRE SETTLEMENT SYSTEM INSTALLED PER THE MANUFACTURER'S INSTRUCTION MANUAL.
2. SETTLEMENT CELL RESERVOIRS SHALL BE SECURELY MOUNTED ON THE READOUT BOARD AT A HIGHER IN ELEVATION THAN THE SETTLEMENT SENSORS AND BE NOT BE IN DIRECT SUNLIGHT.

1. THE VIBRATING WIRE PIEZOMETERS SHALL BE GEOKON MODEL 4500SV, 350KPA INSTALLED PER THE MANUFACTURER'S INSTRUCTION MANUAL.
2. THE PIEZOMETERS SHALL BE INSTALLED IN BOREHOLES DRILLED BY A C-57 CALIFORNIA LICENSED CONTRACTOR USING HOLLOW STEM AUGER. BOREHOLES ARE ANTICIPATED TO BE UP TO 30 FEET DEEP.
3. ENGEO WILL LOG THE BORINGS, SELECT THE FINAL DEPTHS FOR THE PIEZOMETERS, AND PROVIDE SENSOR BASELINE READINGS.
4. PIEZOMETERS SHALL BE FULLY GROUTED (INSTALLATION C) PER THE MANUFACTURER'S INSTRUCTION MANUAL USING THE GROUT DESIGN FOR SOFT SOILS. GROUT SHALL BE PLACED USING A TREMIE PIPE. GROUT LEVEL SHALL BE CHECKED AFTER CURING AND TOPPED OFF, IF NEEDED TO REACH THE GROUND SURFACE.

1. THE INCLINOMETER CASINGS SHALL BE GEOKON MODEL 6400-2 (70MM O.D. ABS), INSTALLED PER THE MANUFACTURER'S INSTRUCTION MANUAL.
2. THE INCLINOMETER CASING SHALL BE INSTALLED IN BOREHOLES DRILLED WITHIN 30 DAYS AFTER THE FINAL EMBANKMENT GRADE IS ACHIEVED BY A C-57 CALIFORNIA LICENSED CONTRACTOR USING HOLLOW STEM AUGER. BOREHOLES ARE ANTICIPATED TO BE UP TO 50 FEET DEEP.
3. INCLINOMETER CASINGS SHALL GROUTED USING THE GROUT DESIGN FOR SOFT SOILS AS DONE FOR THE PIEZOMETER GROUT. GROUT SHALL BE PLACED USING A TREMIE PIPE. TO COUNTERACT BUOYANT FORCES, THE INCLINOMETER CASING SHALL BE HELD DOWN FROM THE BOTTOM DURING GROUTING; ALTERNATIVELY, THE CASING CAN BE HELD FROM THE TOP AND GROUTING CAN BE STAGED SUCH THAT THE BOTTOM 5 FEET IS GROUTED AND CURED BEFORE THE REMAINDER OF THE GROUT IS PLACED. THE GROUT LEVEL SHALL BE CHECKED AFTER CURING AND TOPPED OFF AS NEEDED TO REACH THE GROUND SURFACE.
4. THE TOP OF THE INCLINOMETER CASING SHOULD BE HOUSED IN AN 8-INCH DIAMETER FLUSH MOUNTED EMCO WHEATON TRAFFIC VAULT.
5. ENGEO WILL LOG THE BORINGS, OBSERVE THE INSTALLATION, AND PROVIDE THE BASELINE INCLINOMETER READINGS.

1. DATA LOGGERS SHALL BE GEOKON 8910 SERIES GEONET WIRELESS LORA DATA ACQUISITION SYSTEM. THE SYSTEM IS TO INCLUDE AN ADDRESSABLE DATA LOGGER WITH WIRELESS COMMUNICATION, A MODEL 8032 MULTIPLEXER, AND CELLULAR GATEWAY.
2. DATA LOGGERS, MULTIPLEXERS, CELLULAR GATEWAY SHALL BE SECURELY MOUNTED ON THE READOUT BOARD.
3. ENGE WILL COMPLETE THE FINAL DATA LOGGER, MULTIPLEXER, AND CELLULAR GATEWAY WIRING AS WELL AS THE WIRELESS COMMUNICATION SETUP.

1. READOUT BOARD SHALL BE CONSTRUCTED USING 7/8-INCH THICK PRESSURE TREATED PLYWOOD FASTENED TO 4-INCH X 4-INCH PRESSURE TREATED POSTS. THE POSTS SHALL BE BURIED A MINIMUM OF 18 INCHES DEEP USING FENCE POST CONCRETE. THE MOUNTED INSTRUMENTS ARE TO BE FACING SOUTH AND A PLYWOOD ROOF SHALL BE CONSTRUCTED SUCH THAT THE MOUNTED INSTRUMENTS REMAIN IN CONSTANT SHADE.
2. A GROUNDING ROD SHALL BE DRIVEN INTO THE SOIL ADJACENT TO THE READOUT BOARD.

Equipment ID	Station	Offset (feet landside of the station line)	Data Logger Connection	Cable/Tubing Length, (feet). Distance to data logger plus 20% contingency
S1	486+50	52	DL1	240
S2	486+50	132	DL1	160
S3	486+50	212	DL1	80
S4	486+50	280	DL1	30
S5	496+24	110	DL2	300
S6	496+24	204	DL2	200
S7	496+24	299	DL2	110
S8	496+24	394	DL2	30
S9	507+00	89	DL3	190
S10	507+00	148	DL3	140
S11	507+00	210	DL3	80
S12	507+00	271	DL3	30

Equipment ID	Station	Offset (feet landside of the station line)	Data Logger Connection	Cable Length, (feet). Distance to data logger plus 20% contingency
PZ1	486+34	57	DL1	250
PZ2	486+34	57	DL1	250
PZ3	486+34	159	DL1	150
PZ4	486+34	159	DL1	150
PZ5	486+34	246	DL1	60
PZ6	486+34	246	DL1	60
PZ7	496+08	114	DL2	310
PZ8	496+08	114	DL2	310
PZ9	496+08	220	DL2	200
PZ10	496+08	220	DL2	200
PZ11	496+08	355	DL2	70
PZ12	496+08	355	DL2	70
PZ13	506+84	91	DL3	210
PZ14	506+84	91	DL3	210
PZ15	506+84	173	DL3	130
PZ16	506+84	173	DL3	130
PZ17	506+84	250	DL3	50
PZ18	506+84	250	DL3	50

Equipment ID	Station	Offset (feet landside of the station line)	Data Logger Connection	Depth (feet)
IN 1	486+50	29	N/A	50
IN 2	496+24	54	N/A	50
IN 3	507+00	36	N/A	50

Equipment ID	Station	Offset (feet landside of the station line)	Equipment
DL1	486+60	276	Model 8600-1, Model 8032 Multiplexer
DL2	494+72	395	Model 8600-1, Model 8032 Multiplexer, Cellular Gateway
DL3	507+12	272	Model 8600-1, Model 8032 Multiplexer



NO SCALE

LEGEND
ALL LOCATIONS ARE APPROXIMATE

- S12 ■ VIBRATING WIRE SETTLEMENT CELL
- PZ18 ● VIBRATING WIRE PIEZOMETER
- IN3 ◆ INCLINOMETER
- DL3 ● DATA LOGGER
- SETTLEMENT PLATES (SEE CIVIL PLANS FOR DETAILS)



NOTE: INSTRUMENTATION SYMBOLS AND TRENCH LOCATION APPROXIMATE, NOT TO SCALE

BASE PLANS: KSN, RECLAMATION DISTRICT NO. 1601, TWITCHELL ISLAND, SACRAMENTO COUNTY, CALIFORNIA, SAN JOAQUIN RIVER SETBACK LEVEE, REACH 6, PHASE 1, BETWEEN STATION 479+00 - 509+00, 50% SUBMITTAL, DATED JULY 21, 2025

INSTRUMENTATION PLAN
STATION 482+00 TO 492+00
TWITCHELL ISLAND
SACRAMENTO COUNTY, CALIFORNIA



DESIGNED BY: PC	CC	CAC	SEPT 2025	SCALE: AS SHOWN
DRAWN BY: CC	CC	CAC		
CHECKED BY: CAC				
DATE: SEPT 2025				
BY: _____	DATE: _____	DESCRIPTION: _____	REV: _____	
SHEET NUMBER G-3 OF 5 SHEETS				
PROJECT NO. 9285.000.003				



ALL LOCATIONS ARE APPROXIMATE

- S12**  VIBRATING WIRE SETTLEMENT CELL
- PZ18**  VIBRATING WIRE PIEZOMETER
- IN3**  INCLINOMETER
- DL3**  DATA LOGGER
-  SETTLEMENT PLATES
(SEE CIVIL PLANS FOR DETAILS)

DRAFT

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17278 GOLDEN VALLEY PARKWAY
LATHROP, CALIFORNIA 95330
(939) 855-0610
(908) 274-2056

CALIFORNIA • NEVADA • WASHINGTON • GUAM • NEW ZEALAND • AUSTRALIA

INSTRUMENTATION PLAN
STATION 503+00 TO 508+00
TWITCHELL ISLAND
SACRAMENTO COUNTY, CALIFORNIA



DESIGNED BY: PC	
DRAWN BY: CC	
CHECKED BY: CAC	
DATE:	SEPT 2025
SCALE:	

[illegible]

SHEET NUMBER

G-5

OF 5 SHEETS

PROJECT NO.	9285.000.003
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NOTE: INSTRUMENTATION SYMBOLS AND TRENCH LOCATION APPROXIMATE, NOT TO SCALE

BASE PLAN: K.S.N. RECLAMATION DISTRICT NO. 1001, TWITCHELL ISLAND, SACRAMENTO COUNTY, CALIFORNIA, SAN JOAQUIN RIVER BACKWATER LEVEE REACH 3, PHASE 1, BETWEEN STATION 47+30+00 TO 50+00, SUBMITTAL DATED JULY 21, 2025

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