Meeting of the Central Valley Flood Protection Board
January 23, 2015

Staff Report

Decker Island LLC, Sacramento River, Sacramento County

1.0 – ITEM

Consider approval of Draft Permit No. 18944.
(Attachment B)

2.0 – APPLICANT

Decker Island LLC

3.0 – LOCATION

The project is located on the land-side and water-side slopes and crown of the left bank levee and within channel of the Sacramento River at Levee Mile 3.55, Unit No. 2, Reclamation District 341 (Sacramento River, Sacramento County, see Attachment(s) A).
The project is within the Sacramento San Joaquin Delta.

4.0 – PROJECT DESCRIPTION

The applicant has applied to the Central Valley Flood Protection Board (Board) for an encroachment permit to install a buried electrical conduit under the landside levee slope, under the levee crown and under the waterside levee slope and channel. See Attachment(s) C

5.0 - AUTHORITY OF THE BOARD

California Water Code § 8534, 8590 – 8610.5, and 8700 - 8710

California Code of Regulations, Title 23 (Title 23)

- § 6, Need for a Permit
- § 7, Endorsement by Local Maintaining Agency
- § 13.2 Consent Calendar
- § 112, Streams Regulated and Non-permissible Work Periods
- § 120, Levees
- § 123, Pipelines, Conduits and Utility Lines.

6.0 – BACKGROUND

Decker Island LLC has purchased and is mining dredge spoils that were deposited on Decker Island from past Sacramento River channel dredging operations. Prior to shipping, the dredge spoils are mined and trucked to a central point on the island where they are cleaned, classified, stockpiled and eventually moved by conveyor belt to a dock where the cleaned and classified material is loaded on barges. Currently, the processing plant and conveyor system are powered 100% by diesel-generated electricity.

Due to environmental and cost issues associated with the diesel-powered generator, the applicant is applying to the Central Valley Flood Protection Board (Board) for a permit allowing the applicant to cross the levee and channel with an electrical conduit that will minimize said environmental and cost issues.

7.0 – PROJECT ANALYSIS

The project as proposed will not compromise the functionality and/or maintenance of the Sacramento River Flood Control Project Works.

7.1 – Hydraulic Analysis

While the scope of the work for this project does not require a hydraulic analysis, a scour analysis (Attachment E) was performed to demonstrate that the proposed depth of the buried cable would not be impacted by scour within the channel. The U.S. Army Corps of Engineers (USACE) has reviewed the scour analysis and concurs with its findings.

7.2 – Geotechnical Analysis

The scope of the work for this project does not require a geotechnical analysis.

8.0 – AGENCY COMMENTS AND ENDORSEMENTS

The comments and endorsements associated with this project, from all pertinent agencies are shown below:

- The USACE comment letter was received on December 10, 2014, and indicated that the USACE District Engineer has no objection to the project, subject to conditions. This letter has been incorporated into the permit as Exhibit A.

- Reclamation District 341 has endorsed the project with conditions which are attached to this staff report as Attachment D. All applicable conditions have been incorporated into Permit No. 18944.

9.0 – CEQA ANALYSIS

Board staff has prepared the following CEQA findings:

The Board, as a responsible agency under CEQA, has reviewed an Initial Study/Mitigated Negative Declaration (IS/MND) (SCH Number: 2014032039, March 2014) and Mitigation Measures for the Decker Island Electrical Crossing Project prepared by the lead agency, Reclamation District 341. These documents, including project design, may be viewed or downloaded from the Central Valley Flood Protection Board website at http://www.cvfpb.ca.gov/meetings/2014/09-26-2014.cfm under a link for this agenda item. These documents are also available for review in hard copy at the Board and the Reclamation District 341 offices.

Reclamation District 341 determined that the project would not have a significant effect on the environment on May 13, 2014 and adopted Resolution 2014-03. A Notice of Determination was filed on May 13, 2014 with the State Clearinghouse and the Sacramento and Solano County Clerks. Board staff finds that although the proposed project could have a potentially significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. The project proponent has incorporated mandatory mitigation measures into the project plans to avoid identified impacts or to mitigate such impacts to a point where no significant impacts will occur. These mitigation measures

are included in the project proponent's IS/MND and address impacts to biological resources and cultural resources. The description of the mitigation measures are further described in the adopted IS/MND.

10.0 – SECTION 8610.5 CONSIDERATIONS

1. Evidence that the Board admits into its record from any party, State or local public agency, or nongovernmental organization with expertise in flood or flood plain management:

   The Board will make its decision based on the evidence in the permit application and attachments, this staff report, and any other evidence presented by any individual or group.

2. The best available science that related to the scientific issues presented by the executive officer, legal counsel, the Department or other parties that raise credible scientific issues.

   The accepted industry standards for the work proposed under this permit as regulated by Title 23 have been applied to the review of this permit.

3. Effects of the decision on the entire State Plan of Flood Control, and consistency of the proposed project with the Central Valley Flood Protection Plan as adopted by Board Resolution 2012-25 on June 29, 2012:

   This project has no adverse effects on facilities of the State Plan of Flood Control and is consistent with the Central Valley Flood Protection Plan. The project site will be managed and maintained to all applicable standards by Decker Island LLC.

   The Delta Stewardship Council, and its authorizing statutes, requires that any actions in the Delta be consistent with the Delta Plan. Based upon the completion of the Covered Action Checklist prepared by the Council, the project is exempt from being a Covered Action because there is no evidence that the burial of this cable will have either a substantial positive or negative impact on the achievement of one or both of the co-equal goals or the implementation of a government-sponsored flood control program to reduce risk to people, property, and State interests in the Delta, that is directly or indirectly caused by the project on its own or when the project's incremental effect is considered together with the impacts of other closely-related past, present, or reasonably foreseeable future projects.

4. Effects of reasonable projected future events, including, but not limited to, changes in hydrology, climate, and development within the applicable watershed:

   There will be no impacts to the proposed project from reasonable projected future events.

11.0 – STAFF RECOMMENDATION

Staff recommends that the Board:

1. Adopt the CEQA findings and approve the permit and direct staff to file a Notice of Determination with the State Clearinghouse.

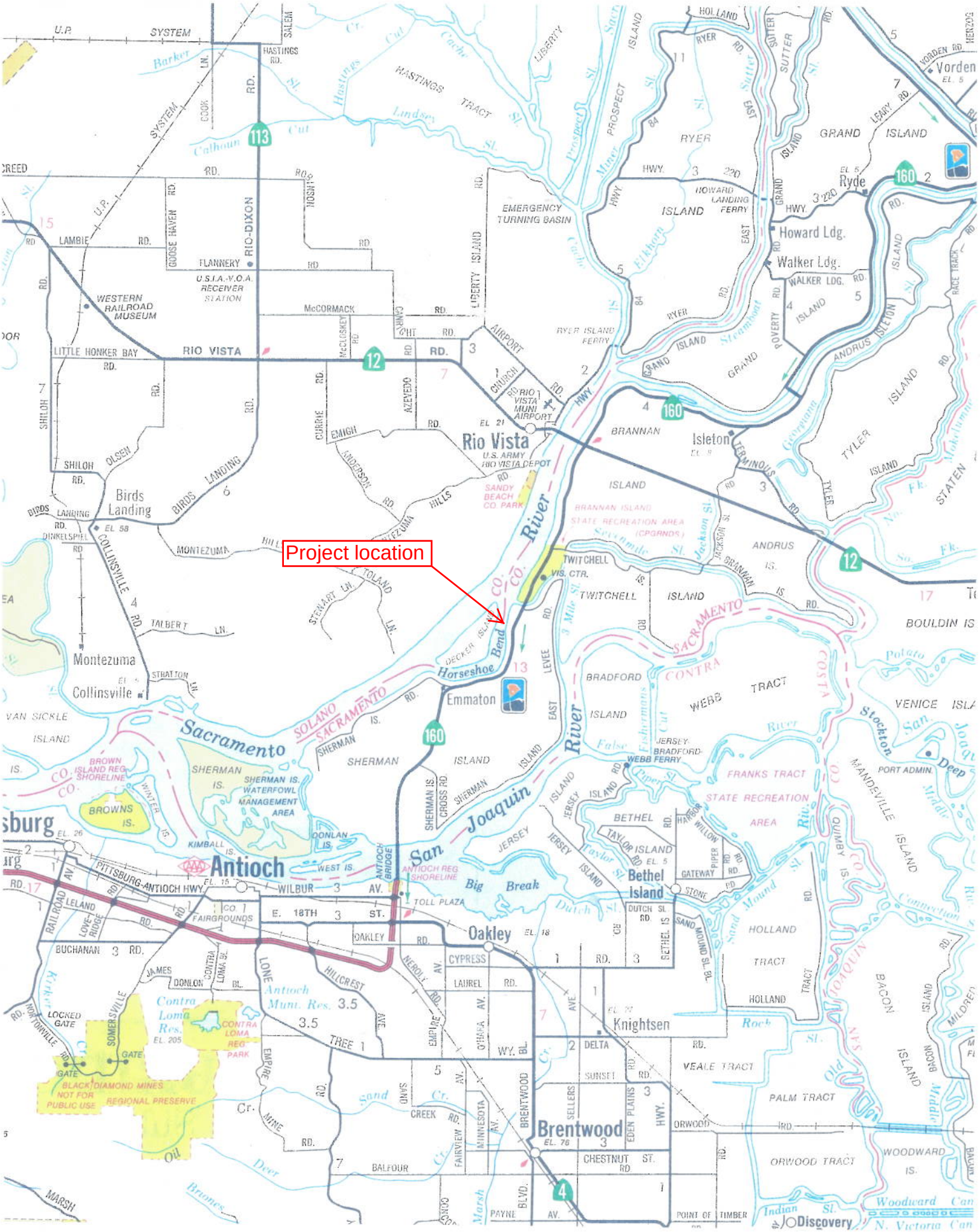
2. Direct the Executive Officer to take the necessary actions to execute the permit.

12.0 – LIST OF ATTACHMENTS

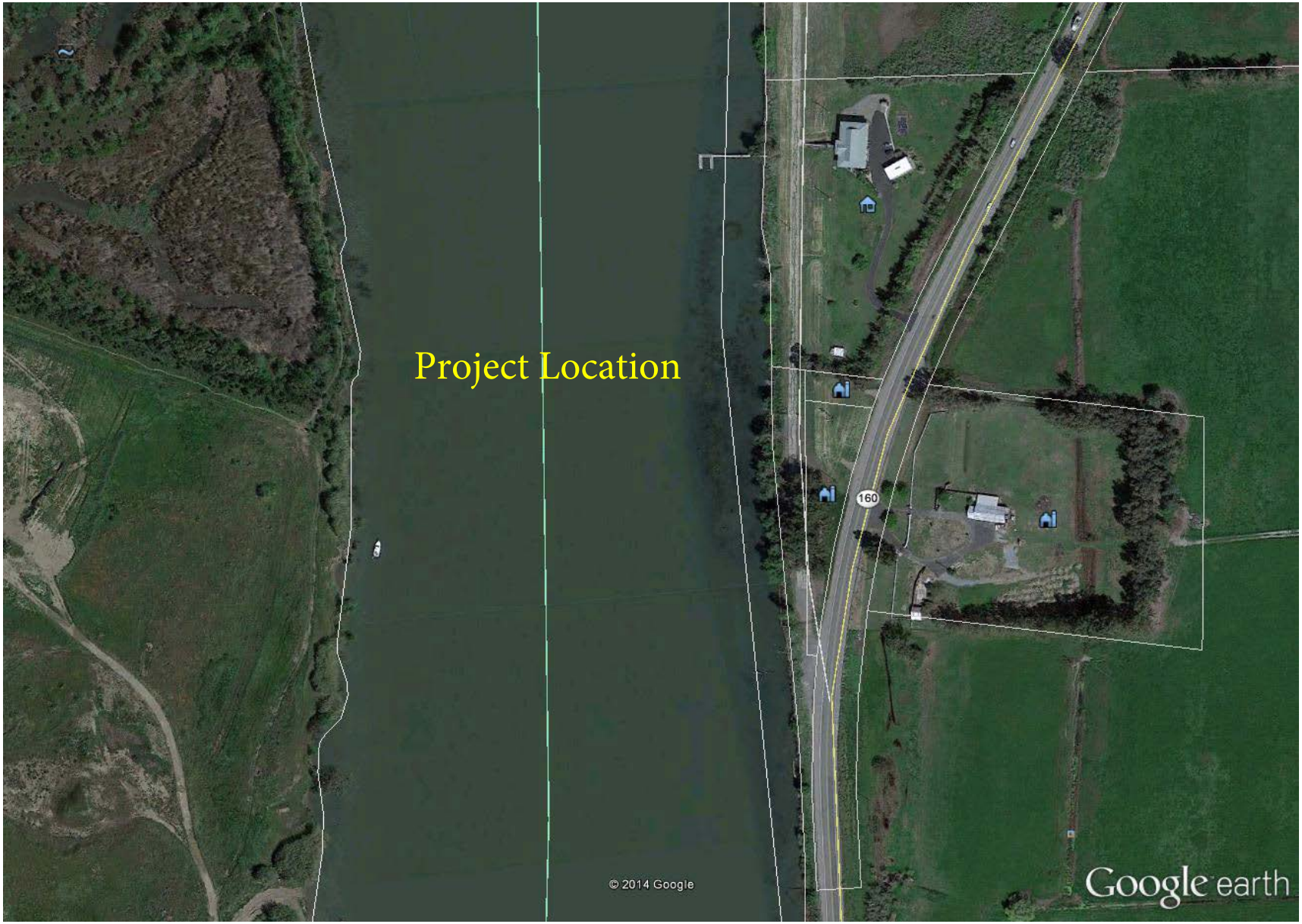
A. Location Maps and Photos
B. Draft Permit No. 18944 w/Exhibit A
C. Plans
D. District Endorsement
E. Scour Analysis

Design Review:	Sterling Sorenson WREA
Environmental Review:	Andrea Buckley, Senior Environmental Scientist
Document Review:	Mitra Emami P.E., Permitting Section Chief, Len Marino P.E., Chief Engineer
Legal Review:	Nicole Rinke, Counsel

Attachment A-1



Attachment A-2


Project Location
160
© 2014 Google
Google earth

Decker Island and Sherman Island PG&G Cable Alignment

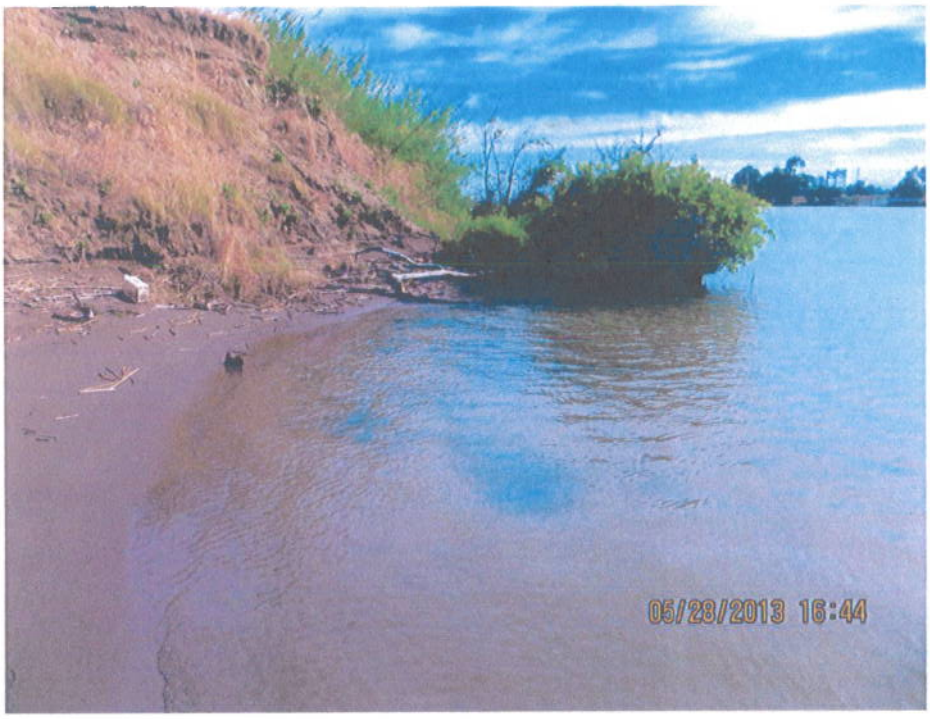


Figure 1. Decker Island.

Figure 2. Decker Island.

Figure 3. Decker Island.

Figure 4. Sherman Island

Figure 5. Sherman Island

DRAFT

STATE OF CALIFORNIA
THE RESOURCES AGENCY

THE CENTRAL VALLEY FLOOD PROTECTION BOARD

PERMIT NO. 18944 BD

This Permit is issued to:

Decker Island L.L.C.
12275 El Camino Real, Suite 110
San Diego, California 92130

To extend electrical cables buried across Sherman Island Flood Protection Levee, under the Sacramento Horseshoe Bend Channel floodway, and up onto Decker Island. The project is located slightly west of Highway 160 and crosses the Horseshoe Bend Channel to Decker Island in Solano County. (Section 13, T3N, R2E, MDB&M, Reclamation District 341, Sacramento River, Sacramento County).

NOTE: Special Conditions have been incorporated herein which may place limitations on and/or require modification of your proposed project as described above.

(SEAL)

Dated: _____

_____
Executive Officer

GENERAL CONDITIONS:

ONE: This permit is issued under the provisions of Sections 8700 – 8723 of the Water Code.

TWO: Only work described in the subject application is authorized hereby.

THREE: This permit does not grant a right to use or construct works on land owned by the Sacramento and San Joaquin Drainage District or on any other land.

FOUR: The approved work shall be accomplished under the direction and supervision of the State Department of Water Resources, and the permittee shall conform to all requirements of the Department and The Central Valley Flood Protection Board.

FIVE: Unless the work herein contemplated shall have been commenced within one year after issuance of this permit, the Board reserves the right to change any conditions in this permit as may be consistent with current flood control standards and policies of The Central Valley Flood Protection Board.

SIX: This permit shall remain in effect until revoked. In the event any conditions in this permit are not complied with, it may be revoked on 15 days' notice.

SEVEN: It is understood and agreed to by the permittee that the start of any work under this permit shall constitute an acceptance of the conditions in this permit and an agreement to perform work in accordance therewith.

EIGHT: This permit does not establish any precedent with respect to any other application received by The Central Valley Flood Protection Board.

NINE: The permittee shall, when required by law, secure the written order or consent from all other public agencies having jurisdiction.

TEN: The permittee is responsible for all personal liability and property damage which may arise out of failure on the permittee's part to perform the obligations under this permit. If any claim of liability is made against the State of California, or any departments thereof, the United States of America, a local district or other maintaining agencies and the officers, agents or employees thereof, the permittee shall defend and shall hold each of them harmless from each claim.

ELEVEN: The permittee shall exercise reasonable care to operate and maintain any work authorized herein to preclude injury to or damage to any works necessary to any plan of flood control adopted by the Board or the Legislature, or interfere with the successful execution, functioning or operation of any plan of flood control adopted by the Board or the Legislature.

TWELVE: Should any of the work not conform to the conditions of this permit, the permittee, upon order of The Central Valley Flood Protection Board, shall in the manner prescribed by the Board be responsible for the cost and expense to remove, alter, relocate, or reconstruct all or any part of the work herein approved.

SPECIAL CONDITIONS FOR PERMIT NO. 18944 BD

LIABILITY AND INDEMNIFICATION

THIRTEEN: The Central Valley Flood Protection Board, Department of Water Resources, and Reclamation District 341 shall not be held liable for any damage(s) to the permitted encroachment(s) resulting from release(s) of water from reservoirs, flood fight, operation, maintenance, inspection, or emergency repair.

FOURTEEN: The permittee is responsible for all liability associated with construction, operation, and maintenance of the herein permitted facilities and shall defend, indemnify, and hold the Central Valley Flood Protection Board and the State of California; including its agencies, departments, boards, commissions, and their respective officers, agents, employees, successors and assigns (collectively, the "State"), safe and harmless, of and from all claims and damages arising from the project undertaken pursuant to this permit, all to the extent allowed by law. The State expressly reserves the right to supplement or take over its defense, in its sole discretion.

FIFTEEN: The permittee shall defend, indemnify, and hold the Central Valley Flood Protection Board and the State of California, including its agencies, departments, boards, commissions, and their respective officers, agents, employees, successors and assigns (collectively, the "State"), safe and harmless, of and from all claims and damages related to the Central Valley Flood Protection Board's approval of this permit, including but not limited to claims filed pursuant to the California Environmental Quality Act. The State expressly reserves the right to supplement or take over its defense, in its sole discretion.

SIXTEEN: The permittee shall be responsible for repair of any damages to the project levee and other flood control facilities due to construction, operation, or maintenance of the proposed project.

PERMITTING AND AGENCY CONDITIONS

SEVENTEEN: The permittee shall comply with all conditions set forth in the letter from the Department of the Army (U.S. Army Corps of Engineers, Sacramento District) dated December 10, 2014 which is attached to this permit as Exhibit A and is incorporated by reference.

PRE-CONSTRUCTION

EIGHTEEN: The permittee shall contact the Central Valley Flood Protection Board by telephone, (916) 574-0609, and submit the enclosed postcard to schedule a conference concerning the issuance of this permit and its conditions. Failure to do so within 10 working days of receipt of this permit may result in adverse action by the Board.

NINETEEN: No construction work of any kind shall be done during the flood season from November 1st to April 15th without prior written approval of the Central Valley Flood Protection Board.

TWENTY: No excavation shall be made or remain in the levee section during the flood season from November 1st to April 15th.

TWENTY-ONE: A temporary bench mark, set to a known datum, shall be placed at the project site during construction.

CONSTRUCTION

TWENTY-TWO: All work approved by this permit shall be in accordance with the submitted drawings and specifications except as modified by special permit conditions herein. No further work, other than that approved by this permit, shall be done in the area without prior approval of the Central Valley Flood Protection Board.

TWENTY-THREE: Cleared trees and brush shall be completely burned or removed from the floodway, and downed trees or brush shall not remain in the floodway during the flood season from November 1st to April 15th.

TWENTY-FOUR: For installation of the cable above the waterline, said cable shall be placed in the center of an open trench 2 feet wider than the diameter of the cable or 2 times the diameter, whichever is greater.

TWENTY-FIVE: The invert of the cable through the levee section shall be 2 feet above the design flood plain elevation of 12.0 feet, U.S. Corps of Engineers Datum.

TWENTY-SIX: The cable shall be installed through the levee section at a right angle to the centerline of the levee.

TWENTY-SEVEN: The conduit shall be buried at least 12 inches below the levee slopes and 24 inches below the levee crown.

TWENTY-EIGHT: Backfill material for any/all excavations relative to this permit and being within the flood control project works that are above the water line, the backfill material for said excavations shall be of the same classification/type as excavated during construction. Said backfill material for excavations above the water line shall be placed in 4- to 6-inch layers and compacted to at least the density of the adjacent, firm, undisturbed material.

TWENTY-NINE: Density tests by a certified materials laboratory will be required to verify compaction of backfill within the levee section.

THIRTY: In the event existing rock revetment on the waterward slope is disturbed or displaced during construction, said revetment shall be restored to its preconstruction condition.

THIRTY-ONE: The permittee shall cover (plate) any/all trenches above the water line prior to the end of each work period and shall leave no open and/or unattended trenches above the water line at any time.

THIRTY-TWO: The fill surface area shall be graded to direct drainage away from the toe of the levee.

THIRTY-THREE: The paved roadway on the levee crown and levee slopes shall be restored to at least the condition that existed prior to commencement of work.

THIRTY-FOUR: Electrical lines over 24 volts installed through the levee section and within 10 feet of the levee toes shall be encased in Schedule 40 PVC conduit or equivalent.

THIRTY-FIVE: Udergground power cable warning signs shall be located at the landward levee toe, on the landward shoulder of the crown roadway and on the waterward shoulder of the crown roadway.

THIRTY-SIX: All debris generated by this project shall be properly disposed of outside the flood control project works.

THIRTY-SEVEN: The herein authorized power cable to be placed below the Sacramento River Horseshoe Bend Channel shall be buried with a minimum of 5 feet of cover.

POST-CONSTRUCTION

THIRTY-EIGHT: In the event that scour of channel bed injurious to facilities of the State Plan of Flood Control occurs at or adjacent to and as a result of the project, the permittee shall repair the eroded area and propose measures, to be approved by the Board, to prevent further erosion.

THIRTY-NINE: The permittee shall maintain the herein permitted encroachment(s) and the project works within the utilized area in the manner required and as requested by the authorized representative of the Department of Water Resources, Reclamation District 341 or any other agency responsible for maintenance.

PROJECT ABANDONMENT, CHANGE IN PLAN OF FLOOD CONTROL

FORTY: If the herein permitted encroachment(s), or any portion(s) thereof, is/are to be abandoned in the future, the permittee or successor shall abandon the encroachment(s) under direction of the Central Valley Flood Protection Board at the permittee's or successor's cost and expense.

FORTY-ONE: The permittee may be required, at permittee's cost and expense, to remove or alter all or any part of the herein permitted encroachment(s) if modification or alteration is necessary as part of or in conjunction with any present or future flood control plan or project or if damaged by any cause. If the permittee does not comply, the Central Valley Flood Protection Board may modify/remove the herein permitted encroachment at the permittee's expense.

FORTY-TWO: The mitigation measures approved by the CEQA lead agency and the permittee are found in its Mitigation and Monitoring Reporting Program (MMRP) adopted by the CEQA lead agency. The permittee shall implement all such mitigation measures.

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO CA 95814-2922

REPLY TO
ATTENTION OF

Flood Protection and Navigation Section (18944)

DEC 10 2014

Ms. Leslie M. Gallagher, Acting Executive Officer
Central Valley Flood Protection Board
3310 El Camino Avenue, Room 151
Sacramento, California 95821

Dear Ms. Gallagher:

We have reviewed a permit application by Decker Island L.L.C. (application number 18944). This project includes extending electrical cables buried across Sherman Island Flood Protection Levee, under the Sacramento Horseshoe Bend Channel floodway, and up onto Decker Island. This project is located slightly west of Highway 160, at 38.0994°N 121.7061°W NAD83, Solano County, California.

The District Engineer has no objection to approval of this application by your Board from a flood control standpoint, subject to the following conditions:

a. That no work shall be performed during the flood season of November 1 to April 15, unless otherwise approved in writing by your Board.

b. That the electrical cables shall be clearly marked in the field such that its location can be easily established in a flood event/emergency repair action.

c. That the invert of the cables through the levee section shall be above the design profile, which is referenced as 12.0 feet COE datum in the Sacramento River Flood Control Project, Levee and Channel Profiles, file number 50-10-3334, sheet 1 of 4, dated March 15, 1957.

d. That the levee slopes shall not be excavated for placement of the box for the electrical cables.

e. That the proposed electrical cables shall be covered by at least one foot of soil on the levee slopes.

f. That if it is necessary to raise the levee crown or slopes to provide the minimum cover, the fill shall be uniformly transitioned on a 1 on 10 slope or flatter on each side of the proposed pipe and feathered into the existing grade.

g. That the levee crest shall be restored using material obtained from the levee excavation, and compacted similar to the adjacent levee.

h. That the levee slope protection and levee crest access road shall be restored to the pre-construction conditions.

i. That the utility trench excavated on the landside of the levee toe shall be backfilled using material obtained from excavation and compacted to the same density as the adjacent undisturbed material.

j. That the proposed electrical cables shall be buried in the channel with a cover depth that is representative of industry standards, minimum depths found in guidance, and depths from the scour analysis.

k. That the proposed electrical cables shall remain buried across the channel and shall not become exposed.

A Section 404 permit (SPK-2013-00496) has been issued for this work.

A copy of this letter is being furnished to Mr. Don Rasmussen, Chief, Flood Project Integrity and Inspection Branch, 3310 El Camino Avenue, Suite 200, Sacramento, CA 95821.

Sincerely,

Rick L. Poeppelman, P.E.
Chief, Engineering Division

PRELIMINARY PLANS
FOR
PROPOSED PRIVATE CROSSING
SACRAMENTO RIVER

GENERAL NOTES:

1. APPLICANT/OWNER: DI AGGREGATE MANAGEMENT, LLC
   12275 EL CAMINO REAL, SUITE 110
   SAN DIEGO, CA 92130
   CONTACT: THOMAS FARRELL, JR

2. CIVIL ENGINEER: LJ CONSULTANTS, INC
   250 CHERRY LANE, SUITE 109
   MANTECA, CA 95337
   CONTACT: LISA SALAZAR, PE

3. BENCH MARK: USGS TIDAL 6: 0.1 MILE EAST ALONG LEVEE ROAD FROM SOUTHWEST END OF THE SHERMAN/BRANNAN ISLAND BRIDGE OVER THREE MILE SLOUGH, ON SHERMAN ISLAND, 47' SOUTHERLY FROM THE CENTERLINE ON THE LEVEE ROAD, IN THE TOP OF THE CONCRETE FOUNDATION FOR A POWER LINE FROM SHERMAN ISLAND TO BRANNAN ISLAND BRASS DISK ON THE NORTHWEST CORNER OF THE 4 LEGS OF THE TOWER READ "USGU NO. 6" ELEVATION: 7.1 FEET (NAVD 88 PER NGS DATA SHEET)

VICINITY MAP:

LJConsultants

250 CHERRY LANE, SUITE 109
MANTECA, CA 95337
(209) 823-5700

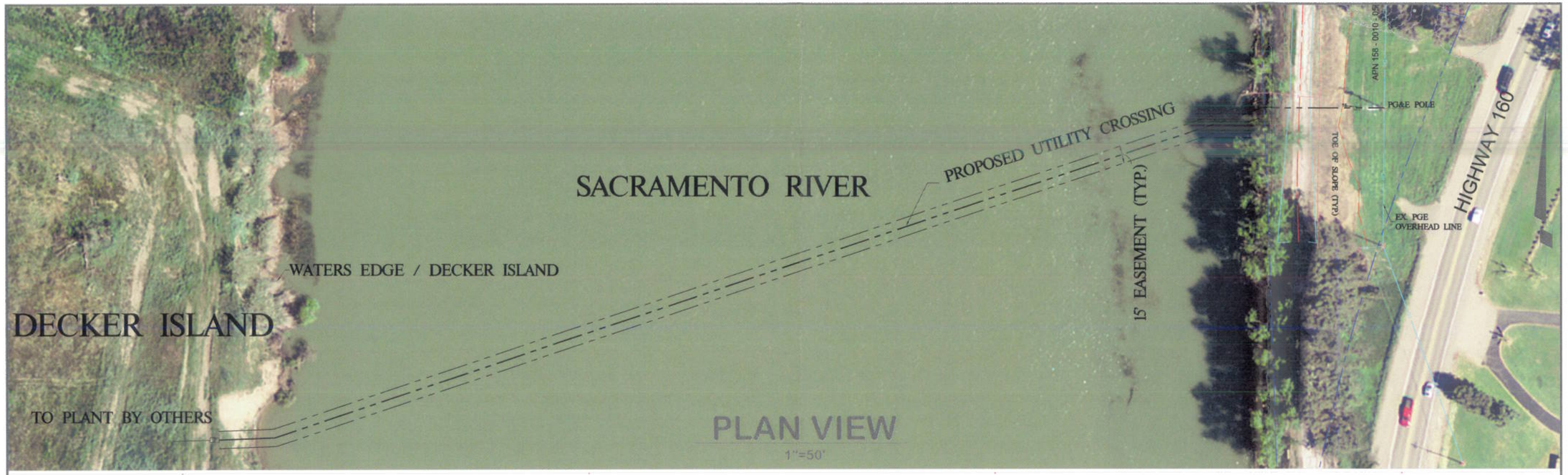
DECKER ISLAND — DI AGGREGATE MANAGEMENT
PRELIMINARY PLANS FOR
PROPOSED PRIVATE CROSSING SACRAMENTO RIVER
RIO VISTA — CALIFORNIA

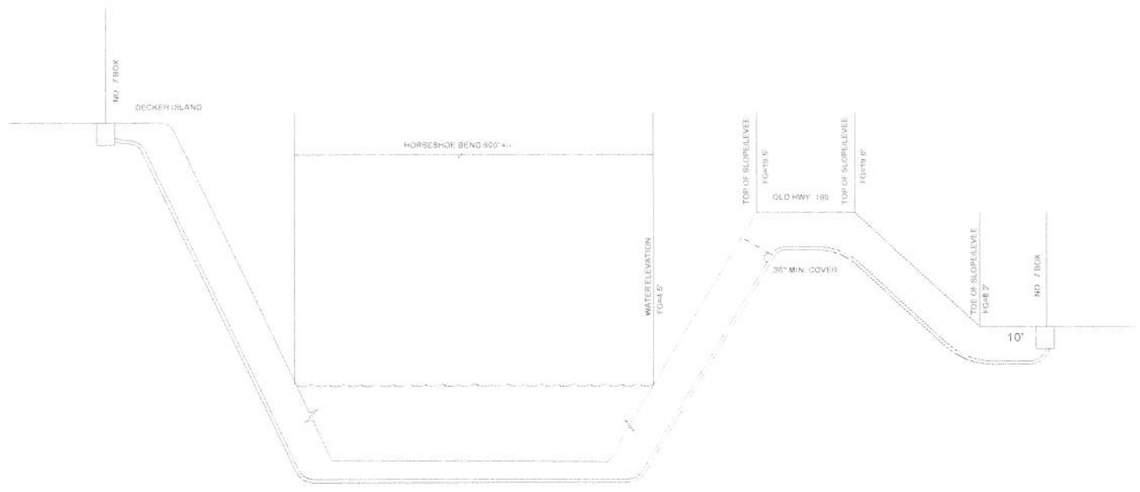
NO.	REVISIONS	BY	APP	DATE

DESIGNED UNDER THE DIRECTION OF:
LISA A. SALAZAR, PE — DATE
R.C.E. No. 53460 REGISTRATION EXPIRES: 06/30/15
DESIGN: LAS DATE: 1-24-14
DRAWN: LAS DATE: 1-24-14
CHECKED: LAS DATE: 1-24-14

REGISTERED PROFESSIONAL ENGINEER — LISA A. SALAZAR — 53460 EXP.6/30/15 — CIVIL — STATE OF CALIFORNIA

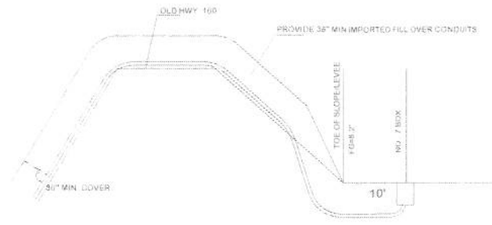
SHEET 1 OF 5 SHEETS





OPTION 'A'

SACRAMENTO RIVER CROSSING PROFILE
NO SCALE



OPTION 'B'

811 Know what's below. Call before you dig. or 1-800-227-2600

LJConsultants
250 CHERRY LANE, SUITE 109
MANTECA, CA 95337
(209) 823-5700

DECKER ISLAND — DI AGGREGATE MANAGEMENT

PRELIMINARY PLAN FOR
PROPOSED PRIVATE CROSSING SACRAMENTO RIVER

RIO VISTA — CALIFORNIA

NO.	REVISIONS	BY	APP	DATE

DESIGNED UNDER THE DIRECTION OF:
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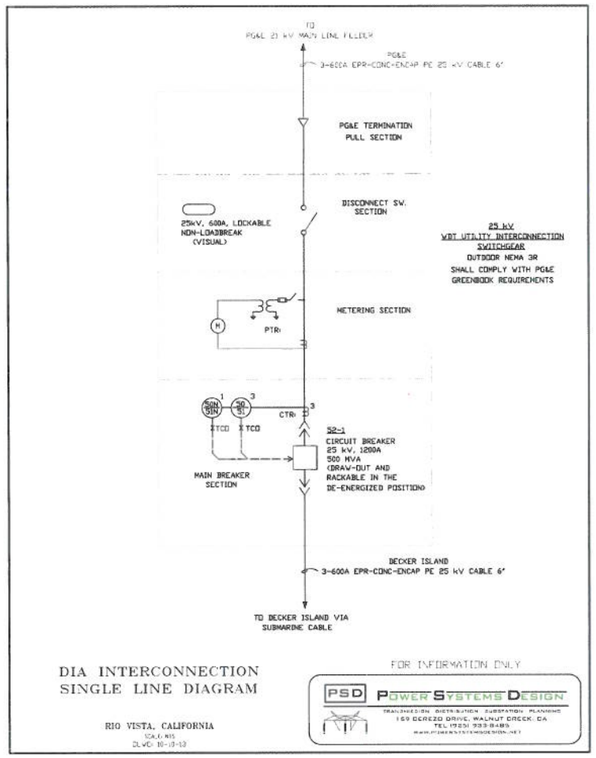
DESIGN: LAS DATE: 1-24-14
DRAWN: LAS DATE: 1-24-14
CHECKED: LAS DATE: 1-24-14

REGISTERED PROFESSIONAL ENGINEER — LISA A SALAZAR — 53460 EXP 6/30/15 — CIVIL — STATE OF CALIFORNIA

SHEET 2 OF 5 SHEETS



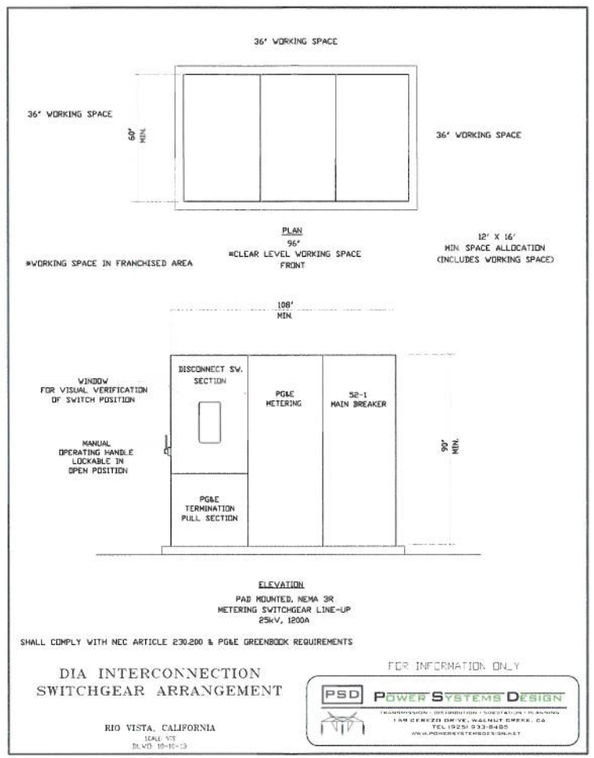
DIA INTERCONNECTION
SINGLE LINE DIAGRAM

RIO VISTA, CALIFORNIA

SCALE: NTS
DLVD: 10-10-13

FOR INFORMATION ONLY

PSD POWER SYSTEMS DESIGN
TRANSMISSION · DISTRIBUTION · SUBSTATION · PLANNING
159 DEREZO DRIVE, WALNUT CREEK, CA
TEL (925) 933-9485
WWW.POWERSYSTEMSDESIGN.NET



SHALL COMPLY WITH NEC ARTICLE 230.200 & PG&E GREENBOOK REQUIREMENTS

DIA INTERCONNECTION
SWITCHGEAR ARRANGEMENT

RIO VISTA, CALIFORNIA

SCALE: NTS
DLVD: 10-10-13

FOR INFORMATION ONLY

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TRANSMISSION · DISTRIBUTION · SUBSTATION · PLANNING
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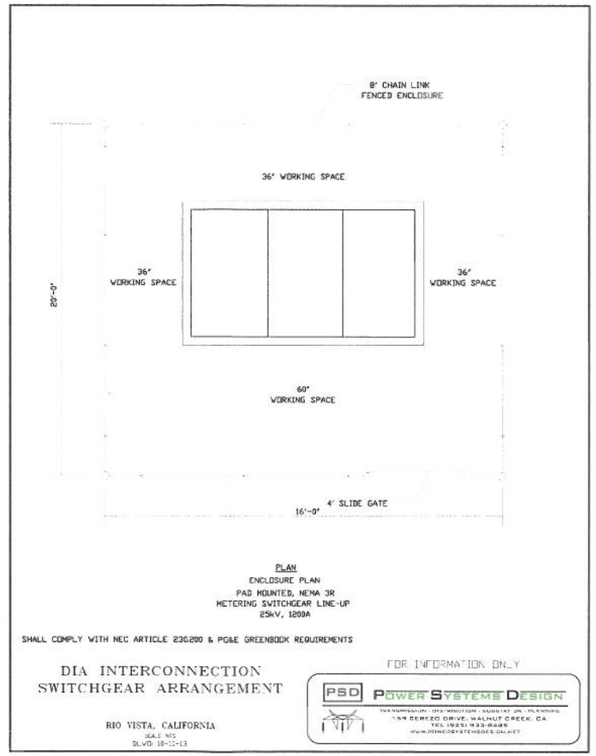

SHALL COMPLY WITH NEC ARTICLE 230.200 & PG&E GREENBOOK REQUIREMENTS

DIA INTERCONNECTION
SWITCHGEAR ARRANGEMENT

RIO VISTA, CALIFORNIA

SCALE: NTS
DLVD: 10-10-13

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WWW.POWERSYSTEMSDESIGN.NET

811
Know what's below.
Call before you dig.
or 1-800-227-2600

LJConsultants
250 CHERRY LANE, SUITE 109
MANTECA, CA 95337
(209) 823-5700

DECKER ISLAND — DI AGGREGATE MANAGEMENT

SINGLE LOAD DIAGRAM FOR
PROPOSED PRIVATE CROSSING SACRAMENTO RIVER

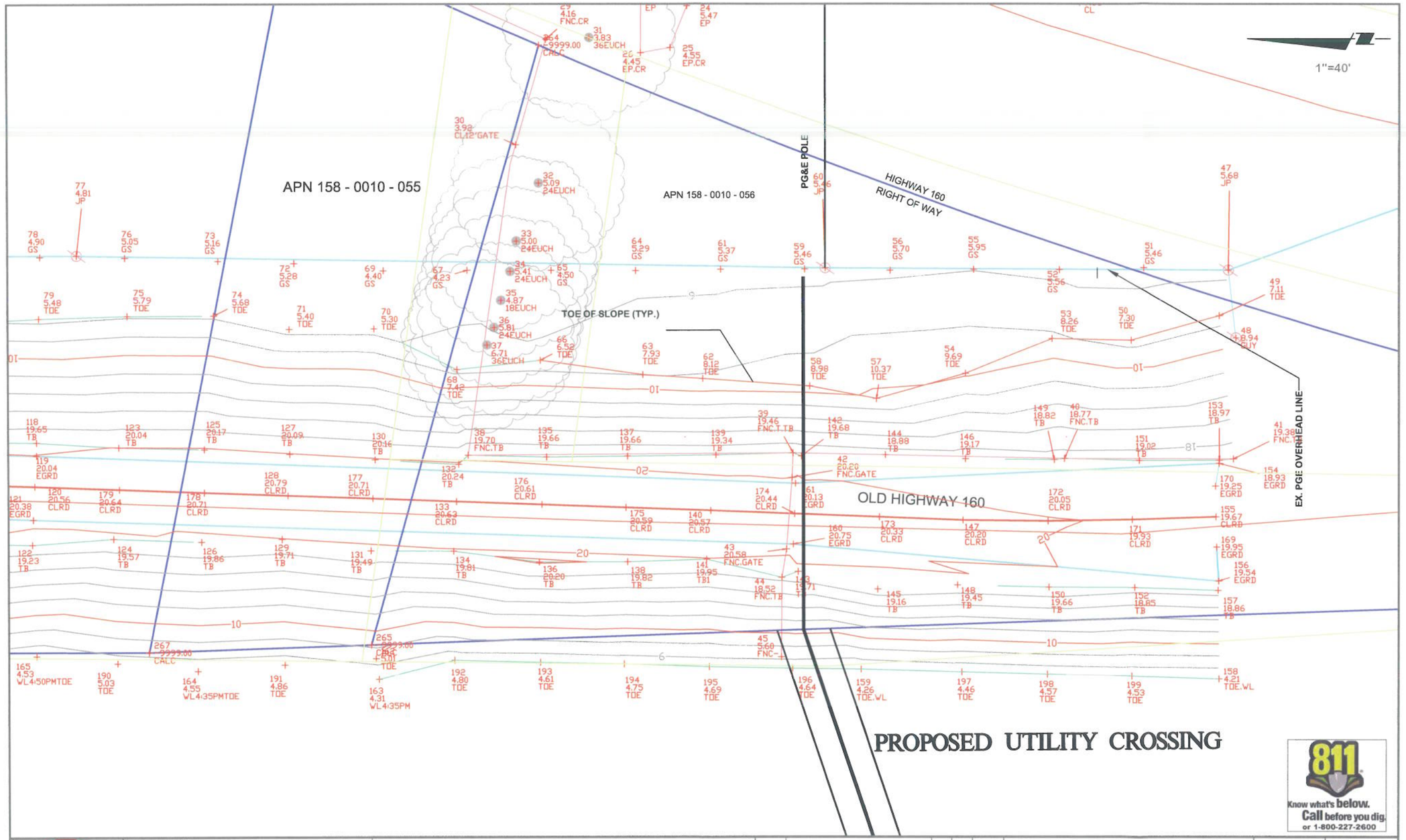
RIO VISTA — CALIFORNIA

NO.	REVISIONS	BY	APP.	DATE

DESIGNED UNDER THE DIRECTION OF:
LISA A. SALAZAR, PE
R.C.E. No. 53460 REGISTRATION EXPIRES: 08/30/15
DATE:
DESIGN: LAS DATE: 11-7-13
DRAWN: LAS DATE: 11-7-13
CHECKED: LAS DATE: 11-7-13

REGISTERED PROFESSIONAL ENGINEER
LISA A. SALAZAR
53460
EXP.8/30/15
CIVIL
STATE OF CALIFORNIA

SHEET 3 OF 5 SHEETS



811 Know what's below. Call before you dig. or 1-800-227-2600

LJConsultants

250 CHERRY LANE, SUITE 109
MANTECA, CA 95337
(209) 823-5700

DECKER ISLAND — DI AGGREGATE MANAGEMENT

PRELIMINARY PLAN FOR PROPOSED PRIVATE CROSSSING
SHERMAN ISLAND
TOPO EXHIBIT

RIO VISTA — CALIFORNIA

NO.	REVISIONS	BY	APP	DATE

DESIGNED UNDER THE DIRECTION OF

LISA A. SALAZAR, PE — DATE
R.C.E. No. 53480 REGISTRATION EXPIRES: 06/30/15

DESIGN: LAS — DATE: 1-24-14
DRAWN: LAS — DATE: 1-24-14
CHECKED: LAS — DATE: 1-24-14

REGISTERED PROFESSIONAL ENGINEER — LISA A. SALAZAR — 53480 EXP.6/30/15 CIVIL — STATE OF CALIFORNIA

SHEET 4 OF 5 SHEETS

NOTE: THIS EXHIBIT IS FOR INFORMATIONAL PURPOSES ONLY.
SURVEY DONE BY OTHERS AND NOT VERIFIED BY LJ CONSULTANTS, INC.

1"=40'

PROPOSED UTILITY CROSSING

TOE OF SLOPE

249+/-

26.6

PROPERTY LINE

23.4

22.7

21.1

24.1

21.8

22.6

DECKER ISLAND

7

811 Know what's below. Call before you dig. or 1-800-227-2600

LJ LJConsultants

250 CHERRY LANE, SUITE 109
MANTECA, CA 95337
(209) 823-5700

DECKER ISLAND — DI AGGREGATE MANAGEMENT

PRELIMINARY PLAN FOR PROPOSED PRIVATE CROSSSING
DECKER ISLAND
TOPO EXHIBIT

RIO VISTA — CALIFORNIA

NO.	REVISIONS	BY	APP	DATE

DESIGNED UNDER THE DIRECTION OF:
LISA A. SALAZAR, PE — DATE
R.C.E. No. 53460 REGISTRATION EXPIRES: 06/30/15

DESIGN: LAS DATE: 1-24-14
DRAWN: LAS DATE: 1-24-14
CHECKED: LAS DATE: 1-24-14

REGISTERED PROFESSIONAL ENGINEER — LISA A. SALAZAR — 53460 — DATE 6/30/13 — CIVIL — STATE OF CALIFORNIA

SHEET 5 OF 5 SHEETS

Attachment D

State of California | DEPARTMENT OF WATER RESOURCES
CENTRAL VALLEY FLOOD PROTECTION BOARD | California Natural Resources Agency

APPLICATION FOR A CENTRAL VALLEY FLOOD PROTECTION BOARD
ENCROACHMENT PERMIT

Application No. _____
(For Office Use Only)

1. Description of proposed work being specific to include all items that will be covered under the issued permit.

Extent Electrical Service as buried cable across Sherman Island Flood Protection Levee, under the Sacramento Horseshoe Bend Channel floodway, and up onto Decker Island.

2. Project Location: Sherman to Decker Is., Sacramento to Solano County, in Section Sacramento
Township: _____ (N) (S), Range: _____ (E) (W), M. D. B. & M.
Latitude: _____ Longitude: _____
Stream : _____ , Levee : Sherman Island Designated Floodway: Sacramento River
APN: 158-0010-056 Sac County

3. Decker Island L.L.C. (Name of Applicant / Land *Owner*) of 12275 El Camino Real, Suite 110 (Address)
San Diego (City) California (State) 92130 (Zip Code) (858) 523-1799 (Telephone Number)
pat@americancottages.com (E-mail)

4. Patrick Brown (Name of Applicant's Representative) of RRDC Inc. (Company)
Newport Beach (City) California (State) 92660 (Zip Code) (949) 553-0627 (Telephone Number)
pat@americancottages.com (E-mail)

5. Endorsement of the proposed project from the Local Maintaining Agency (LMA):

We, the Trustees of SHERMAN ISLAND RD 341 (Name of LMA) approve this plan, subject to the following conditions:

☐ Conditions listed on back of this form ☑ Conditions Attached ☐ No Conditions

Trustee _____ Date SEPT 9, 2014 | Trustee _____ Date

Trustee _____ Date | Trustee _____ Date

NO FEE PER GOV'T CODE 6203

RECORDING REQUESTED BY
AND
WHEN RECORDED MAIL TO:

RECLAMATION DISTRICT NO. 341
c/o WAGNER & BONSIGNORE
CONSULTING CIVIL ENGINEERS
2151 RIVER PLAZA DRIVE, SUITE 100
SACRAMENTO CA 95833

SPACE ABOVE THIS LINE FOR RECORDER'S USE

RECLAMATION DISTRICT NO. 341
ENCROACHMENT PERMIT NO. 140909

To:

Applicant: Decker Island LLC
12275 El Camino Real, Suite 110
San Diego, CA 92130

Landowner: William Siebert
18137 State Highway 160
Rio Vista, CA 94571

Permission is hereby granted to encroach upon the area of jurisdiction of Reclamation District No. 341 (hereafter, "District") in the following manner:

Install utility cable crossing through levee at approximate levee station 996+20

This permit is granted upon the following conditions which, by acceptance of this permit, permittee agrees to observe and perform:

1. All permit fees must be paid with submission of application. Permit fees are charged to defray a portion of District's administrative and inspection costs.

2. This permit shall be canceled and void unless work contemplated hereunder is initiated within 90 days from the date hereof and diligently prosecuted to completion. The District Engineer must be notified at least 3 days prior to the commencement of the permitted work.

3. The permittee shall indicate acceptance of this permit, and the terms and conditions thereof, by executing the form of acceptance on one copy of this permit and returning it to the District office. The permit shall not become effective until accepted and signed by the permittee.

4. Each and every recommendation and requirement set forth herein from the District's Engineer regarding the encroachment above described, shall be fully complied with.

5. The District's property, levees and other reclamation works are used, maintained and operated by the District for District purposes only, and not for any other purposes relating to any use or activity thereon that may be made under

this Permit. Permittee takes such District property and works in such condition as they may exist from time to time, and permittee shall be solely responsible for any personal injury, death or property damage occurring from activities arising out of or under this permit. Permittee agrees to defend, indemnify and hold harmless the District, its Trustees, officers, employees and agents from and against any liability which may be incurred through injury to person or damage to property resulting from or arising out of or connected with the construction, installation or use of the encroachment above described, and from any such liability arising out of or connected with the maintenance and operation of such encroachment, except where maintenance thereof is herein accepted by District.

6. Permittee will provide District with proof of liability insurance satisfactory to the District and an endorsement naming the District, its Trustees, officers, employees and agents as additional insureds, and maintain the same for as long as this encroachment permit continues in effect.

7. Permittee shall acquire no easement or property right in or to the property or right of way of the District by virtue of this permit and the District does not hereby relinquish any right or title therein.

8. Except as herein otherwise provided, all cost of maintenance and repair of the encroachment above described shall be borne by permittee. Permittee shall, whenever instructed by District to do so, repair such encroachment in the manner prescribed by District whenever District shall determine that such repair is required in the interest of District. Any such repair ordered by District which shall not have been performed by permittee within thirty (30) days after written notice has been given by District of such required repair may be performed by District, at permittee's expense and permittee shall promptly reimburse District therefor.

9. District reserves the right of access to the portion of its easement and right of way for such maintenance, repairs or alterations of District facilities or of the facilities described above as may be required for District purposes. District shall not be responsible for any damage done to improvements of permittee whether herein permitted or otherwise where necessary as part of the ordinary and necessary access to or exercise of District's easement and right of way for District purposes and need not replace any paving, black top or other improvement damaged or required to be removed in the process of such maintenance repair or alteration. Permittee shall reimburse District for any increased cost of such access or maintenance or repair occasioned by the improvements of permittee described herein.

10. Permittee may make no alteration or improvement of any portion of District's levee or its easement and right of way not specifically herein permitted nor alter or remove any portion of the encroachment or improvement herein described without further permit from District.

11. This permit is revocable in whole or in part by District on thirty (30) days written notice to permittee when such revocation is determined by Board of Trustees to be necessary for District purposes.

12. Upon the failure of permittee to conform to any of the terms and conditions herein specified this permit shall, at the option of District, cease and terminate and District may remove the encroachment or improvement above described together with any appurtenances thereto located within the easement and right of way of District and permittee shall promptly pay to District all costs and expenses incurred in such removal.

13. Permittee has complied with CEQA, and shall cause no adverse environmental impacts during the construction or installation of the encroachment described above.

14. Issuance of this encroachment permit does not relieve the permittee of his/her responsibility for obtaining any other permits required by federal, state or local statutes, or any right of entry from a private landowner.

15. Except as permitted by the terms of this encroachment permit, permittee shall comply with all District Regulations pertaining to Levees.

16. The terms and conditions hereof shall be binding upon the heirs, successors and assigns of the permittee

17. Special Conditions: Open trench will not be allowed to remain open overnight; open trench must be closed at the end of each work day. This requirement will extend through the levee prism and fifty (50') feet landward from the levee toe.

18. Special Conditions: Bottom of excavated utility trench to be above the 100 year base flood elevation at levee crest.

19. Special Conditions: Levee embankment material excavated during trench excavation to be used as backfill material. No granular material will be allowed as bedding under the conduit or as backfill through the levee

embankment, excavated material to be re-compacted in lifts not exceeding six inches (6") using mechanical pneumatic or vibratory compaction equipment. Material to be compacted to 95% of maximum density as determined by ASTM-D698-70.

20. Special Conditions: Landside levee embankment to be graded to smooth appearance and reseeded with vegetation to minimize erosion.

21. Special Conditions: Area landward of the levee toe to be graded to drain and sloped away from levee to prevent ponding

22. Special Conditions: Existing levee crown pavement removed during excavation of utility trench to be replaced with like kind material.

23. Special Conditions: Levee crest road shall be passable at the end of each day.

24. Special Conditions: Existing rip rap removed for construction to be replaced to the satisfaction of District engineer, unrecoverable rip rap lost during excavation of trench to be replaced with imported rip rap.

25. Special Conditions:

Dated: _____, 2014

RECLAMATION DISTRICT NO. 341

By: _____

ACCEPTANCE

Permittee and/or landowner hereby accepts the above permit and agrees to comply with all of the requirements thereof.

Dated: _____, 2014

PERMITTEE

By _____

LANDOWNER (if applicable)

By _____
William Siebert

PETERSON . BRUSTAD . INC
ENGINEERING . CONSULTING

TECHNICAL MEMORANDUM

Decker Island
Scour Analysis for Horseshoe Bend

Prepared for: Kjeldsen, Sinnock and Neudeck, Inc. *August 14, 2014*

Prepared by: Michael Rossiter, P.E.

Reviewed by: Dave Peterson, P.E.

1.0 INTRODUCTION

Decker Island is located near the downstream mouth of the Sacramento River in a tidal area about 15 miles upstream of Suisun Bay. It is surrounded by the main channel of the Sacramento River on its western side and by Horseshoe Bend on its eastern side (Figure 1). Horseshoe Bend is the site of a proposed electrical conduit crossing which would bring a PG&E line to a quarry on Decker Island. The electrical conduit is proposed to be buried 5-feet below the Horseshoe Bend channel bottom (Figure 2).

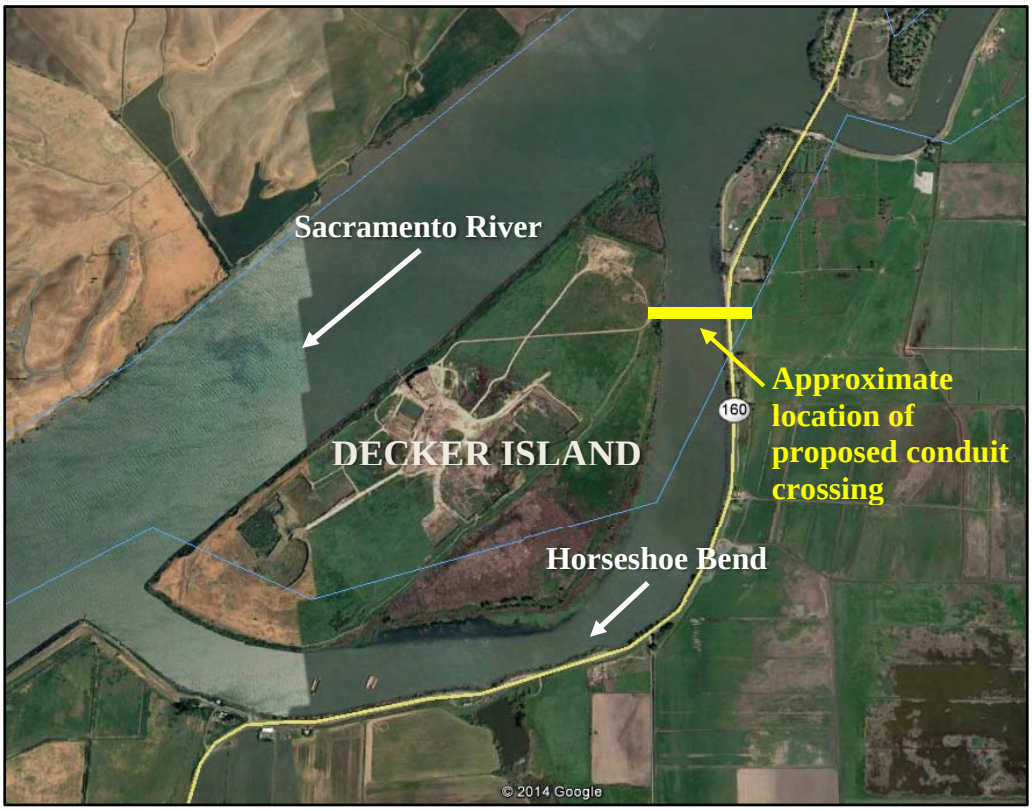


Figure 1. Study location.

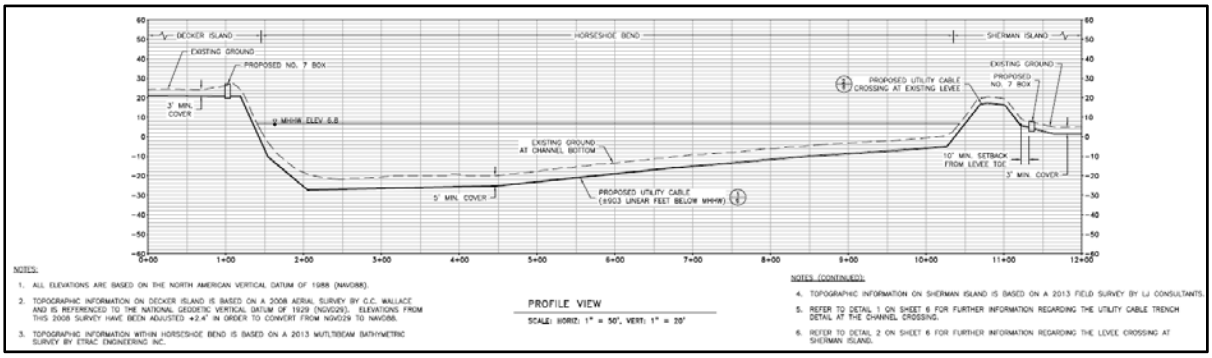


Figure 2. Cross section at proposed conduit crossing.

A basic scour analysis was completed to assess the scour potential at the proposed conduit crossing site in Horseshoe Bend for a 100-year design flow event. Specifically, general scour and bed form scour were analyzed.

General scour occurs in streams particularly during high flow events where particles are detached from the riverbed and transported downstream. The amount of particles detached, resulting in a certain scour depth, depends on the velocity and/or the volume of the flow, and on the grain size of the particles.

The general scour analysis included in this Technical Memorandum (TM) comes with the assumption and qualification that past or future dredging activities in the area will not cause head-cutting and will not affect the thalweg of Horseshoe Bend. Dredging plans and any affiliated head-cutting potential were not assessed for this analysis. However, based on discussions with KSN, Inc.: (a) the Horseshoe Bend channel geometry has demonstrated to be reasonably static, (b) no future dredging activities are expected within Horseshoe Bend, and (c) Horseshoe Bend is in an area where sediment deposition and aggradation typically occur. In addition, current and historical navigation charts were collected from the National Oceanic and Atmospheric Administration (NOAA) and are presented in this TM to document changes seen in the channel bottom of Horseshoe Bend over the years.

Bed form scour occurs as flow patterns form dunes and anti-dunes on the channel bottom. Anti-dunes are troughs that cut below the channel bed. Potential anti-dune depth was estimated for this analysis.

Many industry-standard methods are available for determining scour potential. Several of the available methods are presented in this TM to show a variety of results.

2.0 DATA SOURCES

As previously discussed, the primary data needed for a scour analysis include: channel bed material and grain size, flow/volumes for a design event, and stream flow velocities for a

design event. This section of the TM documents the sources of the data that are used and applied to the methods described later in the *Calculations and Analysis* section.

Channel Bed Material

Krazan and Associates, a geotechnical engineering company working with KSN, Inc. on the Decker Island study, classified channel bed material as primarily silty sands (Classification Code: SM). The median grain size (D_{50}) of this type of soil is typically estimated to be around 0.25 mm[1].

Flows and Velocities

The USACE developed the Common Features HEC-RAS model[2] which covers the entire Sacramento River system and has been widely used for planning and pre-design studies over the past several years. The model is well suited for this study as it includes 100-year simulations and has output available specifically for Horseshoe Bend. No other gaged data is available for flows and velocities within Horseshoe Bend. 100-year model output at the conduit crossing estimated flows and mean channel velocities at 37,500 cfs and 0.6 ft/sec, respectively.

Horseshoe Bend is a short, 2.8-mile reach that is bounded by the Sacramento River on both sides. Note that velocities are particularly low within Horseshoe Bend as it is not a free-flowing reach due to backwater resistance from the Sacramento River.

100-year Water Surface Elevation

Two sources of 100-year water surface elevation (WSEL) estimates were considered for the scour analysis. The USACE Common Features HEC-RAS model simulates the 100-year riverine flow event in the Sacramento River system and estimates the WSEL in Horseshoe Bend at 8.6-feet (NAVD88).

Because Horseshoe Bend is in an area that is highly influenced by tides, WSELs can also be estimated for 100-year high tide events. The USACE "Sacramento-San Joaquin Delta Special Study"[3] estimated the 100-year WSEL at 10.3-feet (NAVD88).

To remain conservative, the higher 100-year WSEL (10.3 feet NAVD88) was used in this analysis.

[1] USACE- Coastal Engineering Research Center. "Coastal Engineering Technical Note". CETN II-29. December 1991.
[2] USACE- Sacramento District. "Sacramento River Basin HEC-RAS Model Release 4 (NAVD'88 Version)". 4 June 2012.
[3] USACE-Sacramento District. "Sacramento-San Joaquin Delta Special Study". Hydrology Office Report, February 1992.

Flow depths and top widths are also needed for certain scour calculations. Channel geometry at the proposed conduit crossing was provided by KSN, Inc. and is shown in Figure 2. Topographic information within Horseshoe Bend is based on a 2013 multibeam bathymetric survey by Etrac Engineering, Inc. A 100-year WSEL of 10.3-feet (NAVD88) was assumed when calculating average flow depths and top widths.

3.0 CALCULATIONS & ANALYSIS

The parameters discussed in the previous section were applied to several industry-standard methods for assessing scour potential. The following is a presentation of results for each method:

USACE Permissible Channel Velocities

Source: USACE. "Hydraulic Design of Flood Control Channels". Engineering Manual 1110-2-1601.

As stated in USACE EM 1601, the following table "gives a set of permissible velocities that can be used as a guide to design nonscouring flood control channels".

Table 1. USACE suggested maximum permissible mean channel velocities (USACE EM 1601).

Suggested Maximum Permissible Mean Channel Velocities

Channel Material	Mean Channel Velocity, fps
Fine Sand	2.0
Coarse Sand	4.0
Fine Gravel[1]	6.0
Earth	
Sandy Silt	2.0
Silt Clay	3.5
Clay	6.0
Grass-lined Earth (slopes less than 5%)[2]	
Bermuda Grass	
Sandy Silt	6.0
Silt Clay	8.0
Kentucky Blue Grass	
Sandy Silt	5.0
Silt Clay	7.0
Poor Rock (usually sedimentary)	10.0
Soft Sandstone	8.0
Soft Shale	3.5
Good Rock (usually igneous or hard metamorphic)	20.0

Notes:
1. For particles larger than fine gravel (about 20 millimetres (mm) = 3/4 in.), see Plates 29 and 30.
2. Keep velocities less than 5.0 fps unless good cover and proper maintenance can be obtained.

Channel material at the study location consists of fine sand which has a permissible mean channel velocity of 2.0 feet/sec. 100-year design velocities within Horseshoe Bend are 0.6 feet/sec which is below the velocity limits recommended by USACE.

Laursen Critical Scour Velocity

Source: US Department of Transportation. "Evaluating Scour at Bridges, Fifth Edition". Federal Highway Administration. Publication No. FHWA-HIF-12-003, April 2012.

As stated in the above source document, the "erosion threshold" is often determined by calculating critical velocity. "Below this threshold, hydraulic conditions are mild enough such that erosion does not occur, whereas above this threshold, erosion occurs at rates that increase as the hydraulic conditions become more and more severe." The Laursen critical velocity is calculated as:

$$V_c = 11.17\, y^{1/6}\ {D_{50}}^{1/3} \qquad \text{(Eqn. 1)}$$

where:

V_c = critical velocity above which bed material of size D and smaller will be transported (ft/sec)
y = average depth of the flow (ft)
D_{50} = median particle size (ft)
K_U = 11.17 = Correction factor for English Units

y =	26.6	ft		
D_{50} =	0.25	mm	or	0.00082 ft
V_c =	**1.81**	**ft/sec**		

100-year velocities within Horseshoe Bend are 0.6 feet/sec which is below the calculated critical velocity.

Zeller General Scour

Source: State of Montana Department of Natural Resources and Conservation. Published Workshop on General Scour Calculations. Available at: *http://www.dnrc.mt.gov/wrd/water_op/floodplain/streambank_course/workshop3_general_scour.pdf.*

The Zeller general scour relationship is based on design flow depths and velocities as presented below.

$$y_{gs} = y_{max}\left[\frac{0.0685\,{V_m}^{0.8}}{{y_h}^{0.4}{S_e}^{0.3}} - 1\right], \text{ or 0, whichever is greater.} \qquad \text{(Eqn. 2)}$$

where:

y_{gs} = general scour depth (ft)
y_{max} = maximum depth of flow (ft)
V_m = average velocity of flow (ft/s)
y_h = hydraulic depth of flow (ft)
S_e = energy slope (E.G. Slope) (ft/ft)

y_{max} =		36.3	ft
V_m =		0.6	ft/sec
y_h =		26.6	ft
S_e =		0.000003	ft/ft (E.G. Slope calculated in HEC-RAS)
y_{gs} =		-16.11	therefore **y_{gs} = 0 -or- n/a**

Lacey & Blench General Scour Equations

Source: Natural Resources Conservation Service. "Technical Supplement 14B: Scour Calculations". National Engineering Handbook. August 2007.

The Lacey and Blench equations are also widely used and offer an alternate method for computing general scour. The input variables for these equations include flow (ft^3/sec) whereas the other methods in this TM rely directly on velocities (ft/sec).

The Lacey and Blench relationships are presented below and their results are averaged as suggested in the listed source document.

$$z_t = KQ_d^a W_f^b D_{50}^c \qquad \text{(Eqn. 3)}$$

where:

z_t	=	maximum scour depth at the cross section or reach in question, ft (m)
K	=	coefficient (table TS14B–8)
Q_d	=	design discharge, ft^3/s (m^3/s)
W_f	=	flow width at design discharge, ft (m)
D_{50}	=	median size of bed material (mm)
a, b, c	=	exponents (table TS14B–8)

BLENCH			**LACEY**		
K =	0.53		K =	0.097	
Q_d =	37,500	cfs	Q_d =	37,500	cfs
W_f =	875	ft	W_f =	875	ft
D_{50} =	0.25	mm	D_{50} =	0.25	mm
a =	0.667		a =	0.33	
b =	-0.667		b =	0.00	
c =	-0.1092		c =	-0.17	
z_t =	7.55	ft	z_t =	4.09	ft

AVERAGE: 5.82 FT

Bed Form Scour – Kennedy Anti-dune Equation

Source: U.S. Bureau of Reclamation. "Double Counting, Overconservative or Misapplication of Safety Factors for Stream Scour Scour Analyses". Presentation by David T. Williams, Ph.D., P.E., P.H., CFM. D.WRE (PBS&J). September 2006.

Bed form scour occurs as flow patterns form dunes and anti-dunes on the channel bottom. Anti-dunes can form troughs that cut below the original channel bed (Figure 3).

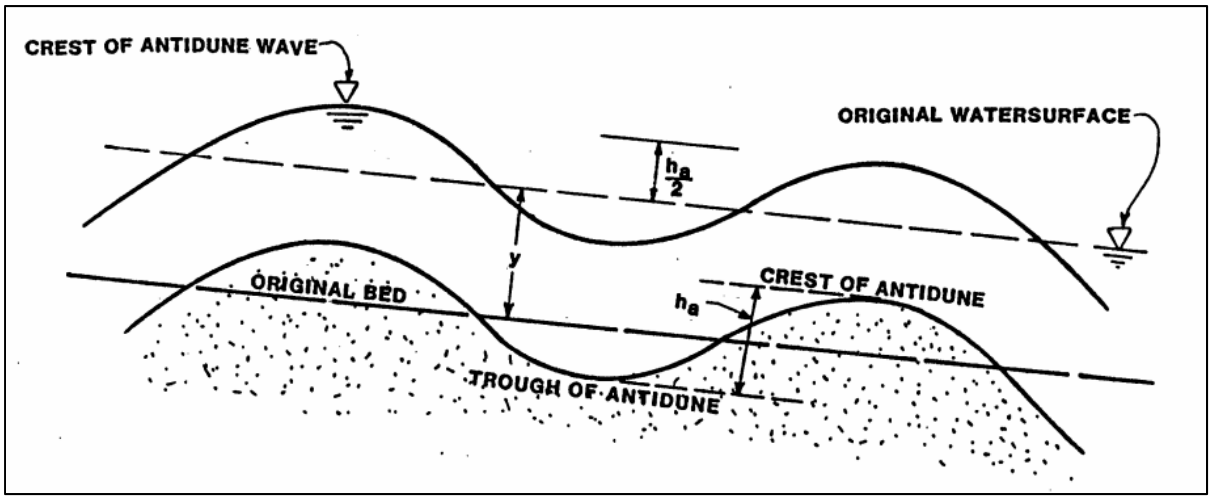


Figure 3. Illustration of bed form scour in the form of antidune troughs.

Potential anti-dune depth was estimated for this analysis. The Kennedy anti-dune equation is presented below:

$$h_a = 0.14 (2 \pi V^2) / g$$

$$= 0.027 V^2$$

$$y_s = ½ h_a$$

where:

y_s = bed form scour depth below original bed, (ft)
h_a = anti-dune height from crest to trough bed, (ft)
V = mean channel velocity (ft/s)
g = acceleration of gravity, (32.2 ft/s^2)

With a mean channel velocity of 0.6 ft/sec, the estimated bed form scour depth below the original channel bed is estimated at **0.005 feet**.

The formation of significant anti-dunes has not been seen within Horseshoe Bend in recent history as discussed in the following section.

4.0 HISTORICAL VARIATIONS IN THE HORSESHOE BEND CHANNEL BOTTOM

Current and historical navigational charts were collected from NOAA's Office of Coast Survey[4] to assess the historical changes seen to the channel bottom within Horseshoe Bend. All sounding depths listed on the charts are in feet and are based on the mean lower low WSEL. Charts were found dating back to 1948 and indicate that the Horseshoe Bend channel has generally been a site of sediment deposition and aggradation over the past 66 years.

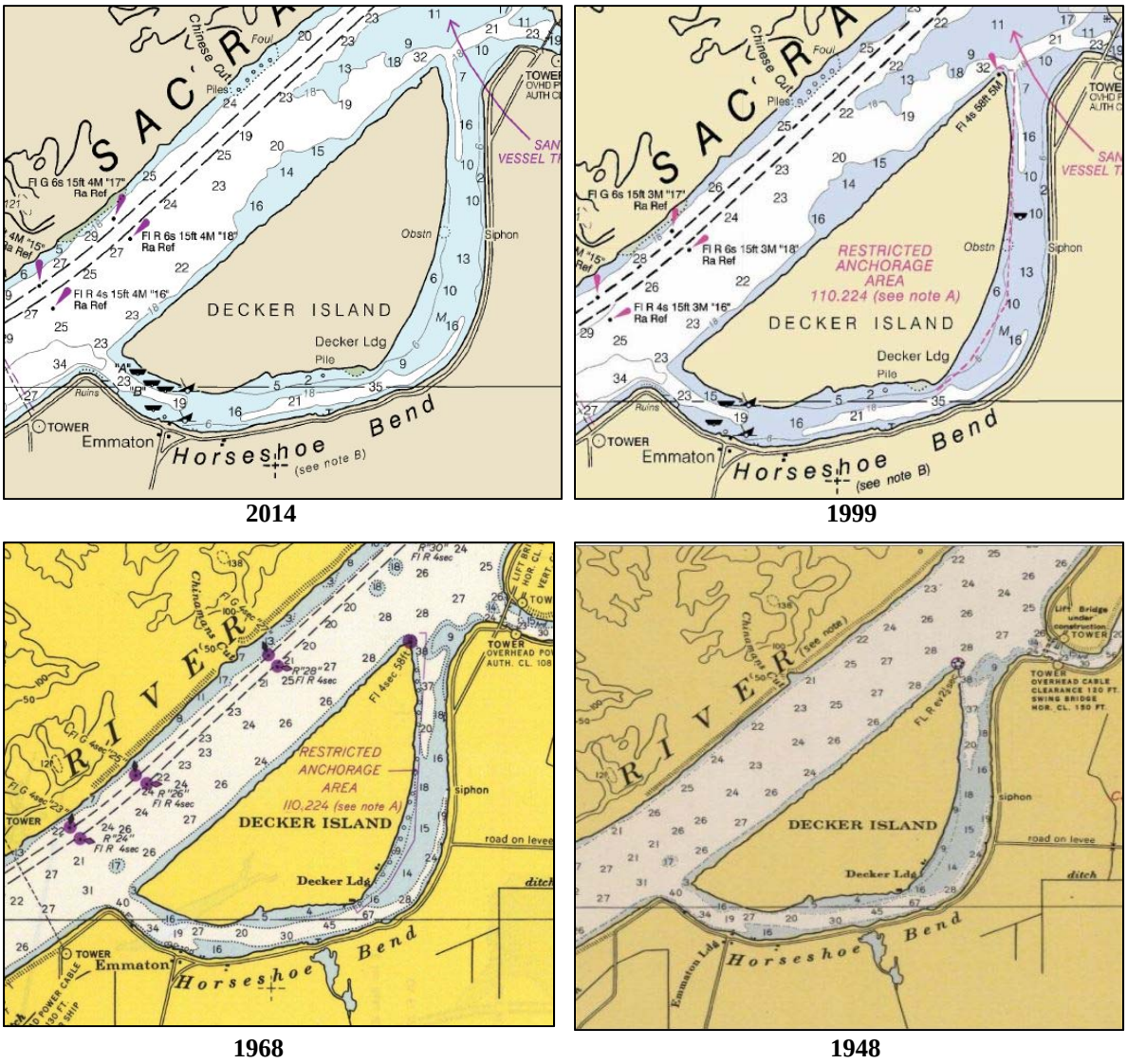


Figure 4. Current and historical NOAA navigational charts.

[4] NOAA Office of Coast Survey. "Historical Map and Chart Collection". < http://historicalcharts.noaa.gov>.

5.0 CONCLUSIONS

Several methods for assessing scour potential were presented in this TM and applied to the study location in Horseshoe Bend. Most methods estimated little or no scour would occur and showed that the 100-year flow velocities in Horseshoe Bend were less than the critical velocities needed to induce scour.

The Lacey and Blench regime equations are sensitive to high flow volumes in a channel and estimated higher scour potential. These equations may be overestimating scour for this particular situation as the study location in Horseshoe Bend has limited potential for flow velocities given the backwater pressures from the Sacramento River.

The scour analysis showed that, overall, scour potential at the conduit crossing site is minimal due to low flow velocities expected within Horseshoe Bend. As discussed previously, this analysis is valid only with the assumption that past or future dredging activities in the area will not cause head-cutting and will not affect the thalweg of Horseshoe Bend. Dredging plans and any affiliated head-cutting potential were not assessed for this analysis, however current and historical maps of the Horseshoe Bend channel bottom suggest that the study location is generally a site of sediment deposition and aggradation rather than a site of scouring and degradation.