

ADDENDUM NO. 1

DATE

July 6th, 2026

PROJECT

KNIGHTS LANDING RIDGE DRAINAGE DISTRICT – RIDGE CUT
EROSION REPAIR PROJECT PHASE 2

NOTICE TO PROSPECTIVE BIDDERS

THIS ADDENDUM FORMS A PART OF THE CONTRACT DOCUMENTS AND MODIFIES THE
ORIGINAL BIDDING DOCUMENTS DATED JUNE 2026, WITH AMENDMENTS AND ADDITIONS
NOTED BELOW.

ACKNOWLEDGE RECEIPT OF THIS ADDENDUM IN THE SPACE PROVIDED IN THE BID FORM AND
SIGNATURE LINE BELOW. FAILURE TO DO SO MAY DISQUALIFY THE BIDDER.

BIDDER'S ADDENDUM 1 RECEIPT SIGNATURE: _____

CHANGES TO VOLUME 1 – CONTRACT SPECIFICATIONS

REVISED TEXT WITH ADDING LANGUAGE, ADDING C-12 CONTRACTOR AS ACCEPTED LICENSE:

- PART 1 – BID DOCUMENTS
- INVITATION TO BID, SECTION 00 11 16
- SUPPLEMENTARY CONDITIONS, SECTION 00 73 00

REVISE TEXT TO CLARIFY BID ITEM 2.3 AND 2.5

- BID FORM, SECTION 00 41 00
- AGREEMENT FORM, SECTION 00 52 00
- PRICE AND PAYMENT, SECTION 01 22 00

REVISE TEXT TO REMOVE REFERENCE TO DISTRICT-FURNISHED MATERIAL. THERE IS NO DISTRICT FURNISHED MATERIAL.

- RIPRAP, SECTION 31 37 00

ADDED TEXT TO INCLUDE SUBGRADE PREPARATION

- AGGREGATE BASE COURSES, 32 11 23

CHANGES TO DRAWINGS

- G-002 CONSTRUCTION NOTES
- C-501 DETAILS

QUESTIONS AND ANSWERS FROM NON-MANDATORY PRE-BID SITE VISIT:

1. Can the contractor use water from the Ridge Cut as their water source?

Answer: The contractor is responsible finding their own water source, water may not be sourced from the Ridge Cut.

2. Are alternate access routes available?

Answer: There is currently only one access route available as described in the plans. Alternate access routes may be established via the nearby farmland, but the District will not be responsible for facilitating those agreements. Proof via letterhead of any agreements will be required prior to commencement of work.

3. What is the projected start date?

Answer: After August 1st, 2026 this is dependent on the water levels in the Ridge Cut.

ADDITIONAL MATERIALS:

The Project Storm Water Prevention Pollution Plan (SWPPP) has been provided in the contract permits section.

QUESTIONS AND ANSWERS FROM BID PERIOD:

1. Sheet C-001 references "Special Provisions, Section 1.12 - Traffic Control & Right-of-Way," but no Special Provisions document is included in the Project Manual (which uses CSI MasterFormat sections). Please provide the Special Provisions or confirm which traffic-control and right-of-way requirements govern.

Answer: Sheet G-002 has been updated.

2. Sheet C-001 requires the Contractor to repair damage to county/levee/access roads "at his expense" and disclaims any warranty on the adequacy of native material, while Bid Item 5 pays for aggregate base to "supplement the all-weather road" and Detail C-501 shows placing 4" AB. Please clarify which AB placement is paid under Bid Item 5 versus the Contractor's incidental, at-expense haul-road improvement and maintenance.

Answer: Bid item 2.3, which includes the AB placement on the levee crown road and staging area limits shown in sheets C-101 and C-102. Any damage that is outside of the staging area or any damage within the staging area that requires additional material and labor shall be at the expense of the Contractor.

Confirm this reference should be Bid Item 2.3 – Supplement all-weather levee crown road with aggregate base. There is no Bid Item 5.

3. On Sheet C-001 the "Haul Route" is drawn on the waterside slope between the top of RSP and the crown hinge, not on the crown all-weather road. (1) Please confirm the intended haul route - the levee crown road (the Class 2 AB all-weather road) - and clarify what the waterside line represents (a misplaced callout, or an equipment work/access bench). (2) This same waterside band between the top of RSP and the crown is the primary excavator work and access area for clearing/grubbing, any overexcavation, and RSP placement, and is the most disturbed ground on the project, yet it has no restoration specification or pay item. The crown is restored with Class 2 AB (Item 5) and the lower face with RSP (Item 4). The Regrade item (Item 7, 80,000 SF) scales to the upper and lower levee access roads and does not cover this band. Please confirm how the waterside work band is regraded, stabilized, and revegetated after construction, and identify the pay item that covers it (see related revegetation RFI).

Answer: 1) The haul route on sheet C-001 is a schematic of the haul route and the Contractor should use existing levee crown access road, and identified haul routes.

2) Bid Item 2.5 has been adjusted to a Lump Sum quantity, and includes restoration, regrading of disturbed areas.

There is no Bid Item 5 or Bid Item 7. This response assumes Bid Item 5 is referencing Bid Item 2.3. This response assumes Bid Item 7 is referencing Bid Item 2.5.

4. Instructions to Bidders Art. 8.01 requires Bid security of 10% of the maximum Bid price as a certified check, bank money order, or Bid bond, and Bid Form 00 41 00 Art. 7 lists "Required Bid security" as a Bid attachment, but no Bid Bond form is included in the Project Manual (no 00 43 13 or equivalent). Please confirm whether the District will issue a Bid Bond form, or whether the Bidder's surety standard Bid Bond form (e.g., AIA A310) is acceptable - in the penal sum of 10% of the maximum Bid, payable to the District, issued by a surety meeting General Conditions 6.01/6.02 (Treasury Circular 570 listed and California-licensed) with the attorney-in-fact's power of attorney attached.

Answer: The bidder is responsible for supplying the Bid Bond Form.

5. The riprap material is described three different ways: Bid Item 4 = "Caltrans Class III Rock Slope Protection"; Spec 31 37 00 defines a site-specific 18" quarry-stone gradation (300 lb max stone) with its own quality tests; and Detail C-501 calls it "(N) Riprap, min 24" thick" with no class. Please confirm the governing material specification and gradation for bidding.

Answer: The governing material for bidding the Riprap can be found in specification 31 37 00.

6. Spec 31 37 00 and the plans state the Contractor is "expected to utilize" District-furnished riprap, "subject to the same requirements as imported riprap." Please confirm the quantity, stockpile location(s), condition, and gradation of District-furnished stone so bidders can deduct it from imported supply.

Answer: There is no district-furnished material for this project.

7. Detail C-501 shows top of new riprap at elev. +/-30.0 with a Design Water Surface Elevation of +/-38.3 (riprap top roughly 8 ft below DWSE) and the key at mudline elev. +/-20.0. Please confirm the anticipated water-surface elevation during the permitted construction window, whether riprap is to be placed in the wet (underwater) or the channel dewatered/diverted, and identify the pay item for any dewatering or diversion.

Answer: The WSE is expected but not guaranteed to be at an elevation +/-20.0' during construction. There will be no dewatering efforts performed by the contractor.

8. The surveyed cross-sections (C-301 to C-304) show the riprap placed on the existing waterside slope at roughly 3:1 to 5:1, while NTS Detail C-501 shows a 1.5:1 repair face with a keyed toe. Please confirm whether the RSP is placed to conform to the existing slope (per the sections) or the bank is to be regraded/cut to 1.5:1 (per the detail). This determines rock quantity, slope earthwork, and the toe key configuration.

Answer: Riprap is to be placed at a minimum slope of 1.5:1 per the Detail 1 on Sheet C-501 and conform to the existing slope.

9. Please confirm that excavation of the 3'x3' keyway at the mudline and disposal of the (likely saturated) key-slot spoil are incidental to the riprap unit price, and provide the anticipated mudline material/condition (basis for differing-site-condition evaluation).

Answer: Disposal of spoils from the keyway are the contractor's responsibility and are incidental to the price of the riprap installation.

10. As a Phase 2 repair, please identify the extent of existing/previously-placed riprap to be rearranged and keyed into, and confirm that rearranging existing stone is incidental to the riprap unit price.

Answer: There is no previously placed riprap to be rearranged or keyed into from STA 0+00 to STA 19+00.

11. Spec 32 11 23 §3.04 references "Section 31 00 00 - Excavation and Fill" for the underlying course/subgrade, but that section is not included in the Project Manual. Please provide it or confirm the subgrade preparation requirements for the aggregate base.

Answer: Specification Section 32 11 23 has been updated to include verbiage for underlying course/subgrade preparation.

12. Detail C-501 shows 4" AB on the levee crown patrol road. Please confirm the stations/limits and total area of aggregate-base placement that correspond to the 533-ton bid quantity.

Answer: The aggregate-base placement and 533-ton bid quantity correspond to the levee crown and toe access roads within the staging area limits.

13. Detail C-501 directs clearing and grubbing of all vegetation in the riprap footprint and to "trim trees as necessary," while Specs 31 11 00 and 31 37 00 provide for preserving, trimming, and hand-placing riprap around trees the Engineer designates to remain. No trees are designated to remain or to be removed on the issued plans. Please confirm whether the existing waterline trees within Sta 0+00 to 19+00 are to be fully removed or specific trees retained; if retained, identify them on the plans and define the hand-placement limits. This affects Bid Items 3 and 4 and the schedule (nesting-bird / special-status windows).

Answer: The current plans do not call for the complete removal of any living waterside trees.

14. Neither Spec 31 11 00 nor 01 22 00 states a measurement method for the acre (AC) unit. Please confirm how the 1.7 AC is measured for payment (plan area versus field-directed).

Answer: The acreage payment measurement is intended to be field-directed.

15. Spec §3.05 requires grubbing to 18" below original ground in construction/paved areas. Please confirm whether the 18" grubbing depth applies to the waterside repair slopes that will receive riprap, or only to road/staging areas.

Answer: The 18" grubbing depth applies to both the riprap and staging areas.

16. Environmental (ESA) fencing has no detail or technical specification in the documents. Please provide the required fence type, height, material/fabric, post spacing, and signage.

Answer: The ESA fencing shall conform to Caltrans Standard 701.5 (1), *ESA and Species Protection Fences*.

17. The 401 Certification requires disturbed areas to be stabilized and revegetated with a California native seed mix, but there is no dedicated revegetation/hydroseed bid item. Please confirm whether revegetation/hydroseed is paid under Regrade (Item 7), SWPPP/BMP (Item 2), or as a separate item.

Answer: Stabilization/erosion control measures are to be implemented in accordance with the SWPPP and Item 12 of the Central Valley Regional Water Quality Control Board, 401 Water Quality Certification. Stabilization/erosion control measures are accounted for in Bid Item 1.2.

18. Please confirm the binding in-water work window and any giant garter snake / nesting-bird seasonal restrictions. These govern the 20-working-day Substantial Completion period and are not stated as specific dates in the documents.

Answer: Construction window will be August 1st through September 30th, 2026.

-- END OF ADDENDUM NO. 1 --

SECTION 00 11 16
INVITATION TO BID – Addendum 1

Interested Bidders are invited to submit a Sealed Bid to Knights Landing Ridge Drainage District for the construction of the following Project:

Knights Landing Ridge Cut Erosion Repair Project – Phase 2

Between Levee Stations:

Station 0+00 to Station 19+00

Knights Landing, California

Job No. 2166-0110

Bids are to be received at the office of the Kjeldsen, Sinnock & Neudeck, Inc., located at 1550 Harbor Blvd, Suite 212, West Sacramento, CA 95691, until 2:00 p.m. on Thursday July 9th, 2026, at which time the Bids received will be publicly opened and read. The Project consists of constructing:

Erosion repairs along the east ridge cut levee located between levee station 0+00 and station 19+00 on approximately 1,900 linear feet of eroded levee slopes by furnishing and placing approximately 3,300 tons of 18-inch minus quarry stone riprap.

Bids will be received for a single prime Contract. Bids shall be on a unit price basis.

The Issuing Office for the Bidding Documents is as follows:

Kjeldsen, Sinnock & Neudeck, Inc.

1550 Harbor Blvd Suite 212

West Sacramento, CA 95691

Phone: (916) 403-5908

Prospective Bidders may obtain copies of the Bidding Documents from the Issuing Office as described below.

Electronic Bidding documents may be obtained at the office of the District's Engineer, Kjeldsen, Sinnock & Neudeck, Inc., 1550 Harbor Blvd Suite 212, West Sacramento, CA 95691 by contacting Gus Rowan (arowan@ksninc.com) at (916) 403-5900, ext. 213.

The date that the Bidding Documents are transmitted by the Issuing Office will be considered the Bidder's date of receipt of the Bidding Documents.

Neither Owner nor Engineer will be responsible for full or partial sets of Bidding Documents, including Addenda if any, obtained from sources other than the Issuing Office.

Bidders shall be skilled, regularly engaged and licensed in the general class or type of work specified and possess a valid California Class "A" or "C-12" Contractor's License.

In accordance with the provisions of the State of California Labor Code §1770 et seq., the Director of the Department of Industrial Relations (DIR) has ascertained the general prevailing rate of wages applicable to the Work to be done. Bidders shall be registered with the DIR pursuant to Labor Code §1725.5 to be qualified to bid on or engage in the performance of work under this Contract. These requirements extend to all Subcontractors to be listed on a bid proposal or engage in the performance of work under this Contract.

Bidders shall submit proof of qualifications to perform the Work as described in the Instructions to Bidders.

Bid security shall be furnished in accordance with the Instructions to Bidders.

Technical, construction, and Project inquiries and questions should be directed to Augustus Rowan (eramos@ksninc.com) at (916) 403-5908.

Estimated cost of project construction is \$447,000.

District Engineer:

Barry O'Regan, P.E.

Kjeldsen, Sinnock & Neudeck, Inc.

1550 Harbor Blvd. Suite 212

West Sacramento, California 95691

Dated: June 3rd, 2026

END OF SECTION

SECTION 00 41 00
BID FORM – Addendum 1

PROJECT NAME:

- Knights Landing Ridge Cut Erosion Repair Project – Phase 2
- Between Levee Stations:
- Station 0+00 to Station 19+00

ARTICLE 1 - BID RECIPIENT

1.01 This Bid is submitted to:

Kjeldsen, Sinnock & Neudeck, Inc.
 1550 Harbor Blvd, Suite 212
 West Sacramento, CA 95691
 Phone: (916) 403-5908

- 1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with District in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 - BIDDER'S ACKNOWLEDGEMENTS

- 2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of District.

ARTICLE 3 - BIDDER'S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

- A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents, and hereby acknowledges receipt of the following Addenda:
- | | |
|-----------------------|-------------------------|
| 1. Addendum No. _____ | Bidder's Initials _____ |
| 2. Addendum No. _____ | Bidder's Initials _____ |
| 3. Addendum No. _____ | Bidder's Initials _____ |
| 4. Addendum No. _____ | Bidder's Initials _____ |
| 5. Addendum No. _____ | Bidder's Initials _____ |
- B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
- C. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work.
- D. Bidder has carefully studied all:
1. reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.
- E. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and any Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information,

observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs.

- F. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.
- G. Bidder is aware of the general nature of work to be performed by District and others at the Site that relates to the Work as indicated in the Bidding Documents.
- H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents and confirms that the written resolution thereof by Engineer is acceptable to Bidder.
- I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.
- J. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.
- K. Bidder, and any Subcontractors listed on the Bid Form or that otherwise engage in the performance of work under this Contract, are registered with the Department of Industrial Relations pursuant to State of California Labor Code §1725.5.

ARTICLE 4 - BIDDER'S CERTIFICATION

4.01 Bidder certifies that:

- A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:
 - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;
 - 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of District, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive District of the benefits of free and open competition;
 - 3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of District, a purpose of which is to establish bid prices at artificial, non-competitive levels; and
 - 4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

ARTICLE 5 - BASIS OF BID

5.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

- A. For all Work, an amount equal to the sum of the extended prices (established for each separately identified item of Unit Price Work by multiplying the unit price times the actual quantity of that item):

1. Schedule 1:

Item	Description	Unit	Estimated Quantity	Unit Cost	Total
1 GENERAL REQUIREMENTS					
1.1	MOBILIZATION/DEMobilize	LS	1.0		
1.2	SWPPP/BMP IMPLEMENTATION	LS	1.0		
2 SITE WORK					
2.1	CLEARING, GRUBBING AND TREE TRIMMING	AC	1.7		
2.2	PLACE CALTRANS CLASS III ROCK SLOPE PROTECTION MATERIAL	TONS	3,306		
2.3	SUPPLEMENT ALL-WEATHER LEVEE CROWN ROAD WITH AGGREGATE BASE	TONS	533		
2.4	INSTALL ESA FENCING	LF	2,000		
2.5	REGRADE LEVEE AND ACCESS ROADS AFTER CONSTRUCTION	LS	1.0		
TOTAL ACCEPTED BID PRICE					

Bidder acknowledges that (1) each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and (2) estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all unit price Bid items will be based on actual quantities, determined as provided in the Contract Documents.

ARTICLE 6 - TIME OF COMPLETION

6.01 Bidder agrees that the Work will be substantially complete within 20 working days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within 30 working days after the date when the Contract Times commence to run.

6.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7 - ATTACHMENTS TO THIS BID

7.01 The following documents are submitted with and made a condition of this Bid:

- A. Required Bid security.
- B. The following supplement(s) to the Bid Form are considered an integral part of the Bid Form. Bidder has acknowledged each supplement with Bidder's name and initials at the bottom of each supplement.
 - 1. Section 00 43 36 - Proposed Subcontractors Form
 - 2. Section 00 43 37 - Public Contract Code Section 10162 Questionnaire Form
 - 3. Section 00 43 40 - Noncollusion Declaration Form

ARTICLE 8 - DEFINED TERMS

8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 9 - BID SUBMITTAL

9.01 This Bid is submitted by:

Bidder Name: _____

Signature: _____

Print Name: _____

Title: _____

Date: _____

(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)

California Contractor's DIR Registration Number:

California Contractor's License Number and Expiration Date:

Address for giving notices (postal and e-mail):

Telephone Number:

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END OF SECTION

SECTION 00 52 00
AGREEMENT FORM – Addendum 1

Contract No. XXXX-XX-XX-XX-XX

THIS AGREEMENT is by and between Knights Landing Ridge Drainage District (hereinafter called "District") and To Be Determined (hereinafter called "Contractor"). District and Contractor hereby agree as follows.

ARTICLE 1 - THE PROJECT

- 1.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows:

Knights Landing Ridge Cut Erosion Repair Project – Phase 2
Between Levee Stations:
Station 0+00 to Station 19+00

ARTICLE 2 - WORK

- 2.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

Erosion repairs along the east ridge cut levee located between levee station 0+00 and station 19+00 on approximately 1,900 linear feet of eroded levee slopes by furnishing and placing approximately 3,300 tons of 18-inch minus quarry stone riprap.

ARTICLE 3 - ENGINEER

- 3.01 The Project has been designed by Kjeldsen, Sinnock & Neudeck, Inc.
- 3.02 District has retained Kjeldsen, Sinnock & Neudeck, Inc. (hereinafter called "Engineer") to act as District's representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 4 - CONTRACT TIMES

- 4.01 Time of the Essence

A. All time limits for Substantial Completion and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

- 4.02 Contract Times: Days

- A. The Work will be substantially completed within 20 working days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions.
- B. The Work will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within 30 working days after the date when the Contract Times commence to run.

- 4.03 Liquidated Damages

- A. Contractor and District recognize that time is of the essence as stated in Paragraph 4.01 above and that District will suffer financial and other losses if the Work is not completed and Milestones not achieved within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with the Contract. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by District if the Work is not completed on time. Accordingly, instead of requiring any such proof, District and Contractor agree that as liquidated damages for delay (but not as a penalty):

1. Substantial Completion: Contractor shall pay District \$500 for each working day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 4.02.A above for Substantial Completion until the Work is substantially complete.
2. Completion of Remaining Work: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay District \$500 for each working day that expires after such time until the Work is completed and ready for final payment.
3. Liquidated damages for failing to timely attain Substantial Completion and final completion are not additive and will not be imposed concurrently.

ARTICLE 5 - CONTRACT PRICE

5.01 District shall pay Contractor for completion of the Work in accordance with the Contract Documents the amounts that follow, subject to adjustment under the Contract:

- A. For all Work, an amount equal to the sum of the extended prices (established for each separately identified item of Unit Price Work by multiplying the unit price times the actual quantity of that item):

1. Schedule 1:

Item	Description	Unit	Estimated Quantity	Unit Cost	Total
1 GENERAL REQUIREMENTS					
1.1	MOBILIZATION/DEMOBILIZE	LS	1.0		
1.2	SWPPP/BMP IMPLEMENTATION	LS	1.0		
2 SITE WORK					
2.1	CLEARING, GRUBBING AND TREE TRIMMING	AC	1.7		
2.2	PLACE CALTRANS CLASS III ROCK SLOPE PROTECTION MATERIAL	TONS	3,306		
2.3	SUPPLEMENT ALL-WEATHER LEVEE CROWN ROAD WITH AGGREGATE BASE	TONS	533		
2.4	INSTALL ESA FENCING	LF	2,000		
2.5	REGRADE AND RESTORE LEVEE AND-DISTURBED AREAS AND ALL ACCESS ROADS AFTER CONSTRUCTION	LS	1.0		
TOTAL ACCEPTED BID PRICE					

The extended prices for Unit Price Work set forth as of the Effective Date of the Contract are based on estimated quantities. As provided in Paragraph 13.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by Engineer.

ARTICLE 6 - PAYMENT PROCEDURES

6.01 Submittal and Processing of Payments

- A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 Progress Payments; Retainage

- A. District shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the 30th day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.
 - 1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as District may withhold, including but not limited to liquidated damages, in accordance with the Contract
 - a. 95 percent of Work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to District and Engineer, then as long as the character and progress of the Work remain satisfactory to District and Engineer, there will be no additional retainage; and
 - b. 95 percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).
- B. Upon Substantial Completion, District shall pay an amount sufficient to increase total payments to Contractor to 95 percent of the Work completed, less such amounts set off by District pursuant to Paragraph 15.01.E of the General Conditions, and less 150 percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

6.03 Final Payment

- A. Upon final completion and acceptance of the Work in accordance with Paragraph 15.06 of the General Conditions, District shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 15.06.

ARTICLE 7 - (NOT USED)

ARTICLE 8 - CONTRACTOR'S REPRESENTATIONS

8.01 In order to induce District to enter into this Contract, Contractor makes the following representations:

- A. Contractor has examined and carefully studied the Contract Documents, and any data and reference items identified in the Contract Documents.
- B. Contractor has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
- C. Contractor is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.
- D. Contractor has carefully studied all:
 - 1. reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.
- E. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the

means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (3) Contractor's safety precautions and programs.

- F. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
- G. Contractor is aware of the general nature of work to be performed by District and others at the Site that relates to the Work as indicated in the Contract Documents.
- H. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
- I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
- J. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

ARTICLE 9 - CONTRACT DOCUMENTS

9.01 Contents

- A. The Contract Documents consist of the following:
 - 1. This Agreement
 - 2. Performance bond
 - 3. Payment bond
 - 4. Section 00 72 00 - General Conditions
 - 5. Section 00 73 00 - Supplementary Conditions
 - 6. Section 00 73 19 - Drug-Free Workplace Policy
 - 7. Specifications as listed in the table of contents of the Project Manual.
 - 8. Drawings as listed in the table of contents of the Project Manual.
 - 9. Addenda (numbers 1 to ____, inclusive).
 - 10. Exhibits to this Agreement (enumerated as follows):
 - a. Contractor's Bid
 - 1) Section 00 41 00 - Bid Form
 - 2) Section 00 43 36 - Proposed Subcontractors Form
 - 3) Section 00 43 37 - Public Contract Code Section 10162 Questionnaire Form
 - 4) Section 00 43 40 - Noncollusion Declaration Form
 - 11. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
 - a. Notice to Proceed
 - b. Work Change Directives
 - c. Change Orders
 - d. Field Orders
- B. The documents listed above in this Article 9 are incorporated into this Agreement by this reference as if fully set forth herein.
- C. There are no Contract Documents other than those listed above in this Article 9.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in the General Conditions.

ARTICLE 10 - MISCELLANEOUS

10.01 Terms

- A. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

10.02 Assignment of Contract

- A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

10.03 Successors and Assigns

- A. District and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

10.04 Severability

- A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon District and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

10.05 Contractor's Certifications

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.05:
 - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process or in the Contract execution;
 - 2. "practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of District, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive District of the benefits of free and open competition;
 - 3. "practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of District, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
 - 4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

IN WITNESS WHEREOF, District and Contractor have signed this Agreement.

This Agreement will be effective on _____ (which is the Effective Date of the Contract).

District:

Knights Landing Ridge Drainage District

Signature: _____

Print Name: _____

Title: _____

Address for giving notices (postal and e-mail):

Contractor:

To Be Determined

Signature: _____

Print Name: _____

Title: _____

Address for giving notices (postal and e-mail):

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END OF SECTION

SECTION 00 73 00
SUPPLEMENTARY CONDITIONS – Addendum 1

GENERAL

Summary:

- A. These Supplementary Conditions amend and/or supplement the General Conditions defined in Section 00 72 00 and other provisions of the Contract Documents as indicated below. All provisions that are not so amended or supplemented remain in full force and effect. In the event of a conflict between the terms of the General Conditions and these Supplementary Conditions, the Supplementary Conditions will control.
- B. The terms used in these Supplementary Conditions that are defined in the General Conditions have the meanings assigned to them in the General Conditions.

ARTICLE 1 - DEFINITIONS AND TERMINOLOGY

1.02 Terminology

- A. Calendar Day:
 - 1. The term "calendar day" may be used interchangeably with "day".
- B. Working Day:
 - 1. The term "working day" refers to any day except Saturday, Sunday, or a legal holiday.

ARTICLE 2 - PRELIMINARY MATTERS

2.03 Before Starting Construction

- A. The Bid Schedule as indicated in Section 00 41 00 - Bid Form shall be used as the basis for the Schedule of Values for all of the Work under the Contract.

ARTICLE 3 - DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 Intent

- A. The intent of Contract Documents is to prescribe the details for the construction and completion of the Work, which the Contractor undertakes to perform in accordance with the terms of the Contract. Where the Contract Documents describe portions of the Work in general terms, but not in complete detail, it is understood that only the best general practice is to prevail and that only materials and workmanship of the first quality are to be used.

ARTICLE 4 - COMMENCEMENT AND PROGRESS OF THE WORK

4.02 Starting the Work

- A. Prior to the commencement of the Work, a joint inspection between Engineer and Contractor will be conducted to review the preconstruction conditions of the existing facilities in the vicinity of the project site, (e.g. roads, pumps, discharge pipes, siphons, ramps, gates, signs, etc.). If such existing facilities are damaged by Contractor's operations, Contractor, at his expense, shall replace or restore them to the condition that existed prior to the commencement of the Work.
- B. Contractor shall notify Engineer a minimum of 48 hours prior to the commencement of any Work.

4.03 Reference Points

- A. On District's behalf, Engineer will provide locations of the designated project sites with start and stop points, benchmarks, and station control in the immediate vicinity of the project site. When Contractor requires such stakes or marks, Contractor shall notify Engineer of such in writing a reasonable length of time in advance of starting operations that require such stakes or marks. In no event, shall a notice of less than two (2) working days be considered a reasonable length of time.

- B. Contractor is responsible for setting all construction staking and surveying, as required for construction activities including, but not limited to, setting elevations, grade control, dimension stakes, slope stakes, etc.

4.05 Delays in Contractor's Progress

- A. If Contractor is prevented by inclement weather or conditions resulting immediately therefrom adverse to the current controlling operation or operations, as determined by Engineer, from proceeding with at least 75 percent (75%) of the normal labor and equipment force engaged on that operation or operations for at least 60 percent (60%) of the total daily time being currently spent on the controlling operation or operations, then Contractor shall be entitled to an equitable adjustment in Contract Times. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for said delay.
- B. Should Contractor prepare to begin work at the regular starting time of any day on which inclement weather, or the conditions resulting from the weather, or the condition of the work, prevents the work from beginning at the usual starting time and the crew is dismissed as a result thereof and Contractor does not proceed with at least 75 percent (75%) of the normal labor and equipment force engaged in the current controlling operation or operations for at least 60 percent (60%) of the total daily time being currently spent on the controlling operation or operations, then Contractor shall be entitled to an equitable adjustment in Contract Times whether or not conditions should change thereafter during that day and the major portion of the day could be considered to be suitable for those construction operations. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for said delay.

ARTICLE 5 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

ARTICLE 6 - BONDS AND INSURANCE

6.01 Performance, Payment, and Other Bonds

- A. Companies supplying sureties or bonds shall be licensed to supply such instruments within the State of California, shall be listed by the Office of the Insurance Commissioner, and shall have a minimum A.M. Best rating of A and have a demonstrated ability to meet their ongoing obligations to policyholders.

6.03 Contractor's Insurance

- A. Minimum limits of insurance:
 - 1. Worker's Compensation (in accordance with the State of California Labor Code §1860 and §3700):
 - a. \$1,000,000 for each accident for bodily injury by accident
 - b. \$1,000,000 for each employee for bodily injury by disease
 - c. \$1,000,000 policy limit for bodily injury by disease
 - 2. Commercial General Liability:
 - a. \$1,000,000 for each occurrence for bodily injury and property damage
 - b. \$2,000,000 for general aggregate
 - 3. Automobile Liability:
 - a. \$1,000,000 for each accident for bodily injury and property damage
- B. Additional insureds: In addition to District and Engineer, Contractor's general liability and automobile liability policies shall also include and list as additional insureds the following individuals or entities in accordance with the General Conditions.
 - 1. State of California

2. Department of Water Resources
3. Central Valley Flood Protection Board

ARTICLE 7 - CONTRACTOR'S RESPONSIBILITIES

7.02 Labor; Working Hours

- A. Contractor shall comply with legal working hours in accordance with State of California Labor Code §1810 et seq.
 1. Eight hours labor constitutes a legal day's work. The time of service of any workman employed upon public work is limited and restricted to 8 hours during any one calendar day, and 40 hours during any one calendar week, except as hereinafter provided for under §1815.
 2. Contractor shall, as a penalty to District, forfeit twenty-five dollars (\$25) for each worker employed in the execution of the Contract by Contractor, or any Subcontractor under him, for each calendar day during which the worker is required or permitted to work more than 8 hours in any one calendar day and 40 hours in any one calendar week in violation of the provisions of §1810 et seq.
 3. Notwithstanding the provisions of §1810 to §1814, inclusive, of this code, work performed by employees of Contractor or Subcontractors in excess of 8 hours per day, and 40 hours during any one week, shall be permitted upon public work upon compensation for all hours worked in excess of 8 hours per day at not less than 1 1/2 times the basic rate of pay.
- B. Contractor shall comply with the payment of prevailing wage rates in accordance with State of California Labor Code §1770 et seq.
 1. Contractor, and any Subcontractor under him, shall pay not less than the specified prevailing rates of wages to all workmen employed in the execution of the Contract.
 2. Contractor shall, as a penalty to District, forfeit not more than two hundred dollars (\$200) for each calendar day, or portion thereof, for each worker paid less than the prevailing wage rates as determined by the State of California Department of Industrial Relations for the work or craft in which the worker is employed for any public work done under the Contract by Contractor or, except as provided in §1775, by any Subcontractor under Contractor. The amount of the penalty shall be determined by the Labor Commissioner in accordance with §1775.
 3. The Director of the Department of Industrial Relations shall determine the general prevailing rate of per diem wages in accordance with the standards set forth in State of California Labor Code §1773. General prevailing wage determinations may be obtained online at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>.
 4. Contractor shall adhere to the use of the term "public works", particularly as it relates to the payment of prevailing wage rates, in accordance with §1720, §1720.2, and §1720.3.
 - a. Hauling – To, From and Within Public Works Sites:
 - 1) On-hauling work performed by truckers who transport material from a source dedicated to the public works project to the public work site itself are required to be paid prevailing wages.
 - 2) On-haul truckers who are engaged in the immediate incorporation of the material into the public works project are required to be paid prevailing wages.
 - 3) According to §1720.3, "public works also means the hauling of refuse from a public works site to an outside disposal location, with respect to contracts involving any state agency or any political subdivision of the state".
 - b. Off-Site Fabrication:
 - 1) The laborers, workers, mechanics employed at a particular facility (dedicated yard) are entitled to payment of prevailing wages if said facility, although geographically separated from the construction project, is:
 - (a) designated exclusively to serve the needs of the particular public works job;

- (b) is an integral part of the continuous operation of the work; and
 - (c) is actually set up for the primary purpose or sole purpose of contributing to the public work.
 - C. Contractor shall comply with the proper keeping of payroll records in accordance with State of California Labor Code §1776.
 - 1. Contractor, and any Subcontractor under him, shall keep accurate payroll records, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by him or her in connection with the Work.
 - 2. Payroll records shall be certified and shall be available for inspection at all reasonable hours at the principal office of Contractor or Subcontractor in accordance with §1776.
 - D. Contractor shall comply with State of California Labor Code §1777.5, §1777.6, and §1777.7 concerning the employment of properly registered apprentices. Every apprentice employed upon public works shall be paid the prevailing rate of per diem wages for apprentices in the trade to which he or she is registered and shall be employed only at the work of the craft or trade to which he or she is registered.
 - E. Contractor, and any Subcontractor under him, shall be registered with the Department of Industrial Relations (DIR) pursuant to State of California Labor Code §1725.5 to be qualified to bid on or engage in the performance of work under this Contract pursuant to Labor Code §1771.1.
 - 1. Contractor shall post all job site notices as prescribed by regulation pursuant to Labor Code §1771.4.
 - 2. Contractor, or any Subcontractor under him, shall furnish the records specified in Labor Code §1776 directly to the Labor Commissioner in accordance with Labor Code §1771.4. The internet website for Contractor and Subcontractors to electronically upload Certified Payroll Records is: <https://apps.dir.ca.gov/eCPR/DAS/altlogin/>.
 - F. In accordance with State of California Labor Code §1735, Contractor, and any Subcontractor under him, shall not discriminate in the employment of persons upon public works on the basis of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, genetic information, marital status, sex, gender, gender identity, gender expression, age, sexual orientation, or military and veteran status of any person, to refuse to hire or employ the person or to refuse to select the person for a training program leading to employment, or to bar or to discharge the person from employment or from a training program leading to employment, or to discriminate against the person in compensation or in terms, conditions, or privileges of employment.
 - G. Contractor, and any Subcontractor under him, are prohibited from accepting, taking wages illegally, or extracting "kickbacks" from employee wages under the State of California Labor Code Section §1778.
 - H. Contractor, and any Subcontractor under him, are prohibited against accepting fees for registering any person for public work under State of California Labor Code §1779 or for filling work orders on public works under §1780.
- 7.06 Concerning Subcontractors, Suppliers, and Others
- A. Contractor shall perform with his own organizational forces Contract work amounting to not less than 20% of the total Contract price.
 - B. Subcontracts between Contractor and any Subcontractor under him shall include provisions that the Contract between District and Contractor is part of the subcontract, and that the terms and provisions of Contract are incorporated into the subcontract. Subcontracts shall also contain certification by the Subcontractor that said Subcontractor is experienced in and qualified to do, and knowledgeable about, the subcontract work. Copies of subcontracts shall be available for review by Engineer.

- C. In accordance with State of California Public Contract Code §6109, Contractor is prohibited from performing work on a public works project with a Subcontractor who is ineligible to perform work on the public works project pursuant to §1777.1 or §1777.7 of the State of California Labor Code.

7.10 Laws and Regulations

- A. Contractor, and any Subcontractor under him, must be licensed by the State of California Contractors' State License Board in accordance with the provisions of Chapter 9 of Division 3 of the Business and Professions Code. Contractor or any Subcontractor not so licensed shall be subject to the penalties imposed in accordance with §7028.15. Contractor shall be skilled, regularly engaged and licensed in the general class or type of work specified and possess a valid California Class "A" or "C-12" Contractor's License
- B. Contractor agrees to comply with the following:
 - 1. Current State Employees: No State officer or employee shall engage in any employment, activity, or enterprise from which the officer or employee receives compensation or has a financial interest and which is sponsored or funded by any State agency, unless the employment, activity, or enterprise is required as a condition of regular State employment. No State officer or employee shall contract on his or her own behalf as an independent contractor with any State agency to provide goods or services.
 - 2. Former State Employees: For the two-year period from the date he or she left State employment, no former State officer or employee may enter into a contract in which he or she engaged in any of the negotiations, transactions, planning, arrangements, or any part of the decision-making process relevant to the contract while employed in any capacity by any State agency. For the twelve-month period from the date he or she left State employment, no former State officer or employee may enter into a contract with any State agency if he or she was employed by that State agency in a policy-making position in the same general subject area as the proposed contract within the twelve-month period prior to his or her leaving State service.
 - 3. Employees of Contractor: Employees of Contractor shall comply with all applicable provisions of law pertaining to conflicts of interest, including but not limited to, any applicable conflict of interest provisions of the California Political Reform Act, State of California Government Code §87100 et seq.
- C. During the performance of Contract, Contractor, and any Subcontractor under him, shall not unlawfully discriminate against any employee or applicant for employment because of race, religion, color, national origin, ancestry, physical handicap, medical condition, marital status, age (over 40) or sex. Contractor and Subcontractors shall insure that the evaluation and treatment of their employees and applicants for employment are free of such discrimination. Contractor and Subcontractors shall comply with the provision of the Fair Employment and Housing Act (Government Code §12900 et seq.) and the applicable regulations promulgated thereunder (California Administrative Code, Title 2, §7285.0 et seq.). The applicable regulations of the Fair Employment and Housing Commission implementing Government Code §12990 set forth in Chapter 5 of Division 4 of Title 2 of the California Administrative Code are incorporated into Contract by reference and made a part hereof as if set forth in full. Contractor and its Subcontractors shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement.
 - 1. Contractor shall include the nondiscrimination and compliance provisions of this clause in all subcontracts to perform work under this Contract.
- D. Contractor, and any Subcontractor under him, shall comply with the Americans with Disabilities Act (ADA) of 1990 (42 U.S.C. 12101 et seq.).
- E. Contractor shall not use any state funds disbursed by Contract for any costs incurred to assist, promote, or deter union organizing in accordance with the State of California Government Code §16645 et seq.

7.11 Record Documents

- A. Contractor shall maintain books, records, documents, and other evidence directly pertinent to performance on State grant work under Contract in accordance with generally accepted accounting principles and the financial information and data used by the Contractor in preparation or support of the cost submission for any negotiated contract or change order and a copy of the cost summary submitted to District.
 - 1. The Department of Water Resources, the Central Valley Flood Protection Board, the State Controller's Office, District, or any of their authorized representatives shall have access to such books, records, documents, and other evidence for the purpose of inspection, audit, and copying. Contractor will provide facilities for such access and inspection.
 - 2. Records shall be maintained and made available during performance on work under this Contract and until ten (10) years from the date of final payment for the project. In addition, those records which relate to any dispute appeal under this Contract, to litigation, to the settlement of claims arising out of such performance, or costs or items to which an audit exception has been taken shall be maintained and made available until three (3) years after the date of resolution of such appeal, litigation, claim, or exception.

7.12 Safety and Protection

- A. Contractor shall so conduct his operations as to offer the least possible obstruction and inconvenience to the public, and Contractor shall have under construction no greater amount of work than he can prosecute properly with due regard to the rights of the public. Whenever Contractor's operations create a condition hazardous to traffic or the public, he shall furnish, erect, and maintain at his expense and without cost to District, such fences, barricades, lights, signs and other devices as are necessary to prevent accidents or damage or injury to the public.
- B. Contractor shall ensure that no alcohol, firearm, or controlled substance enters or is used at the Site. Contractor shall immediately remove from the Site and terminate the employment of any employee found in violation of this provision.

ARTICLE 8 - OTHER WORK AT THE SITE

ARTICLE 9 - DISTRICT'S RESPONSIBILITIES

ARTICLE 10 - ENGINEER'S STATUS DURING CONSTRUCTION

ARTICLE 11 - AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

ARTICLE 12 - CLAIMS

ARTICLE 13 - COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 Cost of the Work

- A. Mobilization costs shall consist of preparatory work and those operations including, but not limited to, the movement of plant, equipment, supplies and incidentals to the project site; establishment of any temporary field offices, buildings, and other facilities necessary for work on this project; and for all other work and operations which must be performed or costs incurred prior to starting project work on the various contract items.
 - 1. When the monthly partial payment estimate of the amount earned, not including the amount earned for mobilization, is 5% or more of the original contract amount, 50% of the Contract item price for mobilization shall be included in the Application for Payment.
 - 2. When the monthly partial payment estimate of the amount earned, not including the amount earned for mobilization, is 25% or more of the original contract amount, the total amount earned for mobilization shall be 75% of the Contract item price for mobilization and shall be included in the Application for Payment.

3. When the monthly partial payment estimate of the amount earned, not including the amount earned for mobilization is 50% or more of the original contract amount, the total amount earned for mobilization shall be 100% of the Contract item price for mobilization and shall be included in the Application for Payment.
4. The Contract lump sum price paid for mobilization shall not exceed 5% of the total Bid.

13.03 Unit Price Work

- A. If the quantity of any item of Unit Price Work performed by Contractor differs by 25% or less from the estimated quantity of such item indicated in the Agreement, then the quantity difference for said item is not considered to be significant, and payment will be made pursuant to the Contract Price.
- B. If the quantity of any item of Unit Price Work performed by Contractor differs by more than 25% from the estimated quantity of such item indicated in the Agreement, then Contractor may submit a Change Proposal, or District may file a Claim, seeking an adjustment in the Contract Price. In the absence of a Change Proposal or Claim, payment will be made pursuant to the Contract Price.
- C. Measurement of quantities:
 1. Materials delivered by land hauling units shall be measured by weight and shall be weighed by and at the expense of Contractor on sealed scales regularly inspected by the State Division of Measurement Standards or its designated representatives. Only a weighmaster that is licensed in accordance with the provisions of the State of California Business and Professions Code (§12700 et seq.) shall operate the scales. Contractor shall furnish a Public Weighmaster's Certificate for each load of material delivered and daily summary weigh sheets.
 2. The weight of material delivered by barge shall be determined by way of water displacement or barge chart showing the displacement for different levels of submergence as prepared and certified by a State of California registered civil engineer, marine surveyor, or architect. Said charts shall be provided for each barge used to provide material for the project. Before loading and after unloading, measurements shall be taken for each load at each of the four corners of the barge. The calculations shall be subject to verification by Engineer. The bilge of the barge shall be free of water or other ballast at the time measurements are taken.

ARTICLE 14 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

ARTICLE 15 - PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 Progress Payments

- A. All documentation required to substantiate completion of the Work shall accompany each Application for Payment including, but not limited to:
 1. related delivery or weight tags;
 2. lien releases; and
 3. updated Progress Schedule indicating actual progress.

ARTICLE 16 - SUSPENSION OF WORK AND TERMINATION

16.01 District May Suspend Work

- A. District reserves the right to suspend the Work at any time in the event of extreme high or low tides, flood events, or other emergencies that may jeopardize the integrity of District's levees, flood control systems, or other facilities. If said suspension of work prevents Contractor from proceeding with the controlling operation or operations, then Contractor shall be entitled to an equitable adjustment in Contract Times. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to

complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for said delay.

16.02 District May Terminate for Cause

- A. The occurrence of any one or more of the following events will also constitute a default by Contractor in accordance with the General Conditions and justify termination for cause:
 - 1. Contractor commences any proceeding under the Bankruptcy Act;
 - 2. Contractor is adjudged a bankruptcy;
 - 3. Contractor makes any assignment for the benefit of creditors; or
 - 4. a receiver is appointed on account of Contractor's insolvency.

ARTICLE 17 - FINAL RESOLUTION OF DISPUTES

ARTICLE 18 - MISCELLANEOUS

END OF SECTION

SECTION 01 22 00
PRICE AND PAYMENT PROCEDURES – ADDENDUM 1

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Lump sum schedule payment items
- B. Unit price schedule payment items
- C. Allowance schedule payment items

1.02 RELATED REQUIREMENTS

- A. Section 00 41 00 – Bid Form
- B. Section 00 52 00 – Agreement Form
- C. Section 00 72 00 - General Conditions
- D. Section 01 33 00 - Submittal Procedures

1.03 SUBMITTALS

- A. Submit the following in accordance with Section 01 33 00 - Submittal Procedures.
 - 1. SD-07 Certificates
 - a. Weight Certificates

1.04 LUMP SUM PAYMENT ITEMS

- A. Payment items for the Work of this Contract for which contract job payments will be made are listed in Section 00 41 00 - Bid Form and Section 00 52 00 - Agreement Form and described below. All costs for items of work, which are not specifically mentioned to be included in a particular job or unit price payment item, are included in the listed job item most closely associated with the work involved. The job price and payment made for each item listed constitutes full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for which separate payment is not otherwise provided.
 - 1. Mobilization
 - a. Payment
 - 1) Payment will be made for costs associated with mobilization and demobilization.
 - 2. SWPPP/BMP Implementation
 - a. Payment
 - 1) Payment will be made for costs associated with following ~~and reporting~~ SWPPP guidelines ~~to SMARTS from the existing SWPPP~~. This may include implementing SWPPP BMPs in a wet weather event or similar event.
 - 3. **Refer to Item 2.5 REGRADE AND RESTORE DISTURBED AREAS AND ALL ACCESS ROADS AFTER CONSTRUCTION for the third Lump Sum Item.**

1.05 UNIT PRICE PAYMENT ITEMS

- A. Payment items for the work of this contract on which the contract unit price payments will be made are listed in Section 00 41 00 - Bid Form and Section 00 52 00 - Agreement Form and described below. The unit price and payment made for each item listed constitutes full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for each of the unit price items. No payment will be made for any material outside the required lines and grades unless authorized by the Engineer.
 - 2.1. CLEARING, GRUBBING AND TREE TRIMMING

- a. Payment
 - 1) Payment will be made for costs associated with clearing and grubbing operations as specified including demolition, off-haul, and disposal offsite of removed materials.
- 2.2. PLACE CALTRANS CLASS III ROCK SLOPE PROTECTION MATERIAL
 - a. Payment
 - 1) Payment will be made for costs associated with furnishing, transporting, stockpiling (if applicable), placing, and constructing the riprap stone protection as specified including any necessary preparation and grading work.
 - b. Measurement
 - 1) Measure riprap for payment by the ton by weighing each truckload. Provide certified weight certificates furnished by a public weighmaster.
 - c. Unit of Measure: ton
- 2.3. SUPPLEMENT ALL-WEATHER **LEVEE CROWN** ROAD WITH AGGREGATE BASE
 - a. Payment
 - 1) Payment will be made for costs associated with furnishing, transporting, stockpiling (if applicable), placing, compacting and constructing the aggregate base material, **on the levee crown road used as part of this project**, as specified including any necessary preparation and grading work.
 - b. Measurement
 - 1) Measure aggregate base for payment by the ton by weighing each truckload. Provide certified weight certificates furnished by a public weighmaster.
 - c. Unit of Measure: ton
- 2.4. INSTALL ESA FENCING
 - a. Payment
 - 1) Payment will be made for costs associated with furnishing, transporting, installing, maintaining, relocating (if required), and removing Environmentally Sensitive Area (ESA) fencing, including fence posts, fabric, signage, anchorage, and all incidental materials, labor, and equipment necessary to complete the work as specified.
 - b. Measurement
 - 1) Measure ESA fencing for payment by the linear foot of fencing installed and accepted. Measurement will be made along the centerline of the fence from end post to end post. No separate measurement will be made for posts, braces, gates, signage, maintenance, relocation, removal, or other incidental work required to complete the installation and protection of environmentally sensitive areas.
 - c. Unit of Measure: Linear Feet
- 2.5. REGRADE **AND RESTORE LEVEE AND DISTURBED AREAS** AND **ALL ACCESS** ROADS AFTER CONSTRUCTION
 - a. Payment
 - 1) Payment will be made for costs associated with furnishing all labor, equipment, materials, transportation, grading, shaping, compacting, and restoring **any disturbed areas**, including the levee and access roads to the required lines, grades, and cross-sections after completion of construction activities, as specified. Payment shall include all incidental work necessary to achieve a stable and serviceable finished surface.
 - b. **Measurement**
 - 1) **Lump Sum**

~~1) — Measure regrading of levee and access roads for payment by the square foot of surface area regraded and restored, as shown on the plans or as directed by the Engineer. The measured area shall include all levee and access road surfaces requiring regrading after construction. No separate measurement will be made for hauling, spreading, shaping, moisture conditioning, compacting, or other incidental work required to complete the work.~~

~~c. — Unit of Measure: Square Feet~~

1.06 ALLOWANCE PAYMENT ITEMS – NOT APPLICABLE

- A. Payment items for the Work of this Contract for which contract allowance payments will be made are listed in Section 00 41 00 - Bid Form and Section 00 52 00 - Agreement Form and described below. Only work authorized by the Engineer will be considered for payment.
- B. The basis for payment for allowance work will be determined at the Engineer's discretion as per one of the following:
 - 1. A mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Section 00 72 00 - General Conditions, Paragraph 11.04.C.2); or
 - 2. The Cost of the Work (determined as provided in Section 00 72 00 - General Conditions, Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Section 00 72 00 - General Conditions, Paragraph 11.04.C).

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 31 37 00
RIPRAP – Addendum 1

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. The work to be performed under this Section shall consist of furnishing all labor, materials, tools, transportation, supplies, equipment, appurtenances, fuel, and power, unless specifically excepted, necessary or required to install quarry stone riprap as shown on the plans and described in these specifications.

1.02 SUBMITTALS

- A. Submit the following and received approval from the Engineer prior to bringing any materials to the site:
1. Supplier's certification obtained within the last 6 months, source (name and location of quarry) and rock gradations.
 2. Supplier Quality Compliance Test Results

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Quarry Stone - The quarry stone riprap shall be angular in shape as to form a stable protection structure for the specified section. Rounded boulders or cobbles shall not be used or accepted as quarry stone riprap. Stone with needle or flat shapes will not be accepted unless the thickness of the individual pieces is greater than one-third (1/3) of the length.
- B. The stone specified shall meet the following gradations as determined by screens with square openings. Neither the breadth nor the thickness of any piece of stone shall be less than one-third (1/3) its length. Materials not meeting the gradation requirements given below as placed at the site of work shall be rejected. If test results show that stone does not meet the required grading, the hauling and placing operation will be stopped immediately and will not resume until rock processing procedures are adjusted and the gradation test is completed demonstrating compliance with gradation requirements. All gradation tests are at the expense of the Contractor. Once the selected material and grading are approved, neither shall be changed without the Engineer's approval.

1. GRADATION GENERAL

- a. All points on the individual grading limits as defined by smooth curves drawn through specified grading limits plotted on a mechanical analysis diagram.
- b. The individual grading curves shall not exhibit abrupt changes in slope or denoting skip grading or scalping of certain sizes.

2. GRADATION FOR 18 INCH QUARRY STONE RIPRAP PROTECTION

- a. The specified grading of quarry stone riprap shall be met both at the source and as delivered to the project.
- b. Material not meeting the specified gradation due to segregation or degradation during placement shall be rejected.
- c. The Contractor/Quarry Operator shall sort and separate rock material at the quarry site to provide the quarry stone riprap slope protection which meets the gradation specified as follows:

<u>WEIGHT OF PIECES IN POUNDS</u>	<u>PERCENT SMALLER BY WEIGHT</u>
300	100
200	90-100
100	50-90
50	25-50
20	5-25
5	0-5

3. QUALITY COMPLIANCE TEST REQUIREMENTS

- C. The stone specified shall meet the following test requirements and the publication standards listed form a part of these specifications and the latest edition of the referenced publication shall govern.

TEST	TEST METHOD	REQUIREMENT
Specific Gravity	ASTM C 127	2.60 minimum
Absorption	ASTM C 127	2.0% maximum
Wetting & Drying	SPD Test Procedure	No fracturing
Sodium Sulfate	ASTM C 88	15% max. loss
Abrasion Loss	ASTM C 535	50% max. loss

- D. The stone shall be clean, sound, hard, dense, and durable, have angular features, be free from lamination, weak cleavages, and undesirable weathering. The stone shall also be free from clay, shale, sandstone, earth, vegetable matter, and other deleterious substances. The quarry stone shall be of such character that it will not disintegrate from the action of air and/or water, handling and placing, and shall be of a quality to ensure permanence.

Stone shall weigh not less than one hundred and sixty-five (165) pounds per solid cubic foot, dry density. The Engineer shall determine the acceptability of the stone with respect to quality and physical properties.

- F. The Contractor shall identify the sources from which he proposes to obtain the material at the time of the preconstruction conference meeting. The Contractor shall also make all arrangements, secure all permits, and pay all royalties for furnishing, transporting, and procurement of the stone specified. The Engineer may require the Contractor to submit material test samples fifteen (15) days prior to placement for quality compliance evaluation. Such samples shall be clearly identified as to source and origin. The Engineer will determine the suitability of the material prior to delivery and placement. If material testing is required, the costs shall be the responsibility of the Contractor.
- G. Gradation, Field Sampling, and Testing for Quarry Stone Riprap
1. The Engineer reserves the right to perform field check tests at any time and retain the services of an independent geotechnical consultant and testing facility to make such tests.
 2. Each sample shall consist of not less than five (5) tons of materials and will be sampled at random from the production run and delivery.
 3. All sampling and gradation tests will be performed by the testing consultant with the use of the Contractor's equipment and personnel under the supervision of the Engineer. The Owner will pay the expense of the consultant's services.
 4. Any on-site, gradation sampling and testing, using Contractor's equipment, and personnel required for tests, will be at the expense of the Contractor.

~~H. Riprap materials provided from the District are all subject to the same requirements as imported Riprap. The contractor is expected to utilize these materials when provided.~~

2.02 CONSTRUCTION

- A. Clearing and Sloping - All areas to receive quarry stone riprap, as shown on the plans, shall be cleared as described in Division 31, Section 31 11 00, "Clearing and Grubbing".
1. The repair areas requiring clearing, the Contractor shall preserve and protect any plants and trees as may be designated and marked by the Engineer at those repair sites designated prior to commencement of site work.
 2. All areas on which quarry stone riprap is to be placed shall be trimmed and dressed to conform to the cross-section shown on the drawings. When sloping, the Contractor shall balance his cuts and fills in order to end up with a uniform slope. Fill areas shall be well

compacted with earth similar to adjacent materials or import fill materials as may be designated and shown on the plans.

3. Repair sites will require landside mechanical equipment to slope the sections in order to end up with a neat and uniform slope prior to placement of quarry stone riprap unless otherwise approved by the Engineer.
4. Control of Erosion - The Contractor shall maintain earthwork surfaces true and smooth and protected from erosion. Where erosion occurs, the Contractor shall provide fill or shall excavate as necessary to return earthwork surfaces to the lines and grades specified. Compensation for erosion control is considered as included in the Contract Prices paid for the various items as set forth in the Contractor's Bid and no additional compensation will be allowed therefor.
5. Placement - After slopes have been cleared, prepared as specified, and accepted by the Engineer, the Contractor shall protect the bank slopes with quarry stone.
 - a. Quarry stone protection shall be placed in such manner as to produce a well-graded mass with a minimum practicable percentage of voids.
 - b. Placement of quarry stone shall be constructed to the lines and grades shown on the drawings or as staked in the field.
 - c. Landside mechanical equipment, e.g. backhoe, excavator, long reach, etc., is required to obtain a well graded and uniform slope, keyway, and for rearranging of existing slope protection prior to placement of new quarry stone riprap, unless otherwise designated by the Engineer.
 - d. Stone protection shall be placed in such a manner as to avoid displacing the underlying material. The finished stone protection shall be free from pockets of small stones and clusters of larger stones.
 - e. Placing of stone protection by methods likely to cause segregation of the various sizes is not acceptable. The desired distribution of the various sizes of stones throughout the mass shall be obtained by selective loading of the material at the quarry or other source by controlled placement of successive loads during final placing or by other methods of placement, which will produce the specified results.
 - f. Rearranging of individual stones by mechanical equipment or by hand will be required to the extent necessary to obtain a reasonably well graded distribution of stone sizes as specified above and to provide a finished surface free of protruding stones. Dozers or other equipment, which would cause degradation or displacement of stone, shall not be used on the slopes. The Contractor shall maintain the stone protection until accepted and any material displaced by any cause shall be replaced as directed by the Engineer.
 - g. Bucket tamping of the stone above the water shall be required to set the new stone protection in place and to achieve the required slope and tolerance of plus 2 inches to minus 1 inch will be allowed from the thickness shown on the plans.
 - h. Bucket tamping of the quarry stone riprap will be performed in a manner not to degrade the stone placed.
 - i. Rearranging of individual stones by mechanical equipment or by hand may be required to the extent necessary to obtain a reasonably well-graded distribution of stone sizes to provide a finished surface free of protruding stones.
 - j. Riprap shall be carefully placed, by hand if necessary, around the base of the designated plants and trees.
 - k. All new quarry stone riprap shall be placed uniformly on prepared levee slopes, and connected and keyed into previously placed riprap, where applicable. The stone protection shall also be keyed into the levee toe or waterside berm, as shown and noted on the contract plans. The Engineer will stake the limits of each site in the field. The Contractor shall set and date a stake/lath at the sites where the material was placed for that workday and/or at the end of each shift.

- l. When stone protection is placed by floating plant and drag type bucket, the material barge shall be modified to prevent spilling of stone into the channel as the bucket is being loaded.
 - m. Quarry stone protection placed underwater shall be placed with approved equipment capable of discharging the material underwater with minimum free fall to reduce segregation.
 - n. The quarry stone shall be placed systematically beginning at the base of the prepared embankment slopes.
 - o. Any low spots located shall be filled in, as a minimum, to design lines and grades as shown on the drawings or as directed by the Engineer.
 - p. Placement of quarry stone protection by clamshell type equipment will not be permitted unless otherwise approved by the Engineer.
- 6. Material Stockpile - Stockpiling of quarry stone riprap on the levee for re-handling and slope placement will not be permitted unless otherwise approved and directed by the Engineer.

PART 4 - MEASUREMENT AND PAYMENT

3.01 MEASUREMENT

- A. All quarry stone riprap will be measured for payment by the number of tons (2,000 pounds avoirdupois) of material placed within the dimensions as shown on the plans and accepted within the completed sections. No payment will be made for material placed outside the specified limits, dimensions, and locations, unless otherwise ordered by the Engineer. The quarry stone riprap material will be measured for payment by the tonnage accepted in place, as determined either by barge displacement measurement or by certified scale weight measurement approved by the Engineer and the Engineer's quantity determination shall be final.
 - 1. The material delivered and placed at each designated repair site shall be recorded by tonnage, identified accordingly, and tickets submitted daily to the Engineer's Field Representative, unless otherwise directed.
- B. Scale Weight Measurement: For materials delivered by land hauling unit, measurements will be based on certified scale weight.
 - 1. Scales used for measurement shall, at the option of the Contractor, be either public scales or tested certified scales provided by the Contractor. Weighing shall be at the point nearest the work at which a public scale is available or at which it is practicable for the Contractor to provide a scale. When the Contractor's scales are used, the Contractor shall be certified and bonded as a licensed weigh master in accordance with all requirements of the State Inspection Bureau, and any employees of the Contractor engaged in weighing materials under this contract shall be deputized to perform such weighing under the provisions of the State Inspection Bureau charged with scales inspection.
 - 2. Contractor scales shall be standard manufactured truck scales of a beam variety and shall be equipped with the type of registering beam, which imprints the weight on the ticket and an "under and over" indicator, and be capable of accommodating the entire vehicle. Scales shall be tested, approved, and sealed by a State Certified Inspector. The scales shall be calibrated and resealed as often as necessary and at least once every three (3) months, to ensure accuracy. All state inspections, calibrations, and sealing of the scales shall be at the expense of the Contractor.
 - 3. Unlicensed weigh masters or individual truck drivers are prohibited from weighing and issuing delivery tickets.
 - 4. Material hauling vehicles shall be weighed empty daily at such time as desired, and each shall bear a plainly legible identification mark.

5. Delivery tickets or weigh bills, which are not dated and signed by the authorized licensed weigh master during that day and shift will not be accepted for measurement and payment and will be deducted from any invoice submitted for payment.
 6. Copies of weigh bills or delivery tickets shall be submitted to the Engineer daily during the progress of the work. The Contractor shall furnish the Engineer or his designated representative scale tickets for each load of material weighed. These tickets shall include ticket number, load number, commodity, tare weight, identification mark of each vehicle weighed, date, time, and location of loading and material source.
 7. A master log of all vehicle loadings shall be furnished for each day of loading operations. Before the final payment, the Contractor shall furnish the Engineer certified weigh bills and/or certified tickets for all material delivered, placed, accepted, and actually used in the construction covered by the Contract.
- C. Displacement Measurement - For materials delivered to the job by barge or to an intermediate point for trans-shipment by rail or highway, the measurement of materials delivered and placed will be based on the displacement of the transporting vessel. One (1) cubic foot of barge displacement will be assumed to be equivalent to 62.5 pounds of weight.
1. All barge displacement charts used for measurement and payment shall be prepared, certified, signed, and dated by an independent licensed Marine Surveyor, for all barges/vessels used to transport materials to the project site. A copy of the certified charts shall be provided to the Engineer by the Contractor prior to the commencement of any material delivery and placement on site.
 2. Use by the Contractor of any revised barge charts, which have not been recalibrated and recertified by a licensed Marine Surveyor, shall nullify any on site displacement measurements and acceptance of material.
 3. Any barges or vessels requiring dry-docking, alterations, refitting, structural repairs, and/or recertification by the U.S. Coast Guard, and any barges or vessels which have not been recertified for displacement within the last five (5) years, shall, at the option of the Engineer, be required to be recertified for displacement by an independent registered and licensed Marine Surveyor prior to the transportation of material.
 4. A new barge displacement chart with the recertification measurements, date, and signature of the registered and licensed Marine Surveyor shall be issued to the Engineer prior to the delivery and acceptance of materials on site.
 5. All displacement measurements shall be made at each repair site where the specified material is to be unloaded and placed. Copies of the barge loading memos, barge tags, or delivery tickets shall be signed/initialed and submitted to the Engineer or his field representative daily, unless otherwise directed. The Contractor shall also furnish the Engineer or his designated representative a barge ticket for each load of material delivered, placed, and accepted.
 - a. Barges/vessels used to deliver materials on site shall bear a plainly legible identification mark (e.g. name, number, etc.).
 - b. The barge delivering materials, when measured at the designated delivery point, shall be free from bilge water. Pumping of excess bilge water during off-loading operations shall nullify the displacement measurements.
 - c. The barge loading memos, barge tags, or delivery tickets for each repair site and each barge load of materials delivered, placed, and accepted shall include the barge/vessel identification (name and/or number), date, commodity/material type, project area, loaded and empty measurements (stabbings), tonnage, off-loading plant/number, and weigh master's signature/initials.
 - d. The off-loading vessel at the project site shall maintain a current master log.
 - e. The master log shall contain actual displacement measurements, loaded and unloaded, for each barge of material placed. The log shall also include the quarry

source; the date and time of the measurements, and a signature by the vessels weigh master certifying the measurements.

- f. The hard copy of the master log shall be made available for the review of the Engineer at his request.

3.02 PAYMENT

- A. Payment for quarry stone riprap material, measured as specified, will be made at the contract unit price per ton, which price shall include compensation for providing and furnishing all labor, materials, tools, equipment, and incidentals as shown on the plans and indicated in the specifications herein.
- B. At the direction of the Engineer for the purpose of District maintenance, the Contractor may be required to make incidental use of quarry stone riprap material for site repairs not specifically shown or otherwise designated on the plans. Payment for such incidental use of quarry stone riprap material, in place will be measured as specified and made by an approved Contract Change Order at unit price per ton.
- C. Full compensation for all costs incurred and work covered in this Section shall be included in the prices paid for as set forth in the Contractor's Bid and no additional or separate compensation will be made therefor.
- D. All delivery tickets, weigh master certificates, weigh bills, barge loading tags, or barge delivery tickets which are not correctly calculated, dated, identified, and signed by an authorized licensed weigh master or authorized representative during that day and shift, will not be accepted for payment and will be deducted from any invoice submitted for payment.
- E. The following quantities will not be paid for and such quantities will be deducted from the final total quantities:
 - 1. Quantities of material wasted or disposed of in a manner not called for under the Contract;
 - 2. Rejected loads of material, including material rejected after it has been placed by reason of the failure of the Contractor to conform to the provisions of the Contract;
 - 3. Material not unloaded from the transporting vehicle;
 - 4. Material placed outside the lines and grades indicated on the plans or established by the Engineer; and
 - 5. Material remaining on hand after completion of the work.
- F. No compensation will be allowed for hauling and disposing of rejected material.

END OF SECTION

SECTION 32 11 23
AGGREGATE BASE COURSES – Addendum 1

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Requirements for aggregate base course

1.02 RELATED REQUIREMENTS

- A. Section 01 33 00 – Submittal Procedures

1.03 REFERENCES

- A. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³); 2012; E 2015.
- B. State of California Department of Transportation (Caltrans), Standard Specification 26 – Aggregate Bases; 2018.

1.04 DEFINITIONS

- A. Aggregate Base
 - 1. Aggregate base (AB) is well graded, durable aggregate uniformly moistened and mechanically stabilized by compaction.
- B. Degree of Compaction
 - 1. Degree of compaction required is expressed as a percentage of the maximum laboratory dry density obtained by the test procedure presented in ASTM D1557 abbreviated as a percent of laboratory maximum dry density.

1.05 SUBMITTALS

- A. Submit the following in accordance with Section 01 33 00 - Submittal Procedures
 - 1. SD-03 Product Data
 - a. Plant, Equipment, and Tools
 - b. Waybills and Delivery Tickets
 - 2. SD-06 Test Reports
 - a. Sampling and Testing
 - b. Field Density Tests

PART 2 PRODUCTS

2.01 PLANT, EQUIPMENT, AND TOOLS

- A. All plant, equipment, and tools used in the performance of the work will be subject to approval before the work is started and shall be maintained in satisfactory working condition at all times. Submit a list of proposed equipment, including descriptive data. Provide adequate equipment having the capability of producing the required compaction, meeting grade controls, thickness control, and smoothness requirements as set forth herein.

2.02 MATERIALS

- A. Provide 3/4 inch maximum, Class 2 aggregate base conforming to Caltrans Standard Specification 26.

2.03 SOURCE QUALITY CONTROL

- A. Sampling
 - 1. Take the number and size of samples required to perform the following tests.
- B. Testing
 - 1. Perform one of each of the following tests for each material used. Provide additional test for each source change.

- a. Aggregate grading testing, in accordance with Caltrans Standard Specification 26.
- b. Aggregate quality testing, in accordance with Caltrans Standard Specification 26.
- c. Moisture-density relationship, in accordance with ASTM D1557

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

- A. When the AB is constructed in more than one layer, clean the previously constructed layer of loose and foreign matter by sweeping with power sweepers or power brooms, except that hand brooms may be used in areas where power cleaning is not practicable. Provide adequate drainage during the entire period of construction to prevent water from collecting or standing on the working area. Provide line and grade stakes as necessary for control. Grade stakes shall be in lines parallel to the centerline of the area under construction and suitably spaced for string lining.

3.02 OPERATION OF AGGREGATE SOURCES

- A. Clearing, stripping, and excavating are the responsibility of the Contractor. Operate the aggregate sources to produce the quantity and quality of materials meeting the specified requirements in the specified time limit. Aggregate sources on private lands shall be conditioned in agreement with local laws or authorities.

3.03 STOCKPILING MATERIAL

- A. Clear and level storage sites prior to stockpiling of material. Stockpile all materials, including approved material available from excavation and grading, in the manner and at the locations designated. Aggregates shall be stockpiled on the cleared and leveled areas designated by the Engineer to prevent segregation. Materials obtained from different sources shall be stockpiled separately.

3.04 PREPARATION OF UNDERLYING COURSE

- A. Prior to constructing the base course(s), the underlying course or subgrade shall be cleaned of all foreign substances. At the time of construction of the base course(s), the underlying course shall contain no frozen material. The surface of the underlying course or subgrade shall meet specified compaction and surface tolerances. The underlying course shall conform to Section 31 00 00 Excavation and Fill. Ruts or soft yielding spots in the underlying courses, areas having inadequate compaction, and deviations of the surface from the requirements set forth herein shall be corrected by loosening and removing soft or unsatisfactory material and by adding approved material, reshaping to line and grade, and recompacting to specified density requirements. The finished underlying course shall not be disturbed by traffic or other operations and shall be maintained in a satisfactory condition until the base course is placed.

3.05 INSTALLATION

- A. Placing
 - 1. Place the mixed material on the prepared subgrade or subbase in layers of uniform thickness with an approved spreader. When a compacted layer 6 inches or less in thickness is required, place the material in a single layer. When a compacted layer in excess of 6 inches is required, place the material in layers of equal thickness. No layer shall be thicker than 6 inches or thinner than 3 inches when compacted. The layers shall be so placed that when compacted they will be true to the grades or levels required with the least possible surface disturbance. Where the base course is placed in more than one layer, the previously constructed layers shall be cleaned of loose and foreign matter by sweeping with power sweepers, power brooms, or hand brooms, as directed. Such adjustments in placing procedures or equipment shall be made as may be directed to obtain true grades, to minimize segregation and degradation, to adjust the water content, and to insure an acceptable base course.
- B. Grade Control

1. The finished and completed base course shall conform to the lines, grades, and cross sections shown. Underlying material(s) shall be excavated and prepared at sufficient depth for the required base course thickness so that the finished base course and the subsequent surface course will meet the designated grades.

C. Compaction

1. Compact each layer of the base course, as specified, with approved compaction equipment. Maintain water content during the compaction procedure to within plus or minus 2 percent of the optimum water content determined from laboratory tests as specified in this Section. Begin rolling at the outside edge of the surface and proceed to the center, overlapping on successive trips at least one-half the width of the roller. Alternate trips of the roller shall be slightly different lengths. Speed of the roller shall be such that displacement of the aggregate does not occur. In all places not accessible to the rollers, the mixture shall be compacted with hand-operated power tampers. Continue compaction until each layer has a degree of compaction that is at least 95 percent of ASTM D1557 through the full depth of the layer. Make such adjustments in compacting or finishing procedures as may be directed to obtain true grades, to minimize segregation and degradation, to reduce or increase water content, and to ensure a satisfactory base course. Any materials that are found to be unsatisfactory shall be removed and replaced with satisfactory material or reworked, as directed, to meet the requirements of this specification.

D. Thickness

1. Construct the compacted thickness of the base course as indicated. No individual layer shall be thicker than 6 inches nor be thinner than 3 inches in compacted thickness. The total compacted thickness of the base course(s) shall be within 1/4 inch of the thickness indicated. Where the measured thickness is more than 1/4 inch deficient, correct such areas by scarifying, adding new material of proper gradation, reblading, and recompacting as directed. Where the measured thickness is more than 1/4 inch thicker than indicated, the course shall be considered as conforming to the specified thickness requirements. Average job thickness shall be the average of all thickness measurements taken for the job, but shall be within 1/4 inch of the thickness indicated.

E. Finishing

1. The surface of the top layer of base course shall be finished after final compaction by cutting any overbuild to grade and rolling with a steel-wheeled roller. Thin layers of material shall not be added to the top layer of base course to meet grade. If the elevation of the top layer of base course is 1/4 inch or more below grade, then the top layer should be scarified to a depth of at least 3 inches and new material shall be blended in and compacted to bring to grade. Adjustments to rolling and finishing procedures shall be made as directed to minimize segregation and degradation, obtain grades, maintain moisture content, and insure an acceptable base course. Should the surface become rough, corrugated, uneven in texture, or traffic marked prior to completion, the unsatisfactory portion shall be scarified, reworked and recompacted or it shall be replaced as directed.

F. Smoothness

1. The surface of the top layer shall show no deviations in excess of 3/8 inch when tested with a 12 foot straightedge. Deviations exceeding this amount shall be corrected by removing material and replacing with new material, or by reworking existing material and compacting it to meet these specifications.

3.06 TRAFFIC

- A. Do not allow traffic on the completed base course.

3.07 MAINTENANCE

- A. Maintain the base course in a satisfactory condition until the full pavement section is completed and accepted. Maintenance shall include immediate repairs to any defects and shall be

repeated as often as necessary to keep the area intact. Any base course that is not paved over prior to the onset of winter, shall be retested to verify that it still complies with the requirements of this specification. Any area of base course that is damaged shall be reworked or replaced as necessary to comply with this specification.

3.08 DISPOSAL OF UNSATISFACTORY MATERIALS

- A. Dispose of any unsuitable materials that must be removed outside the limits of District-controlled land. No additional payments will be made for materials that must be replaced.

3.09 FIELD QUALITY CONTROL

- A. Sampling
 - 1. Take the number and size of samples required to perform the following tests.
- B. The Contractor shall employ a testing laboratory to perform other tests and to submit test reports
 - 1. Perform each of the following tests at the specified frequency.
 - a. In-place density, in accordance with ASTM D1556/D1556M or ASTM D6938.
 - 1) One in-place density test for every 50 cubic yards of completed material unless otherwise specified.
 - 2) Additionally, at least one test for each lift of material placed and material type.
 - 3) The horizontal locations of tests shall be randomly staggered in the material.
 - 4) Material not meeting the required specifications for in-place density shall be retested after additional compaction has been completed.

3.10 SUBGRADE PREPARATION

- A. Unsatisfactory material in surfaces to receive fill or in excavated areas shall be removed and replaced with satisfactory materials as directed by the Engineer. The surface shall be scarified to a depth of 8 inches before the fill is started.
- B. Sloped surfaces steeper than 1 vertical to 3 horizontal shall be plowed, stepped, benched, or broken up so that the fill material will bond with the existing material.
- C. Scarify exposed subgrade in excavations following the depths specificized in the plans, moisture condition to at least the optimum moisture content but no more than 3% above the optimum moisture content based on ASTM D698, and compact to a minimum 95% relative compaction based on ASTM D698.
- D. Material shall not be placed on surfaces that are muddy, frozen, or contain frost. If wet, soft conditions are encountered, mitigation such as discing and air drying, or placement of a stabilization fabric/grid may be necessary prior to placing import fill.
- E. Compaction shall be accomplished by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, or other approved equipment well suited to the soil being compacted. Material shall be moistened or aerated as necessary to provide the moisture content that will readily facilitate obtaining the specified compaction with the equipment used.

END OF SECTION

FILE SPEC: P:\2166_Knights_Landing_Levee_Repair\0110_Ridge_Cut_Erosion_Levee_Repair\08_Civil\400_Plans\020_CAD\Sheets\Phase2\From Station 0+00 to 19+00\G-002-Notes.dwg
PLOT DATE: Jul 02, 2026 -- 2:37pm

GENERAL NOTES:

1.

ALL CONSTRUCTION MATERIALS SHALL CONFORM TO THE SPECIFICATIONS FOR THE KNIGHTS LANDING RIDGE CUT LEFT LEVEE IMPROVEMENT PROJECT. THE CONTRACTOR SHALL OBTAIN AND USE ALL APPLICABLE ADDENDUMS.
2.

THE TOPOGRAPHIC MAPPING IS BASED UPON PHOTOGRAPH DATED MAY 27, 2025.
3.

SURVEY DATUM: HORIZONTAL DATUM, CALIFORNIA STATE PLANE COORDINATE SYSTEM ZONE II NAD83 (2007.00) CA HPGN. VERTICAL DATUM NAVD88.
4.

THE ALIGNMENT INFORMATION SHOWN ON THE DRAWINGS IS A CONSTRUCTION REFERENCE LINE ESTABLISHED FOR THIS PROJECT. THE CONTRACTOR SHALL STAKE THE ALIGNMENT AND ANY OFFSETS REQUIRED.
5.

ALL EXISTING FACILITIES ARE NOT SHOWN. CONTRACTOR SHALL CONFIRM AND BE SATISFIED AS TO LOCATIONS OF EXISTING FACILITIES OR OBSTRUCTIONS WHICH MAY BE AFFECTED BY CONSTRUCTION.
6.

UTILITY INFORMATION WAS COMPILED FROM DATA PROVIDED BY FACILITY OWNERS AND LOCATIONS ARE APPROXIMATE. PRIOR TO COMMENCING CONSTRUCTION UTILITY LOCATIONS AND DEPTHS SHALL BE VERIFIED BY THE CONTRACTOR. ALL EXISTING UNDERGROUND AND OVERHEAD UTILITIES SHALL BE PROTECTED FROM DAMAGE BY CONSTRUCTION EQUIPMENT AND OPERATIONS.
7.

THE CONTRACTOR SHALL NOTIFY UNDERGROUND SERVICE ALERT (USA) A MINIMUM OF 48 HOURS IN ADVANCE OF THE START OF ANY EXCAVATION WORK BY CALLING 800-642-2444.
8.

UTILITY RELOCATIONS REQUIRED FOR CONSTRUCTION OF PROJECT IMPROVEMENTS WILL BE MADE BY PG&E PRIOR TO START OF PROJECT UNLESS OTHERWISE INDICATED. COORDINATE WITH PG&E AS NECESSARY TO COMPLETE THE WORK.
9.

THE CONTRACTOR SHALL COMPLY WITH THE U.S. ARMY CORPS OF ENGINEERS SAFETY & HEALTH MANUAL (EM 385-1-1) AND OBTAIN A PERMIT FROM THE STATE DIVISION OF INDUSTRIAL SAFETY FOR ALL TRENCH EXCAVATION FIVE (5) FEET OR MORE IN DEPTH PRIOR TO BEGINNING ANY EXCAVATION. A COPY OF THIS PERMIT SHALL BE AVAILABLE AT THE SITE AT ALL TIMES.
10.

THE CONTRACTOR SHALL PROVIDE TEMPORARY FENCING AND / OR BARRIERS WHENEVER EXISTING FENCING OR BARRIERS ARE REMOVED. GATES AND FENCES AT ALL ACCESS LOCATIONS SHALL BE PROTECTED AND LOCKED DURING NON-WORKING HOURS.
11.

THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR FURNISHING, INSTALLING AND MAINTAINING WARNING SIGNS AND DEVICES TO SAFE GUARD THE GENERAL PUBLIC AND THE WORK AND TO PROVIDE SAFE AND PROPER ROUTING OF VEHICULAR AND PEDESTRIAN TRAFFIC DURING THE PERFORMANCE OF THE WORK.
12.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING RED LINE AS-BUILT DRAWINGS FOR ALL THE WORK THROUGHOUT THE COURSE OF CONSTRUCTION. SUCH DRAWINGS SHALL RECORD THE LOCATION AND GRADE OF ALL IMPROVEMENTS AND FILLS THAT ARE CONSTRUCTED AND COPIES SHALL BE SUBMITTED TO THE CONTRACTING OFFICER AS INDICATED IN THE SPECIFICATIONS.
13.

MATERIALS MUST MEET THE REQUIREMENTS SET FORTH IN THE SPECIFICATIONS AND BE PROCURED FROM SOURCES APPROVED BY THE COUNTY PRIOR TO PLACEMENT.
14.

CLEARED AND GRUBBED MATERIALS SHALL BE OFF HAULED TO A LEGAL DISPOSAL SITE.
15.

COORDINATE WITH ADJACENT LANDOWNERS ON CONSTRUCTION DETAILS AND SEQUENCING RELATED TO IRRIGATION PIPING, SYSTEMS AND RELATED FACILITIES.
16.

LIMITS OF WORK REQUIRE A 15' TEMPORARY EASEMENT AND A 15' PERMANENT EASEMENT ON THE LANDSIDE LEVEE.
17.

CONTRACTOR IS RESPONSIBLE FOR THE PRESERVATION OF SURVEY MONUMENTS LOCATED WITHIN THE AREA OF WORK HEREIN PERMITTED. PRIOR TO THE START OF CONSTRUCTION, CONTRACTOR SHALL ENSURE THAT SURVEY MONUMENTS THAT POTENTIALLY MAY BE DISTURBED SHALL BE LOCATED AND REFERENCED BY A LICENSED LAND SURVEY AND A CORNER RECORD BE FILED WITH THE COUNTY SURVEYOR. ANY SURVEY MONUMENTS DISTURBED DURING THE COURSE OF CONSTRUCTION SHALL BE REESTABLISHED BY A LICENSED LAND AND ANOTHER CORNER RECORD FILED WITH THE COUNTY SURVEYOR. (LAND SURVEYORS' ACT SECTION 8771).

SPECIAL NOTES:

1.

THE NOTES PLACED ON THIS PLAN SHEET ARE TO BE USED AS A GUIDE FOR VARIOUS TOPICS DESCRIBED. SPECIFIC DETAILS AND FURTHER EXPLANATIONS OF THE VARIOUS NOTES ARE DESCRIBED AT LENGTH IN THE SPECIFICATIONS AND WITHIN THESE PLANS.
2.

THE DISTRICT RESERVES THE RIGHT TO MAKE FIELD, SITE, AND QUANTITY ADJUSTMENTS AS NECESSARY.

DUST AND MUD CONTROL:

1.

DURING THE COURSE OF CONSTRUCTION, THE CONTRACTOR SHALL KEEP ALL CONSTRUCTION AREAS, HAUL ROADS, OTHER ROADWAYS, AND OTHER USE AREAS WHERE DUST IS GENERATED WELL WATERED.
2.

WATER WILL BE MADE AVAILABLE FOR THE CONSTRUCTION OPERATIONS FROM THE SURROUNDING WATERWAY. THE PUMPING FACILITY SHALL BE LOCATED IN AN AREA THAT WILL NOT CREATE A TRAFFIC OR MUD HAZARD ON THE ROADS USED BY THE CONTRACTOR, PUBLIC AND LOCAL TRAFFIC.

ACCESS ROADS:

1.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ACCESS ALONG THE LEVEE ROADS AT ALL TIMES DURING CONSTRUCTION. ANY DAMAGE TO THE COUNTY AND/OR LEVEE ROADS AND ACCESS RAMPS SHALL BE IMMEDIATELY REPAIRED BY THE CONTRACTOR AT HIS EXPENSE.
2.

IF DELIVERING MATERIAL OR EQUIPMENT BY TRUCK, ALL TRUCK TRAFFIC SHALL BE LIMITED TO THE COUNTY AND DESIGNATED ACCESS ROADS, UNLESS OTHERWISE APPROVED.
3.

MAXIMUM SPEED LIMIT ON DISTRICT LEVEE ROADS IS 30 MPH, OR AS POSTED.
4.

THE CONTRACTOR SHALL IMPROVE, MAINTAIN, AND REPAIR UPON COMPLETION, THE DISTRICT ACCESS RAMPS AND ACCESS ROADS AS REQUIRED FOR TRANSPORTATION AND HAULING MATERIAL TO THE REPAIR AREAS.
5.

THE CONTRACTOR SHALL REVIEW THE ACCESS ROADS AND DETERMINE THE LOCATION FOR TURNOUTS, RAMPS, ROAD DRAINAGE, ALIGNMENT, ETC. UPON COMPLETION OF THE PROJECT, SOME PORTIONS OF THE ACCESS ROADS MAY REQUIRE MINOR MODIFICATIONS AND ALTERATIONS. THE ACCESS ROADS WHICH REMAIN SHALL BE LEFT IN GOOD CONDITION FOR THE DISTRICT, FARMERS, AND OTHER LOCAL TRAFFIC.
6.

THE DESIGNATED ACCESS ROADS FOR THIS PROJECT MAY REQUIRE THE CONTRACTOR TO MODIFY AND REWORK THE GRADING OF THE EXISTING ROADS TO MEET THE CONTRACTOR'S HAULING AND ROAD DRAINAGE REQUIREMENTS.
7.

THE CONTRACTOR IS SOLELY RESPONSIBLE FOR MAKING ANY NECESSARY IMPROVEMENTS, MODIFICATIONS, AND ALTERATIONS TO MEET HIS REQUIREMENTS AND FOR THE MAINTENANCE.
8.

THE CONTRACTOR'S EQUIPMENT SHALL BE RESTRICTED TO OPERATE ONLY ON THOSE ROADS AND WITHIN THOSE SPECIFIED WORK AREAS INDICATED ON THE PLANS UNLESS OTHERWISE APPROVED BY THE ENGINEER, DISTRICT, AND LANDOWNERS.
9.

NEITHER THE DISTRICT NOR THE ENGINEER MAKE ANY WARRANTY OR GUARANTEE AS TO THE ADEQUACY OF THE EXISTING NATIVE MATERIALS TO SUPPORT THE CONSTRUCTION TRAFFIC ON THE ACCESS ROADS. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR MAKING THE NECESSARY IMPROVEMENTS AND PROVIDING THE NECESSARY MEASURES REQUIRED TO ACCOMMODATE HIS ANTICIPATED NEEDS.
10.

CONTRACTOR MUST MAINTAIN ACCESS ALONG THE LEVEE CROWN ROAD AT ALL TIMES DURING CONSTRUCTION.

11. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR SECURING ALTERNATE ACCESS ROUTES OUTSIDE OF THE PROPOSED ACCESS ROUTES IN THE PLANS. SUCH ROUTES SHALL FOLLOW STATE AND LOCAL TRAFFIC LAWS. ANY ACCESS AGREEMENTS SHALL BE RECORDED IN WRITING AND DELIVERED AS A SUBMITTAL TO THE DISTRICT/ENGINEER.

ABBREVIATIONS:

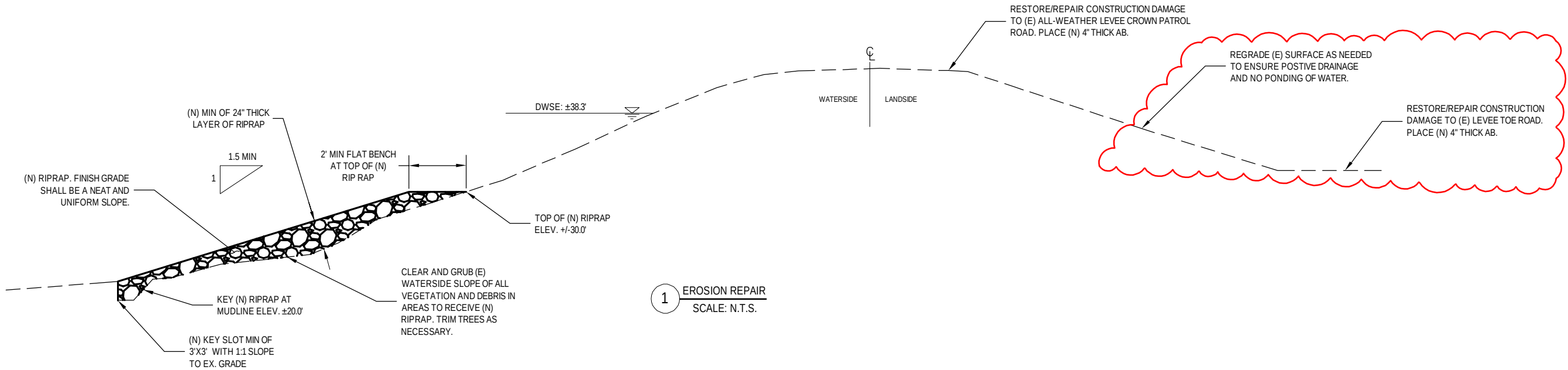
@	AT	LT	LEFT
Ø	DIAMETER	MAX	MAXIMUM
AB	AGGREGATE BASE	MIN	MINIMUM
AC	ASPHALTIC CONCRETE	MH	MANHOLE
ACB	ARTICULATING CONCRETE BLOCK	MHHW	MEAN HIGHER HIGH WATER
AP	ANGLE POINT	MLLW	MEAN LOWER LOW WATER
BC	BEGINNING OF CURVE	MON	MONUMENT
BFE	BASE FLOOD ELEVATION	N	NORTH, NORTHING
BM	BENCHMARK	(N)	NEW
BMP	BEST MANAGEMENT PRACTICE	NIC	NOT IN CONTRACT
BOC	BACK OF CURB	NO	NUMBER
BOW	BACK OF WALK	NTS	NOT TO SCALE
CB	CATCH BASIN	OC	ON CENTER
CC	CENTER TO CENTER	OD	OUTSIDE DIAMETER
CFS	CUBIC FEET PER SECOND	OH	OVERHEAD
CL	CENTERLINE	PCC	PORTLAND CEMENT CONCRETE
CLSM	CONTROLLED LOW STRENGTH MATERIAL	PL	PROPERTY LINE
CONC	CONCRETE	POC	POINT OF CONNECTION
CTR	CENTER	PP	POWER POLE
CY	CUBIC YARD	PRC	POINT OF REVERSE CURVATURE
DIM	DIMENSION	PSI	POUNDS PER SQUARE INCH
DWG	DRAWING	PUE	PUBLIC UTILITY EASEMENT
DWSE	DESIGN WATER SURFACE ELEVATION	PVC	POLYVINYL CHLORIDE
E	EAST, EASTING	R	RADIUS
(E), EX	EXISTING	RC	RELATIVE COMPACTION
EA	EACH	RCP	REINFORCED CONCRETE PIPE
EC	END OF CURVE	ROW	RIGHT-OF-WAY
EF	EACH FACE	RT	RIGHT
EG	EXISTING GROUND	SPEC	SPECIFICATION
EL, ELEV	ELEVATION	S	SOUTH, SLOPE
EP	EDGE OF PAVEMENT	SD	STORM DRAIN
EW	EACH WAY	SF	SQUARE FEET
EWEF	EACH WAY EACH FACE	SHT	SHEET
FF	FINISH FLOOR	SPEC	SPECIFICATION
FG	FINISH GRADE	SS	SANITARY SEWER, STAINLESS STEEL
FL	FLOWLINE	STA	STATION
FOC	FACE OF CURB	STD	STANDARD
FT	FOOT, FEET	SY	SQUARE YARD
G	GAS	TBM	TEMPORARY BENCHMARK
GA	GAUGE	TC	TOP OF CURB
GALV	GALVANIZED	TOC	TOP OF CONCRETE
GB	GRADE BREAK	TOW	TOP OF WALL
GP	GALLONS PER MINUTE	TEL	TELEPHONE
HDPE	HIGH DENSITY POLYETHYLENE	TEMP	TEMPORARY
HORIZ	HORIZONTAL	TN	TON
HP	HIGH POINT	TYP	TYPICAL
ID	INSIDE DIAMETER	UNO	UNLESS NOTED OTHERWISE
IN	INCH, INCHES	VERT	VERTICAL
INV	INVERT	W	WEST, WATER
JP	JOINT POLE	WSP	WELDED STEEL PIPE
LF	LINEAR FEET	XS	CROSS SECTION
LP	LOW POINT	YR	YEAR

CONVENTIONS:

	←	BENCHMARK - VERTICAL & HORIZONTAL
	←	BENCHMARK - VERTICAL ONLY
	←	TEMPORARY CONTROL POINT OR TEMPORARY BENCHMARK
	←	DETAIL INDICATOR
	←	DETAIL IDENTIFICATION NUMBER
	←	DRAWING NUMBER WHERE DETAIL IS SHOWN
	←	SECTION INDICATOR
	←	SECTION IDENTIFICATION NUMBER
	←	DRAWING NUMBER WHERE SECTION IS SHOWN
	←	NOTE IDENTIFICATION NUMBER
	←	REVISION NUMBER

	ADDENDUM 1	7-1-2026	DESIGN BY	ARR	DRAWING SCALE	N.T.S.		711 N. Pershing Avenue Stockton, CA 95203 209-946-0268 1550 Harbor Blvd., Suite 212 West Sacramento, CA 95691 916-403-5900	RIDGE CUT EROSION REPAIR PROJECT KNIGHTS LANDING RIDGE DRAINAGE DISTRICT YOLO COUNTY, CALIFORNIA	DATE	MAY 2026		
												SHEET IDENTIFICATION	G-002
												SHEET 2 OF 8	KSN PROJECT FILE NO. 2166-0110
	NO.	DESCRIPTION	DATE	APPR.	HORIZONTAL DATUM CCS83, ZONE 2	ORIGINAL DRAWING SCALE 0 1/2" 1"			CONSTRUCTION NOTES				
					VERTICAL DATUM NAVD88								

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PLOT DATE: Jul 02, 2026 -- 2:37pm



SUBMITTAL	
%	Date
30	06/13/2025
60	07/22/2025
100	02/03/2026



ADDENDUM 1		7-2-2026	
NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	ARR
DRAWN BY	ARR
CHECK BY	EAR
HORIZONTAL DATUM	CCS83, ZONE 2
VERTICAL DATUM	NAVD88

DRAWING SCALE	AS SHOWN
ORIGINAL DRAWING SCALE	0 1/2" 1"



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916-403-5900

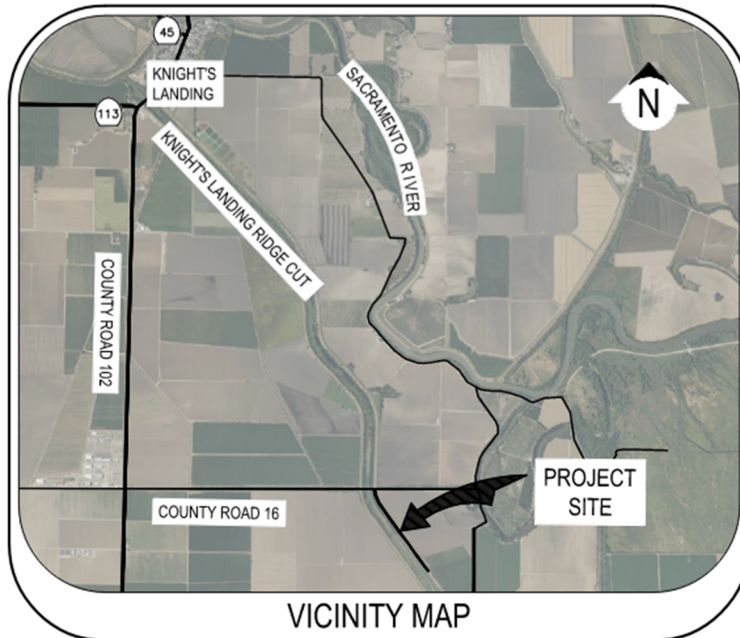
RIDGE CUT EROSION REPAIR PROJECT KNIGHTS LANDING RIDGE DRAINAGE DISTRICT YOLO COUNTY, CALIFORNIA		DATE MAY 2026
DETAILS		SHEET IDENTIFICATION C-501 SHEET 8 OF 8 KSN PROJECT FILE NO. 2166-0110

STORMWATER POLLUTION PREVENTION PLAN

For

Ridge Cut Erosion Repair Phase 2

Project Location:



WDID: 5A57CR00225

RISK LEVEL: 1

Legally Responsible Person (LRP):

Knights Landing Ridge Drainage District (KLRDD)
975 Wilson Bend Road
Grimes, CA 95950
Meegan Nagy, General Manager
(530) 437-2221

Project Address:

Knights Landing Ridge Cut East Levee at County Road 16
Yolo County, CA

Site Operating Hours:

7AM – 5PM weekdays, no weekends

Estimated Project Dates:

Start of Construction: August 31, 2026
Completion of Construction: October 2, 2026

SWPPP Prepared by:

Kjeldsen, Sinnock, & Neudeck, Inc.
1550 Harbor Blvd, Suite 212
West Sacramento, CA
Contact: Sean M. Pritchard, CCM, QSD/P

SWPPP Preparation Date:

June 09, 2026

QSD Name and Signature:

Sean M. Pritchard, CCM, QSD/P

Contact Information

Role	Name	Phone Number	License or Certification Number, if Applicable
Qualified SWPPP Developer (QSD)	Sean Pritchard	(916) 403-5900	#84256
Qualified SWPPP Practitioner (QSP)	Sean Pritchard	(916) 403-5900	#84256
Qualified SWPPP Practitioner (QSP)			
QSP Delegate			
QSP Delegate			
QSP Delegate			
QSP Delegate			

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Appendix S:	Construction General Permit

Qualified SWPPP Developer

Approval and Certification of the Stormwater Pollution Prevention Plan

Project Name: Ridge Cut Erosion Repair Phase 2

Project Number/ID: 2166-0110

"This Stormwater Pollution Prevention Plan and its appendices were prepared under my direction to meet the requirements of the California Construction Stormwater General Permit (*Order No. 2022-0057-DWQ*). I certify that I am a Qualified SWPPP Developer in good standing as of the date signed below and will maintain up to date credentials for the duration of the project."

QSD Signature

Sean M. Pritchard

QSD Name

Senior Construction Manager, KSN

Title and Affiliation

SPritchard@KSNInc.com

Email

Date

#84256

QSD Certificate Number

916.403.5900

Telephone Number

Amendment Log

Project Name: Ridge Cut Erosion Repair Phase 2

Project Number/ID: 2166-0110

Amendment No.	Date	Brief Description of Amendment (include section and page number)	Prepared and Approved By
			Name: QSD#
			Name: QSD#
			Name: QSD#

The SWPPP will be revised when:

- There is a 2022 CGP violation (2022 CGP Section VI.Q.1);
- There is a reduction or increase in total disturbed acreage (2022 CGP Section III.F.2. and F.4);
- BMPs are not effective and are not resulting in a reduction or elimination of pollutants in stormwater discharges and authorized non-stormwater discharges (2022 CGP Section VI.Q.1 and Attachment D Section III.C.5);
- There is a change in the project duration that changes the project Risk Type (2022 CGP Section III.F.1);
- Dischargers with projects where all construction activities (including passive treatment, active treatment systems, and/or active equipment) will be suspended for 30 days or more (2022 CGP Section III.G);
- There is a change in construction or operations that may affect the discharge of pollutants to surface waters, groundwater(s), or a municipal separate storm sewer system (MS4) (2022 CGP Sections IV.O. and VI.Q.1); or

When deemed necessary by the QSD. The QSD has determined that the changes listed in **Table 1-1** can be field determined by the QSP. All other changes will be made by the QSD as formal amendments to the SWPPP. Note that the 2022 CGP requires that the QSD “revise the SWPPP to address potential problems identified by visual inspections, sampling data, comments from a QSP, or their own site observations (2022 CGP Section V.C.2.).

SWPPP Amendment QSD Certifications are located in **Appendix C**.

Abbreviations and Terms

The following abbreviations and terms are used in this SWPPP. Definitions are provided for convenience and do not replace definitions or requirements included in the 2022 CGP.

Abbreviation	Meaning	Abbreviation	Meaning
2022 CGP	State Water Resources Control Board Order No. 2022-0057-DWQ, NPDES No. CAS000002	AB	Aggregate Base
ATS	Active Treatment System	BMP	Best Management Practice
CASQA	California Stormwater Quality Association	COC	Chain-of-Custody
CSMP	Construction Site Monitoring Program	DAR	Duly Authorized Representative
EPA	United States Environmental Protection Agency	ESA	Environmentally Sensitive Area
LRP	Legally Responsible Person	MDL	Method Detection Limit
MS4	Municipal Separate Storm Sewer System	NAL	Numeric Action Level
NOI	Notice of Intent	NOT	Notice of Termination
NPDES	National Pollutant Discharge Elimination System	PRDs	Permit Registration Documents
PTS	Passive Treatment System	QA/QC	Quality Assurance / Quality Control
QPE	Qualifying Precipitation Event	QSD	Qualified SWPPP Developer
QSP	Qualified SWPPP Practitioner	RSP	Rock Slope Protection
SDS	Safety Data Sheet	SMARTS	Storm Water Multiple Application and Report Tracking System
SWPPP	Stormwater Pollution Prevention Plan	TMDL	Total Maximum Daily Load
USACE	United States Army Corps of Engineers	WDID	Waste Discharger Identification Number
WPCD	Water Pollution Control Drawing	WQO	Water Quality Objective

Project-Specific Terms

Term	Meaning
Construction Manager	Person or entity responsible for construction management duties identified in Appendix J
District	Knights Landing Ridge Drainage District
Project	Ridge Cut Erosion Repair Phase 2 Project
Receiving Water	Knights Landing Ridge Cut
Regional Water Board	Central Valley Regional Water Quality Control Board
Ridge Cut	Knights Landing Ridge Cut
State Water Board	State Water Resources Control Board
SWPPP Site Maps	Site Maps and Drawings included in Appendix A

Section 1 SWPPP Requirements

1.1 INTRODUCTION

This Stormwater Pollution Prevention Plan (SWPPP) is designed to comply with California's *General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (2022 CGP)*, State Water Resources Control Board (State Water Board) *Order No. 2022-0057-DWQ (NPDES No. CAS000002)* (Appendix S). This SWPPP has been prepared following the 2022 CGP SWPPP Template for Traditional Projects provided in the California Stormwater Quality Association (CASQA) *Stormwater Best Management Practice (BMP) Handbook: Construction* (CASQA 2023).

This project is considered a traditional construction project.

In accordance with the 2022 CGP, Section IV.O, this SWPPP is designed to address the following:

- Identification of all pollutants, their sources, and control mechanisms, including sources of sediment associated with all construction activities (e.g., sediment, paint, cement, stucco, cleaners, site erosion);
- Pollutant source assessments, including a list of potential pollutant sources and identification of site areas where additional BMPs are necessary to reduce or prevent pollutants in stormwater and authorized non-stormwater discharges, per the minimum requirements when developing the pollutant source assessment;
- Description of site-specific BMPs implemented to reduce or eliminate stormwater pollution;
- Where not otherwise required to be under a Regional Water Quality Control Board (Regional Water Board) permit, all non-stormwater discharges are identified and either eliminated, controlled, or treated;
- Site BMPs are effective and result in the reduction or elimination of pollutants in stormwater discharges and authorized non-stormwater discharges from construction activity to the Best Available Technology/Best Control Technology (BAT/BCT) standard; and;
- Stabilization BMPs are installed to reduce or eliminate pollutants after construction is completed are effective and maintained; and
- Calculations and design details, as well as BMP controls, are complete and correct.

The Ridge Cut Erosion Repair Phase 2 project (Project, or Site) comprises approximately 12 acres of erosion control repair, of which 3.0 acres will be disturbed. The Project is located at Knights Landing Ridge Cut East Levee at County Road 16 from Station 0+00 to 19+00 in Yolo County, California. The property is owned by Knight's Landing Ridge Drainage District (KLDD). The project's location is shown on the Site Maps in Appendix A.

1.2 PERMIT REGISTRATION DOCUMENTS

Required Permit Registration Documents (PRDs) shall be submitted to the State Water Board via the Stormwater Multi Application and Report Tracking System (SMARTS) by the LRP or DAR. The project-specific PRDs include (2022 CGP Section III.A):

1. Notice of Intent (NOI);

2. Risk Level Determination (Construction Site Sediment and Receiving Water Risk Determination);
3. Site Drawings and Map;
4. SWPPP;
5. Annual Fee per the current 23 California Code of Regulations Chapter 9 fee schedule for National Pollutant Discharge Elimination System (NPDES) stormwater permits; and
6. Signed Certification Statement (LRP Certification is provided electronically with SMARTS PRD submittal).

Site Maps can be found in Appendix A. A copy of the submitted PRDs shall also be kept in Appendix B along with the Waste Discharge Identification (WDID) confirmation.

1.3 SWPPP AVAILABILITY AND IMPLEMENTATION

The SWPPP will be available at the construction site during working hours listed on the title sheet, while construction is occurring and shall be made available upon request by a federal, state, or municipal inspector. A current copy of the site-specific SWPPP and any site inspection reports required by the 2022 CGP may be kept in electronic format at the site so long as the information requested by a federal, state, or municipal inspector can be made available during an inspection. Legible maps in hard copy must be available at the site (2022 CGP Section IV.O.1.).

The SWPPP must be implemented at the appropriate level to protect water quality at all times throughout the life of the project. The SWPPP must remain on the site during construction activities, commencing with the initial mobilization and ending with the termination of coverage under the 2022 CGP.

1.4 SWPPP AMENDMENTS

SWPPP changes or amendments will be uploaded through SMARTS within 30 calendar days. The SWPPP will be revised when:

- If there is a 2022 CGP violation (2022 CGP Section VI.Q.1);
- There is a reduction or increase in total disturbed acreage (2022 CGP Section III.F.2 and F.4.);
- BMPs are not effective and are not resulting in a reduction or elimination of pollutants in stormwater discharges and authorized non-stormwater discharges (2022 CGP Section VI.Q.1 and Attachment D Section III.C.5);
- There is a change in the project duration that changes the project's risk level (2022 CGP Section III.F.1); or
- Dischargers with projects where all construction activities (including passive treatment, active treatment systems, and/or active equipment) will be suspended for 30 days or more (2022 CGP Section III.G.).

Additionally, the SWPPP will be amended when:

- There is a change in construction or operations that may affect the discharge of pollutants to surface waters, groundwater(s), or a municipal separate storm sewer system (MS4) (2022 CGP Sections IV.O. and VI.Q.1); or

When deemed necessary by the QSD. The QSD has determined that the changes listed in Table 1-1 can be field determined by the QSP. All other changes will be made by the QSD as formal amendments to the SWPPP. Note that the 2022 CGP requires that the QSD revise the SWPPP to address potential problems identified by visual inspections, sampling data, comments from a QSP, or their own site observations (2022 CGP Section V.C.2.).

The following items shall be included in each amendment:

- Who requested the amendment;
- The location of proposed change;
- The reason for change;
- The original BMP(s) proposed, if any;
- The new BMP(s) proposed; and
- QSD certification.

SWPPP amendments will be logged at the front of the SWPPP and SWPPP Amendment QSD certifications will be located in Appendix C. The SWPPP text will be revised, replaced and/or hand annotated as necessary to properly convey the amendment. SWPPP amendments must be made by a QSD. The following changes have been designated by the QSD as “to be field determined” and constitute minor changes that the QSP may implement based on field conditions.

Table 1-1 List of Changes to be Field Determined

Candidate changes for field location or determination by QSP ⁽¹⁾	Check changes that can be field located or field determined by QSP
Increase quantity of an Erosion or Sediment Control Measure	✓
Relocate/add stockpiles or stored materials	✓
Relocate or add toilets	✓
Relocate vehicle storage and/or fueling locations	✓
Relocate areas for waste storage	✓
Relocate water storage and/or water transfer location	✓
Changes to access points (entrance/exits)	✓
Change type or location of Erosion or Sediment Control Measure	✓
Minor changes to schedule or phases	✓
Changes in construction materials	✓

Table 1-1 List of Changes to be Field Determined

Candidate changes for field location or determination by QSP ⁽¹⁾	Check changes that can be field located or field determined by QSP
<i>(1) Any field changes not identified for field location or field determination by the QSP must be made as an amendment by the QSD.</i>	

1.5 RETENTION OF RECORDS

Paper or electronic records of documents required by this SWPPP will be retained for a minimum of three years from the date generated or date submitted, whichever is later, for the following items:

- SWPPP;
- Visual monitoring reports;
- Sampling equipment calibration records;
- pH and turbidity sampling field sheets;
- Analytical laboratory reports; and

These records will be available at the Site until construction is complete. Records assisting in the determination of compliance with the 2022 CGP will be made available within a reasonable time to the Regional Water Board, State Water Board, or U.S. Environmental Protection Agency (EPA) upon request. Requests by the Regional Water Board for retention of records for a period longer than three years will be adhered to.

1.6 REPORTING

Completed inspection checklists are not required to be submitted to the Regional Water Board. However, completed inspection checklists will be kept with the SWPPP on-site or electronically. The 2022 CGP requires that permittees prepare, certify, and electronically submit an Annual Report no later than September 1 of each year. Reporting requirements are identified in 2022 CGP Section VI.P. Annual reports will be filed in SMARTS and in accordance with information required by the online forms.

Planned changes in site construction activities that may result in non-compliance with the 2022 CGP are required to be provided in writing to the Regional Water Board and local stormwater agency in advance of the changes.

If a 2022 CGP discharge violation occurs, the QSP will immediately notify the LRP. The LRP will include information on the violation with the Annual Report. Corrective measures will be implemented immediately following identification of the discharge or written notice of non-compliance from the Regional Board. Discharges and corrective actions must be documented and include the following items:

- The date, time, location, nature of operation, and type of unauthorized discharge;
- The cause or nature of the notice or order;
- The BMPs deployed before the discharge event, or prior to receiving notice or order; and

- The date of deployment and type of BMPs deployed after the discharge event, or after receiving the notice or order, including additional measures installed or planned to reduce or prevent re-occurrence.

Results of (pH and turbidity, etc.) monitoring will be electronically submitted through SMARTS for all field sampling results within 30 days of the completion of the precipitation event or within 10 days if the field sampling results demonstrate the exceedance of the pH and/or turbidity NALs. See Section 7.7.2 for additional discussion of the reporting requirements. Reporting requirements for pH and turbidity Receiving Water Monitoring Triggers are discussed in Section 7.7.2.

Results of non-visible pollutant monitoring and corrective actions will be electronically submitted within 30 days after obtaining analytical results or within 10 days if the analytical results demonstrate the exceedance of an applicable TMDL-related NAL or NEL or Basin Plan parameter. See Section 7.7.1.5 for additional discussion of the reporting requirements.

Results of monitoring (pH, turbidity, flowrate, volume discharged, and freeboard storage) will be electronically submitted monthly during the project. See the ATS Plan for additional discussion of the reporting requirements.

In the event of an ATS NEL exceedance results will be electronically certified and submitted to SMARTS within 24-hours of obtaining the results.

The Regional Water Board will be notified via email 24 hours prior to the beginning of a planned dewatering discharge.

In the event of an emergency dewatering, the Regional Water Board and applicable MS4 are to be notified within 24 hours of a discharge occurring. An emergency is defined as the need to protect human life and health or prevent severe property damage.

Results of (pH and turbidity, etc.) monitoring will be electronically submitted through SMARTS for all field sampling results within 30 days of the completion of the precipitation event or within 10 days if the field sampling results demonstrate the exceedance of the pH and/or turbidity NALs.

See Section 7.7.3 for additional discussion of the reporting requirements including contacts for Regional Water Board and MS4 notifications.

A Passive Treatment Plan will be submitted electronically 14 days before passive treatment chemicals are used on site. See the Passive Treatment Plan for additional discussion of the reporting requirements.

1.7 CHANGES TO PERMIT COVERAGE

The 2022 CGP allows for the reduction or increase of the total acreage covered under the 2022 CGP when: a portion of the project is complete and/or conditions for termination of coverage have been met; when ownership of a portion of the project is purchased by a different entity; or when new acreage is added to the project.

Modified PRDs will be filed electronically through a Change of Information (COI) within 30 days of a reduction or increase in total disturbed area if a change in permit-covered acreage is to be sought. The SWPPP will be modified appropriately and will be logged at the front of the SWPPP. SWPPP

Amendments QSD Certifications will be located in Appendix C. COIs submitted electronically via SMARTS can be found in Appendix D.

1.8 NOTICE OF TERMINATION

A Notice of Termination (NOT) must be submitted electronically by the LRP or DAR via SMARTS to terminate coverage under the 2022 CGP.

According to the requirements of 2022 CGP Section III.H.4., the following final stabilization method will be used to satisfy final stabilization condition requirements:

70 percent final cover method supported by pre- and post-project photographs demonstrating stabilization.

RUSLE or RUSLE2 method with computation proof supported by pre- and post-project photographs demonstrating stabilization.

Custom method for which Regional Water Board approval has been obtained, supported by documentation required by the Regional Water Board and pre- and post- project photographs demonstrating stabilization.

The Regional Water Board will consider a construction site complete when the conditions of the 2022 CGP Section III.H., have been met.

The discharger is required to submit the following in SMARTS:

- NOT SMARTS Form;
- QSP-prepared final NOT inspection which includes the QSP name and valid QSP certificate number;
- Final site map with photo orientation references;
- Photos demonstrating final stabilization and the applicable post-construction BMPs and/or low impact development; and
- A long-term maintenance plan for the post-construction stormwater runoff BMPs and/or low impact development features being implemented.

According to the 2022 CGP, the NOT will be automatically approved within 30 calendar days after the date the NOT was submitted, unless, within the 30 calendar days the Regional Water Board notifies the discharger through SMARTS that the Notice of Termination has been denied, returned, or accepted for review (2022 CGP Section III.H.7).

Note: If an Annual Report has not been filed in the current reporting year, an Annual Report will need to be submitted prior to the NOT.

Section 2 Project Information

2.1 PROJECT AND SITE DESCRIPTION

2.1.1 Site Description

The Ridge Cut Erosion Repair Phase 2 Project is located along the waterside slope of the Knights Landing Ridge Cut east levee near County Road 16 in Yolo County, California, from approximately Station 0+00 to Station 19+00. The project is located at 38°44'45.21" N, 121°41'27.84" W and is identified on the Site Maps and Drawings included in Appendix A.

The project area is owned and operated by the Knights Landing Ridge Drainage District. The Knights Landing Ridge Cut is a constructed flood and drainage channel that conveys flood and irrigation drainage flows toward the Yolo Bypass from the Colusa Basin drainage system.

The total project area is approximately 12 acres. This area includes the levee repair area, temporary staging areas, haul routes, access routes, stockpile areas, and other temporary construction support areas associated with the project. The permanent construction area consists of approximately 3.5 acres where rock slope protection will be placed to repair existing erosion and reduce the potential for future erosion of the levee slope.

Construction activities will be limited to the work limits and temporary construction support areas shown on the project plans and SWPPP site maps. Temporary staging, hauling, access, and stockpile areas will be managed as part of the SWPPP-covered project area. Soil disturbance is anticipated to occur primarily within the 3.5-acre permanent construction area unless additional disturbance occurs in temporary construction support areas during construction.

2.1.2 Existing Conditions

The project site consists of an existing earthen levee embankment and waterside levee slope along the Knights Landing Ridge Cut east levee. Portions of the waterside levee slope have experienced erosion and require repair and stabilization.

Existing surface conditions within the project area generally consist of levee slope vegetation, exposed or eroded soil areas, previously placed erosion protection, maintained work areas, and adjacent agricultural areas. Existing access roads include an all-weather aggregate base patrol road along the levee crown and an all-weather aggregate base patrol road on the landside stability berm.

Precipitation in the project vicinity occurs primarily as rainfall, with most annual rainfall occurring between October and April. The mean annual precipitation is 7.57 inches at Sacramento International Airport which is approximately 6 miles southeast of the project site. Construction is scheduled to occur prior to the primary wet-weather season.

Existing impervious surface within the project area is minimal. The project area is primarily composed of earthen levee slopes, aggregate-surfaced access roads, and adjacent disturbed or vegetated areas. No substantial buildings, paved surfaces, or permanent impervious improvements are present within the construction area.

2.1.3 Existing Drainage

The project site is located along the Knights Landing Ridge Cut east levee. Existing surface drainage generally follows the levee cross slope away from the levee crown. Runoff from the waterside slope flows west and downslope toward the Knights Landing Ridge Cut. Runoff from the landside slope flows east and downslope toward adjacent farmland and associated agricultural drainage features.

Existing drainage features consist primarily of the levee crown, levee slopes, adjacent maintained areas, agricultural drainage features, and the Ridge Cut channel. No existing storm drain inlets or municipal storm drain facilities are located within the construction area.

The receiving water for the project is the Knights Landing Ridge Cut. Based on the receiving water review completed for this SWPPP, the Knights Landing Ridge Cut is not identified as impaired for sediment-related pollutants, is not subject to a construction-sector TMDL applicable to this project, and does not have COLD, SPAWN, or MIGRATORY beneficial uses that would result in a high receiving water risk determination.

Existing drainage patterns, project limits, and discharge locations are shown on the Site Maps and Drawings included in Appendix A. Applicable receiving water impairments and TMDLs are summarized in Table 2-1.

Table 2-1 Applicable 303(d) List Impairments and TMDLs

Receiving Water	Water Quality Impairment	
	303(d) list	TMDL (2022 CGP Table H-1)
Knights Landing Ridge Cut	None	None

2.1.4 Geology and Groundwater

The project site is located on an existing earthen levee embankment along the Knights Landing Ridge Cut. Subsurface materials are anticipated to consist primarily of levee fill and native alluvial soils typical of the surrounding drainage corridor.

Existing slope materials are erodible, as evidenced by the areas requiring repair along the waterside levee slope. The project will stabilize the repaired slope areas with rock slope protection.

Groundwater is not anticipated to be encountered during construction, and construction dewatering is not expected to be required. If groundwater is encountered or dewatering becomes necessary, the SWPPP will be amended as appropriate, and applicable 2022 CGP dewatering requirements will be evaluated before discharge.

2.1.5 Project Description

The Ridge Cut Erosion Repair Phase 2 Project will repair existing erosion along the waterside slope of the Knights Landing Ridge Cut east levee from approximately Station 0+00 to Station 19+00. The project will place rock slope protection within the erosion repair limits shown on the project plans.

Construction activities are anticipated to include mobilization, temporary access and staging, environmental fencing, clearing and grubbing of vegetation and debris within areas to receive rock slope protection, tree trimming as necessary, slope preparation, excavation of a riprap key slot, placement of rock slope protection, material stockpiling, equipment operation, dust control, and final cleanup.

Rock slope protection will generally consist of a keyed riprap repair placed along the waterside levee slope. The repair details include a riprap key slot at the mudline, a minimum 24-inch-thick layer of riprap, a flat bench at the top of the riprap, and finish grading to provide a neat and uniform slope.

Temporary staging, equipment storage, material stockpiling, and other construction support activities will be located primarily on the all-weather aggregate base patrol road located on the landside stability berm, as shown on the project plans and SWPPP site maps. Hauling and access will use designated access routes shown on the project plans.

The contractor will maintain access along the levee roads during construction and will repair construction-related damage to county roads, levee roads, access ramps, and the existing all-weather aggregate base patrol roads as required by the project plans.

No concrete work, paving, grinding, demolition, temporary batch plant, active treatment system, passive treatment system, or planned construction dewatering is anticipated for this project. If any of these activities become necessary, the QSD will evaluate whether SWPPP amendments, additional BMPs, or additional monitoring requirements are required.

2.1.6 Developed Condition

Following construction, the repaired waterside levee slope will be stabilized with rock slope protection. The completed repair will restore the eroded portions of the levee slope and reduce the potential for future erosion along the repaired reach.

Post-construction drainage patterns are not expected to materially change as a result of the project. Runoff from the waterside slope will continue to drain toward the Knights Landing Ridge Cut, and runoff from the landside slope will continue to drain toward adjacent farmland and associated agricultural drainage features.

The project is not expected to increase amount of impervious area or create new permanent storm drain facilities. Temporary staging, access, stockpile, and construction support areas will be restored or left in stable condition following completion of construction. Construction site estimates for existing and developed conditions are summarized in Table 2-2.

Final stabilization will be achieved through installation of rock slope protection within the permanent repair area and stabilization or restoration of temporary construction support areas disturbed by construction activities.

Table 2-2 Construction Site Estimates

Construction site area	<u>12.0</u>	acres
Total area of disturbance	<u>3.5</u>	acres
Percent impervious before construction	<u>0.0</u>	%

Table 2-2 Construction Site Estimates

Runoff coefficient before construction	<u>0.25</u>	
Percent impervious after construction	<u>0.0</u>	%
Runoff coefficient after construction	<u>0.25</u>	

2.2 PERMITS AND GOVERNING DOCUMENTS

In addition to the 2022 Construction General Permit, the following permits and governing documents apply to the project or have been considered in preparation of this SWPPP:

- Clean Water Act Section 404 – U.S. Army Corps of Engineers - Nationwide Permit 31;
- Clean Water Act Section 401 Water Quality Certification – Central Valley Regional Water Quality Control Board;
- 1602 Streambed Alteration Agreement – Ca. Department of Fish and Wildlife.

In addition to the approved permits and documents, the following permits and governing documents are anticipated to apply to the project or have been considered in preparation of this SWPPP:

- Central Valley Water Regional Water Quality Control Board Basin Plan;
- State Water Board's 2022 Construction General Permit, Order No. 2022-0057-DWQ, NPDES No. CAS000002;
- California Stormwater Quality Association's Stormwater BMP Handbook;
- Yolo HCP/NCCP Certification of Inclusion/Compliance – Yolo Habitat Conservancy;
- Project plans and specifications prepared for the Ridge Cut Erosion Repair Phase 2 Project.

The project plans and specifications identify the project limits, access routes, staging areas, environmental fencing, erosion repair details, and other construction requirements applicable to the work.

Applicable permits, approvals, and governing documents will be incorporated into this SWPPP where they establish requirements related to stormwater pollution prevention, disturbed areas, access, staging, erosion control, sediment control, vegetation removal, or work near the Ridge Cut.

If additional permits, approvals, or agency conditions are issued before or during construction, this SWPPP will be amended as necessary to reflect applicable stormwater-related requirements.

2.3 STORMWATER RUN-ON FROM OFFSITE AREAS

Stormwater run-on from offsite areas is not anticipated. The project site is located on an elevated levee embankment, with surrounding lands generally lower than the project site and managed by agricultural drainage features, including tailwater ditches on the landside.

Existing drainage patterns direct runoff away from the levee crown. Waterside runoff drains toward the Knights Landing Ridge Cut, and landside runoff drains toward adjacent farmland and agricultural drainage features.

Runoff from disturbed areas on the waterside levee slope above the top of the rock slope protection will flow downslope toward the Ridge Cut through or over the placed rock slope protection material. The rock slope protection will help stabilize the slope and reduce sheet flow velocities along the repaired waterside slope.

As shown in Table 2-2, the anticipated runoff coefficient for the project area is approximately 0.25. This coefficient is considered applicable because site soils and surface conditions are generally consistent, the levee slopes are consistent through the site, and adjacent areas are lower and managed for agricultural drainage.

2.4 FINDINGS OF THE CONSTRUCTION SITE SEDIMENT AND RECEIVING WATER RISK DETERMINATION

A construction site sediment and receiving water risk determination has been prepared for the project in accordance with the 2022 CGP. The project has been determined to be a Risk Level 1 project based on the construction schedule, disturbed area, site topography, soil conditions, and receiving water characteristics.

The sediment risk determination was developed using the RUSLE method. Based on an R factor of 0.982, K factor of 0.33, and LS factor of 0.25, the total predicted sediment loss is 0.08 tons/acre, which is below the 15 tons/acre threshold for Low Sediment Risk.

The receiving water for the project is the Knights Landing Ridge Cut. Based on the receiving water review completed for this SWPPP, the Ridge Cut is not identified as impaired for sediment-related pollutants, is not subject to a construction-sector TMDL applicable to this project, and does not have COLD, SPAWN, or MIGRATORY beneficial uses that would result in a high receiving water risk determination.

Tables 2-3 and 2-4 summarize the sediment and receiving water risk determinations. Supporting calculations are included in Appendix L, and the project risk determination is included in Appendix B with the Permit Registration Documents.

Risk Level 1 sites are subject to the narrative effluent limitations specified in the 2022 CGP and may be subject to numeric effluent limits if applicable TMDLs, dewatering activities, active treatment systems, or passive treatment systems are used on site. This SWPPP has been prepared to address Risk Level 1 requirements.

Table 2-3 Summary of Sediment Risk

RUSLE Factor	Value	Method for Establishing Value
R	0.98	Stormwater Phase II Rule- Construction Rainfall Erosivity Waiver, EPA 833-F-00-014, revised 2012 (http://www.epa.gov/npdes/pubs/fact3-1.pdf). Based on construction period September 1, 2026 to September 30, 2026.
K	0.33	SWRCB K Factor Map (whole soil), GIS data available: http://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/constpermits/guidance/k_factor_map.pdf
LS	0.25	SWRCB RUSLE LS Factor Map, GIS data available:

RUSLE Factor	Value	Method for Establishing Value
		http://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/constpermits/guidance/ls_factor_map.pdf
Total Predicted Sediment Loss (tons/acre)		0.08
Overall Sediment Risk Low Sediment Risk < 15 tons/ acre Medium Sediment Risk >= 15 and < 75 tons/acre High Sediment Risk >= 75 tons/acre		☒ Low ☐ Medium ☐ High

Table 2-4 Summary of Receiving Water Risk

Receiving Water Name	303(d) Listed for Sediment Related Pollutant⁽¹⁾	TMDL for Sediment Related Pollutant⁽¹⁾	Beneficial Uses of COLD, SPAWN, and MIGRATORY⁽¹⁾
Knights Landing Ridge Cut	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No
Overall Receiving Water Risk			☒ Low ☐ High

(1) If yes is selected for any option the Receiving Water Risk is High

2.5 CONSTRUCTION SCHEDULE

Construction is scheduled to begin on August 3, 2026 and be completed by October 2, 2026. The estimated construction schedule is included in Appendix E.

The project is anticipated to be completed prior to the primary wet-weather season. Construction activities are expected to include mobilization, temporary access and staging, environmental fencing, clearing and grubbing within the erosion repair limits, slope preparation, excavation of the riprap key slot, placement of rock slope protection, patrol road repair or restoration as needed, and final cleanup.

Modification or extension of the construction schedule may affect the project risk determination and permit requirements. The QSD, serving as the Construction Manager, will review schedule changes and revise the risk determination and SWPPP as necessary.

2.6 POTENTIAL CONSTRUCTION ACTIVITY AND POLLUTANT SOURCES

Appendix F includes a list of construction activities and associated materials anticipated to be used onsite, as well as the pollutant source assessment completed for the project. These activities and materials could potentially contribute pollutants, other than sediment, to stormwater runoff.

The anticipated construction activities and associated pollutants identified in Appendix F were used to select the BMPs described in Section 3. Locations of anticipated construction activities, pollutant source areas, and associated BMPs are shown on the Site Maps and Drawings included in Appendix A.

Proper measures will be implemented to ensure that disturbed soil, construction materials, waste, and other potential pollutants are not discharged with stormwater or non-stormwater discharges into the Ridge Cut, adjacent drainage features, or storm drain systems. If contaminated soil is

encountered during construction, appropriate handling, sampling, agency notification, and disposal procedures will be implemented as required.

For sampling requirements related to non-visible pollutants associated with construction activity, refer to Section 7.7.1. For a complete list of onsite pollutants and materials, refer to Appendix F and the Safety Data Sheets (SDS) maintained onsite or available electronically for the project.

2.7 TMDL REQUIREMENTS

Based on the receiving water review completed for this SWPPP, TMDL requirements are not applicable to this project.

The receiving water for the project is the Knights Landing Ridge Cut. As summarized in Section 2.1.3 and Table 2-1, the Knights Landing Ridge Cut is not identified as impaired for sediment-related pollutants and is not subject to a construction-sector TMDL applicable to this project.

If additional receiving water information, permit conditions, or agency requirements identify an applicable TMDL during construction, the SWPPP will be amended as necessary to incorporate applicable TMDL-related BMPs, monitoring, and reporting requirements.

2.8 IDENTIFICATION OF NON-STORMWATER DISCHARGES

Non-stormwater discharges consist of discharges that do not originate from precipitation events. Non-stormwater discharges into storm drainage systems or waterways that are not authorized under the 2022 CGP, identified in this SWPPP, or authorized under a separate NPDES permit are prohibited.

Authorized non-stormwater discharges anticipated for this project are limited to water used for dust control and other water necessary to support construction activities, provided the discharges are properly managed and do not cause erosion, transport pollutants, or discharge in violation of the 2022 CGP

These authorized non-stormwater discharges will be managed with the stormwater and non-stormwater BMPs described in Section 3 and will be minimized by the contractor.

No planned construction dewatering is anticipated for this project. If groundwater is encountered or dewatering becomes necessary, the SWPPP will be amended as appropriate, and applicable 2022 CGP dewatering requirements will be evaluated before discharge.

Activities at the site that may result in unauthorized non-stormwater discharges include spills or leaks from vehicles and equipment, fueling or maintenance activities, portable sanitary facilities, wash water, and improper handling of construction materials or wastes. Measures will be implemented, including the BMPs described in Section 3, to eliminate, control, contain, or properly dispose of unauthorized non-stormwater discharges.

The following discharges have been authorized by a separate regional NPDES permit:

None.

2.9 REQUIRED SITE MAP INFORMATION

Site Maps and Drawings are included in Appendix A. The Site Maps and Drawings identify the project location, project limits, construction area, access routes, haul routes, staging areas, environmental fencing where applicable to construction limits or avoidance areas, drainage patterns, discharge locations, and other features required by the 2022 CGP.

The SWPPP applies to areas directly related to construction activity, including the erosion repair area, staging areas, stockpile areas, access routes, haul routes, equipment storage areas, and other temporary construction support areas associated with the project.

Table 2-5 identifies where required map information is provided.

Table 2-5 Required Map Information

Required Element	Included on Map/Plan Sheet No. ⁽¹⁾
Construction and Earthwork Drawing(s)	
Site layout, project location, and project boundaries	Appendix A; G-001, C-001, C-101 through C-103
Construction area / erosion repair limits	Appendix A; C-001, C-101 through C-103
Drainage areas, drainage patterns, and discharge locations	Appendix A; SWPPP Site Map
Surface water / receiving water	Appendix A; C-001, C-101 through C-103
Areas of soil disturbance and active disturbance	Appendix A; SWPPP Site Map
Erosion, sediment, run-on, and runoff control BMPs	Appendix A; SWPPP Site Map
Storm drain inlets	Not applicable
Sampling locations, if applicable	Appendix A; SWPPP Site Map / Section 7
ATS or passive treatment locations	Not applicable
Staging, stockpile, material storage, waste storage, and equipment storage areas	Appendix A; C-001, C-101 through C-103; SWPPP Site Map
Fueling and maintenance areas, if applicable	Appendix A; SWPPP Site Map
Site access points, entrances/exits, and haul routes	Appendix A; C-001; SWPPP Site Map
Project limits, avoidance areas, and environmental fencing	Appendix A; C-001, C-101 through C-103; SWPPP Site Map
Final stabilization areas	Appendix A; SWPPP Site Map / C-501

Notes: (1) Indicate maps or drawings that information is included on (e.g., Vicinity Map, Site Map, Drainage Plans, Grading Plans, Progress Maps.)

Section 3 Best Management Practices

3.1 SCHEDULE FOR BMP IMPLEMENTATION

BMPs will be implemented in accordance with the construction schedule, project phasing, site conditions, and anticipated weather conditions. BMPs shall be installed, modified, and maintained as necessary to remain effective throughout construction. The anticipated BMP implementation schedule is provided in Table 3-1.

BMPs will be implemented before or concurrently with the construction activities they are intended to control. Temporary erosion and sediment control BMPs, tracking controls, non-stormwater controls, and waste and materials management BMPs will be maintained until disturbed areas are stabilized and the BMPs are no longer required.

Table 3-1 BMP Implementation Schedule			
	BMP	Initial Implementation Timing	Duration
Erosion and Sediment Controls	EC-1, Scheduling	Prior to Construction	Entirety of Project
	EC-2, Preservation of Existing Vegetation	Start of Construction	Entirety of Project
	EC-16, Non-Vegetated Stabilization / Rock Slope Protection	During construction	Permanent
	SE-1 Silt Fence or SE-5 Fiber Rolls	As needed based on field conditions or prior to forecasted precipitation	Until disturbed areas are stabilized or sediment discharge potential has been eliminated.
	SE-7, Street Sweeping and Vacuuming	As needed during construction.	Entirety of Project
Tracking Control	TC-2, Stabilized Construction Roadway	Existing AB access roads to be used throughout construction.	Entire project, maintained as needed.
	SE-7, Street Sweeping and Vacuuming	As needed if track-out occurs.	Entirety of Project
Wind Erosion	WE-1, Wind Erosion Control	During Construction	Entirety of Project
Material / Waste Management	WM-1, Material Delivery and Storage	During Construction	Entirety of Project
	WM-2, Material Use	During Construction	Entirety of Project
	WM-3, Stockpile Management	During Construction	Entirety of Project
	WM-4, Spill Prevention and Control	During Construction	Entirety of Project
	WM-5, Solid Waste Management	During Construction	Entirety of Project
	WM-6, Hazardous Waste Management	During Construction	Entirety of Project
	WM-9, Sanitary-Septic Waste Management	During Construction	Entirety of Project
	WM-10, Liquid Waste Management	During Construction	Entirety of Project
Non-Stormwater Control	NS-1, Water Conservation Practices	During Construction	Entirety of Project
	NS-6, Illicit Connection/ Discharge	During Construction	Entirety of Project
	NS-9, Vehicle and Equipment Fueling	During Construction	Entirety of Project
	NS-10, Vehicle and Equipment Maintenance	During Construction	Entirety of Project

3.2 EROSION AND SEDIMENT CONTROL

Erosion and sediment control BMPs will be implemented to reduce or eliminate sediment-related pollutants in stormwater discharges and authorized non-stormwater discharges from the project site. BMPs will be selected and implemented based on the construction schedule, site conditions, anticipated weather, and the location of active disturbance.

The project is scheduled for construction during the dry season and will be completed prior to the primary wet-weather season. Permanent stabilization of the repaired waterside levee slope will be provided by placement of rock slope protection. The RSP design includes a keyed trench at the lower limit of the repair area. During construction, the key slot will provide a low point along the repair section where sediment from the active waterside slope work area can collect before the RSP is placed.

Temporary erosion and sediment control BMPs will be implemented as necessary to protect disturbed areas, stockpiles, access routes, staging areas, and downgradient drainage features during construction. Erosion and sediment control BMPs selected for the project are summarized in Sections 3.2.1 and 3.2.2 and shown on the Site Maps and Drawings included in Appendix A. BMP fact sheets are included in Appendix G.

Sufficient BMP materials will be maintained onsite or readily available to allow implementation of temporary controls in response to field conditions, forecasted precipitation, BMP deficiencies, or emergencies.

3.2.1 Erosion Control

Erosion control, also referred to as soil stabilization, consists of source control measures designed to prevent soil particles from detaching and being transported by stormwater, authorized non-stormwater discharges, wind, or construction activities. Erosion control BMPs protect exposed soil by covering, stabilizing, binding, or otherwise reducing the potential for erosion.

This project will implement the following practices to provide effective temporary and permanent erosion control during construction:

- Preserve existing vegetation outside the work limits to the extent practicable.
- Limit soil disturbance to the work areas shown on the project plans and SWPPP site maps.
- Schedule work during the dry season and complete slope stabilization prior to the primary wet-weather season.
- Stabilize the repaired waterside levee slope with rock slope protection.
- Apply temporary erosion control measures where needed based on field conditions, forecasted precipitation, or inactive disturbed areas.

Permanent erosion control for the repaired waterside levee slope will be provided by rock slope protection. The RSP repair includes clearing and grubbing within the repair area, slope preparation, excavation of a key slot, placement of riprap, and finish grading to provide a neat and uniform slope. The project plans identify the RSP repair limits and repair details.

The erosion control BMPs selected for this project are summarized in Table 3-2. BMP fact sheets are included in Appendix G.

Table 3-2 Erosion Control BMPs

CASQA Fact Sheet	BMP Name	Considered for the Project ⁽¹⁾	BMP Used		If not used, state reason and alternate BMP, if applicable
			YES	NO	
EC-1	Scheduling	✓	✓		Work is scheduled during the dry season and prior to the primary wet-weather season.
EC-2	Preservation of Existing Vegetation	✓	✓		Existing vegetation inside & outside the work limits will be preserved to the extent practicable.
EC-3	Hydraulic Mulch	✓ ⁽²⁾		✓	Permanent stabilization provided by rock slope protection.
EC-4	Hydroseed	✓ ⁽²⁾		✓	Permanent stabilization provided by rock slope protection.
EC-5	Soil Binders	✓ ⁽²⁾		✓	Use if needed for temporary stabilization or dust control.
EC-6	Straw Mulch	✓ ⁽²⁾		✓	Permanent stabilization provided by rock slope protection.
EC-7	Geotextiles and Mats	✓ ⁽²⁾		✓	Permanent stabilization provided by rock slope protection.
EC-8	Wood Mulching	✓ ⁽²⁾		✓	Permanent stabilization provided by rock slope protection.
EC-9	Earth Dike and Drainage Swales	✓ ⁽³⁾		✓	Not applicable. Site configuration and absence of off-site run-on.
EC-10	Velocity Dissipation Devices	✓ ⁽³⁾	✓		Rock slope protection to provide sheet flow velocity dissipation.
EC-11	Slope Drains	✓ ⁽³⁾		✓	Existing drainage patterns will be maintained.
EC-12	Stream Bank Stabilization		✓		Bank stabilization provided by rock slope protection.
EC-14	Compost Blankets	✓ ⁽²⁾		✓	Permanent stabilization provided by rock slope protection.
EC-15	Soil Preparation-Roughening	✓		✓	Permanent stabilization provided by rock slope protection.
EC-16	Non-Vegetated Stabilization	✓ ⁽²⁾	✓		Permanent stabilization provided by rock slope protection.
WE-1	Wind Erosion Control	✓	✓		Water and rock slope protection will be used to control dust and wind erosion.
⁽¹⁾ The 2022 CGP Fact Sheet Section I.R.1.d.through I.R.1.i.describes various BMPs that should be considered for use on the construction site. ⁽²⁾ The QSD shall ensure implementation of one of the minimum measures listed or a combination thereof to achieve and maintain the Risk Level requirements. ⁽³⁾ All run-on and runoff from the construction site shall be managed for Risk Level 2 and 3 and Risk Level 1 if the evaluation of quantity and quality of run-on and runoff deems them necessary or visual inspections show that the site requires these controls. Run-on from offsite shall be directed away from all disturbed areas, diversion of offsite flows may require design/analysis by a licensed civil engineer and/or additional environmental permitting.					

Scheduling

Construction is scheduled to occur during the dry season and prior to the primary wet-weather season. Work will be sequenced to limit the duration of exposed soil conditions and to allow permanent stabilization with rock slope protection as construction progresses.

Preservation of Existing Vegetation

Existing vegetation outside the work limits will be preserved to the extent practicable. Vegetation removal will be limited to areas necessary for access, staging, slope preparation, and placement of rock slope protection.

Streambank Stabilization / Rock Slope Protection

The project will repair erosion along the waterside levee slope using rock slope protection. The repair will include clearing and grubbing within the repair limits, slope preparation, excavation of the key slot, placement of riprap, and finish grading consistent with the project plans.

Non-Vegetated Stabilization

Permanent stabilization of the repaired waterside levee slope will be provided by rock slope protection. Temporary construction support areas disturbed during construction will be returned to stable condition by regrading disturbed surfaces, repairing aggregate base surfacing where needed, removing loose sediment and construction debris, and restoring drainage patterns disturbed by construction activities.

Velocity Dissipation / Rock Slope Protection

Rock slope protection will be placed on the repaired waterside levee slope and will function as permanent velocity dissipation by reducing sheet flow velocities and stabilizing the slope surface. Runoff from disturbed areas above the top of RSP will flow downslope toward the waterway through or over the placed RSP material.

Wind Erosion Control

Water or other appropriate dust control measures will be applied as needed to control wind erosion and dust generated by construction activities, haul routes, staging areas, and other exposed or disturbed surfaces.

3.2.2 Sediment Controls

Sediment controls are temporary or permanent measures intended to complement erosion control BMPs and reduce sediment discharges from active construction areas. Sediment controls are designed to intercept, slow, contain, or settle sediment that may be transported from disturbed areas.

The project is scheduled for construction during the dry season and prior to the primary wet-weather season. Offsite run-on is not anticipated, and access, hauling, and staging will occur primarily on existing stabilized aggregate base roadways. Continuous perimeter sediment control is not anticipated; however, sediment control BMPs will be implemented where needed based on field conditions, forecasted precipitation, or observed sediment discharge potential.

The RSP key slot will function as a low point for sediment collection during active construction along the waterside levee slope. SE-1 Silt Fence, SE-5 Fiber Rolls, or equivalent linear sediment controls may be installed downgradient of disturbed soil areas, stockpiles, or other pollutant source areas where sediment-laden runoff could discharge from the work area.

Existing stabilized aggregate base patrol roads and designated haul routes will be used for construction access. These surfaces will be maintained as needed to reduce sediment tracking. Street sweeping or vacuuming will be implemented if track-out occurs on paved public roads or other stabilized surfaces.

The sediment control BMPs selected for this project are summarized in Table 3-3. BMP fact sheets are included in Appendix G.

Table 3-3 Temporary Sediment Control BMPs

CASQA Fact Sheet	BMP Name	Considered for the Project ⁽¹⁾	BMP used		If not used, state reason and alternate BMP, if applicable
			YES	NO	
SE-1	Silt Fence	✓		✓	Not proposed for routine use.
SE-2	Sediment Basin			✓	Not applicable
SE-3	Sediment Trap			✓	Not proposed, however, designed key slot provides localized sediment collection.
SE-4	Check Dams			✓	Not applicable
SE-5	Fiber Rolls	✓		✓	Not proposed for routine use.
SE-6	Gravel Bag Berm	✓		✓	Not applicable
SE-7	Street Sweeping & Vacuuming	✓		✓	Not proposed for routine use.
SE-8	Sandbag Barrier			✓	Not proposed for routine use.
SE-9	Straw Bale Barrier			✓	Not proposed for routine use.
SE-10	Storm Drain Inlet Protection	✓		✓	No storm drains in or near limit of work.
SE-11	ATS			✓	Not applicable
SE-12	Manufactured Linear Sediment Controls			✓	Not applicable
SE-13	Compost Sock and Berm	✓		✓	Not applicable
SE-14	Biofilter Bags	✓		✓	Silt Fence Used
NA	Passive Treatment System			✓	Not applicable
TC-1	Stabilized Construction Entrance and Exit	✓		✓	Existing stabilized AB patrol roads used for ingress/egress.
TC-2	Stabilized Construction Roadway		✓		Existing stabilized AB patrol roads and haul routes will be used and maintained.
TC-3	Entrance Outlet Tire Wash			✓	Not proposed; Stabilized access/egress and dry-season work limit track-out.
⁽¹⁾ The 2022 CGP and 2025 CASQA BMP Fact Sheets describe sediment control BMPs that were considered for use on the project site. ⁽²⁾ Linear sediment control BMPs, including SE-1 and SE-5, may be used if field conditions indicate they are needed to prevent sediment discharge. ⁽³⁾ All run-on and runoff from the construction site shall be managed.					

RSP Key Slot

The RSP key slot will function as a localized low point for sediment collection during active construction along the waterside levee slope. Accumulated sediment within the active work area will be removed or incorporated into the work as appropriate prior to placement of rock slope protection.

Linear Sediment Controls

SE-1 Silt Fence, SE-5 Fiber Rolls, or equivalent linear sediment controls are not proposed for routine installation. These BMPs may be implemented if field conditions, forecasted precipitation, or observed sediment discharge potential indicate that additional downgradient sediment control is needed.

Stabilized Construction Roadway

Existing stabilized aggregate base patrol roads and designated haul routes will be used for construction access and hauling. These surfaces will be maintained as needed to reduce sediment tracking, fugitive dust, and to preserve all-weather access during construction.

Street Sweeping and Vacuuming

Street sweeping or vacuuming will be implemented if sediment track-out occurs on paved public roads or stabilized access surfaces. Sediment tracked onto paved roads or stabilized access surfaces will be removed as soon as practicable and prior to forecasted precipitation events.

3.3 NON-STORMWATER CONTROLS AND WASTE AND MATERIALS MANAGEMENT

3.3.1 Non-Stormwater Controls

Non-stormwater controls, including waste and materials management BMPs, will be implemented to reduce or eliminate pollutants associated with construction materials, equipment, waste, portable sanitary facilities, fueling, maintenance, and authorized non-stormwater discharges.

Non-stormwater discharges that are not authorized by the 2022 CGP, identified in this SWPPP, or authorized under a separate NPDES permit are prohibited. Authorized non-stormwater discharges anticipated for this project are limited to water used for dust control and other water necessary to support construction activities, provided the discharges are properly managed and do not cause erosion or transport pollutants.

Waste and materials management BMPs will minimize exposure of construction materials, wastes, and service areas to precipitation, stormwater runoff, wind, spills, leaks, and improper disposal.

The non-stormwater, materials management, and waste management BMPs selected for this project are summarized in Sections 3.3.1 and 3.3.2. BMP fact sheets are included in Appendix G.

BMPs will be implemented in accordance with this SWPPP, the Site Maps and Drawings in Appendix A, and the BMP fact sheets provided in Appendix G. If there is a conflict, site-specific details shown on the Site Maps and Drawings will prevail over the SWPPP narrative, standard details, or BMP fact sheets. The SWPPP narrative will prevail over general guidance in the BMP fact sheets.

Table 3-4 Temporary Non-Stormwater BMPs

CASQA Fact Sheet	BMP Name	Considered for the Project ⁽¹⁾	BMP used		If not used, state reason and alternate BMP, if applicable
			YES	NO	
NS-1	Water Conservation Practices	✓	✓		Water will be used for dust control and construction support.
NS-2	Dewatering Operation	✓		✓	Not applicable
NS-3	Paving and Grinding Operation			✓	Not applicable
NS-4	Temporary Stream Crossing			✓	Not applicable
NS-5	Clear Water Diversion			✓	Not applicable
NS-6	Illicit Connection/Discharge	✓	✓		
NS-7	Potable Water/Irrigation	✓		✓	Not applicable
NS-8	Vehicle and Equipment Cleaning	✓		✓	Vehicles and equipment cleaning prohibited on-site
NS-9	Vehicle and Equipment Fueling	✓	✓		In designated areas
NS-10	Vehicle and Equipment Maintenance	✓	✓		In designated areas
NS-11	Pile Driving Operation			✓	Not applicable
NS-12	Concrete Curing			✓	Not applicable
NS-13	Concrete Finishing			✓	Not applicable
NS-14	Material and Equipment Use Over Water			✓	Not applicable
NS-15	Demolition Removal Adjacent to Water			✓	Not applicable
NS-16	Temporary Batch Plants			✓	Not applicable
⁽¹⁾ The 2022 CGP and 2025 CASQA BMP Fact Sheets describe non-stormwater BMPs that were considered for use on the project site.					
⁽²⁾ BMPs identified as "No" are not proposed based on the anticipated construction activities and site conditions.					

Water Conservation Practices

Water used for dust control or other construction support activities will be applied in a manner that prevents runoff, erosion, ponding, or transport of pollutants. Water application rates will be limited to the amount necessary to control dust and support construction activities.

Dewatering Operations

Planned construction dewatering is not anticipated. The work will occur on the waterside levee slope but above the anticipated water surface elevation. Excavation is limited to the RSP key slot and slope preparation needed for placement of rock slope protection, and groundwater is not expected to be encountered.

If field conditions change and dewatering becomes necessary, the QSD will evaluate the proposed discharge before dewatering begins and will amend the SWPPP as necessary to address applicable 2022 CGP dewatering requirements.

Illicit Connection/Discharge

Unauthorized non-stormwater discharges are prohibited. The contractor will monitor construction activities for evidence of illicit discharges, spills, leaks, wash water, or other unauthorized releases associated with project operations.

Unauthorized discharges resulting from contractor operations shall be stopped, contained, cleaned up, and reported as required. Illicit or unauthorized discharges observed from offsite or unrelated sources shall be reported to the QSP, Construction Manager, and LRP.

Vehicle and Equipment Fueling

Vehicle and equipment fueling will be conducted only in designated areas on the landside of the levee where runoff does not drain toward the waterway. Fueling areas will be located away from drainage features, concentrated flow paths, and disturbed soil areas.

Fueling activities will be performed in a manner that prevents fuels, oils, and other fluids from contacting soil, stormwater, or authorized non-stormwater discharges. Spill response materials will be available where fueling occurs. Spills or leaks will be stopped, contained, cleaned up, and reported as required.

Vehicle and Equipment Maintenance

Vehicle and equipment maintenance will be performed in designated areas on the landside of the levee where runoff does not drain toward the waterway. Maintenance areas will be located away from drainage features, concentrated flow paths, and disturbed soil areas.

Maintenance activities will be performed in a manner that prevents fuels, oils, grease, hydraulic fluid, coolant, and other vehicle or equipment fluids from contacting soil, stormwater, or authorized non-stormwater discharges. Leaks and spills will be stopped, contained, cleaned up, and reported as required. Waste materials generated from maintenance activities will be properly contained and disposed of offsite.

3.3.2 Materials Management and Waste Management

Materials management and waste management BMPs will be implemented to prevent construction materials, stockpiles, wastes, and service areas from contributing pollutants to stormwater or authorized non-stormwater discharges.

Construction materials, waste containers, portable sanitary facilities, and service areas will be located in designated areas on the landside of the levee where runoff does not drain toward the waterway. Materials and wastes will be stored, covered, contained, or otherwise protected to prevent contact with precipitation, stormwater runoff, wind, spills, leaks, and improper disposal.

Stockpiles and loose materials will be managed to prevent wind dispersal, sediment transport, or discharge to drainage features. Solid waste, debris, and excess materials will be removed from the site regularly and disposed of at appropriate offsite facilities.

Spill response materials will be maintained onsite. Spills, leaks, or releases associated with materials, wastes, equipment, or service areas will be stopped, contained, cleaned up, and reported as required.

Table 3-5 Temporary Materials Management BMPs

CASQA Fact Sheet	BMP Name	Considered for Project ⁽¹⁾	BMP used		If not used, state reason and alternate BMP, if applicable
			YES	NO	
WM-01	Material Delivery and Storage	✓	✓		
WM-02	Material Use	✓	✓		
WM-03	Stockpile Management	✓	✓		
WM-04	Spill Prevention and Control	✓	✓		
WM-05	Solid Waste Management	✓	✓		
WM-06	Hazardous Waste Management	✓	✓		
WM-07	Contaminated Soil Management			✓	No contaminated soil identified
WM-08	Concrete Waste Management	✓		✓	No concrete work
WM-09	Sanitary-Septic Waste Management	✓	✓		
WM-10	Liquid Waste Management	✓	✓		
⁽¹⁾ The 2022 CGP and 2025 CASQA BMP Fact Sheets describe materials management and waste management BMPs that were considered for use on the project site.					
⁽²⁾ BMPs identified as "No" are not proposed based on the anticipated construction activities and site conditions.					

Material Delivery and Storage

Construction materials will be delivered and stored in designated areas on the landside of the levee where runoff does not drain toward the waterway. Materials will be stored in containers, covered, or otherwise protected when not in use to prevent stormwater runoff contact, authorized non-stormwater discharges, and drainage features. Materials will be stored away from concentrated flow paths to the extent practicable.

Material Use

Construction materials will be used in accordance with project specifications and manufacturer recommendations. Where practicable, less hazardous alternative products will be used, and the quantity of hazardous materials stored or used onsite will be minimized. Personnel handling construction materials will be trained in proper use, storage, spill prevention, and cleanup.

procedures. Materials will be managed to prevent spills, leaks, wind dispersal, or discharge to the waterway, adjacent drainage features, or storm drain systems.

Stockpile Management

Stockpiles and loose materials will be located in designated areas and managed to prevent wind dispersal, sediment transport, and contact with stormwater runoff. Stockpiles will be located away from drainage features and concentrated flow paths to the extent practicable. Inactive stockpiles will be covered, stabilized, contained, or otherwise protected. If precipitation is forecast, active stockpiles will also be covered or protected as necessary to prevent pollutant and/or sediment discharge.

Spill Prevention and Control

Spill prevention and response materials will be maintained onsite where materials, fueling, maintenance, or equipment storage activities occur. Spills and leaks will be stopped, contained, cleaned up, and reported as required. Used cleanup materials will be properly contained and disposed of offsite.

Solid Waste Management

Solid waste, debris, and excess construction materials will be contained and removed from the site regularly. Waste storage areas will be located away from the waterway, drainage features, concentrated flow paths, and disturbed soil areas. Waste containers will be covered or otherwise protected when not in use and prior to forecasted precipitation events.

Hazardous Waste Management

Hazardous materials or waste, if generated, will be stored in properly labeled containers with appropriate containment. Hazardous waste will be segregated from non-hazardous wastes, protected from stormwater contact, and disposed of at an approved offsite facility.

Contaminated Soil Management

No contaminated soil is known to be present at the project site. If contaminated soil is encountered during construction, it will be isolated and managed to prevent discharge with stormwater or authorized non-stormwater discharges. Handling, sampling, agency notification, and disposal will be performed as required.

Sanitary-Septic Waste Management

Portable sanitary facilities will be located in designated areas on the landside of the levee and away from the waterway, drainage features, concentrated flow paths, and vehicle traffic. Facilities will be placed within secondary containment, secured to prevent tipping, maintained regularly, and managed to prevent leaks, spills, or discharge.

Liquid Waste Management

Liquid waste, if generated, will be contained in designated containers or controlled areas and disposed of properly. Liquid waste will not be discharged to soil, stormwater, the waterway, adjacent drainage features, or storm drain systems.

3.4 TMDL-RELATED BMPS

Based on the receiving water review completed for this SWPPP, TMDL-related BMPs are not applicable to this project.

3.5 POST CONSTRUCTION STORMWATER MANAGEMENT MEASURES

Post-construction BMPs are permanent measures installed during construction to reduce or eliminate pollutant discharges from the site after construction is complete.

This project is not subject to post-construction requirements of an existing NPDES Phase I or Phase II MS4 permit. The project does not add impervious area, create new permanent storm drain facilities, or materially change existing drainage patterns.

Permanent stabilization will be provided by rock slope protection placed on the repaired waterside levee slope. The rock slope protection will reduce erosion potential, stabilize the repaired slope, and reduce sheet flow velocities toward the waterway.

Temporary construction support areas, including access, staging, stockpile, and equipment storage areas, will be returned to stable condition following completion of work. Stabilization may include regrading disturbed surfaces, grading and track-walking disturbed landside slopes, repairing aggregate base surfacing where needed, removing loose sediment and construction debris, and restoring drainage patterns disturbed by construction activities.

The post-construction runoff reduction requirements have been satisfied through compliance with 2022 CGP Provision IV.N.3 and use of the SMARTS water balance calculator, as applicable. The following post-construction stormwater treatment measures have been identified for the project:

- Source Control: NONE
- Site Design: NONE
- Stormwater Treatment: NONE

Section 4 BMP Inspection and Maintenance

4.1 BMP INSPECTION AND MAINTENANCE

BMPs will be inspected and maintained in accordance with the 2022 CGP, this SWPPP, the Site Maps and Drawings, and applicable BMP fact sheets included in Appendix G. BMP inspections will be conducted to confirm that BMPs are properly installed, functioning as intended, and maintained in effective condition.

BMP inspection requirements are addressed in the Construction Site Monitoring Program in Section 7. A blank BMP Inspection Form is included in Appendix H. Completed inspection forms will be retained in Appendix N or in an accompanying project file maintained with the SWPPP.

BMP deficiencies identified during inspections will be corrected as soon as practicable. Maintenance, repair, or implementation of replacement BMPs will begin within 72 hours of identification and will be completed as soon as possible, and prior to the next forecasted precipitation event when applicable.

The QSP will verify that BMP maintenance and repairs have been completed and that BMPs remain effective. The QSP may delegate BMP inspection, maintenance, and repair verification tasks to trained QSP Delegates in accordance with the 2022 CGP and this SWPPP.

Section 5 Training

Personnel responsible for SWPPP implementation, BMP installation, BMP maintenance, inspections, monitoring, sampling, or other stormwater-related activities will receive training appropriate to their assigned roles and responsibilities.

The QSP will provide or verify project-specific stormwater training for applicable job-site personnel. Training may be provided during project meetings, tailgate meetings, preconstruction meetings, or task-specific discussions as needed. Refresher training will be provided when site conditions, construction activities, BMPs, personnel, or permit requirements change.

Training topics may include SWPPP requirements, selected BMPs, good housekeeping, erosion and sediment controls, non-stormwater controls, waste and materials management, spill prevention and response, inspection requirements, weather tracking, and reporting procedures.

QSP Delegates, if used, will receive foundational and site-specific training from the QSP before performing delegated SWPPP-related tasks. Delegated tasks may include BMP inspections, visual observations, BMP maintenance verification, or sampling, as applicable. QSP Delegates shall report identified issues to the QSP within 24 hours of identification.

Training documentation will be retained in Appendix I. Training records may include the training date, instructor, attendees, topics covered, training objective, and delegated responsibilities, if applicable. Appendix I includes the Contractor Personnel Training Log and QSP Delegate Training Log.

Section 6 Responsible Parties and Operators

This section identifies the parties responsible for implementation of this SWPPP and compliance with the 2022 CGP. Responsible parties and operators are listed in Appendix J and shall be updated as necessary during construction.

6.1 RESPONSIBLE PARTIES

Legally Responsible Person and Duly Authorized Representatives

The Legally Responsible Person is responsible for obtaining and maintaining coverage under the 2022 CGP and for certifying required permit documents in SMARTS. Duly Authorized Representatives, if any, may be designated in writing by the Legally Responsible Person to sign or certify permit-related documents and assist with permit compliance responsibilities.

QSD

QSDs assigned to the project are responsible for SWPPP preparation, certification, risk determination, SWPPP amendments, and QSD-required site inspections. The QSD will amend the SWPPP, as necessary, to address changed conditions, ineffective BMPs, inspection findings, sampling results, QSP recommendations, or the QSD's own site observations. The QSD shall perform site inspections at the following times:

- Within 30 days of construction activities commencing on site;
- Within 30 days when a new QSD is assigned to the project;
- Twice annually, once August through October and once January through March;
- Within 14 calendar days after a numeric action level exceedance; and
- Within the time period requested in writing from Regional Water Board staff.

QSP

QSPs assigned to the project are responsible for implementing the SWPPP in the field and performing QSP-required inspections, monitoring, sampling, BMP maintenance verification, reporting, and corrective action documentation.

Duties of the QSP include, but are not limited to:

- Implementing applicable elements of the 2022 CGP and this SWPPP;
- Performing required site inspections, including monthly inspections, pre-qualifying precipitation event inspections, post-NAL exceedance inspections, and inspections prior to submitting a Notice of Termination or Change of Information for acreage changes, as applicable;
- Ensuring that BMPs are implemented, inspected, and properly maintained;
- Ensuring the SMARTS-generated WDID Number Notification form is posted onsite in a location viewable by the public or readily available upon request, and that posted dates match the dates listed in SMARTS;
- Implementing non-stormwater controls and materials and waste management activities, including monitoring discharges, general site cleanup, vehicle and equipment fueling and maintenance controls, spill prevention and response, and elimination of unauthorized discharges;

- Coordinating with the contractor to ensure required corrections or repairs are made immediately and that the project remains in compliance with the SWPPP, the 2022 CGP, and approved plans;
- Notifying the LRP or Duly Authorized Representative immediately of offsite discharges or other non-compliance events; and
- Providing foundational and site-specific training to QSP Delegates and overseeing delegated work.

The QSP shall be assigned authority by the LRP to mobilize crews or coordinate with the contractor to make immediate repairs to control measures.

Tasks that may be delegated to appropriately trained QSP Delegates include stormwater and non-stormwater visual observations, routine inspections, BMP maintenance verification, documentation, and stormwater sampling and analysis, as required.

QSP Delegate

QSP delegates, if used, shall be trained by the QSP before performing delegated SWPPP-related tasks. QSP Delegate training shall include foundational stormwater training and site-specific training appropriate to the delegated responsibilities.

QSP Delegates may assist the QSP with assigned tasks, including stormwater and non-stormwater visual observations, routine inspections, BMP maintenance verification, documentation, and stormwater sampling and analysis, as required. QSP Delegates shall perform only those tasks delegated by the QSP and shall report identified deficiencies, discharges, or other compliance concerns to the QSP.

The QSP remains responsible for oversight of delegated work and for confirming that QSP Delegate activities are performed in accordance with the 2022 CGP and this SWPPP.

Table 6-1. QSP and QSP Delegate Authorized Inspections

	Weekly BMP & Non-Stormwater (NSW) Inspection	Pre-Qualifying Precipitation Event (QPE)	Daily - QPE Visual Inspections	Post-QPE - Visual Inspections	Post NAL Exceedances	Monthly - BMP & NSW Inspection	NOT Inspection
QSP	X	X	X	X	X	X	X
QSP Delegate	X		X	X			

6.2 CONTRACTOR LIST

Contractors and subcontractors working on the project are identified in Appendix K. Appendix K shall be updated as necessary during construction to reflect current contractor and subcontractor information, including company name, contact information, role, and emergency contact information.

Section 7 Construction Site Monitoring Program

This Construction Site Monitoring Program describes the inspections, visual observations, monitoring, sampling, and reporting requirements applicable to the project under the 2022 CGP.

The project has been determined to be a **Risk Level 1** project. Monitoring requirements will be implemented in accordance with the 2022 CGP, this SWPPP, the project risk determination, and the Site Maps and Drawings.

The following subsections describe the project-specific requirements for weather tracking, BMP inspections, non-stormwater observations, stormwater observations, sampling, corrective actions, and recordkeeping.

7.1 Purpose

This Construction Site Monitoring Program has been developed to address the monitoring requirements applicable to the project under the 2022 CGP. The purpose of the Construction Site Monitoring Program is to establish procedures for visual inspections, monitoring, sampling, reporting, and documentation needed to evaluate SWPPP implementation and permit compliance.

The objectives of the Construction Site Monitoring Program are to:

1. Demonstrate that the site is compliant with applicable Discharge Prohibitions;
2. Determine whether non-visible pollutants discharged from the construction site and are causing or contributing to exceedances of water quality objectives;
3. Determine whether immediate corrective actions, additional BMP implementation, or SWPPP revisions are necessary to reduce pollutants in stormwater discharges and authorized non-stormwater discharges; and
4. Determine whether BMPs included in the SWPPP are effective in preventing or reducing pollutants in stormwater discharges and authorized non-stormwater discharges.

Details regarding weather tracking, monitoring locations, safety and monitoring exemptions, visual monitoring, sampling, and records retention are provided in the following subsections.

7.2 Applicability of Permit Requirements

The project has been determined to be a Risk Level 1 project. The monitoring requirements applicable to this project include weather tracking, routine BMP inspections, non-stormwater discharge observations, qualifying precipitation event inspections, and documentation of corrective actions.

Risk Level 2 and Risk Level 3 monitoring requirements for routine pH and turbidity sampling are not applicable to this project. Receiving water monitoring requirements are not applicable because the project is not Risk Level 3.

TMDL-specific monitoring requirements are not applicable because no construction-sector TMDL requirements have been identified for the project. Active treatment system, passive treatment, watershed monitoring option, and planned dewatering monitoring requirements are not applicable because those activities are not proposed for this project.

Sampling for non-visible pollutants will be conducted only if triggered by a spill, leak, breach, malfunction, or other condition with the potential to discharge non-visible pollutants in stormwater or authorized non-stormwater discharges, as described in Section 7.7.1.

7.3 Weather and Precipitation Event Tracking

Weather and precipitation event tracking will be conducted during construction to identify forecasted Qualifying Precipitation Events and to support required visual monitoring, BMP maintenance, and corrective actions.

A Qualifying Precipitation Event is any weather pattern that is forecast to have a 50 percent or greater Probability of Precipitation and a Quantitative Precipitation Forecast of 0.5 inches or more within a 24-hour period. A Qualifying Precipitation Event begins with the 24-hour period when 0.5 inches or more of precipitation has been forecast and continues for each subsequent 24-hour period when the Quantitative Precipitation Forecast is 0.25 inches or more.

Pre-Qualifying Precipitation Event inspections will be performed within 72 hours prior to a forecasted Qualifying Precipitation Event. If National Weather Service extended forecast precipitation data is available, the pre-Qualifying Precipitation Event inspection may be performed up to 120 hours prior to the forecasted Qualifying Precipitation Event.

7.3.1 Weather Tracking

The QSP will consult National Weather Service forecast information during construction to identify forecasted qualifying precipitation events and determine whether required inspections, BMP maintenance, or corrective actions are needed. Weather reports used to support inspection decisions will be retained in Appendix M and will include the date and time the forecast was obtained.

These forecasts can be obtained at <http://forecast.weather.gov>.

7.3.2 Rain Gauges

The QSP will utilize the governmental rain gauge for the project. The nearest appropriate governmental rain gauge is the NOAA weather station at Sacramento International Airport. Rainfall information from this gauge will be used to support rain event tracking and inspection documentation.

Online weather information for this gauge can be found at: [7-Day Forecast 38.7N 121.58W \(weather.gov\)](#)

7.4 Monitoring Locations

Monitoring locations are identified on the Site Maps and Drawings included in Appendix A. Monitoring locations will be established to evaluate stormwater discharges, authorized non-stormwater discharges, BMP effectiveness, and potential pollutant discharge locations.

Monitoring locations may be modified by the QSP as necessary based on active construction areas, site conditions, drainage patterns, discharge locations, BMP locations, and safety considerations. Updates to monitoring locations will be documented on the Site Maps, inspection forms, sampling records, or field notes, as applicable.

7.5 Safety and Monitoring Exemptions

Safety practices for visual monitoring and sample collection will be conducted in accordance with the contractor's health and safety plan.

This project is not required to collect samples or conduct visual observations under the following conditions:

- During dangerous weather conditions, such as electrical storms, flooding, or high winds above 40 miles per hour;
- Outside of scheduled site operating hours; or
- When the site is not accessible to personnel.

Site operating hours are established by the project specifications and identified on the SWPPP cover page.

If visual monitoring or sample collection is not performed because of unsafe conditions, inaccessible site conditions, or another permit-allowed exemption, the QSP shall document the reason the monitoring was not performed. Exemption documentation will be retained in Appendix N and included in the Annual Report.

7.6 Visual Monitoring

Visual monitoring will be conducted in accordance with the 2022 CGP requirements applicable to the project's Risk Level 1 status. Required inspections and observations will be performed by the QSP or trained QSP Delegate, as applicable, and documented using the inspection forms and records maintained with this SWPPP.

Table 7-1 summarizes the required visual monitoring and inspection frequencies. Visual monitoring locations are shown on the Site Maps and Drawings included in Appendix A. The following subsections describe the requirements for routine observations and inspections, Qualifying Precipitation Event triggered observations and inspections, visual monitoring procedures, and follow-up reporting.

Table 7-1 Summary of Visual Monitoring and Inspections

Inspection / Observation Type	Minimum Frequency / Timing	Responsible Party
QSD Site Inspection	• Within 30 days of construction commencement • Within 30 days when a new QSD is assigned • Twice annually • Within 14 calendar days after a NAL exceedance, if applicable • As requested by Regional Water Board staff	QSD
Routine BMP Inspections	Weekly ²	QSP or QSP Delegate
Non-Stormwater Discharge Observations	Quarterly ⁴ during daylight hours	QSP

Table 7-1 Summary of Visual Monitoring and Inspections

Inspection / Observation Type	Minimum Frequency / Timing	Responsible Party
Pre-Qualifying Precipitation Event Inspection	Within 72 hours prior to a forecasted QPE, or up to 120 hours prior if supported by NWS extended forecast precipitation data.	QSP
Visual Observations During an Extended QPE	Once every 24-hour period of a qualifying precipitation event ^{1&3}	QSP or QSP Delegate
Post-Qualifying Precipitation Event Inspection	Within 96 hours after the QPE has ended	QSP or QSP Delegate
Post-NAL Exceedance Inspection	Within 14 calendar days after exceedance, if applicable	QSP
NOT / COI Inspection	Prior to submittal of a Notice of Termination or Change of Information for acreage changes	QSP
¹ Required during scheduled site operating hours, as identified on the SWPPP cover page. ² One inspection performed monthly by QSP if weekly is performed by QSP Delegate. ³ Required on days that the forecast predicts at least 0.25 inches of precipitation once the qualifying precipitation event commences. ⁴ Quarters are January–March, April–June, July–September, and October–December		
Notes: 1. Visual monitoring locations are shown on the Site Maps and Drawings included in Appendix A. 2. Inspection records will be retained in Appendix N or in an accompanying project file maintained with the SWPPP.		

7.6.1 Routine Observations and Inspections

Routine observations and inspections will be conducted in accordance with the 2022 CGP and the frequencies summarized in Table 7-1. Routine observations and inspections include routine BMP inspections and non-stormwater discharge observations.

Routine observations and inspections will be conducted at applicable construction areas, BMP locations, material and waste storage areas, access and haul routes, discharge locations, and other locations shown on the Site Maps and Drawings included in Appendix A. Inspection findings will be documented using the inspection forms maintained with this SWPPP.

7.6.1.1 Routine BMP Inspections

Routine BMP inspections will be performed weekly in accordance with Table 7-1. Routine BMP inspections may be performed by the QSP or a trained QSP Delegate. If weekly inspections are performed by a trained QSP Delegate, at least one routine BMP inspection per calendar month will be performed by the QSP.

Routine BMP inspections will include, at a minimum, observations of the following:

- BMPs are properly installed, maintained, and effective for current site conditions;
- BMPs requiring maintenance, repair, replacement, or additional implementation;
- Active and inactive disturbed soil areas;

- Material storage, waste storage, stockpile, staging, fueling, maintenance, and sanitary facility areas;
- Access roads, haul routes, entrances, exits, and potential track-out locations;
- Stormwater discharge locations and areas where sediment or pollutants could leave the project site;
- Unauthorized non-stormwater discharges, spills, leaks, or other pollutant sources; and
- Corrective actions identified during previous inspections.

BMP deficiencies identified during routine inspections will be documented and corrected in accordance with Section 4. Completed inspection records will be retained in Appendix N.

7.6.1.2 Non-Stormwater Discharge Observations

Non-stormwater discharge observations will be performed quarterly during daylight hours in accordance with Table 7-1. Observations will be conducted by the QSP and will evaluate whether unauthorized non-stormwater discharges are present at the project site.

Non-stormwater discharge observations will include, at a minimum, observations of the following:

- Presence or absence of unauthorized non-stormwater discharges;
- Evidence of spills, leaks, wash water, or other unauthorized releases;
- Authorized non-stormwater discharges, if present, are properly managed and do not cause erosion or transport pollutants;
- BMPs associated with non-stormwater controls are implemented and effective;
- Discharge locations, drainage features, and areas where non-stormwater discharges could leave the project site; and
- Corrective actions identified during previous observations.

Unauthorized non-stormwater discharges identified during observations will be documented, reported, and corrected in accordance with the 2022 CGP and this SWPPP. Completed observation records will be retained in Appendix N.

7.6.2 Qualifying Precipitation Event Triggered Observations and Inspections

Qualifying Precipitation Event triggered observations and inspections will be conducted in accordance with the 2022 CGP and the frequencies summarized in Table 7-1. Qualifying Precipitation Event triggers, forecast sources, and weather tracking requirements are described in Section 7.3.

QPE-triggered observations and inspections include visual observations prior to a forecasted QPE, BMP inspections during an extended QPE, and visual observations following a QPE. Observations and inspections will be conducted at applicable monitoring locations shown on the Site Maps and Drawings included in Appendix A.

Inspection findings, BMP deficiencies, corrective actions, and maintenance activities identified during QPE-triggered observations and inspections will be documented using the inspection forms maintained with this SWPPP. Completed records will be retained in Appendix N.

7.6.2.1 Visual Observations Prior to a Forecasted Qualifying Precipitation Event

Visual observations prior to a forecasted Qualifying Precipitation Event will be conducted in accordance with the 2022 CGP and Table 7-1. Qualifying Precipitation Event triggers, forecast sources, and weather tracking requirements are described in Section 7.3.

Pre-Qualifying Precipitation Event observations will include, at a minimum, observations of the following:

- BMPs are properly implemented, maintained, and appropriate for forecasted conditions;
- BMPs requiring maintenance, repair, replacement, or additional implementation prior to the forecasted event;
- Active and inactive disturbed soil areas;
- Stockpile, staging, material storage, waste storage, fueling, maintenance, and sanitary facility areas;
- Access roads, haul routes, entrances, exits, and potential track-out locations;
- Discharge locations and areas where sediment or pollutants could leave the project site;
- Evidence of spills, leaks, unauthorized non-stormwater discharges, or other pollutant sources; and
- Corrective actions identified during previous inspections.

Deficiencies or conditions requiring maintenance, repair, replacement, or additional BMP implementation will be documented and corrected in accordance with Section 4. Completed observation records will be retained in Appendix N.

7.6.2.2 *BMP Inspections During a Qualifying Precipitation Event*

BMP inspections during an extended Qualifying Precipitation Event will be conducted in accordance with the 2022 CGP and Table 7-1. Inspections will be conducted during scheduled site operating hours on days that the forecast predicts at least 0.25 inches of precipitation once the Qualifying Precipitation Event commences.

BMP inspections during an extended Qualifying Precipitation Event will include, at a minimum, observations of the following:

- BMPs are functioning as intended under active precipitation conditions;
- BMPs requiring maintenance, repair, replacement, or additional implementation;
- Evidence of erosion, sediment transport, ponding, overtopping, bypass, or BMP failure;
- Active and inactive disturbed soil areas;
- Stockpile, staging, material storage, waste storage, fueling, maintenance, and sanitary facility areas;
- Access roads, haul routes, entrances, exits, and track-out locations;
- Discharge locations and areas where sediment or pollutants could leave the project site;
- Authorized non-stormwater discharges, if present, are properly managed; and
- Unauthorized non-stormwater discharges, spills, leaks, or other pollutant sources.

Deficiencies or conditions requiring maintenance, repair, replacement, or additional BMP implementation will be documented and corrected in accordance with Section 4. Completed inspection records will be retained in Appendix N.

7.6.2.3 *Visual Observations Following a Qualifying Precipitation Event*

Visual observations following a Qualifying Precipitation Event will be conducted in accordance with the 2022 CGP and Table 7-1. Observations will be performed within 96 hours after the Qualifying Precipitation Event has ended.

- BMPs are functioning as intended following the precipitation event;
- BMPs requiring maintenance, repair, replacement, or additional implementation;

- Evidence of erosion, sediment transport, ponding, overtopping, bypass, or BMP failure;
- Active and inactive disturbed soil areas;
- Stockpile, staging, material storage, waste storage, fueling, maintenance, and sanitary facility areas;
- Access roads, haul routes, entrances, exits, and track-out locations;
- Discharge locations and areas where sediment or pollutants may have left the project site;
- Evidence of spills, leaks, unauthorized non-stormwater discharges, or other pollutant sources; and
- Corrective actions identified during previous inspections.

Deficiencies or conditions requiring maintenance, repair, replacement, or additional BMP implementation will be documented and corrected in accordance with Section 4. Completed observation records will be retained in Appendix N.

7.6.3 Visual Monitoring Procedures

Visual monitoring will be conducted by the QSP or trained QSP Delegate, as applicable, in accordance with the 2022 CGP, this SWPPP, and the inspection frequencies summarized in Table 7-1. Visual monitoring will be conducted at the monitoring locations shown on the Site Maps and Drawings included in Appendix A.

Visual monitoring procedures will include the following:

- BMP inspections will be documented using the BMP Inspection Form included in Appendix H;
- Visual observations will be documented using the Visual Inspection Field Log Sheet included in Appendix O;
- Weather reports used to determine Qualifying Precipitation Event inspection requirements will be retained in Appendix M;
- Visual monitoring will include the applicable observation and inspection items identified in Sections 7.6.1.1 through 7.6.2.3; and
- Deficiencies, ineffective BMPs, unauthorized discharges, pollutant sources, and other conditions requiring corrective action will be photographed and documented in the applicable BMP Inspection Form or Visual Inspection Field Log Sheet; and
- Completed BMP Inspection Forms, Visual Inspection Field Log Sheets, photographs, and related visual monitoring records will be submitted to the Construction Manager for review and retained in Appendix N.

7.6.4 Visual Monitoring Follow-Up and Reporting

Deficiencies, ineffective BMPs, unauthorized discharges, pollutant sources, or other conditions requiring corrective action identified during visual monitoring will be reported to the Construction Manager and documented in the applicable BMP Inspection Form or Visual Inspection Field Log Sheet. Corrective actions will be completed in accordance with Section 4.

Corrective actions shall be photographed and documented in the applicable BMP Inspection Form or Visual Inspection Field Log Sheet. Corrective action documentation will identify the deficiency or condition observed, the corrective action taken, the date the corrective action was completed, and any follow-up verification performed.

Completed inspection and observation reports will be submitted to the Construction Manager within seven days of completion. Offsite discharges, non-compliance events, numeric action level

exceedances, or other reportable conditions will be reported in accordance with the 2022 CGP and this SWPPP. Completed visual monitoring records, corrective action documentation, photographs, and related reports will be retained in Appendix N.

7.7 Water Quality Sampling and Analysis

Water quality sampling and analysis will be conducted in accordance with the 2022 CGP requirements applicable to the project's Risk Level 1 status. Routine stormwater sampling for pH and turbidity is not required for Risk Level 1 projects unless otherwise required by the 2022 CGP, this SWPPP, or the Regional Water Board.

Sampling may be required if a breach, leakage, malfunction, spill, or other release has the potential to discharge non-visible pollutants associated with construction activities, materials, wastes, or equipment. Potential non-visible pollutant sources for this project include fuels, lubricants, hydraulic fluids, coolant, sanitary waste, liquid waste, hazardous materials or wastes if generated, and spill cleanup materials.

Sampling and analysis requirements, if triggered, are described in the following subsections. Completed sampling records, field logs, chain-of-custody forms, analytical results, and related documentation will be retained in Appendix N.

7.7.1 Sampling and Analysis Plan for Non-Visible Pollutants in Stormwater Runoff Discharges

Sampling and analysis for non-visible pollutants will be conducted if a breach, leakage, malfunction, spill, or other release is observed and there is potential for non-visible pollutants to discharge with stormwater or authorized non-stormwater discharges.

Potential sources of non-visible pollutants are identified in Section 2.6 and Appendix F. Appendix F includes the project-specific evaluation of existing site features, soil amendments, construction activities, materials, wastes, and stormwater run-on conditions that may contribute non-visible pollutants to stormwater discharges.

Non-visible pollutant sampling is not required if releases, should they occur, are contained and cleaned up before contact with stormwater or authorized non-stormwater discharges occurs. If a release is not fully contained or cleaned up before a precipitation event or other discharge condition, the QSP will evaluate whether sampling is required based on the pollutant source, discharge potential, drainage conditions, and applicable 2022 CGP requirements.

Sampling will be limited to pollutants associated with the observed or suspected source of the release. Sampling preparation, analytical constituents, sample collection requirements, sample analysis, data evaluation, and reporting requirements are described in the following subsections.

Sampling Schedule

Non-visible pollutant sampling is event-driven and is not performed on a routine or recurring schedule. Sampling will be conducted when required by the 2022 CGP based on an observed condition that has the potential to discharge non-visible pollutants with stormwater or authorized non-stormwater discharges.

Sampling triggers may include, but are not limited to, the following conditions:

- A spill, leak, breach, malfunction, or release from construction materials, equipment, vehicles, waste containers, sanitary facilities, fueling areas, maintenance areas, storage areas, or other pollutant source areas;
- Evidence that a non-visible pollutant has contacted stormwater, authorized non-stormwater discharge, or another flow path with the potential to discharge from the site;
- A release that is not fully contained, cleaned up, or corrected before contact with stormwater or authorized non-stormwater discharge occurs;
- A discharge of authorized non-stormwater that may have contacted a non-visible pollutant source;
- A spill or release that enters or has the potential to enter a drainage feature, discharge location, waterway, or storm drain system; or
- Direction from the Regional Water Board or other regulatory agency.

When sampling is required during a precipitation event, samples will be collected during the first two hours of discharge that produces sufficient flow for sample collection, when safe and feasible. When sampling is required during an authorized non-stormwater discharge or other non-precipitation discharge condition, samples will be collected as soon as practicable after the discharge is observed and while sufficient flow is present for sample collection.

If a discharge begins outside scheduled site operating hours, during unsafe conditions, or when the site is inaccessible, sampling will be conducted as soon as practicable after the site is accessible and conditions allow sample collection. Sampling exemptions or missed sampling events will be documented in the applicable sampling record.

Sampling will continue for each discharge condition associated with the observed or suspected non-visible pollutant source until the source has been contained, cleaned up, corrected, or otherwise eliminated, and the QSP determines that non-visible pollutant sampling is no longer required.

Sampling Locations

Anticipated non-visible pollutant sampling locations are based on the project drainage patterns, discharge locations, construction support areas, and receiving water conditions identified in Section 2.1 and shown on the Site Maps and Drawings included in Appendix A.

For releases occurring within the waterside work area, sampling will be conducted, when required and feasible, at the affected stormwater or authorized non-stormwater discharge location downgradient of the release and before discharge to the Knights Landing Ridge Cut. For releases occurring within landside staging, access, stockpile, fueling, maintenance, storage, or sanitary facility areas, sampling will be conducted, when required and feasible, at the affected discharge location downgradient of the release and before discharge to adjacent farmland or agricultural drainage features.

Background samples will be collected, when required, available, and safe to collect, from stormwater or authorized non-stormwater discharge that has not contacted the observed or suspected pollutant source. Background sample locations may include an upgradient or adjacent unaffected drainage area with similar surface conditions.

The project does not include storm drain inlets or municipal storm drain facilities within the construction area, and offsite stormwater run-on is not anticipated. Sampling locations may be

adjusted by the QSP based on the actual release location, flow path, discharge conditions, site access, and safety considerations at the time sampling is required.

Sampling locations will be documented on the applicable Effluent Sampling Field Log Sheet included in Appendix O. Completed sampling records will be retained in Appendix N.

7.7.1.1 *Monitoring Preparation*

The QSP will determine whether non-visible pollutant sampling is required based on observed site conditions, the source of the potential pollutant, discharge potential, drainage conditions, and applicable 2022 CGP requirements.

Sampling equipment and supplies will be maintained onsite or readily available when sampling may be required. Sampling supplies may include clean sample containers, nitrile gloves, sample labels, chain-of-custody forms, Effluent Sampling Field Log Sheets, coolers, ice, plastic bags, paper towels, decontamination supplies, personal protective equipment, and other materials necessary to collect, preserve, and transport samples.

Effluent Sampling Field Log Sheets and chain-of-custody forms are included in Appendix O. Completed sampling records, field logs, chain-of-custody forms, analytical results, and related documentation will be retained in Appendix N.

7.7.1.2 *Analytical Constituents*

Table 7-2 identifies water quality indicator constituents, analytical methods, sample container requirements, preservation requirements, reporting limits, and holding times for non-visible pollutant sampling. The constituents identified in Table 7-2 are based on the project pollutant source assessment included in Appendix F and the Safety Data Sheets maintained onsite or electronically available for the project.

If non-visible pollutant sampling is required, analytical constituents will be selected from Table 7-2 based on the observed or suspected pollutant source. Sampling will be limited to constituents associated with the observed or suspected source of the release.

Analytical methods identified in Table 7-2 shall be selected in compliance with U.S. EPA sufficiently sensitive method requirements in 40 Code of Federal Regulations Part 136, as evidenced by the applicable method detection limit and minimum level.

7.7.1.3 *Sample Collection*

Samples will be collected by the QSP or trained QSP Delegate using clean sampling techniques and the sampling equipment, containers, preservation methods, and holding times identified in Table 7-2. Samples will be collected only when sufficient discharge is present to allow representative sample collection and when site conditions allow sampling to be performed safely.

Samples will be collected from the affected stormwater or authorized non-stormwater discharge at the sampling locations identified in Section 7.7.1 under Sampling Locations. Where required, available, and safe to collect, a background sample will be collected from stormwater or authorized non-stormwater discharge that has not contacted the observed or suspected pollutant source.

Samples will be collected in a manner that minimizes disturbance of sediment, debris, vegetation, or other material that could affect the sample result. Sample containers will be labeled at the time of collection and documented on the Effluent Sampling Field Log Sheet and chain-of-custody form included in Appendix O.

Sample collection and handling procedures are described in Section 7.7.5, and applicable quality assurance and quality control procedures are described in Section 7.11. Completed sampling records, field logs, chain-of-custody forms, photographs, and related documentation will be retained in Appendix N.

Table 7-2 Sample Collection, Preservation and Analysis for Monitoring Non-Visible Pollutants

Constituent	Analytical Method	Minimum Sample Volume	Sample Containers	Sample Preservation	Method Detection Limit	Maximum Holding Time
VOCs-Solvents	EPA 8260B	3 x 40 mL	VOA-glass	Store at 4° C, HCl to pH<2	1 µg/L	14 days
SVOCs	EPA 8270C	1 x 1 L	Glass-Amber	Store at 4° C	10 µg/L	7 days
Pesticides/PCBs	EPA 8081A/8082	1 x 1 L	Glass-Amber	Store at 4° C	0.1 µg/L	7 days
Herbicides	EPA 8151A	1 x 1 L	Glass-Amber	Store at 4° C	Check Lab	7 days
BOD	EPA 405.1	1 x 500 mL	Polypropylene	Store at 4° C	1 mg/L	48 hours
COD	EPA 410.4	1 x 250 mL	Glass-Amber	Store at 4° C, H ₂ SO ₄ to pH<2	5 mg/L	28 days
DO	SM 4500-O G	1 x 250 mL	Glass-Amber	Store at 4° C	Check Lab	8 hours
pH	EPA 150.1	1 x 100 mL	Polypropylene	None	Unit less	Immediate
Alkalinity	SM 2320B	1 x 250 mL	Polypropylene	Store at 4° C	1 mg/L	14 days
Metals (Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, Se, Na, Th, Va, Zn)	EPA 6010B/7470A	1 x 250 mL	Polypropylene	Store at 4° C, HNO ₃ to pH<2	0.1 mg/L	6 months
Metals (Chromium VI)	EPA 7199	1 x 500 mL	Polypropylene	Store at 4° C	1.0 µg/L	24 hours
Key: °C: Degrees Celsius BOD: Biological Oxygen Demand COD: Chemical Oxygen Demand DO: Dissolved Oxygen EPA: Environmental Protection Agency HCl: Hydrogen Chloride H ₂ SO ₄ : Sulfuric Acid H ₂ S: Hydrogen Sulfide HNO ₃ : Nitric Acid L: Liter			mg/L: Milligrams per Liter µg/L: Micrograms per Liter mL: Milliliter PCB: Polychlorinated Biphenyl SM: Standard Method, Per the Standard Methods for the Examination of Water and Wastewater, 20th Edition, American Water Works Association SVOC: Semi-Volatile Organic Compound VOA: Volatile Organic Analysis VOC: Volatile Organic Compound			

7.7.1.4 *Sample Analysis*

Samples collected for non-visible pollutant analysis will be submitted to the laboratory identified below. Laboratory information and sample delivery procedures shall be confirmed before sampling is performed.

Samples will be analyzed by:

Laboratory Name:	A&L Western Laboratories
Street Address:	1311 Woodland Avenue
City, State Zip:	Modesto, CA 95351
Telephone Number:	209-529-4080

Samples shall be delivered to the analytical laboratory by hand delivery by the QSP, QSP Delegate, or Contractor; by laboratory courier; by laboratory pickup; or by another method approved by the QSP. Samples shall be submitted under chain-of-custody and delivered within the applicable holding times identified in Table 7-2. Laboratory analytical reports, chain-of-custody forms, delivery documentation, and related sampling records will be retained in Appendix N. Laboratory analytical results will be reviewed in accordance with the quality assurance and quality control procedures described in Section 7.11.

7.7.1.5 *Data Evaluation and Reporting*

The QSP shall complete an evaluation of the water quality sample analytical results based on a comparison of the affected discharge sample results to the unaffected background sample results. Runoff or downgradient results shall be compared with associated upgradient or unaffected results and any associated run-on results, if applicable.

If the runoff or downgradient sample shows an increased level of the tested analyte relative to the unaffected background sample, and the increase cannot be explained by run-on results, the QSP shall assess the BMPs, site conditions, and surrounding influences to determine the probable cause of the increase.

As determined by the site and data evaluation, appropriate BMPs shall be repaired, modified, or supplemented to mitigate discharges of non-visible pollutant concentrations. Revisions to BMPs shall be recorded as an amendment to the SWPPP, as applicable.

Analytical results of non-visible pollutant monitoring shall be submitted to SMARTS within 30 days after obtaining the analytical results, when required by the 2022 CGP. The 2022 CGP prohibits stormwater discharges that contain hazardous substances equal to or in excess of reportable quantities established in 40 Code of Federal Regulations Sections 117.3 and 302.4. The results of any stormwater or non-stormwater discharge monitoring that indicate the presence of a hazardous substance in excess of established reportable quantities shall be immediately reported to the Regional Water Board and other agencies as required.

Laboratory analytical reports, chain-of-custody forms, Effluent Sampling Field Log Sheets, corrective action documentation, SMARTS submittal records, and related sampling records will be retained in Appendix N. Data evaluation will include review of applicable quality assurance and quality control information described in Section 7.11.

7.7.2 *Sampling and Analysis Plan for pH and Turbidity in Stormwater Runoff Discharges*

Sampling and analysis of runoff for pH and turbidity is not required for Risk Level 1 projects.

If the project risk level changes, or if pH or turbidity sampling is required by the Regional Water Board or another applicable permit requirement, this SWPPP will be amended as necessary to incorporate applicable sampling, analysis, reporting, and recordkeeping requirements.

7.7.3 *Sampling and Analysis Plan for Other Pollutants Required by the Regional Water Board*

The Regional Water Board has not specified monitoring for additional pollutants for this project.

If the Regional Water Board requires monitoring for additional pollutants during construction, this SWPPP will be amended as necessary to identify the required pollutants, sampling locations, sampling frequency, analytical methods, reporting requirements, and recordkeeping procedures. Sampling and analysis will be conducted in accordance with the Regional Water Board direction, the 2022 CGP, and this SWPPP.

7.7.4 *Training of Sampling Personnel*

Sampling will be performed by the QSP or by a trained QSP Delegate under the direction of the QSP. Personnel assigned to perform sampling shall be trained before collecting samples.

Training for sampling personnel shall include applicable 2022 CGP sampling requirements, sample collection procedures, clean sampling techniques, sample labeling, preservation requirements, chain-of-custody procedures, sample delivery requirements, field log documentation, safety considerations, and the project-specific sampling locations and pollutant source assessment.

Training records for sampling personnel will be retained in Appendix I. Completed sampling records, Effluent Sampling Field Log Sheets, chain-of-custody forms, laboratory analytical reports, and related documentation will be retained in Appendix N.

7.7.5 *Sample Collection and Handling*

Samples collected under this Construction Site Monitoring Program shall be collected, handled, preserved, transported, and documented in accordance with the 2022 CGP, 40 Code of Federal Regulations Part 136, Standard Methods for the Examination of Water and Wastewater, applicable analytical laboratory requirements, and the forms included in Appendix O.

The procedures in this section apply to samples collected for laboratory analysis and to field measurements, as applicable. Project-specific sampling triggers, sampling schedules, sampling locations, analytical constituents, and data evaluation requirements are described in the preceding sections. Quality assurance and quality control procedures applicable to sample collection, handling, documentation, and data review are described in Section 7.11.

7.7.5.1 *Sample Collection*

Samples shall be collected at the sampling locations identified in the applicable sampling section of this SWPPP. Non-visible pollutant sampling locations are described in Section 7.7.1 under Sampling Locations. Additional sampling locations required by the Regional Water Board, if any, will be identified in Section 7.7.3 or in an amendment to this SWPPP.

Sample collection shall be documented on the applicable field log included in Appendix O. Non-visible pollutant sampling shall be documented on the Effluent Sampling Field Log Sheet. Receiving water sampling, if required by the Regional Water Board or another applicable requirement, shall be documented on the Receiving Water Sampling Field Log Sheet, as applicable.

Sample containers shall be provided or approved by the analytical laboratory. Laboratory-provided sample containers shall not be decontaminated or rinsed unless specifically directed by the analytical laboratory. Reusable sampling equipment, if used, shall be decontaminated before sample collection. Decontamination wash water and rinse water shall be contained and disposed of properly and shall not be discharged to storm drains, drainage features, receiving waters, or the project site.

Samples shall be collected from flowing discharge when sufficient flow is present to allow representative sample collection. Sampling personnel shall avoid collecting samples from stagnant or ponded water unless no other representative discharge is available. Samples shall be collected in a manner that minimizes disturbance of sediment, debris, vegetation, or other material that could affect the sample result.

Where sample collection can be performed safely, samples may be collected by placing the sample container directly into the flow path with the container opening facing upstream. For small flow paths, the sample container may be dipped directly into the flow until filled. For larger accessible flow paths, the sample should be collected from a representative portion of the flow with the container opening facing upstream and positioned to avoid contamination by the sampler. If the representative flow cannot be safely accessed, a pole sampler or other appropriate sampling device may be used.

Sampling personnel shall avoid collecting samples immediately downstream from bridges, culverts, road crossings, or similar structures when those features could affect sample quality or introduce pollutants from unrelated sources. Sampling personnel shall also avoid activities that could contaminate the sample during collection, including eating, drinking, smoking, coughing over sample containers, placing containers on contaminated surfaces, or allowing sample containers to contact vehicles, equipment, soil, or waste materials.

If sample containers contain preservatives, the container shall not be dipped directly into the discharge unless approved by the analytical laboratory. When necessary, the sample shall be collected using a clean intermediate container and transferred to the preserved sample container in a manner that prevents loss of preservative and minimizes contamination.

7.7.5.2 *Sample Handling*

Sample containers shall be capped immediately after collection and labeled at the time of collection. Sample labels shall include, at a minimum, the sample identification number, sample location, sample date and time, sampler, and requested analysis, as applicable.

Samples requiring laboratory analysis shall be placed in a cooler with ice or otherwise preserved in accordance with Table 7-2 and analytical laboratory requirements. Samples shall be maintained at the required temperature from collection through delivery to the analytical laboratory. Sample containers shall be packaged to prevent breakage, leakage, or cross-contamination during transport.

Samples shall be delivered to the analytical laboratory as soon as practicable after collection and within the applicable holding times identified in Table 7-2. Hold times begin at the time of sample

collection. Samples shall be submitted under chain-of-custody control from collection through delivery to the analytical laboratory.

Field measurements, if required, shall be performed in accordance with the applicable equipment manufacturer's instructions, the 2022 CGP, and this SWPPP. Field measurements shall be performed immediately or as soon as practicable after sample collection and shall be documented on the applicable field log.

7.7.5.3 Sample Documentation Procedures

Sampling personnel shall document sample collection using the applicable field log and chain-of-custody form included in Appendix O. Non-visible pollutant sampling shall be documented on the Effluent Sampling Field Log Sheet. Receiving water sampling, if required by the Regional Water Board or another applicable requirement, shall be documented on the Receiving Water Sampling Field Log Sheet, as applicable.

Sample labels, field logs, and chain-of-custody forms shall be completed using waterproof ink or another durable method appropriate for field documentation. Sample documentation shall include, as applicable, the sample identification number, sample location, sample date and time, sampler, weather conditions, discharge conditions, source or suspected pollutant source, requested analyses, field measurements, preservation method, and any unusual conditions observed during sample collection.

Errors on sample labels, field logs, or chain-of-custody forms shall be corrected by drawing a single line through the incorrect entry, entering the correct information, and initialing and dating the correction. Original entries shall remain legible. Correction fluid, erasure, or other methods that obscure the original entry shall not be used.

A chain-of-custody form shall be completed for each laboratory sampling event. The sampler shall sign the chain-of-custody form when samples are transferred to the laboratory, laboratory courier, laboratory pickup personnel, or other approved delivery method. Duplicate samples, if collected, shall be identified in the field log and labeled in accordance with the project sample numbering system.

Completed field logs, chain-of-custody forms, laboratory analytical reports, delivery documentation, field measurement records, and related sampling records will be retained in Appendix N.

7.8 Active Treatment System Monitoring

Will an Active Treatment System (ATS) be deployed on the site?

☐ Yes ☒ No

An Active Treatment System is not planned for this project. Therefore, this project does not require a project-specific Sampling and Analysis Plan for Active Treatment System monitoring.

If an Active Treatment System is proposed during construction, the SWPPP will be amended before the system is deployed. The amendment will include applicable monitoring, operation, maintenance, reporting, and recordkeeping requirements in accordance with Attachment F of the 2022 CGP. The Active Treatment System plan, if required, will be included in Appendix R.

7.9 Passive Treatment Monitoring

Will passive treatment technologies be deployed on the site?

☐ Yes ☒ No

A Passive Treatment System is not planned for this project. Therefore, this project does not require a project-specific Sampling and Analysis Plan for Passive Treatment System monitoring.

If a Passive Treatment System is proposed during construction, the SWPPP will be amended before the system is deployed. The amendment will include applicable monitoring, operation, maintenance, reporting, and recordkeeping requirements in accordance with the 2022 CGP. The Passive Treatment System plan, if required, will be included in Appendix R.

7.10 Watershed Monitoring Option

This project is not participating in a qualified regional watershed-based monitoring program. Therefore, no elements of the 2022 CGP monitoring requirements have been suspended, replaced, or modified based on participation in a watershed monitoring option.

The monitoring requirements applicable to this project are described in this Construction Site Monitoring Program, including weather tracking, visual monitoring, inspections, non-stormwater discharge observations, non-visible pollutant sampling if triggered, quality assurance and quality control procedures, and records retention.

If the project later participates in a Regional Water Board-approved watershed monitoring program, this SWPPP will be amended before relying on the watershed monitoring option. The amendment will describe the approved watershed monitoring program, identify the monitoring requirements covered by the approved program, identify any monitoring requirements that remain applicable to the project, and include documentation of Regional Water Board Executive Officer approval, as applicable.

Records associated with participation in a watershed monitoring program, if applicable, will be retained in Appendix N or Appendix Q.

7.11 Quality Assurance and Quality Control

Quality assurance and quality control procedures will be implemented to support the accuracy, completeness, and defensibility of monitoring and sampling records collected under this Construction Site Monitoring Program.

Monitoring and sampling activities will be conducted by the QSP or trained QSP Delegate, as applicable. Sampling personnel will use the sample collection, handling, preservation, transport, and documentation procedures described in Section 7.7.5. Field logs, chain-of-custody forms, inspection forms, and related documentation will be completed using the forms included in Appendix O, Appendix H, or other applicable SWPPP records.

Quality assurance and quality control procedures will include, as applicable:

- Using clean sampling techniques to reduce the potential for sample contamination;
- Using sample containers provided or approved by the analytical laboratory;
- Labeling samples at the time of collection;

- Maintaining samples under chain-of-custody control;
- Preserving, storing, and transporting samples in accordance with Table 7-2 and analytical laboratory requirements;
- Documenting sample collection conditions, sample locations, requested analyses, and field observations on the applicable field log;
- Reviewing field logs, chain-of-custody forms, inspection forms, laboratory reports, and related records for completeness;
- Correcting documentation errors in a manner that preserves the original entry; and
- Retaining completed monitoring and sampling records in Appendix N.

If field or laboratory quality control concerns are identified, the QSP will evaluate whether the affected results are usable for permit compliance purposes. Additional sampling, corrective action, documentation, or SWPPP revisions will be completed as necessary.

7.11.1 *Field Logs*

Field logs will be used to document monitoring and sampling activities conducted under this Construction Site Monitoring Program. Field logs shall be completed at the time monitoring or sampling is performed and shall include the information necessary to document site conditions, monitoring locations, sampling locations, discharge conditions, observations, field measurements, and related monitoring or sampling activities.

Field logs shall be completed using waterproof ink or another durable method appropriate for field documentation. Entries shall be legible, complete, and accurate. Errors shall be corrected by drawing a single line through the incorrect entry, entering the correct information, and initialing and dating the correction. Original entries shall remain legible. Correction fluid, erasure, or other methods that obscure the original entry shall not be used.

Effluent Sampling Field Log Sheets, Visual Inspection Field Log Sheets, and other applicable field documentation forms are included in Appendix O. Completed field logs will be retained in Appendix N.

7.11.2 *Clean Sampling Techniques*

Clean sampling techniques will be used to reduce the potential for sample contamination and to support representative sampling results. Sampling personnel shall follow the sample collection and handling procedures described in Section 7.7.5 and shall use sample containers, preservatives, and handling procedures consistent with Table 7-2 and analytical laboratory requirements.

Sampling personnel shall avoid touching the inside of sample containers, lids, or preservatives. Sample containers shall remain closed until immediately before sample collection and shall be capped immediately after sample collection. Sampling personnel shall wear clean, powder-free nitrile gloves and shall change gloves between sampling locations or after contacting surfaces or materials that could contaminate the sample.

Reusable sampling equipment, if used, shall be cleaned or decontaminated before sample collection using procedures approved by the QSP and consistent with analytical laboratory requirements. Decontamination wash water and rinse water shall be contained and disposed of properly and shall not be discharged to storm drains, drainage features, receiving waters, or the project site.

Samples shall be collected in a manner that avoids contamination from personnel, vehicles, equipment, soil, waste materials, or other non-representative sources. Conditions that could affect sample quality will be documented on the applicable field log.

7.11.3 Chain of Custody

Chain-of-custody procedures will be used for samples submitted for laboratory analysis. A chain-of-custody form shall be completed for each laboratory sampling event using the applicable form included in Appendix O or a laboratory-provided chain-of-custody form.

The chain-of-custody form shall identify, at a minimum, the project name, sample identification number, sample location, sample date and time, sampler, requested analyses, sample containers, preservation method, and any special laboratory instructions. The chain-of-custody form shall accompany the samples from the time of collection through delivery to the analytical laboratory.

Samples shall remain under the control of the sampler or designated sample custodian until transferred to the analytical laboratory, laboratory courier, laboratory pickup personnel, or another QSP-approved delivery method. Each transfer of custody shall be documented by the signatures, dates, and times of the person relinquishing custody and the person receiving custody.

Completed chain-of-custody forms, laboratory analytical reports, delivery documentation, and related sampling records will be retained in Appendix N.

7.11.4 QA/QC Samples

QA/QC samples provide an indication of the accuracy and precision of sample collection, sample handling, field measurements, and analytical laboratory methods. QA/QC samples will be collected as necessary based on the sampling required for the project, the analytical constituents being sampled, laboratory requirements, and QSP direction.

QA/QC sample requirements for this project are summarized in Table 7-3.

Table 7-3 QA/QC Sample Requirements

QA/QC Sample Type	Required for Project	Requirement / Applicability
Field Duplicates	☒ Yes ☐ No	Field duplicates will be collected at a frequency of 5 percent or a minimum of one duplicate per sampling event when field measurements or laboratory analysis are performed.
Equipment Blanks	☐ Yes ☒ No	Equipment blanks are not required unless reusable or non-dedicated sampling equipment is used, or unless required by the analytical laboratory, QSP, or sampling method.
Field Blanks	☐ Yes ☒ No	Field blanks are not required unless required by the sampling method, analytical laboratory, QSP, or Regional Water Board.
Travel Blanks	☐ Yes ☒ No	Travel blanks are not required unless VOC samples are collected or unless required by the analytical laboratory, QSP, or sampling method.

Field duplicates, if collected, shall be collected at the same location and time as the original sample and handled in the same manner as the original sample. Duplicate samples shall be identified using the project sample numbering system and documented on the applicable field log. Duplicate sample

identification shall not indicate to the analytical laboratory that the sample is a duplicate unless required by the laboratory or QSP.

Equipment blanks, field blanks, travel blanks, or other QA/QC samples, if required, shall be collected and handled in accordance with the applicable laboratory requirements, sampling method, and QSP direction. QA/QC sample results will be reviewed by the QSP to evaluate potential impacts to sampling results or data usability.

Completed QA/QC sample records, field logs, chain-of-custody forms, laboratory analytical reports, and related documentation will be retained in Appendix N.

7.11.4.1 *Field Duplicates*

Field duplicates provide verification of laboratory or field analysis and sample collection. A field duplicate is a second sample collected from the same discharge location as the primary sample and handled, preserved, transported, and analyzed using the same protocols as the primary sample.

Field duplicates shall be collected at the frequency identified in Table 7-3. The sample location where field duplicates are collected shall be randomly selected from the applicable discharge locations. Duplicate samples shall be collected immediately after the primary sample has been collected, in the same manner as the primary sample, and as close in time as possible to the primary sample.

Field duplicate results will be used to evaluate sampling precision, sample handling, and analytical consistency. Duplicate samples shall not independently influence compliance evaluations or conclusions unless reviewed by the QSP as part of the overall data verification process.

Field duplicates shall be documented on the applicable field log and chain-of-custody form. Completed field duplicate records will be retained in Appendix N.

7.11.4.2 *Equipment Blanks*

Equipment blanks are used to evaluate whether reusable or non-dedicated sampling equipment may contribute contamination to a sample. Equipment blanks are collected by passing analyte-free water over or through the sampling equipment after decontamination and before sample collection.

Equipment blanks are typically collected when reusable sampling equipment is used, when sampling equipment is decontaminated between sampling locations, when non-dedicated sampling equipment is used for multiple samples, or when required by the analytical laboratory, sampling method, QSP, or Regional Water Board. Equipment blank requirements are summarized in Table 7-3.

Equipment blanks are not required for this project unless reusable or non-dedicated sampling equipment is used, or unless required by the analytical laboratory, sampling method, QSP, or Regional Water Board.

If equipment blanks are required, they shall be collected, handled, preserved, transported, analyzed, and documented in accordance with the applicable sampling method, analytical laboratory requirements, and QSP direction. Completed records for equipment blanks will be retained in Appendix N.

7.11.4.3 *Field Blanks*

Field blanks are used to evaluate whether sample collection, sample handling, field conditions, or ambient site conditions may contribute contamination to a sample. Field blanks are collected by

transferring analyte-free water into a sample container at the sampling location and handling the field blank in the same manner as the associated environmental sample.

Field blanks are typically collected when required by the analytical laboratory, sampling method, QSP, or Regional Water Board. Field blanks may also be collected when field conditions create a potential for sample contamination or when additional quality control information is needed to evaluate data usability. Field blank requirements are summarized in Table 7-3.

Field blanks are not required for this project unless required by the analytical laboratory, sampling method, QSP, or Regional Water Board, or unless field conditions indicate that a field blank is needed to evaluate potential sample contamination.

If field blanks are required, they shall be collected, handled, preserved, transported, analyzed, and documented in accordance with applicable sampling method and analytical laboratory requirements. Field blank results will be reviewed by the QSP as part of the data verification process. Completed field blank records will be retained in Appendix N.

7.11.4.4 *Travel Blanks*

Travel blanks are used to evaluate whether sample containers or samples may be affected by contamination during transport, handling, storage, or shipment. Travel blanks are prepared by the analytical laboratory using analyte-free water, transported with the sample containers to the field, kept with the sample containers during sample collection activities, and returned unopened to the analytical laboratory with the associated samples.

Travel blanks are typically used when samples are collected for volatile organic compound analysis or when required by the analytical laboratory, sampling method, QSP, or Regional Water Board. Travel blank requirements are summarized in Table 7-3.

Travel blanks are not required for this project unless volatile organic compound samples are collected, or unless travel blanks are required by the analytical laboratory, sampling method, QSP, or Regional Water Board.

If travel blanks are required, they shall be handled, transported, analyzed, and documented in accordance with applicable sampling method and analytical laboratory requirements. Travel blank results will be reviewed by the QSP as part of the data verification process. Completed travel blank records will be retained in Appendix N.

7.11.5 *Data Verification*

After analytical results are received from the laboratory, the QSP or QSP Delegate will verify the data to determine whether the results are complete, accurate, and consistent with applicable QA/QC requirements. Data shall be verified as soon as practicable after laboratory reports are received.

Laboratory data verification will include the following:

- Review chain-of-custody forms and laboratory reports to confirm that all requested analyses were performed and that all samples are accounted for in the reports;
- Review laboratory reports to confirm that sample holding times were met and that reporting limits are consistent with Table 7-2;
- Review laboratory reports for typographical errors, unit reporting errors, incomplete results, or other apparent inconsistencies;
- Review reported values that appear outside the expected range or inconsistent with other sample results, field observations, or previous results from the same location;

- Follow up with the laboratory to clarify, correct, confirm, or reanalyze results, if appropriate;
- Review laboratory QA/QC results, including method blanks, field blanks, equipment blanks, matrix spikes, matrix spike duplicates, laboratory control samples, and other applicable QA/QC results; and
- Review laboratory qualifiers or flags and evaluate whether they affect data usability.

Field data, including inspection, observation, field measurement, and sampling documentation, shall be verified as soon as practicable after field logs are received, typically at the end of the sampling event or inspection.

Field data verification will include the following:

- Review field logs to confirm that required observations, inspections, field measurements, and sample collection information were completed and appropriately documented;
- Review reported field values that appear outside the expected range or inconsistent with site conditions;
- Follow up immediately to identify potential reporting errors, equipment problems, or calibration issues;
- Verify that required equipment calibrations were completed and documented, if field meters were used;
- Review observations noted on the field logs, including discharge conditions, visual observations, pollutant indicators, BMP conditions, and unusual site conditions; and
- Review notations of errors and actions taken to correct equipment, measurement, or recording errors.

If deficiencies, inconsistencies, missing information, QA/QC concerns, or other data usability issues are identified, the QSP will evaluate whether the affected monitoring or sampling results are valid for permit compliance purposes. Additional documentation, corrective action, resampling, SWPPP amendment, reporting, or laboratory follow-up will be completed as necessary.

Completed data verification records and related monitoring and sampling documentation will be retained in Appendix N.

7.12 Records Retention

Stormwater monitoring records and copies of reports, including Annual Reports, shall be retained for a minimum of three years from the date generated or submitted, whichever is later, or for a longer period if required by the Regional Water Board.

Results of visual monitoring, inspections, field measurements, sampling activities, laboratory analyses, chain-of-custody forms, and related monitoring documentation will be retained with the SWPPP. Records will be kept onsite or electronically available while construction is ongoing. Completed monitoring records will be retained in Appendix N.

Records to be retained include, as applicable:

- The date, place, and time of inspections, sampling, visual observations, field measurements, and precipitation observations;
- The individual(s) who performed inspections, sampling, visual observations, and field measurements;
- The date and approximate time of field measurements and laboratory analyses;
- The individual(s) who performed laboratory analyses;

- A summary of analytical results, method detection limits, reporting limits, and analytical techniques or methods used;
- Weather reports and rain gauge readings used to support monitoring decisions;
- QA/QC records and results;
- Calibration records;
- Visual observation and sample collection exemption records;
- Corrective action records and follow-up documentation resulting from analytical results, visual observations, inspections, or other monitoring activities;
- Completed BMP Inspection Forms, Visual Inspection Field Log Sheets, Effluent Sampling Field Log Sheets, chain-of-custody forms, laboratory analytical reports, photographs, and related monitoring records; and
- SMARTS submittal records and other reports required by the 2022 CGP.

Records assisting in the determination of compliance with the 2022 CGP will be made available within a reasonable time to the Regional Water Board, State Water Board, or U.S. Environmental Protection Agency upon request.

Section 8 References

American Public Health Association, American Water Works Association, and Water Environment Federation. Standard Methods for the Examination of Water and Wastewater. Current edition.

California Stormwater Quality Association. Stormwater Best Management Practice Handbook: Construction. Current edition.

California Stormwater Quality Association. Stormwater BMP Handbook: Construction BMP Fact Sheets. Current edition. Included in Appendix G.

California Code of Regulations. Title 23, Division 3, Chapter 9, Waste Discharge Reports and Requirements.

Central Valley Regional Water Quality Control Board. Water Quality Control Plan for the Sacramento River Basin and San Joaquin River Basin. Current edition.

Code of Federal Regulations. 40 CFR Part 136, Guidelines Establishing Test Procedures for the Analysis of Pollutants.

National Oceanic and Atmospheric Administration, National Weather Service. Weather Forecast Office Forecasts and Precipitation Forecast Information.

State Water Resources Control Board. National Pollutant Discharge Elimination System General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities, Order No. 2022-0057-DWQ, NPDES No. CAS000002. 2022 Construction General Permit. Included in Appendix S.

State Water Resources Control Board. California 303(d) List of Water Quality Limited Segments. Current approved list.

State Water Resources Control Board. Storm Water Multiple Application and Report Tracking System.

United States Environmental Protection Agency. Industrial Stormwater Monitoring and Sampling Guide.

United States Environmental Protection Agency. National Pollutant Discharge Elimination System Stormwater Program Guidance and Construction Stormwater Resources.

Project plans, specifications, permits, approvals, and supporting documents listed in Section 2.2 and included or referenced in the SWPPP appendices.

Appendix A

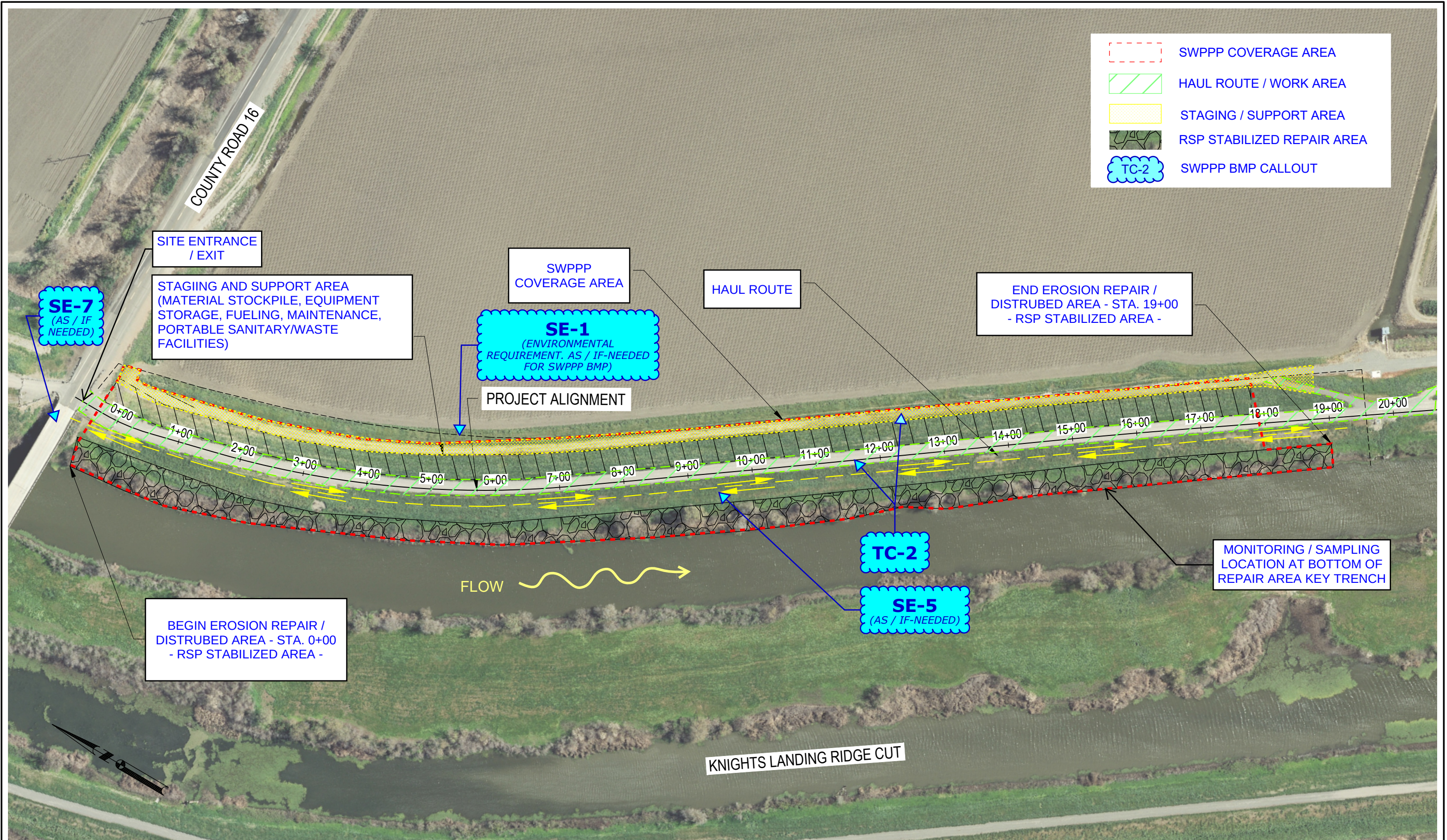
Site Maps and Drawings

RIDGE CUT EROSION REPAIR PROJECT KNIGHTS LANDING RIDGE DRAINAGE DISTRICT YOLO COUNTY, CALIFORNIA	DATE MAY 2026
	SHEET IDENTIFICATION SW-01
	KSN PROJECT FILE NO. 2166-0110

SWPPP VACINITY MAP



FILE SPEC: P:\2166_Knights_Landing_Levee_Repair\0110_Ridge_Cut_Erosion_Repair\08_Civil\400_Plans\020_CAD_Sheets\Phase2\From Station 0+00 to 19+00\C-001-SiteMap.dwg
PLOT DATE: Jun 03, 2026 - 4:35pm





Know what's below.
Call before you dig.

SUBMITTAL	
%	Date
30	06/13/2025
60	07/22/2025
100	02/03/2026



PROJECT ENGINEER
2/3/2026

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY ARR
DRAWN BY EYT
CHECK BY EAR
HORIZONTAL DATUM CCS83, ZONE 2
VERTICAL DATUM NAVD88

DRAWING SCALE
1" = 70'
ORIGINAL DRAWING SCALE
0 1/2" 1"



KJELSEN SINNOCK NEUDECK inc.
CIVIL ENGINEERS & LAND SURVEYORS
www.ksninc.com

711 N. Pershing Avenue
Stockton, CA 95203
209-946-0268
1550 Harbor Blvd., Suite 212
West Sacramento, CA 95691
916-403-5900

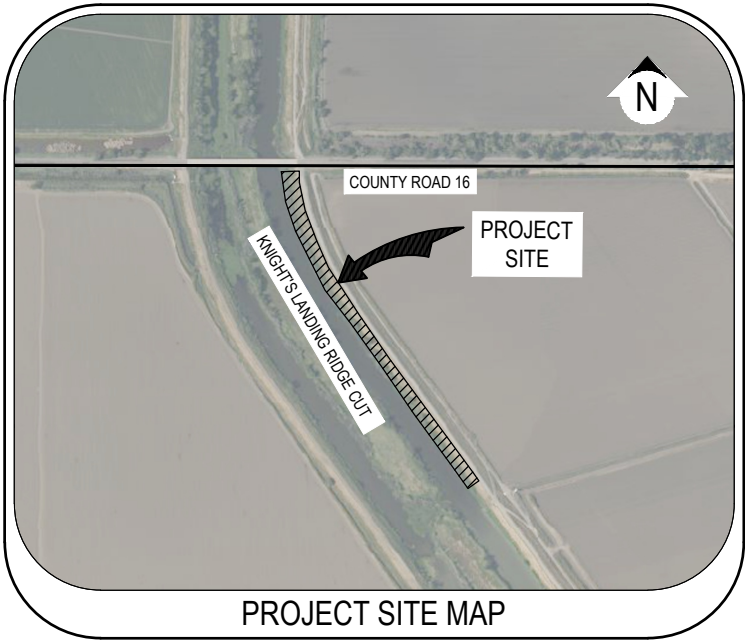
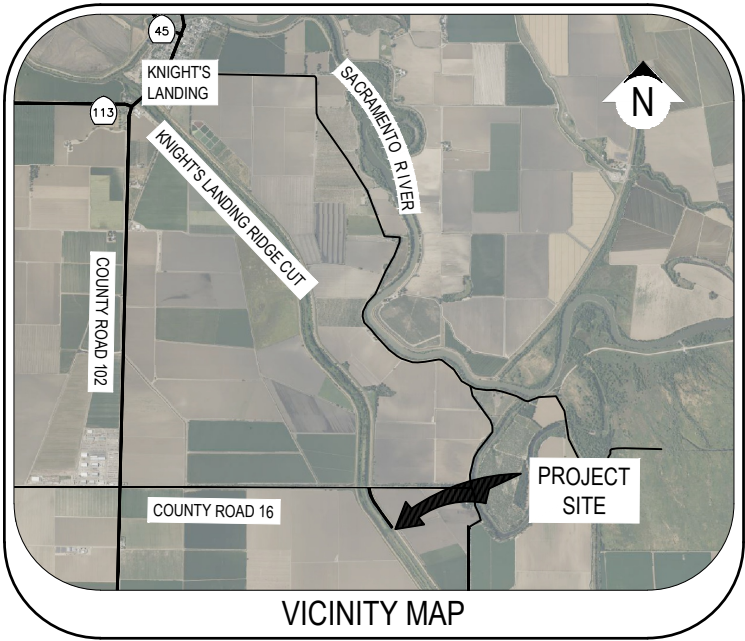
RIDGE CUT EROSION REPAIR PROJECT
KNIGHTS LANDING RIDGE DRAINAGE DISTRICT
YOLO COUNTY, CALIFORNIA

SWPPP SITE MAP

DATE MAY 2026
SHEET IDENTIFICATION SW-02
KSN PROJECT FILE NO. 2166-0110

KNIGHT’S LANDING RIDGE DRAINAGE DISTRICT
KNIGHT’S LANDING RIDGE CUT
EROSION REPAIR PROJECT

PHASE 2 FROM STATIONS 0+00 TO 19+00
YOLO COUNTY, CALIFORNIA



SHEET ID	SHEET	DESCRIPTION
G-001	1	TITLE SHEET
G-002	2	CONSTRUCTION NOTES
C-001	3	SITE MAP
C-101-103	4-5	PLAN VIEWS
C-301-304	6-7	SECTIONS
C-501	8	DETAILS

SHEET INDEX

FILE SPEC: P:\2166_Knights_Landing_Levee_Repair\0110_Ridge_Cut_Erosion_Repair\08_Civil\400_Plans\020_CAD\Sheets\Phase2\From Station 0+00 to 19+00\G-001-Title.dwg
PLOT DATE: Jun 03, 2026 - 4:35pm

 Know what's below. Call before you dig.	SUBMITTAL	
	%	Date
	30	06/13/2025
	60	07/22/2025
	100	02/03/2026

 PROJECT ENGINEER 2/3/2026				DESIGN BY	ARR	DRAWING SCALE N.T.S. ORIGINAL DRAWING SCALE 0 1/2" 1" 
				DRAWN BY	EYT	
				CHECK BY	EAR	
				HORIZONTAL DATUM	CCS83, ZONE 2	
				VERTICAL DATUM	NAVD88	
	NO.	DESCRIPTION	DATE	APPR.		

 KJELSEN SINNOCK NEUDECK inc. CIVIL ENGINEERS & LAND SURVEYORS www.ksninc.com	711 N. Pershing Avenue Stockton, CA 95203 209-946-0268
	1550 Harbor Blvd., Suite 212 West Sacramento, CA 95691 916-403-5900

RIDGE CUT EROSION REPAIR PROJECT KNIGHTS LANDING RIDGE DRAINAGE DISTRICT YOLO COUNTY, CALIFORNIA TITLE SHEET	DATE MAY 2026
	SHEET IDENTIFICATION G-001
	SHEET 1 OF 8
	KSN PROJECT FILE NO. 2166-0110

FILE SPEC: P:\2166_Knights_Landing_Levee_Repair\08_Civil_Cut_Erosion_Repair\0110_Ridge_Cut_Erosion_Repair\08_Civil\400_Plans\020_CAD\Sheets\Phase2\From Station 0+00 to 19+00\G-002-Notes.dwg
PLOT DATE: Jun 03, 2026 - 4:35pm

GENERAL NOTES:

1.

ALL CONSTRUCTION MATERIALS SHALL CONFORM TO THE SPECIFICATIONS FOR THE KNIGHTS LANDING RIDGE CUT LEFT LEVEE IMPROVEMENT PROJECT. THE CONTRACTOR SHALL OBTAIN AND USE ALL APPLICABLE ADDENDUMS.
2.

THE TOPOGRAPHIC MAPPING IS BASED UPON PHOTOGRAPH DATED MAY 27, 2025.
3.

SURVEY DATUM: HORIZONTAL DATUM, CALIFORNIA STATE PLANE COORDINATE SYSTEM ZONE II NAD83 (2007.00) CA HPGN. VERTICAL DATUM NAVD88.
4.

THE ALIGNMENT INFORMATION SHOWN ON THE DRAWINGS IS A CONSTRUCTION REFERENCE LINE ESTABLISHED FOR THIS PROJECT. THE CONTRACTOR SHALL STAKE THE ALIGNMENT AND ANY OFFSETS REQUIRED.
5.

ALL EXISTING FACILITIES ARE NOT SHOWN. CONTRACTOR SHALL CONFIRM AND BE SATISFIED AS TO LOCATIONS OF EXISTING FACILITIES OR OBSTRUCTIONS WHICH MAY BE AFFECTED BY CONSTRUCTION.
6.

UTILITY INFORMATION WAS COMPILED FROM DATA PROVIDED BY FACILITY OWNERS AND LOCATIONS ARE APPROXIMATE. PRIOR TO COMMENCING CONSTRUCTION UTILITY LOCATIONS AND DEPTHS SHALL BE VERIFIED BY THE CONTRACTOR. ALL EXISTING UNDERGROUND AND OVERHEAD UTILITIES SHALL BE PROTECTED FROM DAMAGE BY CONSTRUCTION EQUIPMENT AND OPERATIONS.
7.

THE CONTRACTOR SHALL NOTIFY UNDERGROUND SERVICE ALERT (USA) A MINIMUM OF 48 HOURS IN ADVANCE OF THE START OF ANY EXCAVATION WORK BY CALLING 800-642-2444.
8.

UTILITY RELOCATIONS REQUIRED FOR CONSTRUCTION OF PROJECT IMPROVEMENTS WILL BE MADE BY PG&E PRIOR TO START OF PROJECT UNLESS OTHERWISE INDICATED. COORDINATE WITH PG&E AS NECESSARY TO COMPLETE THE WORK.
9.

THE CONTRACTOR SHALL COMPLY WITH THE U.S. ARMY CORPS OF ENGINEERS SAFETY & HEALTH MANUAL (EM 385-1-1) AND OBTAIN A PERMIT FROM THE STATE DIVISION OF INDUSTRIAL SAFETY FOR ALL TRENCH EXCAVATION FIVE (5) FEET OR MORE IN DEPTH PRIOR TO BEGINNING ANY EXCAVATION. A COPY OF THIS PERMIT SHALL BE AVAILABLE AT THE SITE AT ALL TIMES.
10.

THE CONTRACTOR SHALL PROVIDE TEMPORARY FENCING AND / OR BARRIERS WHENEVER EXISTING FENCING OR BARRIERS ARE REMOVED. GATES AND FENCES AT ALL ACCESS LOCATIONS SHALL BE PROTECTED AND LOCKED DURING NON-WORKING HOURS.
11.

THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR FURNISHING, INSTALLING AND MAINTAINING WARNING SIGNS AND DEVICES TO SAFE GUARD THE GENERAL PUBLIC AND THE WORK AND TO PROVIDE SAFE AND PROPER ROUTING OF VEHICULAR AND PEDESTRIAN TRAFFIC DURING THE PERFORMANCE OF THE WORK.
12.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING RED LINE AS-BUILT DRAWINGS FOR ALL THE WORK THROUGHOUT THE COURSE OF CONSTRUCTION. SUCH DRAWINGS SHALL RECORD THE LOCATION AND GRADE OF ALL IMPROVEMENTS AND FILLS THAT ARE CONSTRUCTED AND COPIES SHALL BE SUBMITTED TO THE CONTRACTING OFFICER AS INDICATED IN THE SPECIFICATIONS.
13.

MATERIALS MUST MEET THE REQUIREMENTS SET FORTH IN THE SPECIFICATIONS AND BE PROCURED FROM SOURCES APPROVED BY THE COUNTY PRIOR TO PLACEMENT.
14.

CLEARED AND GRUBBED MATERIALS SHALL BE OFF HAULED TO A LEGAL DISPOSAL SITE.
15.

COORDINATE WITH ADJACENT LANDOWNERS ON CONSTRUCTION DETAILS AND SEQUENCING RELATED TO IRRIGATION PIPING, SYSTEMS AND RELATED FACILITIES.
16.

LIMITS OF WORK REQUIRE A 15' TEMPORARY EASEMENT AND A 15' PERMANENT EASEMENT ON THE LANDSIDE LEVEE.
17.

CONTRACTOR IS RESPONSIBLE FOR THE PRESERVATION OF SURVEY MONUMENTS LOCATED WITHIN THE AREA OF WORK HEREIN PERMITTED. PRIOR TO THE START OF CONSTRUCTION, CONTRACTOR SHALL ENSURE THAT SURVEY MONUMENTS THAT POTENTIALLY MAY BE DISTURBED SHALL BE LOCATED AND REFERENCED BY A LICENSED LAND SURVEY AND A CORNER RECORD BE FILED WITH THE COUNTY SURVEYOR. ANY SURVEY MONUMENTS DISTURBED DURING THE COURSE OF CONSTRUCTION SHALL BE REESTABLISHED BY A LICENSED LAND AND ANOTHER CORNER RECORD FILED WITH THE COUNTY SURVEYOR. (LAND SURVEYORS' ACT SECTION 8771).
18.

RIPRAP MATERIALS PROVIDED FROM THE DISTRICT ARE ALL SUBJECT TO THE SAME REQUIREMENTS AS IMPORTED RIPRAP. THE CONTRACTOR IS EXPECTED TO UTILIZE THESE MATERIALS WHEN PROVIDED.

SPECIAL NOTES:

1.

THE NOTES PLACED ON THIS PLAN SHEET ARE TO BE USED AS A GUIDE FOR VARIOUS TOPICS DESCRIBED. SPECIFIC DETAILS AND FURTHER EXPLANATIONS OF THE VARIOUS NOTES ARE DESCRIBED AT LENGTH IN THE SPECIFICATIONS AND WITHIN THESE PLANS.
2.

THE DISTRICT RESERVES THE RIGHT TO MAKE FIELD, SITE, AND QUANTITY ADJUSTMENTS AS NECESSARY.

DUST AND MUD CONTROL:

1.

DURING THE COURSE OF CONSTRUCTION, THE CONTRACTOR SHALL KEEP ALL CONSTRUCTION AREAS, HAUL ROADS, OTHER ROADWAYS, AND OTHER USE AREAS WHERE DUST IS GENERATED WELL WATERED.
2.

WATER WILL BE MADE AVAILABLE FOR THE CONSTRUCTION OPERATIONS FROM THE SURROUNDING WATERWAY. THE PUMPING FACILITY SHALL BE LOCATED IN AN AREA THAT WILL NOT CREATE A TRAFFIC OR MUD HAZARD ON THE ROADS USED BY THE CONTRACTOR, PUBLIC AND LOCAL TRAFFIC.

ACCESS ROADS:

1.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ACCESS ALONG THE LEVEE ROADS AT ALL TIMES DURING CONSTRUCTION. ANY DAMAGE TO THE COUNTY AND/OR LEVEE ROADS AND ACCESS RAMPS SHALL BE IMMEDIATELY REPAIRED BY THE CONTRACTOR AT HIS EXPENSE.
2.

IF DELIVERING MATERIAL OR EQUIPMENT BY TRUCK, ALL TRUCK TRAFFIC SHALL BE LIMITED TO THE COUNTY AND DESIGNATED ACCESS ROADS, UNLESS OTHERWISE APPROVED.
3.

MAXIMUM SPEED LIMIT ON DISTRICT LEVEE ROADS IS 30 MPH, OR AS POSTED.
4.

THE CONTRACTOR SHALL IMPROVE, MAINTAIN, AND REPAIR UPON COMPLETION, THE DISTRICT ACCESS RAMPS AND ACCESS ROADS AS REQUIRED FOR TRANSPORTATION AND HAULING MATERIAL TO THE REPAIR AREAS.
5.

THE CONTRACTOR SHALL REVIEW THE ACCESS ROADS AND DETERMINE THE LOCATION FOR TURNOUTS, RAMPS, ROAD DRAINAGE, ALIGNMENT, ETC. UPON COMPLETION OF THE PROJECT, SOME PORTIONS OF THE ACCESS ROADS MAY REQUIRE MINOR MODIFICATIONS AND ALTERATIONS. THE ACCESS ROADS WHICH REMAIN SHALL BE LEFT IN GOOD CONDITION FOR THE DISTRICT, FARMERS, AND OTHER LOCAL TRAFFIC.
6.

THE DESIGNATED ACCESS ROADS FOR THIS PROJECT MAY REQUIRE THE CONTRACTOR TO MODIFY AND REWORK THE GRADING OF THE EXISTING ROADS TO MEET THE CONTRACTOR'S HAULING AND ROAD DRAINAGE REQUIREMENTS.
7.

THE CONTRACTOR IS SOLELY RESPONSIBLE FOR MAKING ANY NECESSARY IMPROVEMENTS, MODIFICATIONS, AND ALTERATIONS TO MEET HIS REQUIREMENTS AND FOR THE MAINTENANCE.
8.

THE CONTRACTOR'S EQUIPMENT SHALL BE RESTRICTED TO OPERATE ONLY ON THOSE ROADS AND WITHIN THOSE SPECIFIED WORK AREAS INDICATED ON THE PLANS UNLESS OTHERWISE APPROVED BY THE ENGINEER, DISTRICT, AND LANDOWNERS.
9.

NEITHER THE DISTRICT NOR THE ENGINEER MAKE ANY WARRANTY OR GUARANTEE AS TO THE ADEQUACY OF THE EXISTING NATIVE MATERIALS TO SUPPORT THE CONSTRUCTION TRAFFIC ON THE ACCESS ROADS. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR MAKING THE NECESSARY IMPROVEMENTS AND PROVIDING THE NECESSARY MEASURES REQUIRED TO ACCOMMODATE HIS ANTICIPATED NEEDS.
10.

CONTRACTOR MUST MAINTAIN ACCESS ALONG THE LEVEE CROWN ROAD AT ALL TIMES DURING CONSTRUCTION.
11.

THE CONTRACTOR SHALL SECURE ALL OTHER ACCESS ROAD EASEMENTS AS MAY BE REQUIRED WITH THE INDIVIDUAL PROPERTY OWNERS FOR ALL NON-DISTRICT AND/OR PUBLIC ACCESS ROADS AND AS DESCRIBED IN SPECIAL PROVISIONS, SECTION 1.12, "TRAFFIC CONTROL & RIGHT-OF-WAY."

ABBREVIATIONS:

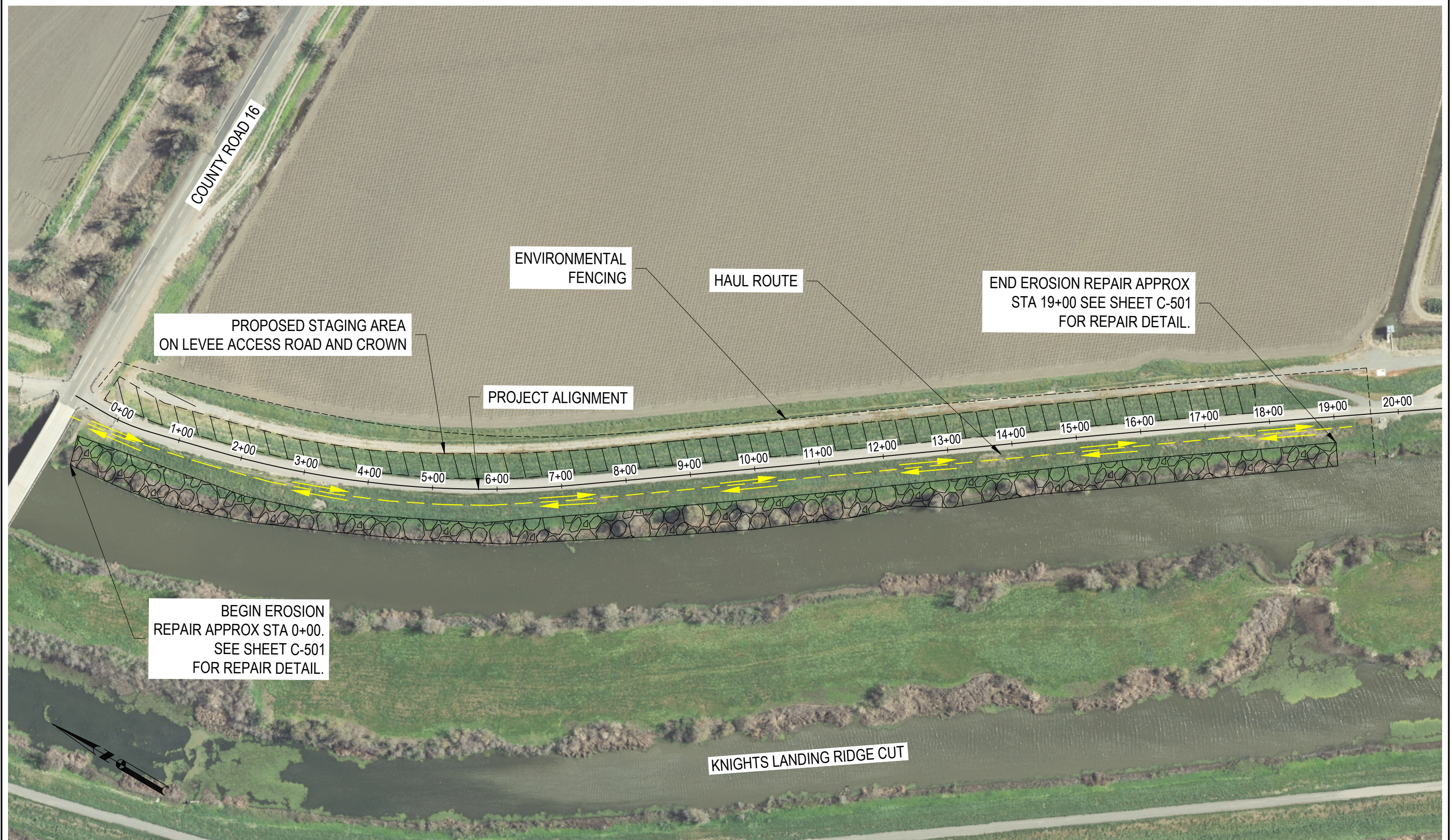
@	AT	LT	LEFT
Ø	DIAMETER	MAX	MAXIMUM
AB	AGGREGATE BASE	MIN	MINIMUM
AC	ASPHALTIC CONCRETE	MH	MANHOLE
ACB	ARTICULATING CONCRETE BLOCK	MHHW	MEAN HIGHER HIGH WATER
AP	ANGLE POINT	MLLW	MEAN LOWER LOW WATER
BC	BEGINNING OF CURVE	MON	MONUMENT
BFE	BASE FLOOD ELEVATION	N	NORTH, NORTHING
BM	BENCHMARK	(N)	NEW
BMP	BEST MANAGEMENT PRACTICE	NIC	NOT IN CONTRACT
BOC	BACK OF CURB	NO	NUMBER
BOW	BACK OF WALK	NTS	NOT TO SCALE
CB	CATCH BASIN	OC	ON CENTER
CC	CENTER TO CENTER	OD	OUTSIDE DIAMETER
CFS	CUBIC FEET PER SECOND	OH	OVERHEAD
CL	CENTERLINE	PCC	PORTLAND CEMENT CONCRETE
CLSM	CONTROLLED LOW STRENGTH MATERIAL	PL	PROPERTY LINE
CONC	CONCRETE	POC	POINT OF CONNECTION
CTR	CENTER	PP	POWER POLE
CY	CUBIC YARD	PRC	POINT OF REVERSE CURVATURE
DIM	DIMENSION	PSI	POUNDS PER SQUARE INCH
DWG	DRAWING	PUE	PUBLIC UTILITY EASEMENT
DWSE	DESIGN WATER SURFACE ELEVATION	PVC	POLYVINYL CHLORIDE
E	EAST, EASTING	R	RADIUS
(E), EX	EXISTING	RC	RELATIVE COMPACTION
EA	EACH	RCP	REINFORCED CONCRETE PIPE
EC	END OF CURVE	ROW	RIGHT-OF-WAY
EF	EACH FACE	RT	RIGHT
EG	EXISTING GROUND	SPEC	SPECIFICATION
EL, ELEV	ELEVATION	S	SOUTH, SLOPE
EP	EDGE OF PAVEMENT	SD	STORM DRAIN
EW	EACH WAY	SF	SQUARE FEET
EWEF	EACH WAY EACH FACE	SHT	SHEET
FF	FINISH FLOOR	SPEC	SPECIFICATION
FG	FINISH GRADE	SS	SANITARY SEWER, STAINLESS STEEL
FL	FLOWLINE	STA	STATION
FOC	FACE OF CURB	STD	STANDARD
FT	FOOT, FEET	SY	SQUARE YARD
G	GAS	TBM	TEMPORARY BENCHMARK
GA	GAUGE	TC	TOP OF CURB
GALV	GALVANIZED	TOC	TOP OF CONCRETE
GB	GRADE BREAK	TOW	TOP OF WALL
GPM	GALLONS PER MINUTE	TEL	TELEPHONE
HDPE	HIGH DENSITY POLYETHYLENE	TEMP	TEMPORARY
HORIZ	HORIZONTAL	TN	TON
HP	HIGH POINT	TYP	TYPICAL
ID	INSIDE DIAMETER	UNO	UNLESS NOTED OTHERWISE
IN	INCH, INCHES	VERT	VERTICAL
INV	INVERT	W	WEST, WATER
JP	JOINT POLE	WSP	WELDED STEEL PIPE
LF	LINEAR FEET	XS	CROSS SECTION
LP	LOW POINT	YR	YEAR

CONVENTIONS:

	←	BENCHMARK - VERTICAL & HORIZONTAL
	←	BENCHMARK - VERTICAL ONLY
	←	TEMPORARY CONTROL POINT OR TEMPORARY BENCHMARK
	←	DETAIL INDICATOR
	←	DETAIL IDENTIFICATION NUMBER
	←	DRAWING NUMBER WHERE DETAIL IS SHOWN
	←	SECTION INDICATOR
	←	SECTION IDENTIFICATION NUMBER
	←	DRAWING NUMBER WHERE SECTION IS SHOWN
	←	NOTE IDENTIFICATION NUMBER
	←	REVISION NUMBER

	DESIGN BY	ARR	DRAWING SCALE N.T.S. ORIGINAL DRAWING SCALE 0 1/2" 1" 	KJELDEN SINNOCK NEUDECK CIVIL ENGINEERS & LAND SURVEYORS www.ksninc.com	711 N. Pershing Avenue Stockton, CA 95203 209-946-0268 1550 Harbor Blvd., Suite 212 West Sacramento, CA 95691 916-403-5900	RIDGE CUT EROSION REPAIR PROJECT KNIGHTS LANDING RIDGE DRAINAGE DISTRICT YOLO COUNTY, CALIFORNIA	DATE MAY 2026
	DRAWN BY	ARR					SHEET IDENTIFICATION G-002
	CHECK BY	EAR				CONSTRUCTION NOTES	SHEET 2 OF 8
	HORIZONTAL DATUM CCS83, ZONE 2	VERTICAL DATUM NAVD88					KSN PROJECT FILE NO. 2166-0110

FILE SPEC: P:\2166_Knights_Landing_Ridge_Cut_Erosion_Repair\0110_Ridge_Cut_Erosion_Repair\08_Civil\400_Plans\020_CAD\Sheets\Phase2\From Station 0+00 to 19+00\C-001-SiteMap.dwg
PLOT DATE: Jun 03, 2026 - 4:35pm



 Know what's below. Call before you dig.	SUBMITTAL	
	%	Date
	30	06/13/2025
	60	07/22/2025
	100	02/03/2026

PROJECT ENGINEER


2/3/2026

NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	ARR
DRAWN BY	EYT
CHECK BY	EAR
HORIZONTAL DATUM	CCS83, ZONE 2
VERTICAL DATUM	NAVD88

DRAWING SCALE	1" = 70'
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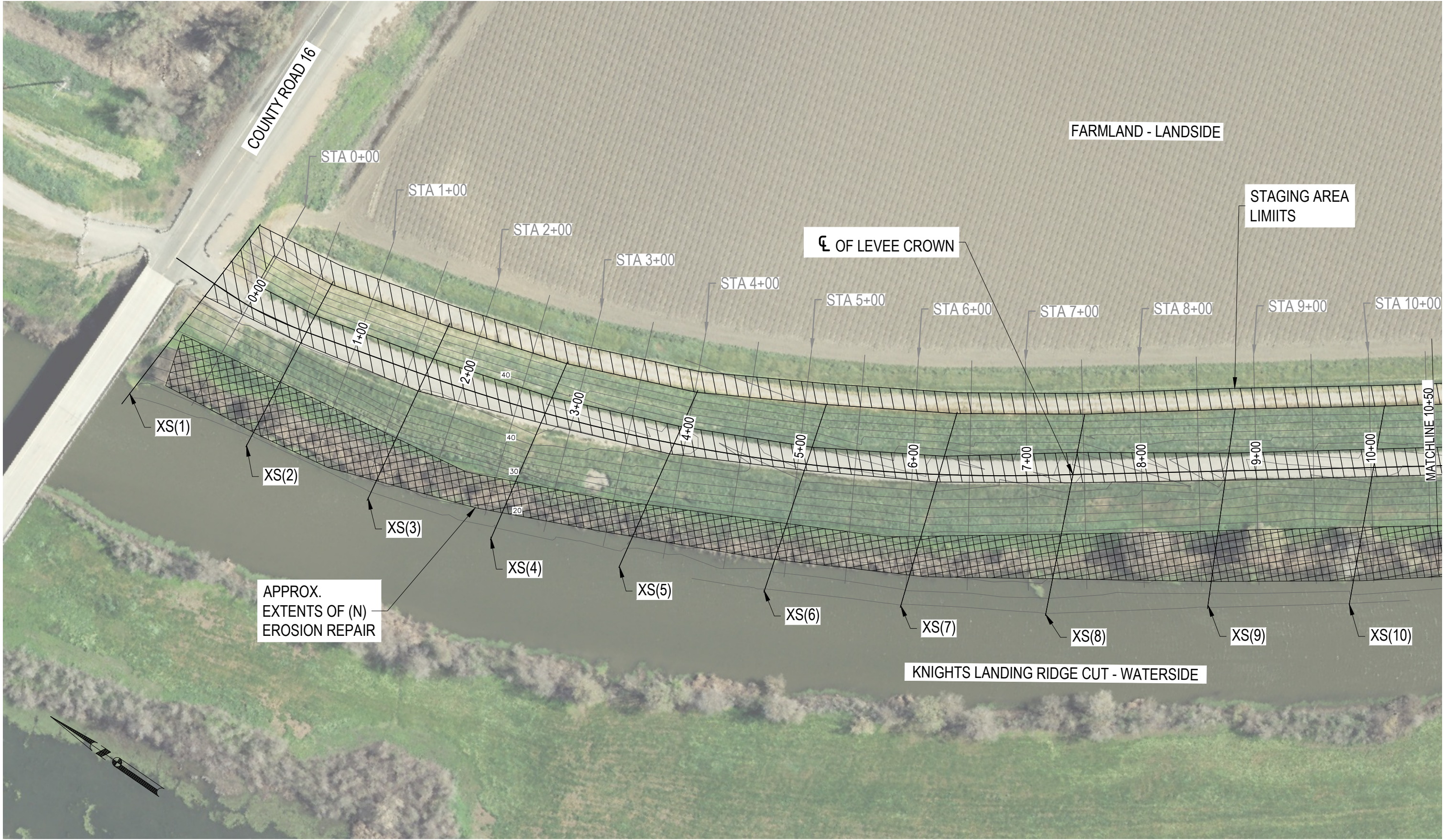
711 N. Pershing Avenue
Stockton, CA 95203
209-946-0268
1550 Harbor Blvd., Suite 212
West Sacramento, CA 95691
916-403-5900

RIDGE CUT EROSION REPAIR PROJECT
KNIGHTS LANDING RIDGE DRAINAGE DISTRICT
YOLO COUNTY, CALIFORNIA

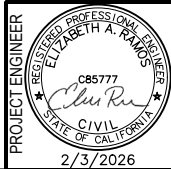
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DATE	MAY 2026
SHEET IDENTIFICATION	C-001
SHEET 3 OF 8	
KSN PROJECT FILE NO.	2166-0110

FILE SPEC: P:\2166_Knights_Landing_Levee_Repair\0110_Ridge_Cut_Erosion_Repair\08_Civil\400_Plans\Phase2\From Station 0+00 to 19+00\C-101-102-Plans.dwg
PLOT DATE: Jun 03, 2026 - 4:35pm



SUBMITTAL	
%	Date
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60	07/22/2025
100	02/03/2026



NO.	DESCRIPTION	DATE	APPR.

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DRAWN BY	EYT
CHECK BY	EAR
HORIZONTAL DATUM	CCS83, ZONE 2
VERTICAL DATUM	NAVD88

DRAWING SCALE	1" = 40'
ORIGINAL DRAWING SCALE	0 1/2" 1"



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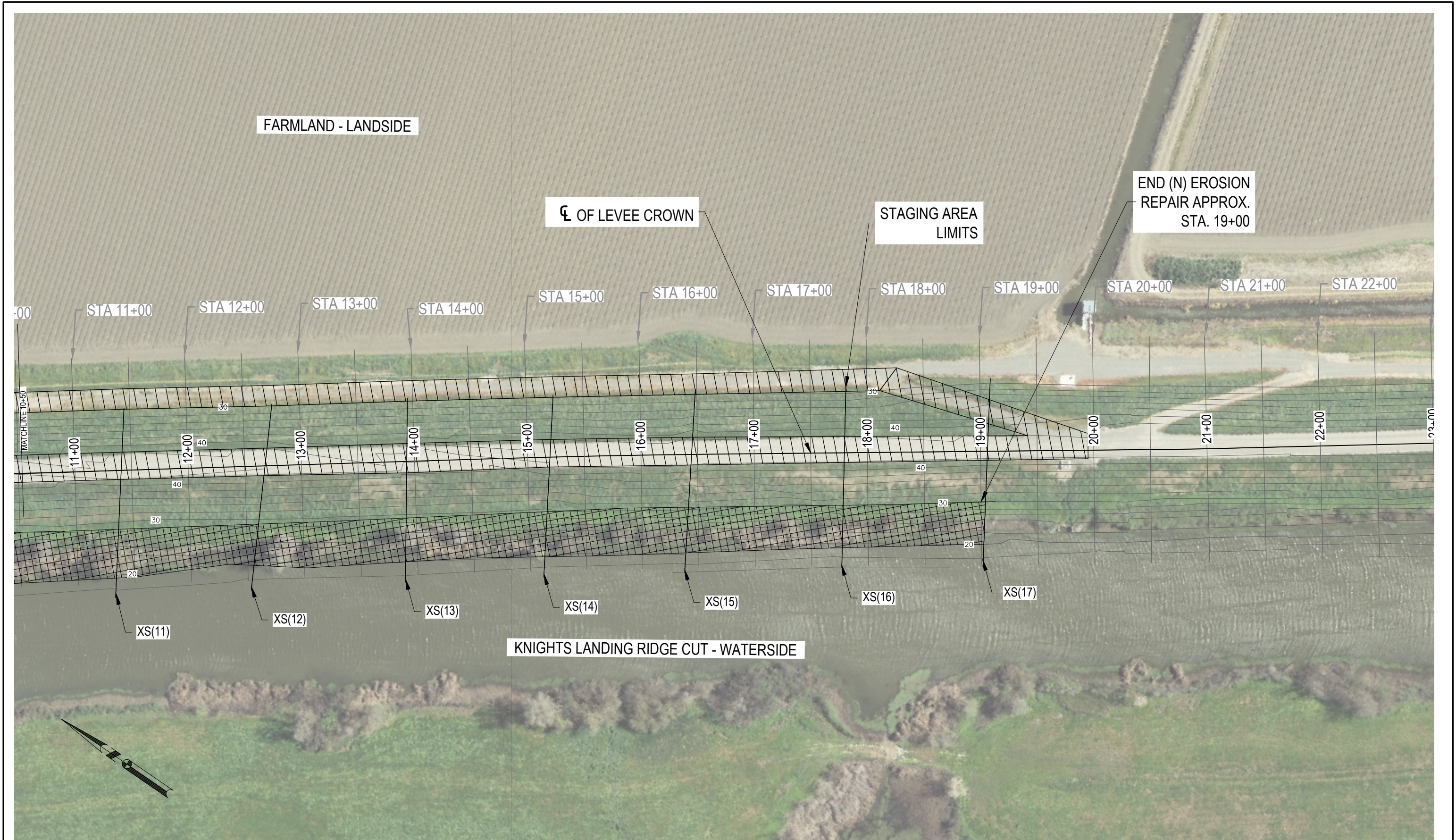
711 N. Pershing Avenue
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1550 Harbor Blvd., Suite 212
West Sacramento, CA 95691
916-403-5900

RIDGE CUT EROSION REPAIR PROJECT
KNIGHTS LANDING RIDGE DRAINAGE DISTRICT
YOLO COUNTY, CALIFORNIA

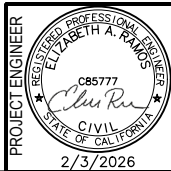
PLAN VIEW

DATE	MAY 2026
SHEET IDENTIFICATION	C-101
SHEET 4 OF 8	
KSN PROJECT FILE NO.	2166-0110

FILE SPEC: P:\2166_Knights_Landing_Levee_Repair\0110_Ridge_Cut_Erosion_Repair\08_Civil\400_Plans\020_CAD\Sheets\Phase2\From Station 0+00 to 19+00\C-101-102-Plans.dwg
PLOT DATE: Jun 03, 2026 - 4:35pm



 Know what's below. Call before you dig.	SUBMITTAL	
	%	Date
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	60	07/22/2025
	100	02/03/2026

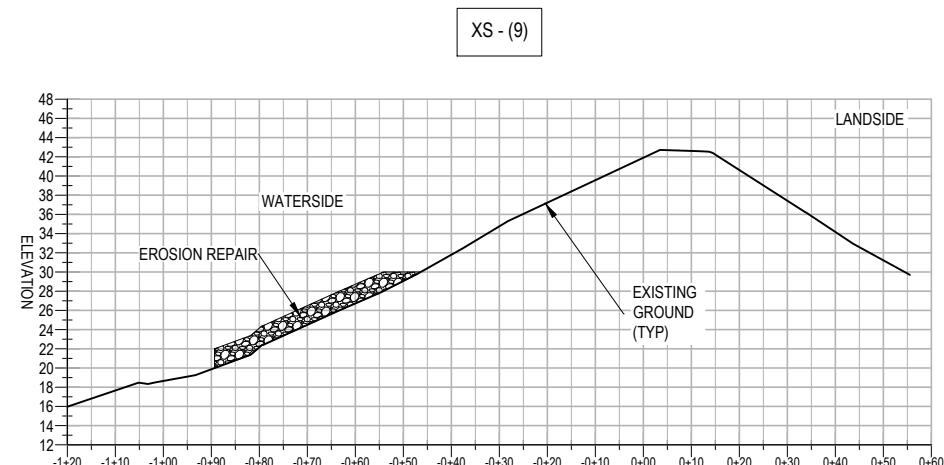
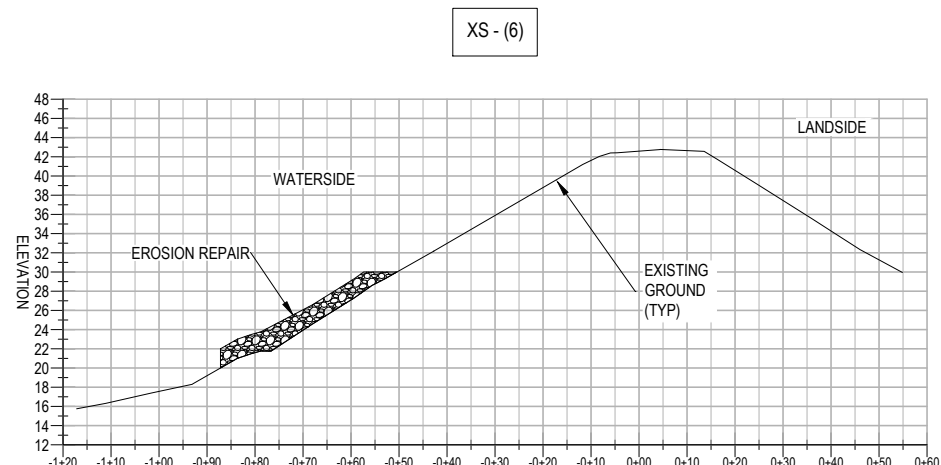
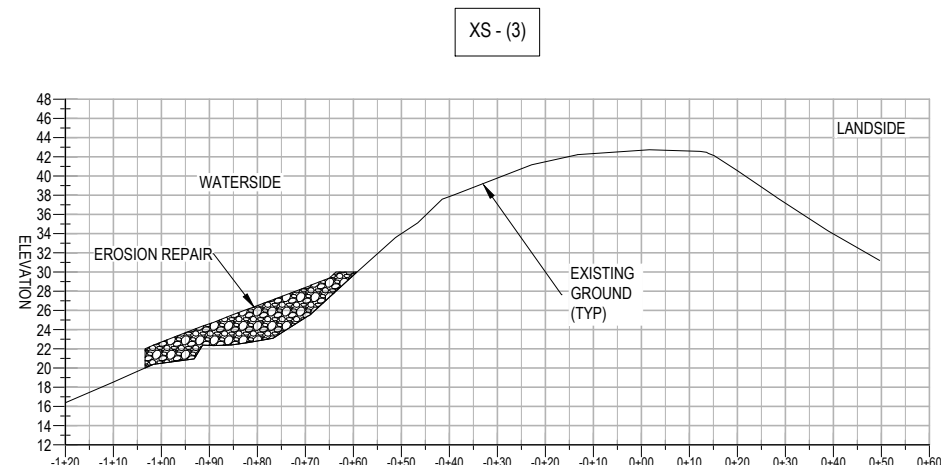
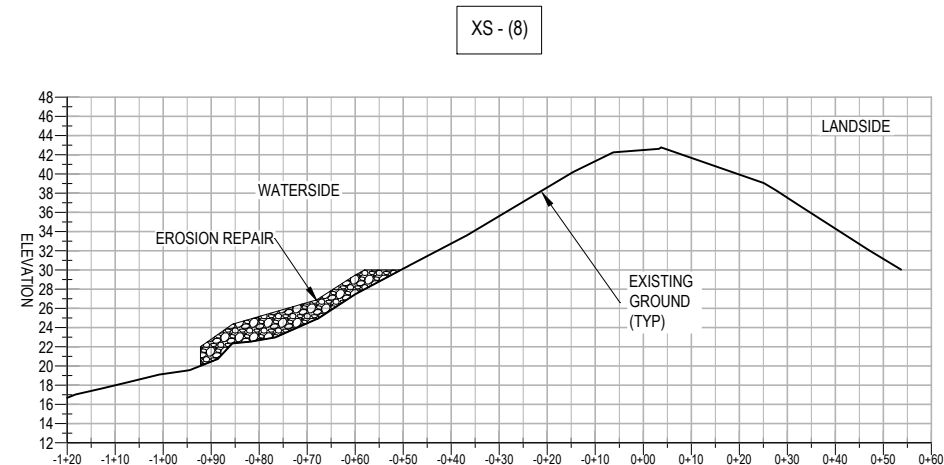
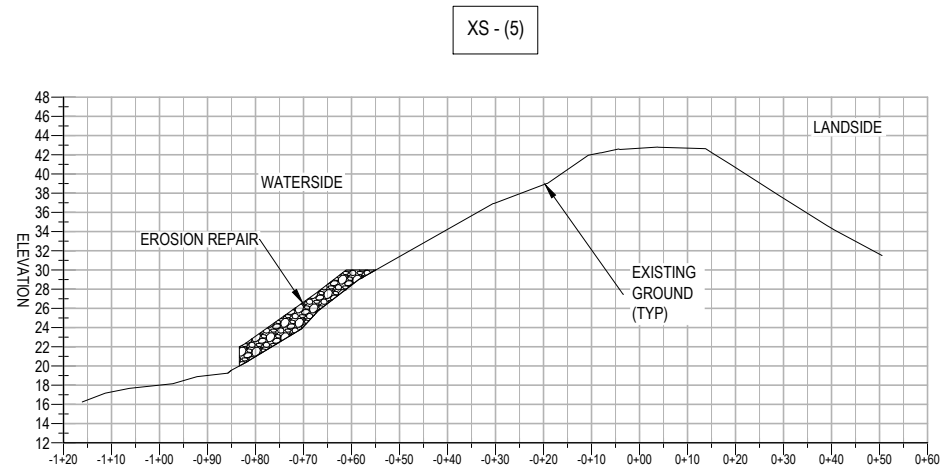
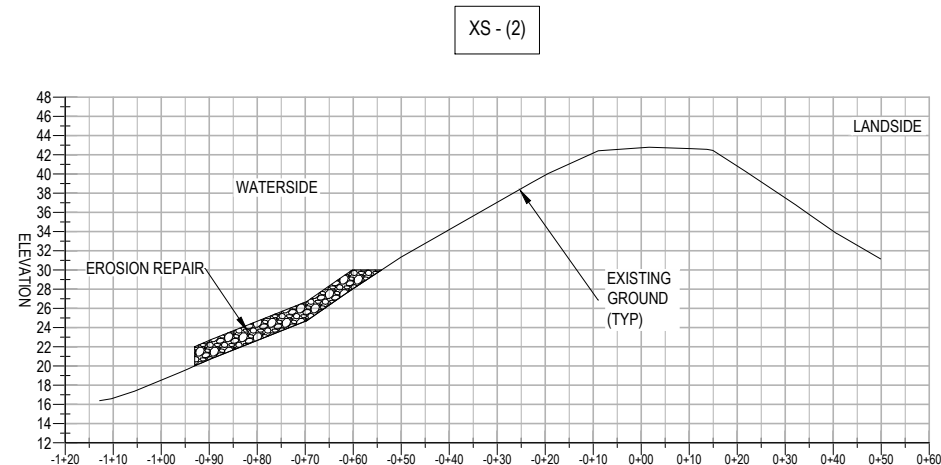
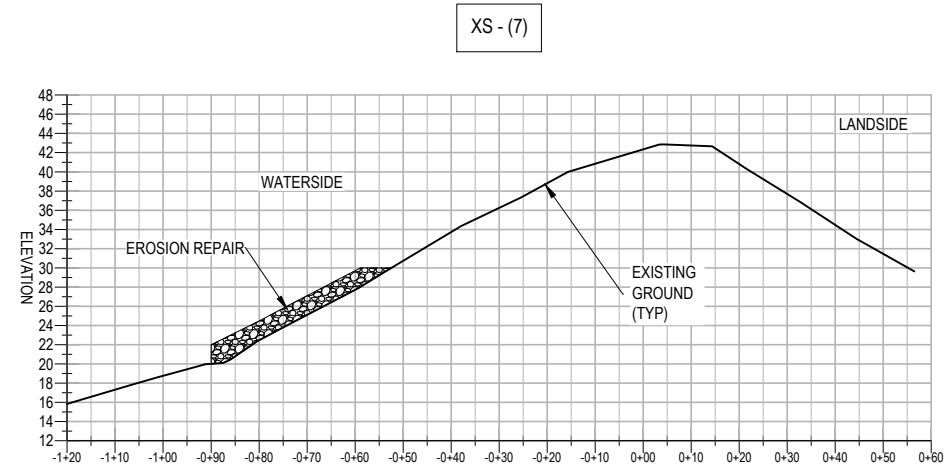
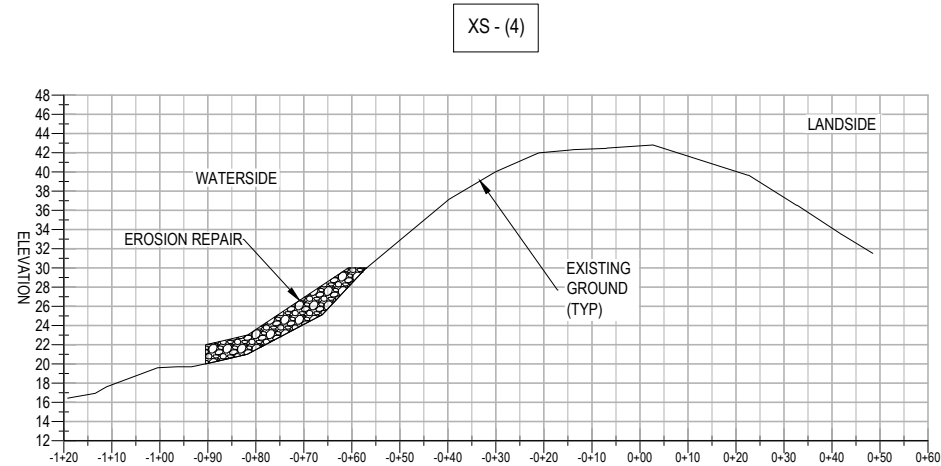
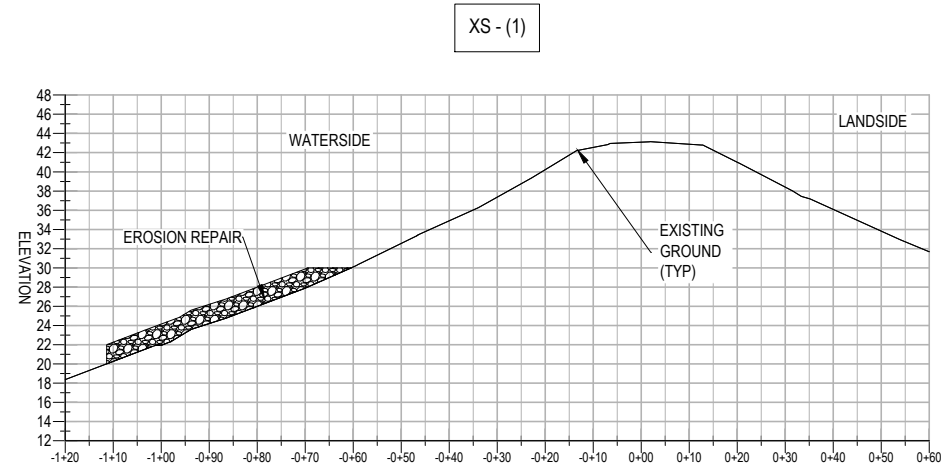


NO.	DESCRIPTION	DATE	APPR.

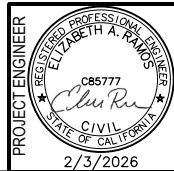
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DRAWN BY	EYT
CHECK BY	EAR
HORIZONTAL DATUM	CCS83, ZONE 2
VERTICAL DATUM	NAVD88

 www.ksninc.com	DRAWING SCALE
	1" = 40'
711 N. Pershing Avenue Stockton, CA 95203 209-946-0268 1550 Harbor Blvd., Suite 212 West Sacramento, CA 95691 916-403-5900	ORIGINAL DRAWING SCALE
	0 1/2" 1"

RIDGE CUT EROSION REPAIR PROJECT KNIGHTS LANDING RIDGE DRAINAGE DISTRICT YOLO COUNTY, CALIFORNIA PLAN VIEW	DATE
	MAY 2026
	SHEET IDENTIFICATION
	C-102
	SHEET 5 OF 8
	KSN PROJECT FILE NO. 2166-0110



NOTE:
1. SEE SHEET C-501 FOR REPAIR DETAIL



No.	Description	Date	Appr

DESIGN BY	ARR
DRAWN BY	EYT
CHECK BY	EAR
HORIZONTAL DATUM	CCS83, ZONE 2
VERTICAL DATUM	NAVD88

DRAWING SCALE	
HORZ. 1" = 20'	
VERT. 1" = 10'	
ORIGINAL DRAWING SCALE	
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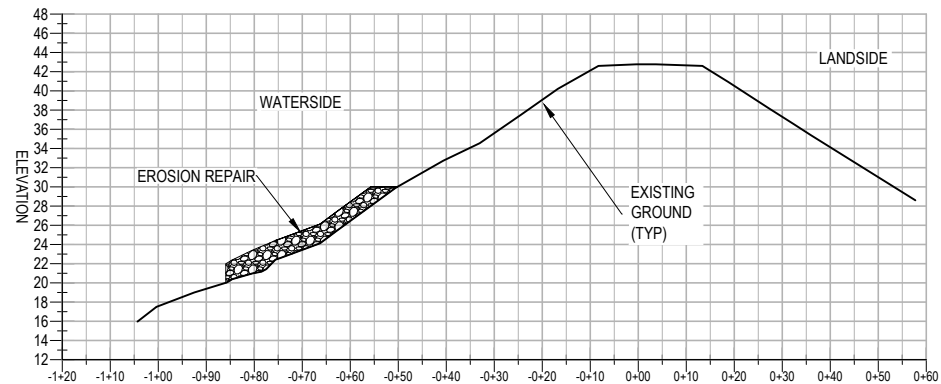
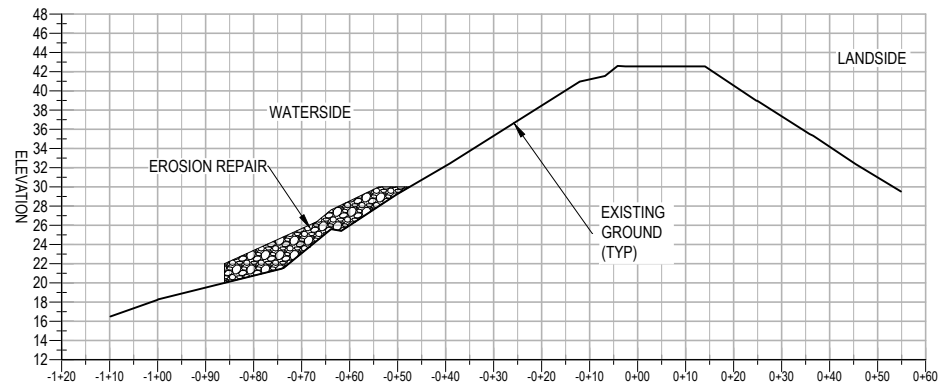
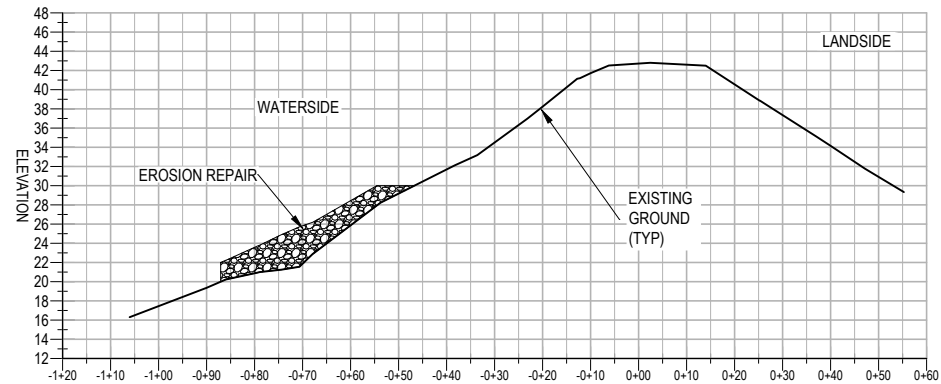
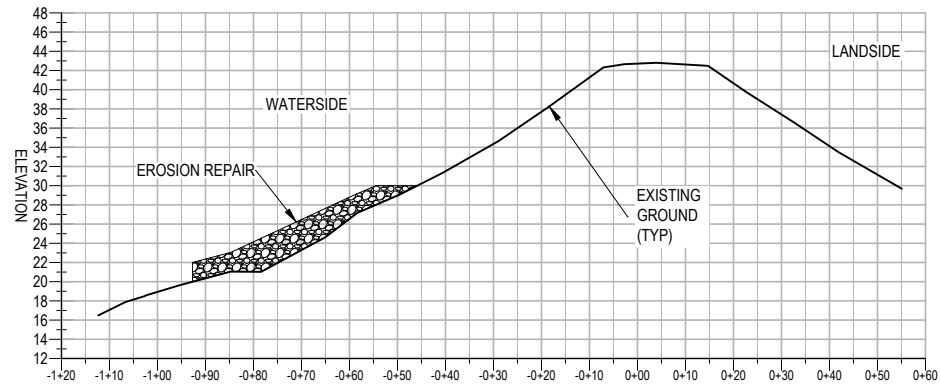
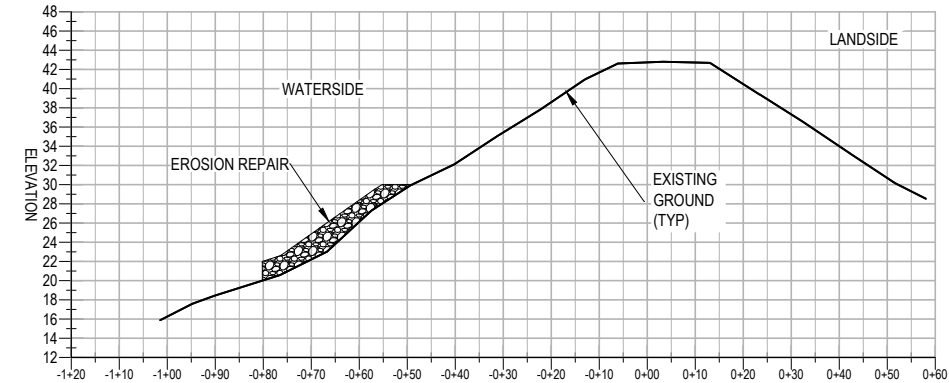
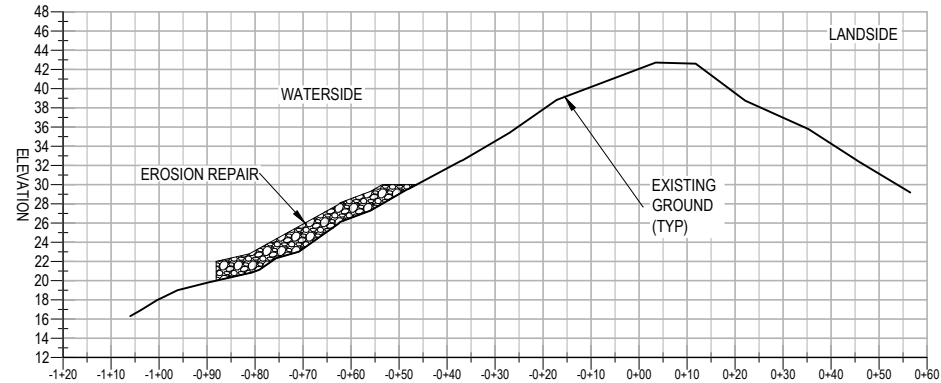
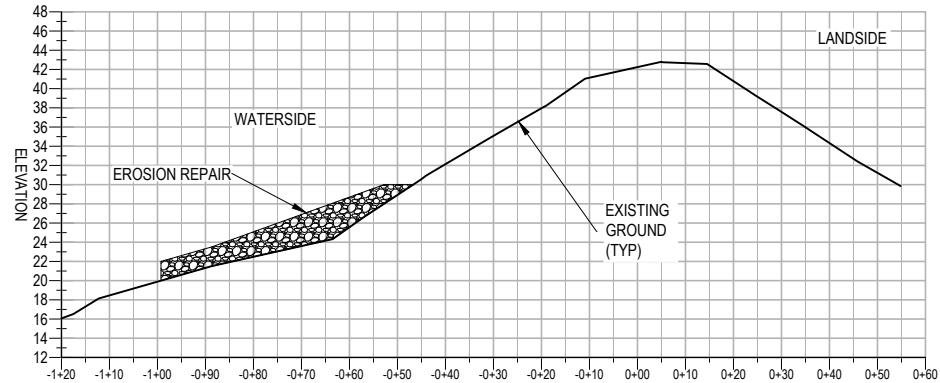
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RIDGE CUT EROSION REPAIR PROJECT
KNIGHTS LANDING RIDGE DRAINAGE DISTRICT
YOLO COUNTY, CALIFORNIA

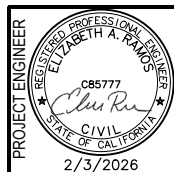
ALIGNMENT SECTIONS
XS-1 to XS-9

DATE	MAY 2026
SHEET IDENTIFICATION	C-301
SHEET 6	OF 8
KSN PROJECT FILE NO.	2166-0110



NOTE:
1. SEE SHEET C-501 FOR REPAIR DETAIL

811
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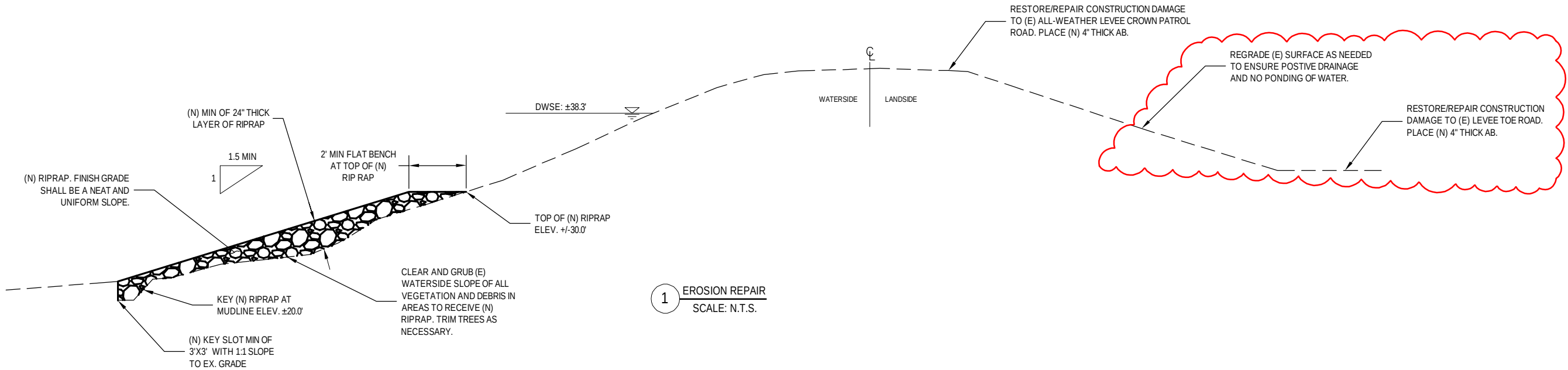
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DESIGN BY ARR	DRAWING SCALE HORZ. 1" = 20' VERT. 1" = 10'
DRAWN BY EYT	
CHECK BY EAR	
HORIZONTAL DATUM CCS83, ZONE 2	ORIGINAL DRAWING SCALE
VERTICAL DATUM NAVD88	0 1/2" 1" 



RIDGE CUT EROSION REPAIR PROJECT KNIGHTS LANDING RIDGE DRAINAGE DISTRICT YOLO COUNTY, CALIFORNIA	DATE MAY 2026
	SHEET IDENTIFICATION C-302 SHEET 7 OF 8 KSN PROJECT FILE NO. 2166-0110
ALIGNMENT SECTIONS XS-10 to XS-18	

FILE SPEC: P:\2166_Knights_Landing_Levee_Repair\0110_Ridge_Cut_Erosion_Repair\08_Civil\400_Plans\020_CAD\Sheets\Phase2\From Station 0+00 to 19+00\C-501-Details.dwg
PLOT DATE: Jul 02, 2026 -- 2:37pm



SUBMITTAL	
%	Date
30	06/13/2025
60	07/22/2025
100	02/03/2026



ADDENDUM 1		7-2-2026	
NO.	DESCRIPTION	DATE	APPR.

DESIGN BY	ARR
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HORIZONTAL DATUM	CCS83, ZONE 2
VERTICAL DATUM	NAVD88

DRAWING SCALE	AS SHOWN
ORIGINAL DRAWING SCALE	0 1/2" 1"



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RIDGE CUT EROSION REPAIR PROJECT
KNIGHTS LANDING RIDGE DRAINAGE DISTRICT
YOLO COUNTY, CALIFORNIA

DETAILS

DATE	MAY 2026
SHEET IDENTIFICATION	C-501
SHEET 8 OF 8	
KSN PROJECT FILE NO.	2166-0110

Appendix B

Permit Registration Documents

This appendix identifies the Permit Registration Documents associated with project coverage under the 2022 CGP and indicates where those documents are included in the SWPPP.

Location in SWPPP	Permit Registration Document (in addition to a copy of the SWPPP)
Appendix B	Notice of Intent
Appendix B	Risk Level Determination
Appendix B	LRP Certification / Signed Certification Statement
Appendix B	Annual Fee Receipt
Appendix B	WDID Confirmation
Appendix B	Post-Construction Requirements, if applicable
Appendix B	Post-Construction Water Balance Calculator, if applicable
Appendix R	ATS Design Documents, if applicable
Appendix R	Passive Treatment Design Documents, if applicable
Appendix A	Site Maps and Drawings, see Appendix A

STORMWATER POLLUTION PREVENTION PLAN

Ridge Cut Erosion Repair Phase 2

RISK ASSESSMENT WORKSHEET 1 of 3

Sediment Risk Factor Worksheet

A) R Factor

Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of EI30 for storm events during a rainfall record of at least 22 years. "Isoerodent" maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site.

<https://www.epa.gov/npdes/rainfall-erosivity-factor-calculator-small-construction-sites>

R Factor Value 0.98

B) K Factor (weighted average, by area, for all site soils)

The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted.

[Site-specific K factor guidance](#)

K Factor Value 0.33

C) LS Factor (weighted average, by area, for all slopes)

The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction.

[LS Table](#)

LS Factor Value 0.25

Watershed Erosion Estimate (=R_xK_xLS) in tons/acre 0.08085

Site Sediment Risk Factor

Low Sediment Risk: < 15 tons/acre

Medium Sediment Risk: >=15 and <75 tons/acre

High Sediment Risk: >= 75 tons/acre

Low

STORMWATER POLLUTION PREVENTION PLAN

Ridge Cut Erosion Repair Phase 2

RISK ASSESSMENT WORKSHEET 2 of 3

Receiving Water (RW) Risk Factor Worksheet

	Entry	Score
A. Watershed Characteristics	(yes/no)	
A.1. Does the disturbed area discharge (either directly or indirectly) to a 303(d)-listed waterbody impaired by sediment (For help with impaired waterbodies please check the attached worksheet or visit the link below) or has a USEPA approved TMDL implementation plan for sediment ?: 2006 Approved Sediment-impaired WBs Worksheet http://www.waterboards.ca.gov/water_issues/programs/tmdl/303d_lists2006_epa.shtml OR	NO	Low
A.2. Does the disturbed area discharge to a waterbody with designated beneficial uses of SPAWN & COLD & MIGRATORY? http://www.ice.ucdavis.edu/geowbs/asp/wbquse.asp		

STORMWATER POLLUTION PREVENTION PLAN

Ridge Cut Erosion Repair Phase 2

RISK ASSESSMENT WORKSHEET 3 of 3

Combined Risk Level Matrix

		<u>Sediment Risk</u>		
		Low	Medium	High
<u>Receiving Water Risk</u>	Low	Level 1	Level 2	
	High	Level 2		Level 3

Project Sediment Risk: **Low**

Project RW Risk: **Low**

Project Combined Risk: **Level 1**

Appendix C

SWPPP Amendment QSD Certifications

SWPPP Amendment No. _____

Project Name: Ridge Cut Erosion Repair Phase 2

Project Number: 2166-0110

**Qualified SWPPP Developer's Certification of the
Stormwater Pollution Prevention Plan Amendment**

"This Stormwater Pollution Prevention Plan and its appendices were prepared under my direction to meet the requirements of the 2022 CGP (SWRCB Order No. 2022-0057-DWQ). I certify that I am a Qualified SWPPP Developer in good standing as of the date signed below."

QSD's Signature

Date

Sean M. Pritchard

QSD Name

#84256

QSD Certificate Number

Senior Construction Manager, KSN

Title and Affiliation

916.403.5900

Telephone

1550 Harbor Blvd. Suite 212
West Sacramento, CA 95691

Address

SPritchard@KSNInc.com

Email

Appendix D

Submitted Changes of Information

Log of Updated PRDs

The 2022 CGP allows for the reduction or increase of the total acreage when a portion of the project is complete and/or conditions for termination of coverage have been met; when ownership of a portion of the project is purchased by a different entity; or when new acreage is added to the project.

A Change of Information (COI) shall be filed electronically within the timeframe shown in the table below. The SWPPP shall be modified appropriately, with revisions and amendments recorded in the SWPPP Amendment Log at the front of the SWPPP. COIs submitted electronically via SMARTS can be found in this Appendix.

Reason for Filing COI	Timeline for Filing COI
Reduction or increase in total disturbed area	Within 30 days of the reduction or increase
Updating site specific BMPs	Within 14 days of design change
Change construction start or end date	At least 14 days prior to the date to be changed
Post-construction plans updated or approved by the municipal stormwater permittee	Within 14 days of approval

This appendix includes all of the following updated PRDs (check all that apply):

- ☐ Change of Information;
- ☐ Revised Site Map;
- ☐ Revised Risk Assessment;
- ☐ New landowner's information (name, address, phone number, email address); and
- ☐ New signed certification statement.

Signature of [Authorized Representative of]
Legally Responsible Person or Duly
Authorized Representative

Date

Name of [Authorized Representative of]
Legally Responsible Person or Duly
Authorized Representative

Telephone Number

Appendix E

Construction Schedule

TO BE PROVIDED BY CONTRACTOR

Appendix F

Construction Activities, Materials Used, and Associated Pollutants

This appendix identifies construction activities, materials, wastes, and other potential pollutant sources associated with the project. The information in this appendix supports the BMP selection in Section 3 and the non-visible pollutant sampling requirements in Section 7.7.

The pollutant source assessment shall be updated during construction if site conditions, construction activities, materials, wastes, staging areas, fueling or maintenance practices, or other pollutant sources change.

Table F.1 Pollutant Source Assessment Form

Construction Activity / Source Area	Pollutant Source	Potential Pollutant	Water Quality Indicator Constituent	Applicable BMPs / Controls
Mobilization and demobilization	Vehicle and equipment operation, temporary materials, site setup, and general construction activity	Sediment, dust, trash, debris, fuel, oil, grease, hydraulic fluid	TSS / turbidity; oil and grease if release occurs	EC-1, SE-7, TC-2, NS-6, WM-1, WM-4, WM-5
Temporary access, haul routes, and staging areas	Vehicle and equipment traffic, stabilized access surfaces, disturbed soil, and material handling	Sediment, dust, track-out, fuel, oil, grease, hydraulic fluid	TSS / turbidity; oil and grease if release occurs	EC-1, SE-7, TC-2, WE-1, NS-6, WM-4, WM-5
Clearing, grubbing, vegetation removal, and tree trimming	Disturbed soil, vegetation debris, and equipment operation	Sediment, dust, vegetation debris, fuel, oil, grease, hydraulic fluid	TSS / turbidity; BOD from vegetation debris if discharge occurs; oil and grease if release occurs	EC-1, EC-2, WE-1, SE-7, TC-2, NS-6, WM-4, WM-5
Slope preparation, grading, and disturbed soil areas	Exposed soil, erodible levee slope materials, and equipment operation	Sediment, dust, fuel, oil, grease, hydraulic fluid	TSS / turbidity; oil and grease if release occurs	EC-1, EC-10, EC-12, EC-16, WE-1, TC-2, NS-6, WM-4
Excavation of RSP key slot	Excavated soil, disturbed soil, localized sediment collection area, and equipment operation	Sediment, turbidity if discharge occurs, dust, fuel, oil, grease, hydraulic fluid	TSS / turbidity; oil and grease if release occurs	EC-1, EC-10, EC-12, EC-16, WE-1, TC-2, NS-6, WM-4
Placement of rock slope protection	Rock placement, disturbed slope surface, and equipment operation	Sediment, dust, fuel, oil, grease, hydraulic fluid	TSS / turbidity; oil and grease if release occurs	EC-1, EC-10, EC-12, EC-16, WE-1, TC-2, NS-6, WM-4
Aggregate base patrol road repair or restoration (if required)	Aggregate base material, grading, roadway repair, and equipment operation	Sediment, dust, aggregate material, fuel, oil, grease, hydraulic fluid	TSS / turbidity; oil and grease if release occurs	EC-1, TC-2, SE-7, WE-1, NS-6, WM-4

Construction Activity / Source Area	Pollutant Source	Potential Pollutant	Water Quality Indicator Constituent	Applicable BMPs / Controls
Stockpiles and loose materials	RSP, aggregate base, soil, excavated material, and other loose materials	Sediment, dust, aggregate material	TSS / turbidity	WM-3, WE-1, EC-1
Equipment operation	Construction equipment, vehicles, leaks, spills, and refueling support	Fuel, oil, grease, hydraulic fluid, coolant, petroleum hydrocarbons	Oil and grease; petroleum hydrocarbons; source-specific constituents if release occurs	NS-6, NS-9, NS-10, WM-4
Onsite fueling (<i>if performed</i>)	Fuel transfer, fuel storage, leaks, and spills	Fuel, oil and grease, petroleum hydrocarbons	Oil and grease; petroleum hydrocarbons	NS-9, WM-1, WM-2, WM-4
Equipment maintenance (<i>if performed</i>)	Maintenance fluids, leaks, waste materials, used parts, and maintenance activities	Oil, grease, hydraulic fluid, coolant, petroleum hydrocarbons, liquid waste	Oil and grease; petroleum hydrocarbons; source-specific constituents if release occurs	NS-10, WM-1, WM-2, WM-4, WM-6, WM-10
Portable sanitary facilities	Portable toilets, sanitary waste storage, service activities, leaks, and spills	Sanitary waste, bacteria, nutrients, BOD	BOD; total/fecal coliform; nutrients if applicable	WM-9, WM-4
Solid waste and construction debris	Trash, packaging, vegetation debris, general construction debris, and waste handling	Trash, debris, floatable materials, sediment if commingled with soil	Visual indicators; TSS / turbidity if sediment is present	WM-5
Liquid waste (<i>if generated</i>)	Containerized liquid waste, leaks, spills, and improper disposal	Source-specific liquid waste constituents	Constituents specific to material; check with laboratory	WM-10, WM-4, WM-6
Hazardous materials or hazardous waste (<i>if generated</i>)	Stored hazardous materials, hazardous waste containers, leaks, and spills	Source-specific hazardous constituents	Constituents specific to material; check with laboratory	WM-1, WM-2, WM-4, WM-6
Spill cleanup materials	Used absorbents, contaminated soil, cleanup debris, and residual pollutants	Pollutants associated with the spill source	Constituents specific to spill source; check with laboratory	WM-4, WM-5, WM-6
Dust control water	Water application for dust control and construction support	Sediment if over-applied; non-stormwater discharge if not controlled	TSS / turbidity if discharge occurs	NS-1, WE-1, EC-1

Construction Activity / Source Area	Pollutant Source	Potential Pollutant	Water Quality Indicator Constituent	Applicable BMPs / Controls
Final cleanup and stabilization	Removal of temporary materials, cleanup of disturbed or used areas, and final stabilization activities	Sediment, dust, trash, debris, fuel, oil, grease	TSS / turbidity; oil and grease if release occurs	EC-1, EC-16, SE-7, TC-2, NS-6, WM-5
1. TSS means total suspended solids. 2. BOD means biochemical oxygen demand. 3. Water quality indicator constituents identified as "source-specific" shall be selected based on the material released, applicable Safety Data Sheets, analytical laboratory recommendations, and QSP evaluation. 4. This table shall be updated if additional construction activities, materials, wastes, or pollutant sources are introduced during construction.				

Existing Site Features

The following existing site features, as identified in Section 2.1, are potential sources of non-visible pollutants to stormwater discharges from the project:

- NONE IDENTIFIED

Soil Amendments

The following soil amendments have the potential to change the chemical properties, engineering properties, or erosion resistance of the soil and will be used on the project site:

- NONE USED

Stormwater Run-On

The following stormwater run-on sources have the potential to contribute non-visible pollutants to stormwater discharges from the project:

- NONE IDENTIFIED

This appendix shall be updated if additional construction activities, materials, wastes, pollutant sources, soil amendments, or stormwater run-on conditions are identified during construction.

Appendix G

CASQA Stormwater BMP Handbook: Construction BMP Fact Sheets

This appendix includes BMP fact sheets for the erosion control, sediment control, tracking control, non-stormwater management, and waste and materials management BMPs identified in Section 3 of this SWPPP.

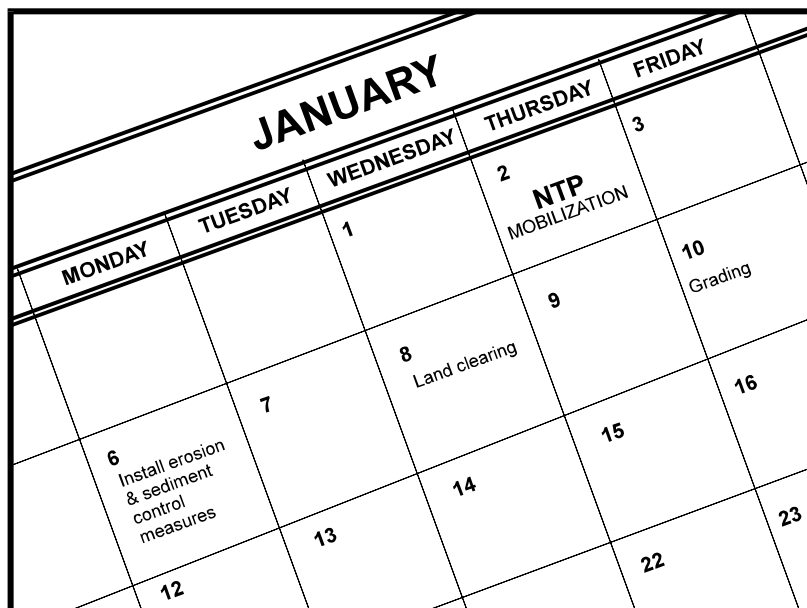
BMP fact sheets provide general implementation and maintenance guidance. Site-specific BMP requirements are described in Section 3 and shown on the Site Maps and Drawings included in Appendix A. If there is a conflict between the BMP fact sheets and site-specific SWPPP requirements, the site-specific SWPPP requirements shall govern.

Table G.1 identifies the BMP fact sheets included in this appendix:

Table G.1 BMP Fact Sheets

	BMP
Erosion and Sediment Controls	EC-1: Scheduling
	EC-2: Preservation of Existing Vegetation
	EC-10: Velocity Dissipation Device
	EC-12: Streambank Stabilization
	EC-16: Non-Vegetated Stabilization
	SE-1: Silt Fence
	SE-5: Fiber Rolls
	SE-7: Street Sweeping and Vacuuming
Tracking Control	TC-2: Stabilized Construction Roadway
Wind Erosion	WE-1: Wind Erosion Control
Material Management	WM-1: Material Delivery and Storage
	WM-2: Material Use
	WM-3: Stockpile Management
	WM-4: Spill Prevention and Control
	WM-5: Solid Waste Management
	WM-6: Hazardous Waste Management
	WM-7: Contaminated Soil Management
	WM-9: Sanitary-Septic Waste Management
	WM-10: Liquid Waste Management
Non-Stormwater Control	NS-1: Water Conservation Practices
	NS-6: Illicit Connection/ Discharge
	NS-9: Vehicle and Equipment Fueling
	NS-10: Vehicle and Equipment Maintenance

Additional BMP fact sheets may be added to this appendix if new BMPs are implemented during construction or if field conditions require BMPs not currently identified in Section 3. BMPs added during construction shall be documented in the SWPPP, shown on the Site Maps and Drawings as applicable, and maintained in accordance with the 2022 CGP and this SWPPP.



Description and Purpose

Scheduling is the development of a written plan that includes sequencing of construction activities and the implementation of BMPs such as erosion control and sediment control while taking local climate (rainfall, wind, etc.) into consideration. The purpose is to reduce the amount and duration of soil exposed to erosion by wind, rain, runoff, and vehicle tracking, and to perform the construction activities and control practices in accordance with the planned schedule.

Suitable Applications

Proper sequencing of construction activities to reduce erosion potential should be incorporated into the schedule of every construction project especially during rainy season. Use of other, more costly yet less effective, erosion and sediment control BMPs may often be reduced through proper construction sequencing.

Limitations

- Environmental constraints such as nesting season prohibitions reduce the full capabilities of this BMP.

Implementation

- Avoid rainy periods. Schedule major grading operations during dry months when practical. Allow enough time before rainfall begins to stabilize the soil with vegetation or physical means or to install sediment trapping devices.

Categories

EC	Erosion Control	☒
SE	Sediment Control	☒
TC	Tracking Control	☒
WE	Wind Erosion Control	☒
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

- ☒ Primary Objective
- ☒ Secondary Objective

Targeted Constituents

Sediment	☒
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

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- Plan the project and develop a schedule showing each phase of construction. Clearly show how the rainy season relates to soil disturbing and re-stabilization activities. Incorporate the construction schedule into the SWPPP.
- Include on the schedule, details on the rainy season implementation and deployment of:
 - Erosion control BMPs
 - Sediment control BMPs
 - Tracking control BMPs
 - Wind erosion control BMPs
 - Non-stormwater BMPs
 - Waste management and materials pollution control BMPs
- Include dates for activities that may require non-stormwater discharges such as dewatering, sawcutting, grinding, drilling, boring, crushing, blasting, painting, hydro-demolition, mortar mixing, pavement cleaning, etc.
- Work out the sequencing and timetable for the start and completion of each item such as site clearing and grubbing, grading, excavation, paving, foundation pouring utilities installation, etc., to minimize the active construction area during the rainy season.
 - Sequence trenching activities so that most open portions are closed before new trenching begins.
 - Incorporate staged seeding and re-vegetation of graded slopes as work progresses.
 - Schedule establishment of permanent vegetation during appropriate planting time for specified vegetation.
- Non-active areas should be stabilized as soon as practical after the cessation of soil disturbing activities or one day prior to the onset of precipitation.
- Monitor the weather forecast for rainfall.
- When rainfall is predicted, adjust the construction schedule to allow the implementation of soil stabilization and sediment treatment controls on all disturbed areas prior to the onset of rain.
- Be prepared year-round to deploy erosion control and sediment control BMPs. Erosion may be caused during dry seasons by un-seasonal rainfall, wind, and vehicle tracking. Keep the site stabilized year-round and retain and maintain rainy season sediment trapping devices in operational condition.

- Apply permanent erosion control to areas deemed substantially complete during the project's defined seeding window.
- Avoid soil disturbance during periods with high wind velocities.

Inspection and Maintenance

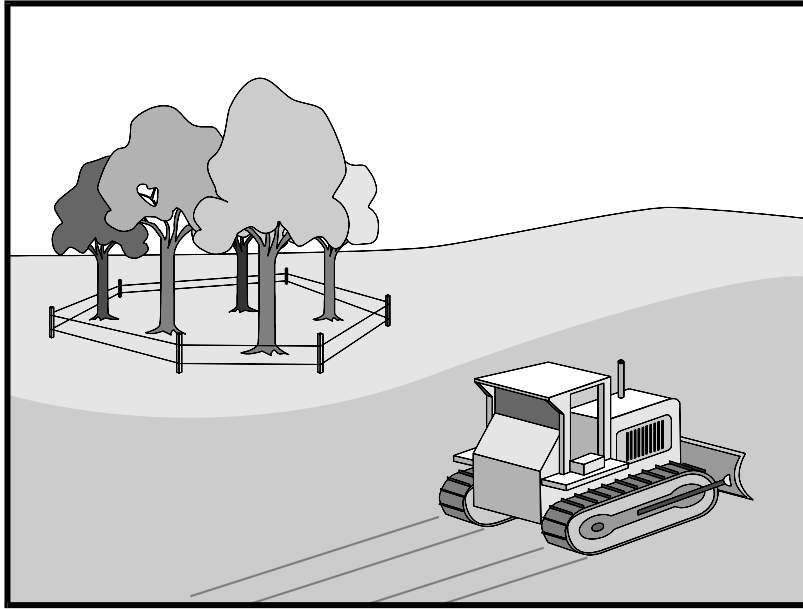
- Verify that work is progressing in accordance with the schedule. If progress deviates, take corrective actions.
- Amend the schedule when changes are warranted.
- Amend the schedule prior to the rainy season to show updated information on the deployment and implementation of construction site BMPs.

References and Additional Resources

Construction Site Best Management Practices (BMPs) Manual, CTSW-RT-24-425.11.1, California Department of Transportation (Caltrans), March 2024.

Storm Water Management for Construction Activities Developing Pollution Prevention Plans and Best Management Practices (EPA 832-R-92-005), U.S. Environmental Protection Agency, Office of Water, September 1992.

Preservation of Existing Vegetation EC-2



Description and Purpose

Carefully planned preservation of existing vegetation minimizes the potential of removing or injuring existing trees, vines, shrubs, and grasses that protect soil from erosion.

Suitable Applications

Preservation of existing vegetation is suitable for use on most projects. Large project sites often provide the greatest opportunity for use of this BMP. Suitable applications include the following:

- Areas within the site where no construction activity occurs or occurs at a later date. This BMP is especially suitable to multi year projects where grading can be phased.
- Areas where natural vegetation exists and is designated for preservation. Such areas often include steep slopes, watercourse, and building sites in wooded areas.
- Areas where local, state, and federal government require preservation, such as vernal pools, wetlands, marshes, certain oak trees, etc. These areas are usually designated on the plans, or in the specifications, permits, or environmental documents.
- Where vegetation designated for ultimate removal can be temporarily preserved and be utilized for erosion control and sediment control.
- Protecting existing vegetation buffers and swales.

Categories

EC	Erosion Control	☒
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

- ☒ **Primary Objective**
- ☐ **Secondary Objective**

Targeted Constituents

Sediment	☒
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

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Preservation of Existing Vegetation EC-2

Limitations

- Requires forward planning by the owner/developer, contractor, and design staff.
- Limited opportunities for use when project plans do not incorporate existing vegetation into the site design.
- For sites with diverse topography, it is often difficult and expensive to save existing trees while grading the site satisfactory for the planned development.

Implementation

The best way to prevent erosion is to not disturb the land. In order to reduce the impacts of new development and redevelopment, projects may be designed to avoid disturbing land in sensitive areas of the site (e.g., natural watercourses, steep slopes), and to incorporate unique or desirable existing vegetation into the site's landscaping plan. Clearly marking and leaving a buffer area around these unique areas during construction will help to preserve these areas as well as take advantage of natural erosion prevention and sediment trapping.

Existing vegetation to be preserved on the site must be protected from mechanical and other injury while the land is being developed. The purpose of protecting existing vegetation is to ensure the survival of desirable vegetation for shade, beautification, and erosion control. Mature vegetation has extensive root systems that help to hold soil in place, thus reducing erosion. In addition, vegetation helps keep soil from drying rapidly and becoming susceptible to erosion. To effectively save existing vegetation, no disturbances of any kind should be allowed within a defined area around the vegetation. For trees, no construction activity should occur within the drip line of the tree.

Timing

- Provide for preservation of existing vegetation prior to the commencement of clearing and grubbing operations or other soil disturbing activities in areas where no construction activity is planned or will occur at a later date.

Design and Layout

- Mark areas to be preserved with temporary fencing. Include sufficient setback to protect roots.
 - Orange colored plastic mesh fencing works well.
 - Use appropriate fence posts and adequate post spacing and depth to completely support the fence in an upright position.
- Locate temporary roadways, stockpiles, and layout areas to avoid stands of trees, shrubs, and grass.
- Consider the impact of grade changes to existing vegetation and the root zone.
- Maintain existing irrigation systems where feasible. Temporary irrigation may be required.
- Instruct employees and subcontractors to honor protective devices. Prohibit heavy equipment, vehicular traffic, or storage of construction materials within the protected area.

Preservation of Existing Vegetation EC-2

- Consider pruning or mowing vegetation instead of removing it to allow for regrowth.
- If possible, retain vegetation buffer around the site and adjacent waterways.

Inspection and Maintenance

During construction, the limits of disturbance should remain clearly marked at all times. Irrigation or maintenance of existing vegetation should be described in the landscaping plan. If damage to protected trees still occurs, maintenance guidelines described below should be followed:

- Verify that protective measures remain in place. Restore damaged protection measures immediately.
- Serious tree injuries shall be attended to by an arborist.
- Damage to the crown, trunk, or root system of a retained tree shall be repaired immediately.
- Trench as far from tree trunks as possible, usually outside of the tree drip line or canopy. Curve trenches around trees to avoid large roots or root concentrations. If roots are encountered, consider tunneling under them. When trenching or tunneling near or under trees to be retained, place tunnels at least 18 in. below the ground surface, and not below the tree center to minimize impact on the roots.
- Do not leave tree roots exposed to air. Cover exposed roots with soil as soon as possible. If soil covering is not practical, protect exposed roots with wet burlap or peat moss until the tunnel or trench is ready for backfill.
- Cleanly remove the ends of damaged roots with a smooth cut.
- Fill trenches and tunnels as soon as possible. Careful filling and tamping will eliminate air spaces in the soil, which can damage roots.
- If bark damage occurs, cut back all loosened bark into the undamaged area, with the cut tapered at the top and bottom and drainage provided at the base of the wood. Limit cutting the undamaged area as much as possible.
- Aerate soil that has been compacted over a trees root zone by punching holes 12 in. deep with an iron bar and moving the bar back and forth until the soil is loosened. Place holes 18 in. apart throughout the area of compacted soil under the tree crown.
- Fertilization:
 - Fertilize trees in the late fall or early spring. Although to note, many native species do not require fertilization.
 - Apply fertilizer to the soil over the feeder roots and in accordance with label instructions, but never closer than 3 ft to the trunk. Increase the fertilized area by one-fourth of the crown area for conifers that have extended root systems.
- Retain protective measures until all other construction activity is complete to avoid damage during site cleanup and stabilization.

Preservation of Existing Vegetation EC-2

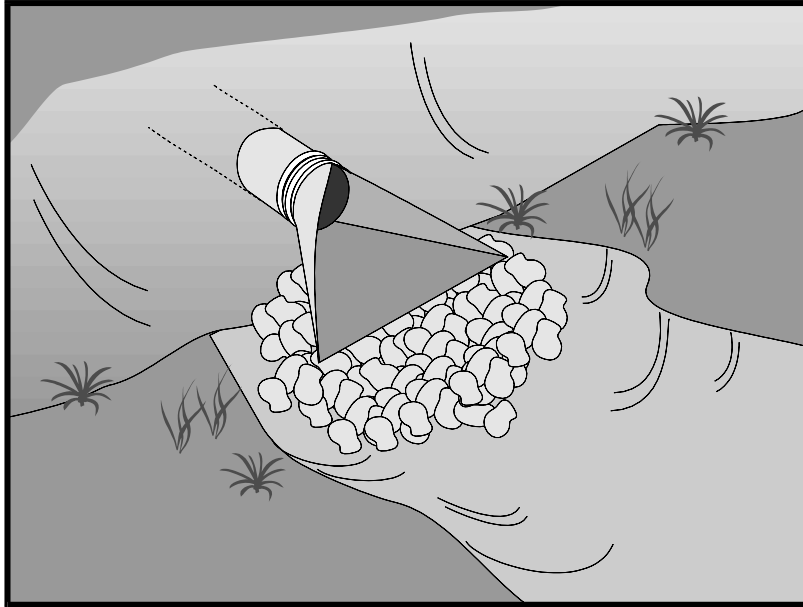
References and Additional Resources

Construction Site Best Management Practices (BMPs) Manual, CTSW-RT-24-425.11.1, California Department of Transportation (Caltrans), March 2024.

County of Sacramento Tree Preservation Ordinance, September 1981.

Storm Water Management of the Puget Sound Basin, Technical Manual, Publication #91-75, Washington State Department of Ecology, February 1992.

Water Quality Management Plan for The Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency, November 1988.



Description and Purpose

Outlet protection is a physical device composed of rock, grouted riprap, or concrete rubble, which is placed at the outlet of a pipe or channel to prevent scour of the soil caused by concentrated, high velocity flows.

Suitable Applications

Whenever discharge velocities and energies at the outlets of culverts, conduits, or channels are sufficient to erode the next downstream reach. This includes temporary diversion structures to divert runoff during construction.

- These devices may be used at the following locations:
 - Outlets of pipes, drains, culverts, slope drains, diversion ditches, swales, conduits, or channels.
 - Outlets located at the bottom of mild to steep slopes.
 - Discharge outlets that carry continuous flows of water.
 - Outlets subject to short, intense flows of water, such as flash floods.
 - Points where lined conveyances discharge to unlined conveyances.

Limitations

- Large storms or high flows can wash away the rock outlet protection and leave the area susceptible to erosion.

Categories

EC	Erosion Control	☒
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

- ☒ **Primary Objective**
- ☒ **Secondary Objective**

Targeted Constituents

Sediment	☒
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

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- Sediment captured by the rock outlet protection may be difficult to remove without removing the rock.
- Outlet protection may negatively impact the channel habitat.
- Grouted riprap may break up in areas of freeze and thaw.
- If there is not adequate drainage, and water builds up behind grouted riprap, it may cause the grouted riprap to break up due to the resulting hydrostatic pressure.
- Sediment accumulation, scour depressions, and/or persistent non-stormwater discharges can result in areas of standing water suitable for mosquito production in velocity dissipation devices.

Implementation

General

Outlet protection is needed where discharge velocities and energies at the outlets of culverts, conduits or channels are sufficient to erode the immediate downstream reach. This practice protects the outlet from developing small eroded pools (plunge pools) and protects against gully erosion resulting from scouring at a culvert mouth.

Design and Layout

As with most channel design projects, depth of flow, roughness, gradient, side slopes, discharge rate, and velocity should be considered in the outlet design. Compliance to local and state regulations should also be considered while working in environmentally sensitive streambeds. General recommendations for rock size and length of outlet protection mat are shown in the rock outlet protection figure in this BMP and should be considered minimums. The apron length and rock size gradation are determined using a combination of the discharge pipe diameter and estimate discharge rate: Select the longest apron length and largest rock size suggested by the pipe size and discharge rate. Where flows are conveyed in open channels such as ditches and swales, use the estimated discharge rate for selecting the apron length and rock size. Flows should be same as the culvert or channel design flow but never the less than the peak 5-year flow for temporary structures planned for one rainy season, or the 10-year peak flow for temporary structures planned for two or three rainy seasons.

- There are many types of energy dissipaters, with rock being the one that is represented in the attached figure.
- Best results are obtained when sound, durable, and angular rock is used.
- Install riprap, grouted riprap, or concrete apron at selected outlet. Riprap aprons are best suited for temporary use during construction. Grouted or wired tied rock riprap can minimize maintenance requirements.
- Rock outlet protection is usually less expensive and easier to install than concrete aprons or energy dissipaters. It also serves to trap sediment and reduce flow velocities.
- Carefully place riprap to avoid damaging the filter fabric.

- Stone 4 in. to 6 in. may be carefully dumped onto filter fabric from a height not to exceed 12 in.
 - Stone 8 in. to 12 in. must be hand placed onto filter fabric, or the filter fabric may be covered with 4 in. of gravel and the 8 in. to 12 in. rock may be dumped from a height not to exceed 16 in.
 - Stone greater than 12 in. shall only be dumped onto filter fabric protected with a layer of gravel with a thickness equal to one half the D_{50} rock size, and the dump height limited to twice the depth of the gravel protection layer thickness.
- For proper operation of apron: Align apron with receiving stream and keep straight throughout its length. If a curve is needed to fit site conditions, place it in upper section of apron.
 - Outlets on slopes steeper than 10 percent should have additional protection.

Inspection and Maintenance

- Inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Inspect BMPs subjected to non-stormwater discharges daily while non-stormwater discharges occur. Minimize areas of standing water by removing sediment blockages and filling scour depressions.
- Inspect apron for displacement of the riprap and damage to the underlying fabric. Repair fabric and replace riprap that has washed away. If riprap continues to wash away, consider using larger material.
- Inspect for scour beneath the riprap and around the outlet. Repair damage to slopes or underlying filter fabric immediately.
- Temporary devices should be completely removed as soon as the surrounding drainage area has been stabilized or at the completion of construction.

References and Additional Resources

Construction Site Best Management Practices (BMPs) Manual CTSW-RT-24-425.11.1, California Department of Transportation (Caltrans), March 2024.

County of Sacramento Improvement Standards, Sacramento County, May 1989.

Erosion and Sediment Control Handbook, S.J. Goldman, K. Jackson, T.A. Bursztynsky, P.E., McGraw Hill Book Company, 1986.

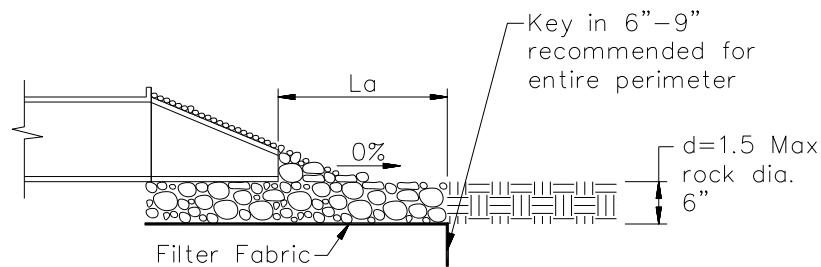
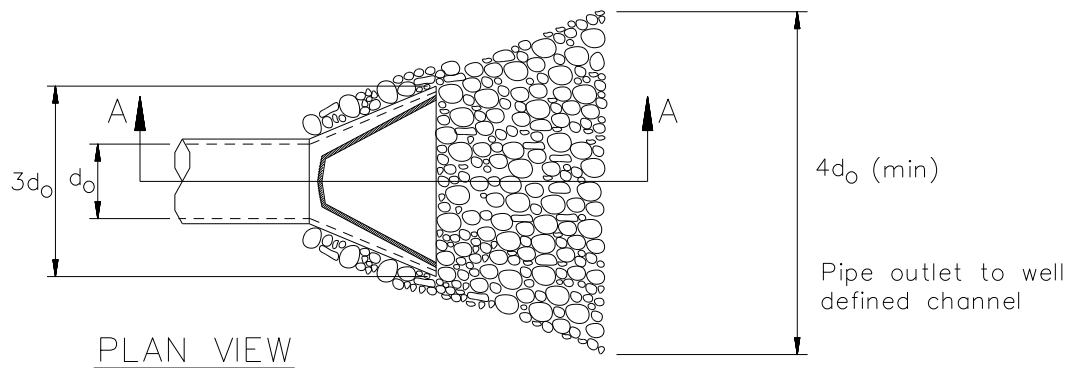
Handbook of Steel Drainage & Highway Construction, American Iron and Steel Institute, 1983.

Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, May 1995.

Metzger, M.E. 2004. Managing mosquitoes in stormwater treatment devices. University of California Division of Agriculture and Natural Resources, Publication 8125. On-line: <http://anrcatalog.ucdavis.edu/pdf/8125.pdf>

Stormwater Management of the Puget Sound Basin, Technical Manual, Publication #91-75, Washington State Department of Ecology, February 1992.

Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency, November 1988.



Pipe Diameter inches	Discharge ft ³ /s	Apron Length, La ft	Rip Rap D ₅₀ Diameter Min inches
12	5	10	4
	10	13	6
18	10	10	6
	20	16	8
	30	23	12
	40	26	16
24	30	16	8
	40	26	8
	50	26	12
	60	30	16

For larger or higher flows consult a Registered Civil Engineer
Source: USDA - SCS



Description and Purpose

Stream channels, streambanks, and associated riparian areas are dynamic and sensitive ecosystems that respond to changes in land use activity. Streambank and channel disturbance resulting from construction activities can increase the stream's sediment load, which can cause channel erosion or sedimentation and have adverse affects on the biotic system. BMPs can reduce the discharge of sediment and other pollutants to minimize the impact of construction activities on watercourses. Streams on the 303(d) list and listed for sediment may require numerous measures to prevent any increases in sediment load to the stream.

Suitable Applications

These procedures typically apply to all construction projects that disturb or occur within stream channels and their associated riparian areas.

Limitations

Specific permit requirements or mitigation measures such as Regional Water Quality Control Board (RWQCB) 401 Certification, U.S. Army Corps of Engineers 404 permit and approval by California Department of Fish and Game supercede the guidance in this BMP.

Categories

EC	Erosion Control	☒
SE	Sediment Control	☒
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☒
WM	Waste Management and Materials Pollution Control	

Legend:

- ☒ **Primary Objective**
- ☒ **Secondary Objective**

Targeted Constituents

Sediment	☒
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

Combination of erosion and sediment controls.

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- If numerical based water quality standards are mentioned in any of these and other related permits, testing and sampling may be required. Streams listed as 303(d) impaired for sediment, silt, or turbidity, are required to conduct sampling to verify that there is no net increase in sediment load due to construction activities.

Implementation

Planning

- Proper planning, design, and construction techniques can minimize impacts normally associated with in stream construction activities. Poor planning can adversely affect soil, fish, wildlife resources, land uses, or land users. Planning should take into account: scheduling; avoidance of in-stream construction; minimizing disturbance area and construction time period; using pre-disturbed areas; selecting crossing location; and selecting equipment.

Scheduling

- Construction activities should be scheduled according to the relative sensitivity of the environmental concerns and in accordance with EC-1, Scheduling. Scheduling considerations will be different when working near perennial streams vs. ephemeral streams and are as follows.
- When in-stream construction is conducted in a perennial stream, work should optimally be performed during the rainy season. This is because in the summer, any sediment-containing water that is discharged into the watercourse will cause a large change in both water clarity and water chemistry. During the rainy season, there is typically more and faster flowing water in the stream, so discharges are diluted faster. However, should in-stream work be scheduled for summer, establishing an isolation area, or diverting the stream, will significantly decrease the amount of sediment stirred up by construction work. Construction work near perennial streams should optimally be performed during the dry season (see below).
- When working in or near ephemeral streams, work should be performed during the dry season. By their very nature, ephemeral streams are usually dry in the summer, and therefore, in-stream construction activities will not cause significant water quality problems. However, when tying up the site at the end of the project, wash any fines (see Washing Fines) that accumulated in the channel back into the bed material, to decrease pollution from the first rainstorm of the season.
- When working near ephemeral or perennial streams, erosion and sediment controls (see silt fences, straw bale barriers, etc.) should be implemented to keep sediment out of stream channel.

Minimize Disturbance

- Minimize disturbance through: selection of the narrowest crossing location; limiting the number of equipment trips across a stream during construction; and, minimizing the number and size of work areas (equipment staging areas and spoil storage areas). Place work areas at least 50 ft from stream channel. Field reconnaissance should be conducted during the planning stage to identify work areas.

Use of Pre-Disturbed Areas

- Locate project sites and work areas in areas disturbed by prior construction or other activity when possible.

Selection of Project Site

- Avoid steep and unstable banks, highly erodible or saturated soils, or highly fractured rock.
- Select project site that minimizes disturbance to aquatic species or habitat.

Equipment Selection

- Select equipment that reduces the amount of pressure exerted on the ground surface, and therefore, reduces erosion potential and/or use overhead or aerial access for transporting equipment across drainage channels. Use equipment that exerts ground pressures of less than 5 or 6 lb/in², where possible. Low ground pressure equipment includes: wide or high flotation tires (34 to 72 in. wide); dual tires; bogie axle systems; tracked machines; lightweight equipment; and, central tire inflation systems.

Streambank Stabilization

Preservation of Existing Vegetation

- Preserve existing vegetation in accordance with EC-2, Preservation of Existing Vegetation. In a streambank environment, preservation of existing vegetation provides the following benefits.

Water Quality Protection

- Vegetated buffers on slopes trap sediment and promote groundwater recharge. The buffer width needed to maintain water quality ranges from 15 to 100 ft. On gradual slopes, most of the filtering occurs within the first 30 ft. Steeper slopes require a greater width of vegetative buffer to provide water quality benefits.

Streambank Stabilization

- The root system of riparian vegetation stabilizes streambanks by increasing tensile strength in the soil. The presence of vegetation modifies the moisture condition of slopes (infiltration, evapo transpiration, interception) and increases bank stability.

Riparian Habitat

- Buffers of diverse riparian vegetation provide food and shelter for riparian and aquatic organisms. Minimizing impacts to fisheries habitat is a major concern when working near streams and rivers. Riparian vegetation provides shade, shelter, organic matter (leaf detritus and large woody debris), and other nutrients that are necessary for fish and other aquatic organisms. Buffer widths for habitat concerns are typically wider than those recommended for water quality concerns (100 to 1500 ft).
- When working near watercourses, it is important to understand the work site's placement in the watershed. Riparian vegetation in headwater streams has a greater impact on overall water quality than vegetation in downstream reaches. Preserving existing vegetation upstream is necessary to maintain water quality, minimize bank failure, and maximize riparian habitat, downstream of the work site.

Limitations

- Local county and municipal ordinances regarding width, extent and type of vegetative buffer required may exceed the specifications provided here; these ordinances should be investigated prior to construction.

Streambank Stabilization Specific Installation

- As a general rule, the width of a buffer strip between a road and the stream is recommended to be 50 ft plus four times the percent slope of the land, measured between the road and the top of stream bank.

Hydraulic Mulch

- Apply hydraulic mulch on disturbed streambanks above mean high water level in accordance with EC-3, Hydraulic Mulch to provide temporary soil stabilization.

Limitations

- Do not place hydraulic mulch or tackifiers below the mean high-water level, as these materials could wash into the channel and impact water quality or possibly cause eutrophication (eutrophication is an algal bloom caused by excessively high nutrient levels in the water).

Hydroseeding

- Hydroseed disturbed streambanks in accordance with EC-4, Hydroseeding.

Limitations

- Do not place tackifiers or fertilizers below the mean high-water level, as these materials could wash into the channel and impact water quality or possibly cause eutrophication.

Soil Binders

- Apply soil binders to disturbed streambanks in accordance with EC-5, Soil Binders.

Limitations

- Do not place soil binders below the mean high-water level. Soil binder must be environmentally benign and non-toxic to aquatic organisms.

Straw Mulch

- Apply straw mulch to disturbed streambanks in accordance with EC-6, Straw Mulch.

Limitations

- Do not place straw mulch below the mean high-water level, as this material could wash into the channel and impact water quality or possibly cause eutrophication.

Geotextiles and Mats

- Install geotextiles and mats as described in EC-7, Geotextiles and Mats, to stabilize disturbed channels and streambanks. Not all applications should be in the channel, for example, certain geotextile netting may snag fish gills and are not appropriate in fish bearing streams. Geotextile fabrics that are not biodegradable are not appropriate for in stream use. Additionally, geotextile fabric or blankets placed in channels must be adequate to sustain anticipated hydraulic forces.

Earth Dikes, Drainage Swales, and Lined Ditches

- Convey, intercept, or divert runoff from disturbed streambanks using EC-9, Earth Dikes and Drainage Swales.

Limitations

- Do not place earth dikes in watercourses, as these structures are only suited for intercepting sheet flow and should not be used to intercept concentrated flow.
- Appropriately sized velocity dissipation devices (EC-10) must be placed at outlets to minimize erosion and scour.

Velocity Dissipation Devices

- Place velocity dissipation devices at outlets of pipes, drains, culverts, slope drains, diversion ditches, swales, conduits or channels in accordance with EC-10, Velocity Dissipation Devices.

Slope Drains

- Use slope drains to intercept and direct surface runoff or groundwater into a stabilized watercourse, trapping device or stabilized area in accordance with EC-11, Slope Drains.

Limitations

- Appropriately sized outlet protection and velocity dissipation devices (EC-10) must be placed at outlets to minimize erosion and scour.

Streambank Sediment Control

Silt Fences

- Install silt fences in accordance with SE-1, Silt Fence, to control sediment. Silt fences should only be installed where sediment laden water can pond, thus allowing the sediment to settle out.

Fiber Rolls

- Install fiber rolls in accordance with SE-5, Fiber Rolls, along contour of slopes above the high-water level to intercept runoff, reduce flow velocity, release the runoff as sheet flow and provide removal of sediment from the runoff. In a stream environment, fiber rolls should be used in conjunction with other sediment control methods such as SE-1, Silt Fence or SE-9 Straw Bale Barrier. Install silt fence, straw bale barrier, or other erosion control method along toe of slope above the high-water level.

Gravel Bag Berm

- A gravel bag berm or barrier can be utilized to intercept and slow the flow of sediment laden sheet flow runoff in accordance with SE-6, Gravel Bag Berm. In a stream environment gravel bag barrier can allow sediment to settle from runoff before water leaves the construction site and can be used to isolate the work area from the live stream.

Limitations

- Gravel bag barriers are not recommended as a perimeter sediment control practice around streams.

Straw Bale Barrier

- Install straw bale barriers in accordance with SE-9, Straw Bale Barrier, to control sediment. Straw bale barriers should only be installed where sediment laden water can pond, thus allowing the sediment to settle out. Install a silt fence in accordance with SE-1, Silt Fence, on down slope side of straw bale barrier closest to stream channel to provide added sediment control.

Rock Filter

Description and Purpose

Rock filters are temporary erosion control barriers composed of rock that is anchored in place. Rock filters detain the sediment laden runoff, retain the sediment, and release the water as sheet flow at a reduced velocity. Typical rock filter installations are illustrated at the end of this BMP.

Applications

- Near the toe of slopes that may be subject to flow and rill erosion.

Limitations

- Inappropriate for contributing drainage areas greater than 5 acres.
- Requires sufficient space for ponded water.
- Ineffective for diverting runoff because filters allow water to slowly seep through.
- Rock filter berms are difficult to remove when construction is complete.
- Unsuitable in developed areas or locations where aesthetics is a concern.

Specifications

- Rock: open graded rock, 0.75 to 5 in. for concentrated flow applications.
- Woven wire sheathing: 1 in. diameter, hexagonal mesh, galvanized 20gauge (used with rock filters in areas of concentrated flow).
- In construction traffic areas, maximum rock berm heights should be 12 in. Berms should be constructed every 300 ft on slopes less than 5%, every 200 ft on slopes between 5% and 10%, and every 100 ft on slopes greater than 10%.

Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Reshape berms as needed and replace lost or dislodged rock, and filter fabric.

- Sediment that accumulates in the BMP must be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one third of the barrier height. Sediment removed during maintenance may be incorporated into earthwork on the site or disposed at an appropriate location.

K-rail

Description and Purpose

This is temporary sediment control that uses K-rails to form the sediment deposition area, or to isolate the near bank construction area. Install K-rails at toe of slope in accordance with procedures described in NS-5, Clear Water Diversion.

Barriers are placed end to end in a pre-designed configuration and gravel filled bags are used at the toe of the barrier and at their abutting ends to seal and prevent movement of sediment beneath or through the barrier walls.

Appropriate Applications

- This technique is useful at the toe of embankments, cuts or fills slopes.

Limitations

- The K-rail method should not be used to dewater a project site, as the barrier is not watertight.

Implementation

- Refer to NS-5, Clear Water Diversion, for implementation requirements.

Instream Construction Sediment Control

There are three different options currently available for reducing turbidity while working in a stream or river. The stream can be isolated from the area in which work is occurring by means of a water barrier, the stream can be diverted around the work site through a pipe or temporary channel, or one can employ construction practices that minimize sediment suspension.

Whatever technique is implemented, an important thing to remember is that dilution can sometimes be the solution. A probable “worst time” to release high TSS into a stream system might be when the stream is very low; summer low flow, for example. During these times, the flow may be low while the biological activity in the stream is very high. Conversely, the addition of high TSS or sediment during a big storm discharge might have a relatively low impact, because the stream is already turbid, and the stream energy is capable of transporting both suspended solids, and large quantities of bedload through the system. The optimum time to “pull” in-stream structures may be during the rising limb of a storm hydrograph.

Techniques to minimize Total Suspended Solids (TSS)

- **Padding** - Padding laid in the stream below the work site may trap some solids that are deposited in the stream during construction. After work is done, the padding is removed from the stream, and placed on the bank to assist in re-vegetation.
- **Clean, washed gravel** - Using clean, washed gravel decreases solid suspension, as there are fewer small particles deposited in the stream.

- **Excavation using a large bucket** - Each time a bucket of soil is placed in the stream, a portion is suspended. Approximately the same amount is suspended whether a small amount of soil is placed in the stream, or a large amount. Therefore, using a large excavator bucket instead of a small one, will reduce the total amount of soil that washes downstream.
- **Use of dozer for backfilling** - Using a dozer for backfilling instead of a backhoe follows the same principles – the fewer times soil is deposited in the stream, the less soil will be suspended.
- **Partial dewatering with a pump** - Partially dewatering a stream with a pump reduces the amount of water, and thus the amount of water that can suspend sediment.

Washing Fines

Definition and Purpose

- Washing fines is an “in-channel” sediment control method, which uses water, either from a water truck or hydrant, to wash stream fines that were brought to the surface of the channel bed during restoration, back into the interstitial spaces of the gravel and cobbles.
- The purpose of this technique is to reduce or eliminate the discharge of sediment from the channel bottom during the first seasonal flow. Sediment should not be allowed into stream channels; however, occasionally in-channel restoration work will involve moving or otherwise disturbing fines (sand and silt sized particles) that are already in the stream, usually below bankfull discharge elevation. Subsequent re-watering of the channel can result in a plume of turbidity and sedimentation.
- This technique washes the fines back into the channel bed. Bedload materials, including gravel cobbles, boulders and those fines, are naturally mobilized during higher storm flows. This technique is intended to delay the discharge until the fines would naturally be mobilized.

Appropriate Applications

- This technique should be used when construction work is required in channels. It is especially useful in intermittent or ephemeral streams in which work is performed “in the dry”, and which subsequently become re-watered.

Limitations

- The stream must have sufficient gravel and cobble substrate composition.
- The use of this technique requires consideration of time of year and timing of expected stream flows.
- The optimum time for the use of this technique is in the fall, prior to winter flows.
- Consultation with, and approval from the Department of Fish and Game and the Regional Water Quality Control Board may be required.

Implementation

- Apply sufficient water to wash fines, but not cause further erosion or runoff.

- Apply water slowly and evenly to prevent runoff and erosion.
- Consult with Department of Fish and Game and the Regional Water Quality Control Board for specific water quality requirements of applied water (e.g. chlorine).

Inspection and Maintenance

- None necessary

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events until final stabilization is achieved.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Inspect and repair equipment (for damaged hoses, fittings, and gaskets).

References and Additional Resources

Construction Site Best Management Practices (BMPs) Manual CTSW-RT-24-425.11.1, California Department of Transportation (Caltrans), March 2024.

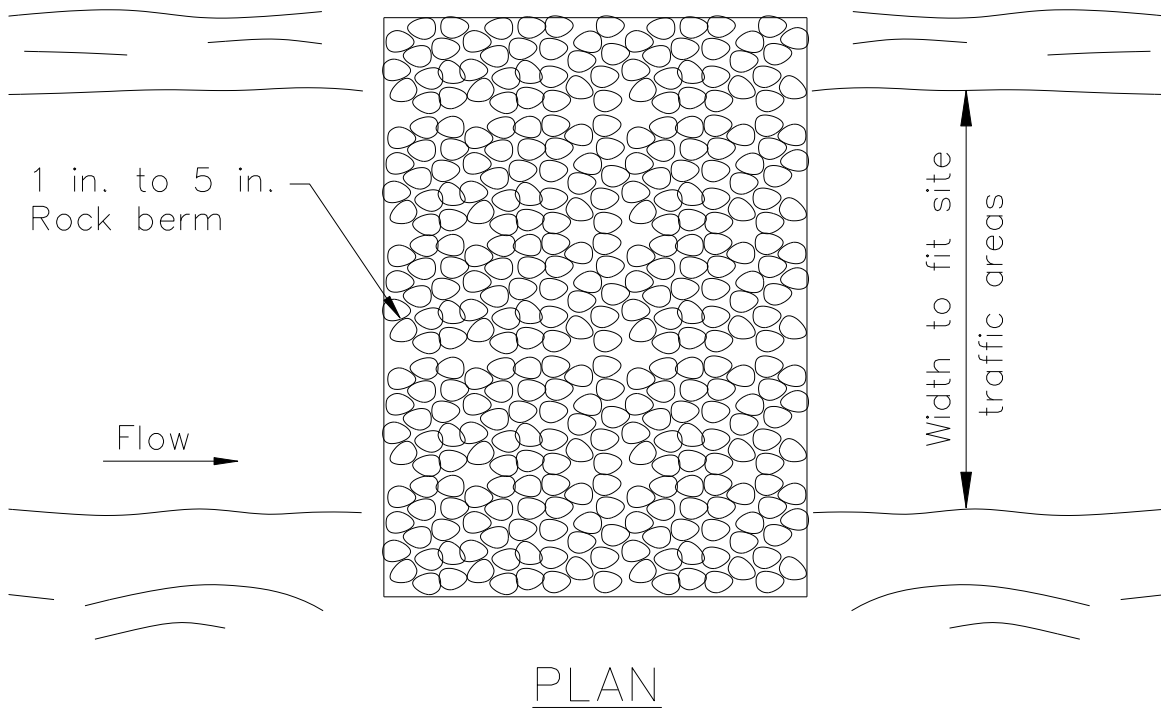
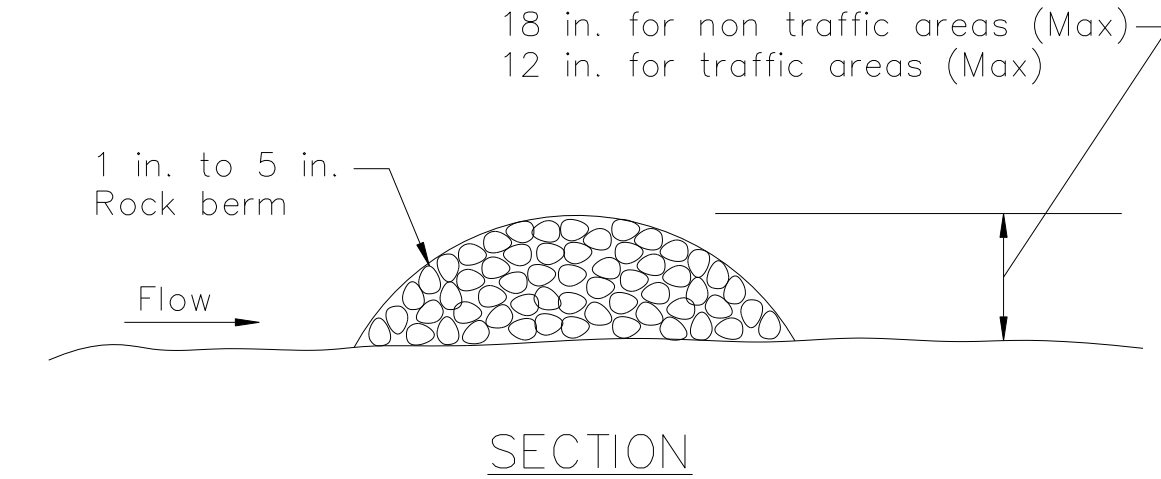
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Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency, November 1988.



TYPICAL ROCK FILTER
NOT TO SCALE



Description and Purpose

Non-vegetative stabilization methods are used for temporary or permanent stabilization of areas prone to erosion and should be used only where vegetative options are not feasible; examples include:

- Areas of vehicular or pedestrian traffic such as roads or paths;
- Arid environments where vegetation would not provide timely ground coverage, or would require excessive irrigation;
- Rocky substrate, infertile or droughty soils where vegetation would be difficult to establish; and
- Areas where vegetation will not grow adequately within the construction time frame.

There are several non-vegetative stabilization methods and selection should be based on site-specific conditions.

Decomposed Granite (DG) is a permanent erosion protection method that consists of a layer of stabilized decomposed granite placed over an erodible surface.

Degradable Mulches of various types (see EC-3, EC-6, EC-8) can be used for temporary non-vegetative stabilization; examples include straw mulch, compost, wood chips or hydraulic mulch.

Geotextiles and Mats can be used for temporary non-vegetative stabilization (see EC-7). These BMPs are typically manufactured from degradable or synthetic materials and are

Categories

EC	Erosion Control	☒
SE	Sediment Control	☒
TR	Tracking Control	
WE	Wind Erosion Control	☒
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

- ☒ **Primary Category**
- ☒ **Secondary Category**

Targeted Constituents

Sediment	☒
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

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designed and specified based on their functional longevity, i.e., how long they will persist and provide erosion protection. All geotextiles and mats should be replaced when they exceed their functional longevity or when permanent stabilization methods are instituted.

Gravel Mulch is a non-degradable erosion control product that is composed of washed and screened coarse to very coarse gravel, 16 mm to 64 mm (0.6" - 2.5"), similar to an AASHTO No. 3 coarse aggregate.

Rock Slope Protection consists of utilizing large rock or rip-rap (4" - 24") to stabilize slopes with a high erosion potential and those subject to scour along waterways.

Soil Binders can be used for temporary non-vegetative stabilization (see EC-5). The key to their use is functional longevity. In most cases, the soil binder will need to be routinely monitored and re-applied to maintain an erosion-resistant coverage.

Suitable Applications

Non-vegetated stabilization methods are suitable for use on disturbed soil areas and on material stockpiles that need to be temporarily or permanently protected from erosion by water and wind. Non-vegetated stabilization should only be utilized when vegetation cannot be established in the required timeframe, due to soil or climactic conditions, or where vegetation may be a potential fire hazard.

Decomposed Granite (DG) and Gravel Mulch are suitable for use in areas where vegetation establishment is difficult, on flat surfaces, trails and pathways, and when used in conjunction with a stabilizer or tackifier, on shallow slopes (i.e., 10:1 [H:V]). DG and gravel can also be used on shallow rocky slopes where vegetation cannot be established for permanent erosion control.

Degradable Mulches can be used to cover and protect soil surfaces from erosion both in temporary and permanent applications. In many cases, the use of mulches by themselves requires routine inspection and re-application. See EC-3 Hydraulic Mulch, EC-6 Straw Mulch, EC-8 Wood Mulch, or EC-14 Compost Blankets for more information.

Geotextiles and Mats can be used as a temporary stand-alone soil stabilization method. Depending on material selection, geotextiles and mats can be a short-term (3 mos – 1 year) or long-term (1-2 years) temporary stabilization method. For more information on geotextiles and mats see EC-7 Geotextiles and Mats.

Rock Slope Protection can be used when the slopes are subject to scour or have a high erosion potential, such as slopes adjacent to flowing waterways or slopes subject to overflow from detention facilities (spillways).

Soil Binders can be used for temporary stabilization of stockpiles and disturbed areas not subject to heavy traffic. See EC-5 Soil Binders for more information.

Limitations

General

- Refer to EC-3, EC-6, EC-8, and EC-14 for limitations on use of mulches. Refer to EC-7 for limitations on use of geotextiles and mats. Refer to EC-5 for limitations on use of Soil Binders.

Decomposed Granite

- Not available in some geographic regions.
- If not tackified, material may be susceptible to erosion even on slight slopes (e.g., 30:1 [H:V]).
- Installed costs may be more expensive than vegetative stabilization methods.

Gravel Mulch

- Availability is limited in some geographic regions.
- If not properly screened and washed, can contain fine material that can erode and/or create dust problems.
- If inadequately sized, material may be susceptible to erosion on sloped areas.
- Pore spaces fill with dirt and debris over time; may provide a growing medium for weeds.

Rock Slope Protection

- Installation is labor intensive.
- Installed costs can be significantly higher than vegetative stabilization methods.
- Rounded stones may not be used on slopes greater than 2:1 [H:V].

Implementation

General

Non-vegetated stabilization should be used in accordance with the following general guidance:

- Should be used in conjunction with other BMPs, including drainage, erosion controls and sediment controls.
- Refer to EC-3, EC-6, EC-8, and EC-14 for implementation details for mulches. Refer to EC-7 for implementation details for geotextiles and mats. Refer to EC-5 for implementation details for soil binders.
- Non-vegetated stabilization measures should be implemented as soon as the disturbance in the areas they are intended to protect has ceased.
- Additional guidance on the comparison and selection of temporary slope stabilization methods is provided in Appendix F of the Handbook.

Decomposed Granite Stabilization

- If used for a road or path should be installed on a prepared base.
- Should be mixed with a stabilizer if used for roads or pathways, or on slope applications.
- Though porous it is recommended to prevent standing water on or next to a decomposed granite road or pathway.

Gravel Mulch

- Should be sized based on slope, rainfall, and upgradient run-on conditions. Stone size should be increased as potential for erosion increases (steeper slopes, high intensity rainfall).
- If permanent, a weed control fabric should be placed prior to installation.
- Should be installed at a minimum 2" depth.
- Should completely cover all exposed surfaces.

Rock Slope Protection

- Rock slope protection installation should follow Caltrans Standard Specification 72-2: Rock Slope Protection. Refer to the specification for rock conformity requirements and installation methods.
- When using rock slope protection, rock size and installation method should be specified by an Engineer.
- A geotextile fabric should be placed prior to installation.

Inspection and Maintenance

General

- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- For permanent installation, require inspection periodically and after major storm events to look for signs of erosion or damage to the stabilization.
- All damage should be repaired immediately.
- Refer to EC-3, EC-6, EC-8, and EC-14 for inspection and maintenance requirements for mulches. Refer to EC-7 for inspection and maintenance requirements for geotextiles and mats. Refer to EC-5 for inspection and maintenance requirements for soil binders.

Decomposed Granite and Gravel Mulch Stabilization

- Rake out and add decomposed granite or gravel as needed to areas subject to rill erosion. Inspect upgradient drainage controls and repair/modify as necessary.
- Should remain stable under loose surface material. Any significant problem areas should be repaired to restore uniformity to the installation.

References and Additional Resources

Arid Zone Forestry: A Guide for Field Technicians. Food and Agriculture Organization of the United Nations, 1989.

Construction Site Best Management Practices (BMPs) Manual CTSW-RT-24-425.11.1, California Department of Transportation (Caltrans), March 2024.

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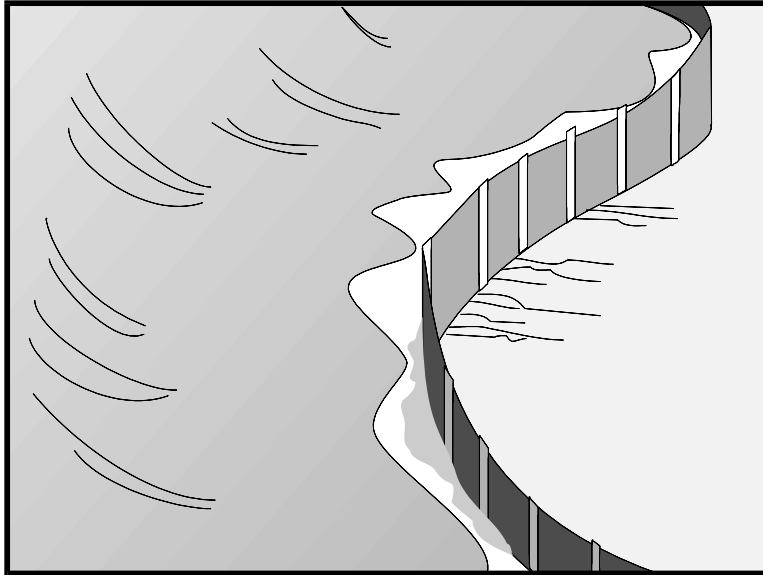
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National Menu of Best Management Practices, US Environmental Protection Agency, 2006.

Standard Specification 72-2: Rock Slope Protection. California Department of Transportation, 2006.



Description and Purpose

A silt fence is made of a woven geotextile that has been entrenched, attached to supporting poles, and sometimes backed by a plastic or wire mesh for support. The silt fence detains water, promoting sedimentation of coarse sediment behind the fence. Silt fence does not retain soil fine particles like clays or silts.

Suitable Applications

Silt fences are suitable for perimeter control, placed below areas where sheet flows discharge from the site. They could also be used as interior controls below disturbed areas where runoff may occur in the form of sheet and rill erosion and around inlets within disturbed areas (Storm Drain Inlet Protection, SE-10). Silt fences should not be used in locations where the flow is concentrated. Silt fences should always be used in combination with erosion controls. Suitable applications include:

- At perimeter of a project (although they should not be installed up and down slopes).
- Below the toe or down slope of exposed and erodible slopes.
- Along streams and channels.
- Around temporary spoil areas and stockpiles.
- Around inlets.
- Below other small cleared areas.

Categories

EC	Erosion Control	
SE	Sediment Control	☒
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

- ☒ **Primary Category**
- ☒ **Secondary Category**

Targeted Constituents

Sediment (coarse sediment)	☒
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

- SE-5 Fiber Rolls
- SE-6 Gravel Bag Berm
- SE-12 Manufactured Linear Sediment Controls
- SE-13 Compost Socks and Berms
- SE-14 Biofilter Bags

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Limitations

- Do not use in streams, channels, drain inlets, or anywhere flow is concentrated.
- Do not use in locations where ponded water may cause a flooding hazard.
- Do not use silt fence to divert water flows or place across any contour line.
- Improperly installed fences are subject to failure from undercutting, overtopping, or collapsing.
- Must be trenched and keyed in.
- According to the State Water Board's *CGP Review, Issue #2* (2014), silt fences reinforced with metal or plastic mesh should be avoided due to plastic pollution and wildlife concerns.
- Not intended for use as a substitute for Fiber Rolls (SE-5), when fiber rolls are being used as a slope interruption device.
- Do not use on slopes subject to creeping, slumping, or landslides.

Implementation

General

A silt fence is a temporary sediment barrier consisting of woven geotextile stretched across and attached to supporting posts, trenched-in, and, depending upon the strength of fabric used, supported with plastic or wire mesh fence. Silt fences trap coarse sediment by intercepting and detaining sediment-laden runoff from disturbed areas in order to promote sedimentation behind the fence.

The following layout and installation guidance can improve performance and should be followed:

- Silt fence should be used in combination with erosion controls up-slope in order to provide the most effective sediment control.
- Silt fence alone is not effective at reducing turbidity. (Barrett and Malina, 2004)
- Designers should consider diverting sediment laden water to a temporary sediment basin or trap. (EPA, 2012)
- Use principally in areas where sheet flow occurs.
- Install along a level contour, so water does not pond more than 1.5 ft. at any point along the silt fence.
- Provide sufficient room for runoff to pond behind the fence and to allow sediment removal equipment to pass between the silt fence and toes of slopes or other obstructions. About 1200 ft.² of ponding area should be provided for every acre draining to the fence.
- Efficiency of silt fences is primarily dependent on the detention time of the runoff behind the control. (Barrett and Malina, 2004)

- The drainage area above any fence should not exceed a quarter of an acre. (Rule of Thumb-100-feet of silt fence per 10,000 ft.² of disturbed area.) (EPA, 2012)
- The maximum length of slope draining to any point along the silt fence should be 100 ft. per ft of silt fence.
- Turn the ends of the filter fence uphill to prevent stormwater from flowing around the fence.
- Leave an undisturbed or stabilized area immediately down slope from the fence where feasible.
- Silt fences should remain in place until the disturbed area draining to the silt fence is permanently stabilized, after which, the silt fence fabric and posts should be removed and properly disposed.
- J-hooks, which have ends turning up the slope to break up long runs of fence and provide multiple storage areas that work like mini-retention areas, may be used to increase the effectiveness of silt fence.
- Be aware of local regulations regarding the type and installation requirements of silt fence, which may differ from those presented in this fact sheet.

Design and Layout

In areas where high winds are anticipated the fence should be supported by a plastic or wire mesh. The geotextile fabric of the silt fence should contain ultraviolet inhibitors and stabilizers to provide longevity equivalent to the project life or replacement schedule.

- Layout in accordance with the attached figures.
- For slopes that contain a high number of rocks or large dirt clods that tend to dislodge, it may be necessary to protect silt fence from rocks (e.g., rockfall netting) ensure the integrity of the silt fence installation.

Standard vs. Heavy Duty Silt Fence

Standard Silt Fence

- Generally applicable in cases where the area draining to fence produces moderate sediment loads.

Heavy Duty Silt Fence

- Heavy duty silt fence usually has 1 or more of the following characteristics, not possessed by standard silt fence.
 - Fabric is reinforced with wire backing or additional support.
 - Posts are spaced closer than pre-manufactured, standard silt fence products.
- Use is generally limited to areas affected by high winds.
- Area draining to fence produces moderate sediment loads.

Materials

Standard Silt Fence

- Silt fence material should be woven geotextile with a minimum width of 36 in. The fabric should conform to the requirements in ASTM designation D6461.

- Wooden stakes should be commercial quality lumber of the size and shape shown on the plans. Each stake should be free from decay, splits or cracks longer than the thickness of the stake or other defects that would weaken the stakes and cause the stakes to be structurally unsuitable.
- Staples used to fasten the fence fabric to the stakes should be not less than 1.75 in. long and should be fabricated from 15-gauge or heavier wire. The wire used to fasten the tops of the stakes together when joining two sections of fence should be 9 gauge or heavier wire. Galvanizing of the fastening wire will not be required.

Heavy-Duty Silt Fence

- Some silt fence has a wire backing to provide additional support, and there are products that may use prefabricated plastic holders for the silt fence and use metal posts instead of wood stakes.

Installation Guidelines – Traditional Method

Silt fences are to be constructed on a level contour. Sufficient area should exist behind the fence for ponding to occur without flooding or overtopping the fence.

- A trench should be excavated approximately 6 in. wide and 6 in. deep along the line of the proposed silt fence (trenches should not be excavated wider or deeper than necessary for proper silt fence installation).
- Bottom of the silt fence should be keyed-in a minimum of 12 in.
- Posts should be spaced a maximum of 6 ft. apart and driven securely into the ground a minimum of 18 in. or 12 in. below the bottom of the trench.
- When standard strength geotextile is used, a plastic or wire mesh support fence should be fastened securely to the upslope side of posts using heavy-duty wire staples at least 1 in. long. The mesh should extend into the trench.
- When extra-strength geotextile and closer post spacing are used, the mesh support fence may be eliminated.
- Woven geotextile should be purchased in a long roll, then cut to the length of the barrier. When joints are necessary, geotextile should be spliced together only at a support post, with a minimum 6 in. overlap and both ends securely fastened to the post.
- The trench should be backfilled with native material and compacted.
- Construct the length of each reach so that the change in base elevation along the reach does not exceed $\frac{1}{3}$ the height of the barrier; in no case should the reach exceed 500 ft.
- Cross barriers should be a minimum of $\frac{1}{3}$ and a maximum of $\frac{1}{2}$ the height of the linear barrier.
- See typical installation details at the end of this fact sheet.

Installation Guidelines - Static Slicing Method

- Static Slicing is defined as insertion of a narrow blade pulled behind a tractor, similar to a plow blade, at least 10 in. into the soil while at the same time pulling silt geotextile fabric into the ground through the opening created by the blade to the depth of the blade. Once the geotextile is installed, the soil is compacted using tractor tires.
- This method will not work with pre-fabricated, wire backed silt fence.
- Benefits:
 - Ease of installation (most often done with a 2-person crew).
 - Minimal soil disturbance.
 - Better level of compaction along fence, less susceptible to undercutting
 - Uniform installation.
- Limitations:
 - Does not work in shallow or rocky soils.
 - Complete removal of geotextile material after use is difficult.
 - Be cautious when digging near potential underground utilities.

Inspection and Maintenance

- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Repair undercut silt fences.
- Repair or replace split, torn, slumping, or weathered fabric. The lifespan of silt fence fabric is generally 5 to 8 months.
- Silt fences that are damaged and become unsuitable for the intended purpose should be removed from the site of work, disposed, and replaced with new silt fence barriers.
- Sediment that accumulates in the BMP should be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches 1/3 of the barrier height.
- Silt fences should be left in place until the upgradient area is permanently stabilized. Until then, the silt fence should be inspected and maintained regularly.
- Remove silt fence when upgradient areas are stabilized. Fill and compact post holes and anchor trench, remove sediment accumulation, grade fence alignment to blend with adjacent ground, and stabilize disturbed area.

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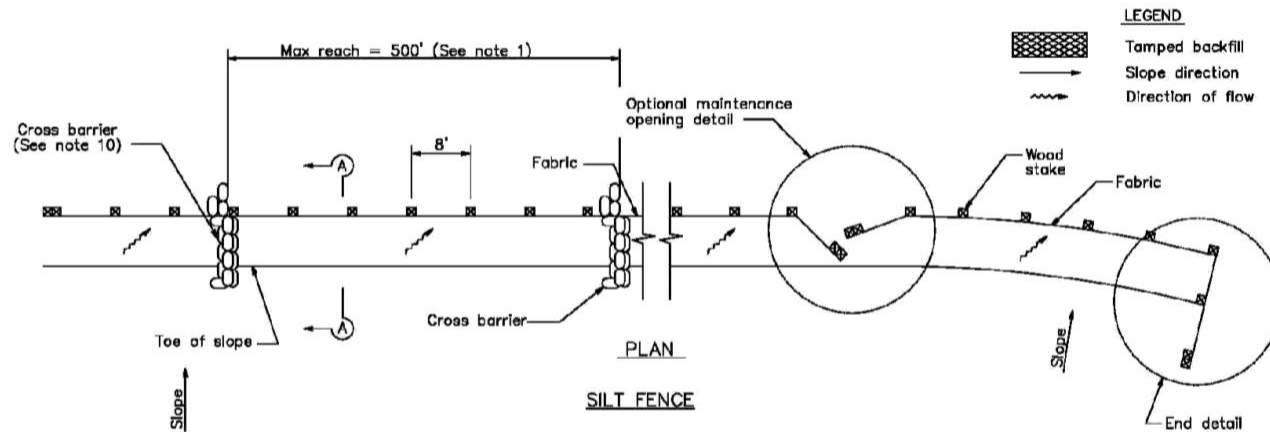
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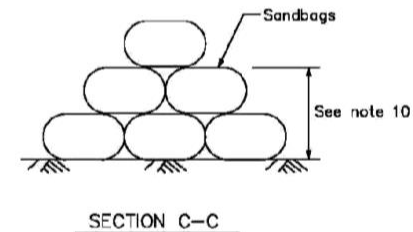
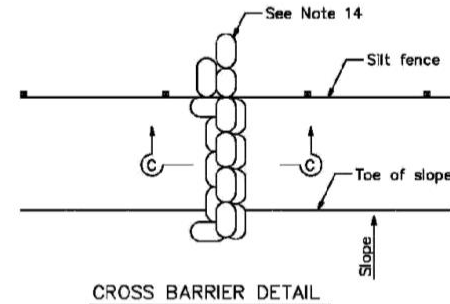
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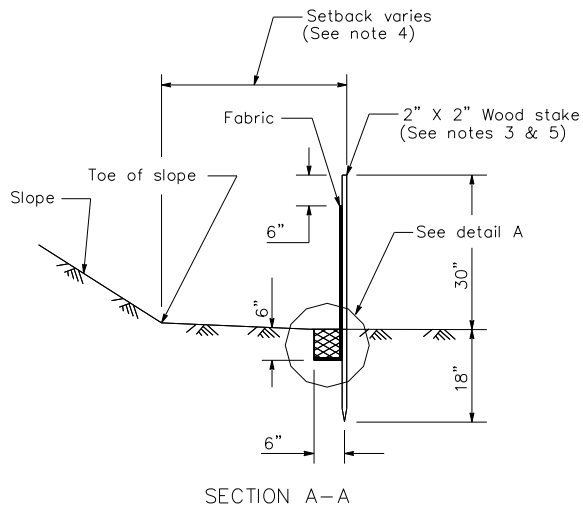
Erosion and Sediment Control Manual, Oregon Department of Environmental Quality, February 2005.



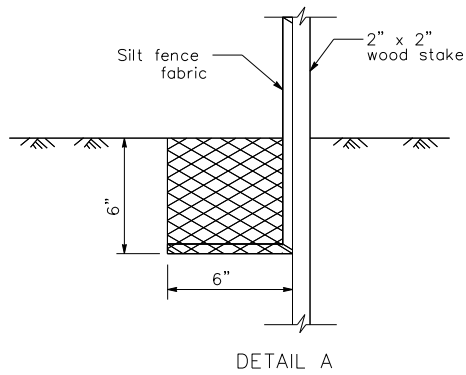
NOTES

- Construct the length of each reach so that the change in base elevation along the reach does not exceed $\frac{1}{3}$ the height of the linear barrier, in no case shall the reach length exceed 500'.
- The last 8'-0" of fence shall be turned up slope.
- Stake dimensions are nominal.
- Dimension may vary to fit field condition.
- Stakes shall be spaced at 8'-0" maximum and shall be positioned on downstream side of fence.
- Stakes to overlap and fence fabric to fold around each stake one full turn. Secure fabric to stake with 4 staples.
- Stakes shall be driven tightly together to prevent potential flow-through of sediment at joint. The tops of the stakes shall be secured with wire.
- For end stake, fence fabric shall be folded around two stakes one full turn and secured with 4 staples.
- Minimum 4 staples per stake. Dimensions shown are typical.
- Cross barriers shall be a minimum of $\frac{1}{3}$ and a maximum of $\frac{1}{2}$ the height of the linear barrier.
- Maintenance openings shall be constructed in a manner to ensure sediment remains behind silt fence.
- Joining sections shall not be placed at sump locations.
- Sandbag rows and layers shall be offset to eliminate gaps.
- Add 3-4 bags to cross barrier on downgradient side of silt fence as needed to prevent bypass or undermining and as allowable based on site limits of disturbance.

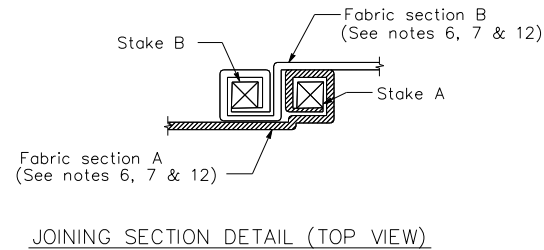




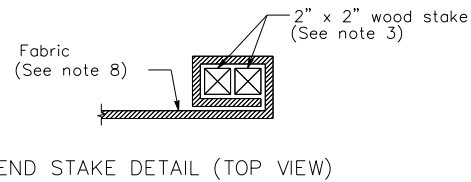
SECTION A-A



DETAIL A



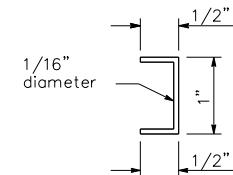
JOINING SECTION DETAIL (TOP VIEW)



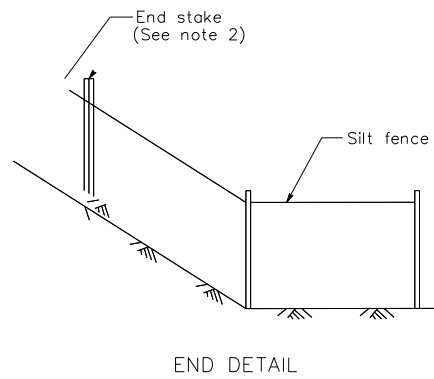
END STAKE DETAIL (TOP VIEW)



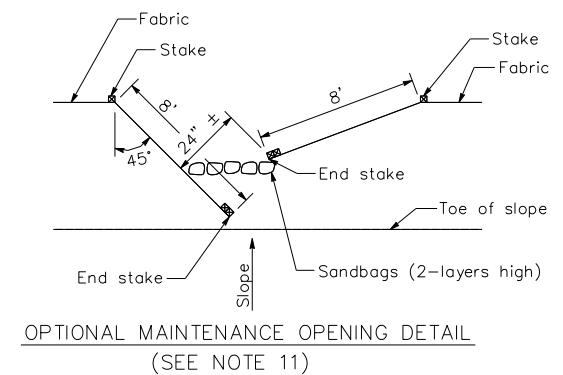
LEGEND



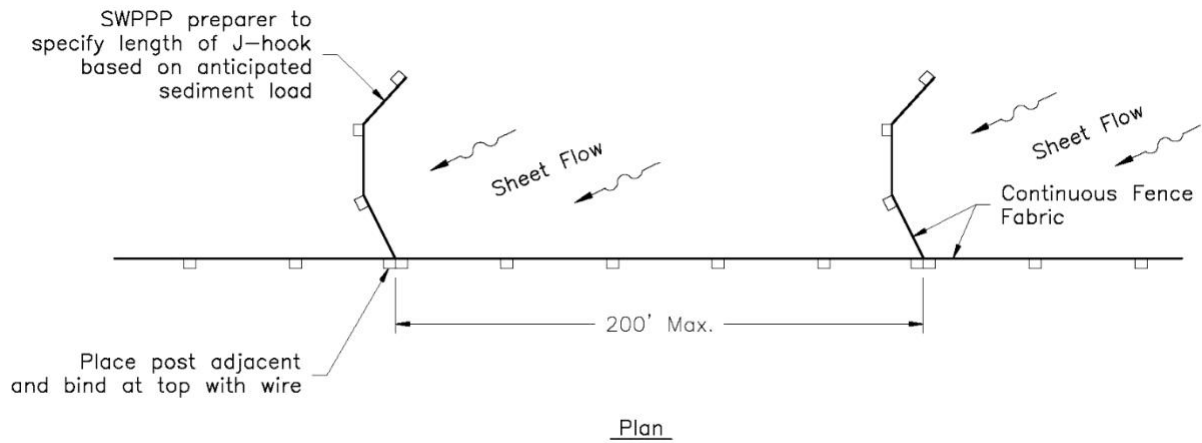
STAPLE DETAIL
(SEE NOTE 9)



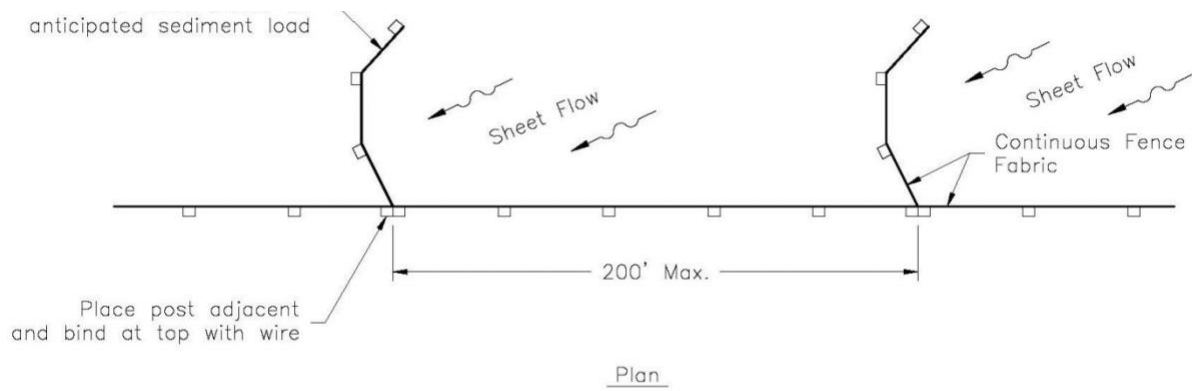
END DETAIL



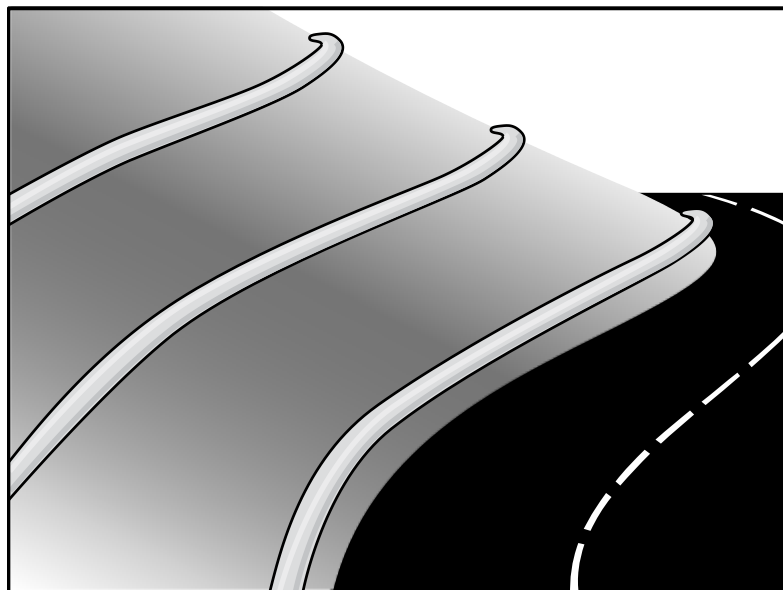
OPTIONAL MAINTENANCE OPENING DETAIL
(SEE NOTE 11)



J-HOOK



J-HOOK



Description and Purpose

A fiber roll (also known as a wattle or log) consists of straw, coir, curled wood fiber, or other biodegradable materials bound into a tight tubular roll wrapped by netting. Additionally, gravel core fiber rolls are available, which contain an imbedded ballast material such as gravel or sand for additional weight, when staking the rolls are not feasible (such as use as inlet protection).

When fiber rolls are placed at the top, toe, and on the face of slopes along the contours, fiber rolls intercept runoff, reduce flow velocity, release runoff as sheet flow, and provide sediment removal from the runoff (through sedimentation). By interrupting the length of a slope, fiber rolls can also reduce sheet and rill erosion until vegetation is established.

Suitable Applications

Fiber rolls may be suitable:

- Along the top, toe, face, and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow.
- At the end of a downward slope where it transitions to a steeper slope.
- Along the perimeter of a project.
- As check dams in unlined ditches with minimal grade.
- Down-slope of exposed soil areas.

Categories

EC	Erosion Control	☒
SE	Sediment Control	☒
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

- ☒ **Primary Category**
- ☒ **Secondary Category**

Targeted Constituents

Sediment	☒
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

- SE-1 Silt Fence
- SE-6 Gravel Bag Berm
- SE-8 Sandbag Barrier
- SE-12 Manufactured Linear Sediment Controls
- SE-13 Compost Socks and Berms
- SE-14 Biofilter Bags

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- At operational storm drains as a form of inlet protection.
- Around temporary stockpiles.

Limitations

- Fiber rolls are to be used in conjunction with erosion control, such as hydroseed, mulch, rolled erosion control products (RECPs), etc.
- Only biodegradable fiber rolls containing no plastic can remain on a site when applying for a Notice of Termination (NOT) due to plastic pollution and wildlife concerns. There may be further limitations on the use of plastic wrapped fiber rolls in wildlife sensitive areas. Fiber rolls containing plastic must be removed and disposed of prior to final stabilization.
- Do not install fiber rolls in high traffic areas where vehicles and equipment will displace or damage them.
- Do not use fiber rolls on paved surfaces where they cannot be staked and trenched in. Only gravel core rolls may be effective in this situation. See Gravel Bags (SE-6), Manufactured Linear Sediment Controls (SE-12), Compost Socks and Berms (SE-13), and Biofilter Bags (SE-14) for situations where staking or trenching is not possible.
- Do not use fiber rolls on slopes subject to creep, slumping, or landslides.
- Improper installation of a fiber roll such as not being trenched in, not staked appropriately, or not sufficiently overlapping at the ends, may cause undercutting and increased erosion.
- Fiber rolls installed by the Type 1 method are not effective unless trenched in and staked. If not properly staked and trenched in, fiber rolls will not work as intended and could be transported by high flows.
- Fiber rolls installed by the Type 2 method are not effective unless staked. If not properly staked in, fiber rolls will not work as intended and could be transported by high flows.
- Not intended for use in concentrated flows.
- Not intended to contain stormwater. See Sediment Basin (SE-2) or Sediment Trap (SE-3) for stormwater containment BMPs.
- Difficult to move once saturated.
- Difficult to repair when a small section of the fiber roll is damaged. Replacement of the entire fiber roll or installation of an additional fiber roll adjacent to the damage is often required.
- Fiber rolls are susceptible to damage from wildlife.
- Fiber rolls have a limited sediment capture zone.
- Fiber rolls typically function for 12-24 months, depending upon local conditions, roll material, and installation method. For example, the Type 2 installation method may last longer than the Type 1 installation method because the fiber roll is not penetrated.

- Fiber rolls that come manufactured containing polyacrylamide (PAM), a flocculating agent within the roll, are considered passive treatment technologies and are subject to additional requirements, see Passive Treatment (SE-15).

Implementation

Fiber Roll Materials

- Fiber rolls are to be prefabricated.
- Fiber rolls are made from weed-free rice straw, flax, curled wood fiber, or coir bound into a tight tubular roll by netting or wrap (see Limitations above regarding plastic netting).
- Typical fiber rolls vary in diameter from 6 in. to 20 in. Larger diameter rolls are available as well. The larger the roll diameter, the higher the sediment retention capacity.
- Typical fiber rolls lengths are 4, 10, 20 and 25 ft., although other lengths may be available.

Installation

- Locate fiber rolls on level contours spaced as follows:
 - Slope inclination between 20:1 and 4:1 (H:V): Place fiber rolls at a maximum interval of 35 ft.
 - Slope inclination of 4:1 (H:V): Place fiber rolls at a maximum interval of 20 ft.
 - Slope inclination between 4:1 and 2:1 (H:V): Place fiber rolls at a maximum interval of 15 ft. (a closer spacing is more effective).
 - Slope inclination 2:1 (H:V) or greater: Place fiber rolls at a maximum interval of 10 ft. (a closer spacing is more effective).
- It is critical that fiber rolls are installed perpendicular to water flow and parallel to the slope contour.
- Prepare the slope before beginning installation.
- Dig small trenches across the slope on the contour. The trench depth is to be $\frac{1}{4}$ to $\frac{1}{3}$ of the thickness of the roll, and the width is to be equal to the roll diameter, in order to provide area to backfill the trench.
- Use wood stakes with a nominal classification of 0.75 by 0.75 in. and minimum length of 24 in.
- For Type 1 installations:
 - Place in a trench that is from 2 to 4 inches deep.
 - Fasten with wood stakes every 4 feet along the length of the fiber roll.
 - Fasten the ends of the fiber roll by placing a stake 6 inches from the end of the roll.

- Drive the stakes into the soil so the top of the stake is less than 2 inches above the top of the fiber roll.
- For Type 2 installations (Caltrans, 2024):
 - Trenching in the fiber rolls is optional.
 - J-hook the ends of the fiber roll up-slope to prevent runoff from going around the fiber roll.
 - Drive stakes along alternating sides of each fiber roll, spaced 2 ft. apart. Stakes are to alternate between upslope and downslope of the fiber roll.
 - Lace the rope tightly around the stakes and over the fiber roll. Knot the rope at each stake.
 - Tighten the fiber roll to the surface of the slope by driving the stakes further into the soil.
- If more than one fiber roll is placed in a row, the rolls should overlap, not abut at the ends. Stagger overlapping joints in adjacent rows by 5 to 10 feet.
- See typical fiber roll installation details at the end of this fact sheet.

Removal

- Fiber rolls can be left in place or be removed depending on the type of fiber roll and its application (temporary vs. permanent installation).
- For temporary installations, only remove fiber rolls when upgradient areas are stabilized per General Permit requirements, and/or pollutant sources are no longer present. Remove fiber rolls before vegetation becomes too mature so that the removal process does not disturb more soil and vegetation than is necessary.
- For permanent installations for final stabilization, fiber rolls encased with plastic netting or containing any plastic material are to be removed from the site. If a fiber roll is to be left in place as part of a final stabilization design, the fiber roll must be non-plastic, made of plant-based materials (e.g., burlap-wrapped, coconut jute netting, and any other plant-based netting), and fully biodegradable.
- Fiber rolls can be an effective component of a final stabilization system, if all components of the fiber rolls are plant-based, fully biodegradable, and the fiber rolls are coupled with fully biodegradable effective erosion control measures (hydroseeding, RECPs, etc.) properly applied/installed per manufacturer's specifications and/or per the current CASQA BMP Fact Sheets. Removal of fiber rolls that are used as part of a final stabilization system can result in greater disturbance; therefore, during the BMP planning phase, only specify fiber rolls wrapped in non-plastic fully biodegradable materials for areas where fiber rolls will be used on final slopes.

Inspection and Maintenance

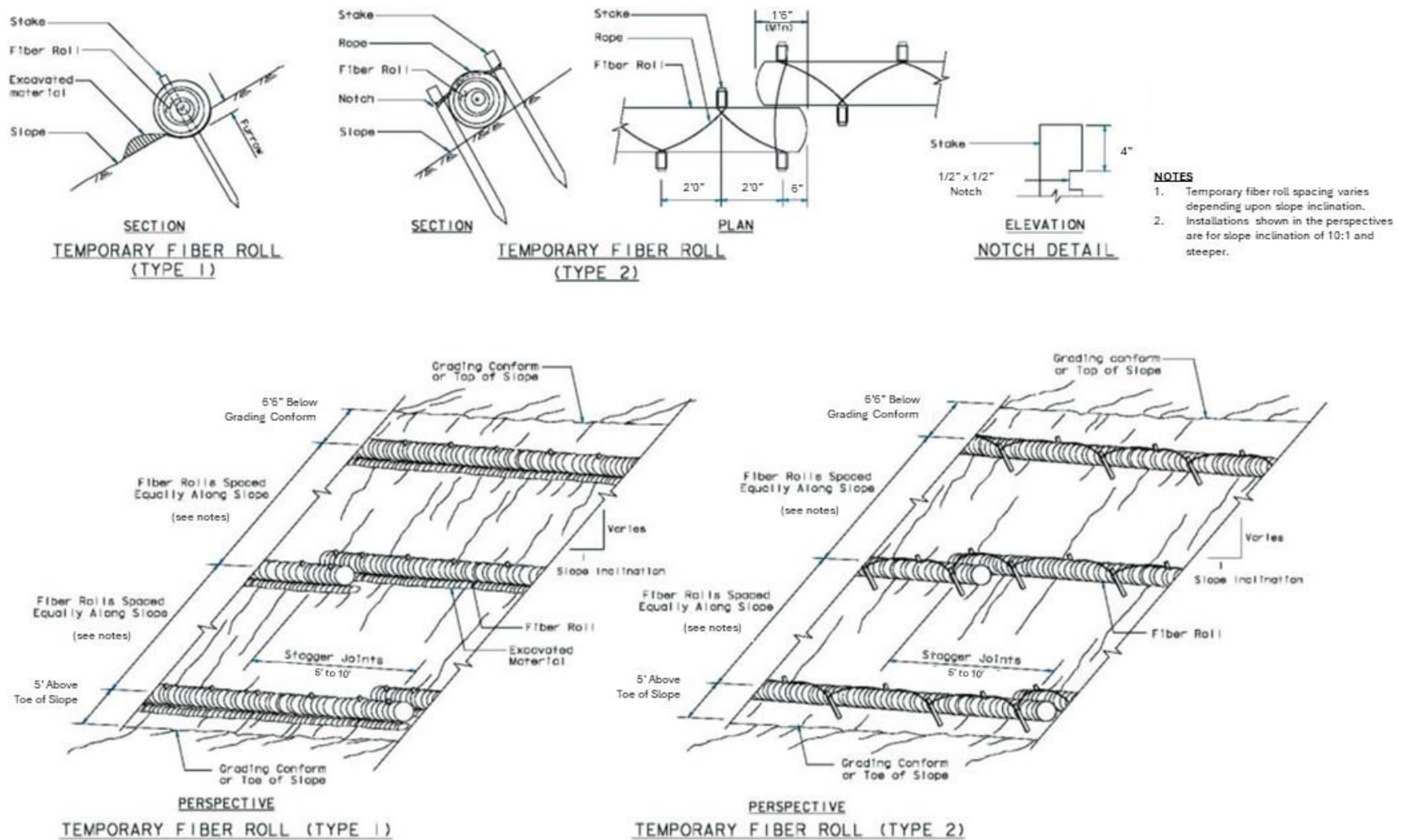
- BMPs are to be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that BMPs be inspected weekly at a minimum and prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Repair/replace split, torn, unraveling, or slumping fiber rolls as needed.
- Replace fiber rolls when they are disintegrated, flattened, and no longer effective.
- If construction activities or access to a work area are impaired by a fiber roll, move the fiber roll to avoid its damage or disintegration. Reinstall the fiber roll once active work is complete.
- If a fiber roll is used as a sediment capture device, or as an erosion control device to maintain sheet flows, periodically remove sediment that accumulates upgradient of the fiber roll to maintain BMP effectiveness. Remove sediment when sediment accumulation reaches one-third of the height of the fiber roll.
- If fiber rolls are used for erosion control, such as in a check dam, sediment removal may not be required as long as the system continues to control the grade. Sediment control BMPs will be implemented in conjunction with this type of application.
- Repair any undercutting, rills, and gullies promptly.

References and Additional Resources

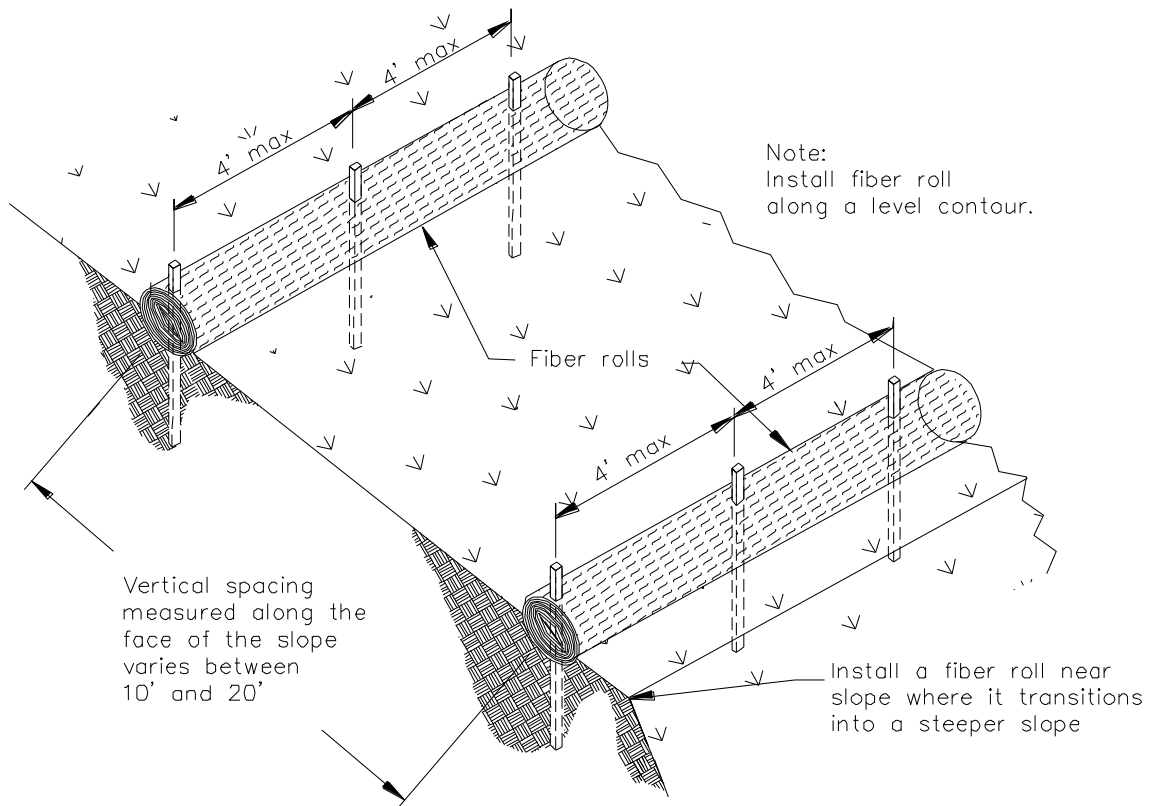
Construction Site Best Management Practices (BMPs) Manual, CTSW-RT-24-425-11.1, Section 4, Fiber Rolls SC-5, California Department of Transportation (Caltrans), March 2024.

Construction Stormwater Program website, State Water Resources Control Board, online at: https://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.html

Order 2022-0057-DWQ, NPDES General Permit No. CAS000002: National Pollutant Discharge Elimination System (NDPES) General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (General Permit), California State Water Resources Control Board (State Water Board), September 2022.

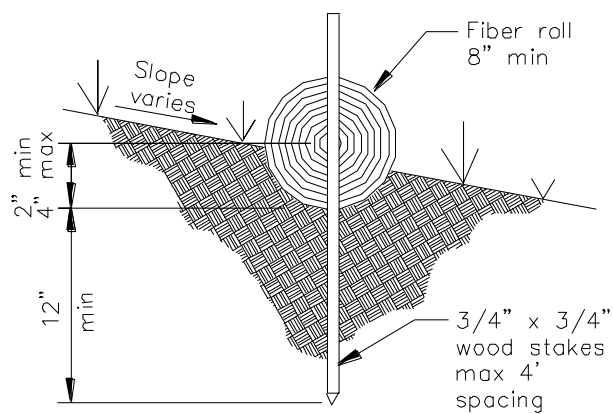


Reference: Construction Site Best Management Practices (BMPs) Manual, CTSW-RT-24-425-11.1, Section 4, Fiber Rolls SC-5, California Department of Transportation (Caltrans), March 2024.



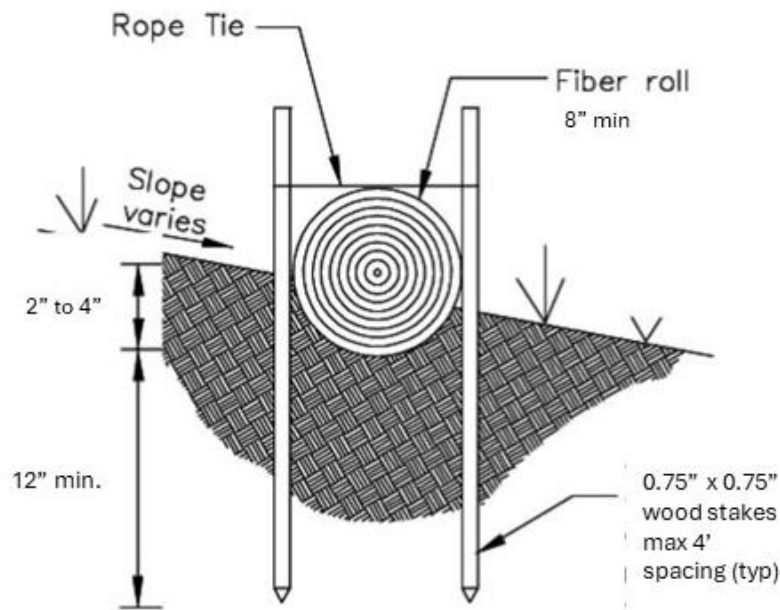
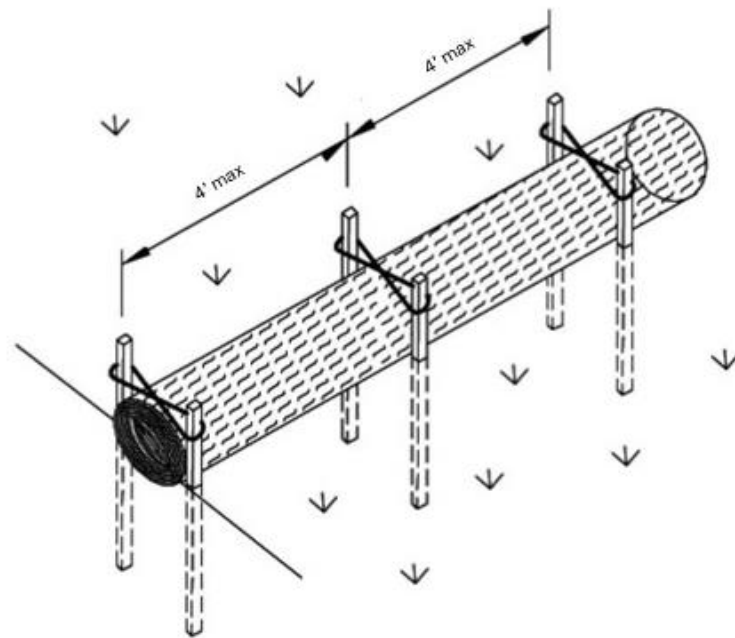
TYPICAL FIBER ROLL INSTALLATION

N.T.S.



ENTRENCHMENT DETAIL

N.T.S.



OPTIONAL ENTRENCHMENT DETAIL

N.T.S.

Reference: Construction Site Best Management Practices (BMPs) Manual, CTSW-RT-24-425-11.1, Section 4, Fiber Rolls SC-5, California Department of Transportation (Caltrans), March 2024.



Description and Purpose

Street sweeping and vacuuming includes use of self-propelled and walk-behind equipment to remove sediment from streets and roadways and to clean paved surfaces in preparation for final paving. Sweeping and vacuuming prevents sediment from the project site from entering storm drains or receiving waters.

Suitable Applications

Sweeping and vacuuming are suitable anywhere sediment is tracked from the project site onto public or private paved streets and roads, typically at points of egress. Sweeping and vacuuming are also applicable during preparation of paved surfaces for final paving.

Limitations

- Sweeping and vacuuming may not be effective when sediment is wet or when tracked soil is caked (caked soil may need to be scraped loose).
- Sweeping may be less effective for fine particle soils (i.e., clay).

Implementation

- Controlling the number of points where vehicles can leave the site will allow sweeping and vacuuming efforts to be focused and perhaps save money.
- Inspect potential sediment tracking locations daily.

Categories

EC	Erosion Control	
SE	Sediment Control	☒
TC	Tracking Control	☒
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

- ☒ **Primary Objective**
- ☒ **Secondary Objective**

Targeted Constituents

Sediment	☒
Nutrients	
Trash	☒
Metals	
Bacteria	
Oil and Grease	☒
Organics	

Potential Alternatives

None

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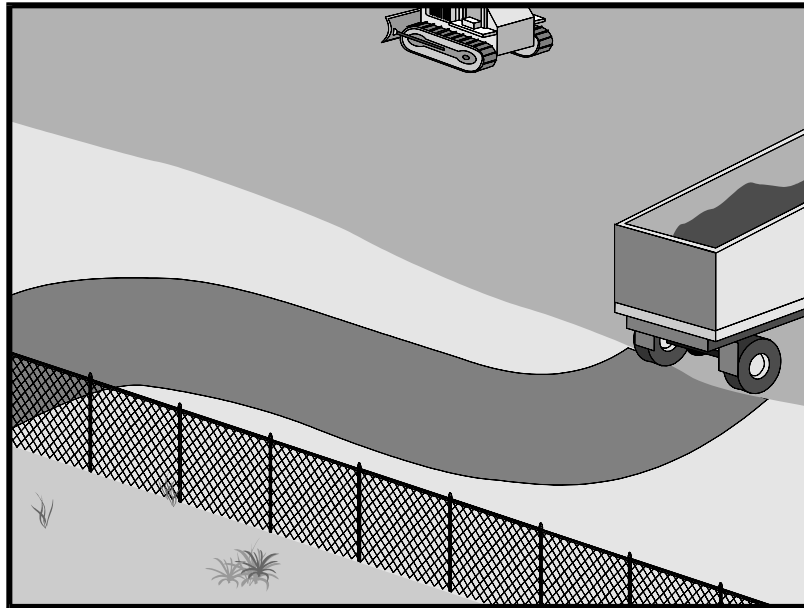
- Visible sediment tracking should be swept or vacuumed on a daily basis.
- Do not use kick brooms or sweeper attachments. These tend to spread the dirt rather than remove it.
- If not mixed with debris or trash, consider incorporating the removed sediment back into the project

Inspection and Maintenance

- Inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- When actively in use, points of ingress and egress must be inspected daily.
- When tracked or spilled sediment is observed outside the construction limits, it must be removed at least daily. More frequent removal, even continuous removal, may be required in some jurisdictions.
- Be careful not to sweep up any unknown substance or any object that may be potentially hazardous.
- Adjust brooms frequently; maximize efficiency of sweeping operations.
- After sweeping is finished, properly dispose of sweeper wastes at an approved dumpsite.

References and Additional Resources

Construction Site Best Management Practices (BMPs) Manual CTSW-RT-24-425.11.1, California Department of Transportation (Caltrans), March 2024.



Categories

EC	Erosion Control	☒
SE	Sediment Control	☒
TC	Tracking Control	☒
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

- ☒ Primary Objective
- ☒ Secondary Objective

Targeted Constituents

Sediment	☒
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Description and Purpose

Access roads, subdivision roads, parking areas, and other onsite vehicle transportation routes should be stabilized immediately after grading, and frequently maintained to prevent erosion and control dust.

Suitable Applications

This BMP should be applied for the following conditions:

- Temporary Construction Traffic:
 - Phased construction projects and offsite road access
 - Construction during wet weather
- Construction roadways and detour roads:
 - Where mud tracking is a problem during wet weather
 - Where dust is a problem during dry weather
 - Adjacent to water bodies
 - Where poor soils are encountered

Limitations

- The roadway must be removed or paved when construction is complete.
- Certain chemical stabilization methods may cause stormwater or soil pollution and should not be used. See WE-1, Wind Erosion Control.

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- Management of construction traffic is subject to air quality control measures. Contact the local air quality management agency.
- Materials will likely need to be removed prior to final project grading and stabilization.
- Use of this BMP may not be applicable to very short duration projects.

Implementation

General

Areas that are graded for construction vehicle transport and parking purposes are especially susceptible to erosion and dust. The exposed soil surface is continually disturbed, leaving no opportunity for vegetative stabilization. Such areas also tend to collect and transport runoff waters along their surfaces. During wet weather, they often become muddy quagmires that generate significant quantities of sediment that may pollute nearby streams or be transported offsite on the wheels of construction vehicles. Dirt roads can become so unstable during wet weather that they are virtually unusable.

Efficient construction road stabilization not only reduces onsite erosion but also can significantly speed onsite work, avoid instances of immobilized machinery and delivery vehicles, and generally improve site efficiency and working conditions during adverse weather

Installation/Application Criteria

Permanent roads and parking areas should be paved as soon as possible after grading. As an alternative where construction will be phased, the early application of gravel or chemical stabilization may solve potential erosion and stability problems. Temporary gravel roadway should be considered during the rainy season and on slopes greater than 5%.

Temporary roads should follow the contour of the natural terrain to the maximum extent possible. Slope should not exceed 15%. Roadways should be carefully graded to drain transversely. Provide drainage swales on each side of the roadway in the case of a crowned section or one side in the case of a super elevated section. Simple gravel berms without a trench can also be used.

Installed inlets should be protected to prevent sediment laden water from entering the storm sewer system (SE-10, Storm Drain Inlet Protection). In addition, the following criteria should be considered.

- Road should follow topographic contours to reduce erosion of the roadway.
- The roadway slope should not exceed 15%.
- Chemical stabilizers or water are usually required on gravel or dirt roads to prevent dust (WE-1, Wind Erosion Control).
- Properly grade roadway to prevent runoff from leaving the construction site.
- Design stabilized access to support heaviest vehicles and equipment that will use it.
- Coordinate materials with those used for stabilized construction entrance/exit points.

- Stabilize roadway using aggregate, asphalt concrete, or concrete based on longevity, required performance, and site conditions. The use of cold mix asphalt or asphalt concrete (AC) grindings for stabilized construction roadway is not allowed.
- If aggregate is selected, place crushed aggregate over geotextile fabric to at least 12 in. depth. A crushed aggregate greater than 3 in. but smaller than 6 in. should be used.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Keep all temporary roadway ditches clear.
- When no longer required, remove stabilized construction roadway and re-grade and repair slopes.
- Periodically apply additional aggregate on gravel roads.
- Active dirt construction roads are commonly watered three or more times per day during the dry season.

References and Additional Resources

Construction Site Best Management Practices (BMPs) Manual, CTSW-RT-24-425.11.1, California Department of Transportation (Caltrans), March 2024.

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Coastal Nonpoint Pollution Control Program; Program Development and Approval Guidance, Working Group, Working Paper; USEPA, April 1992.

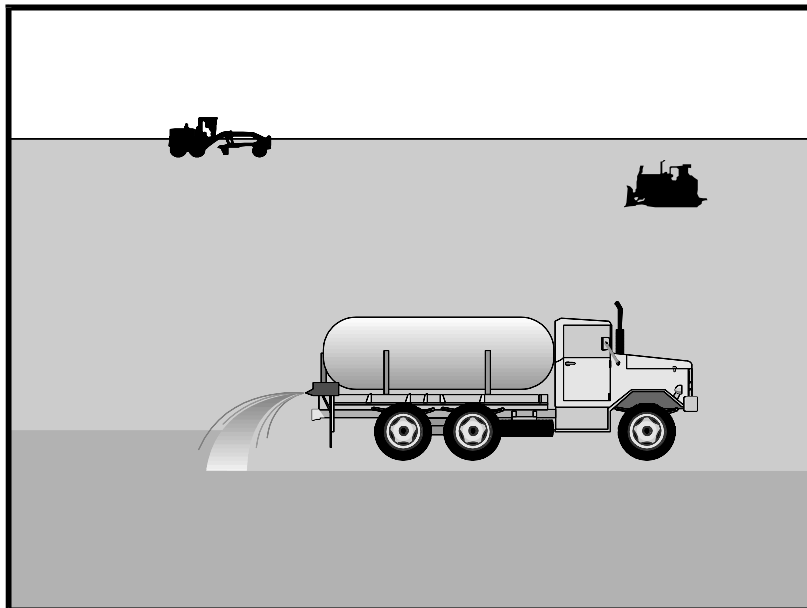
Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, May 1995.

Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

Stormwater Management of the Puget Sound Basin, Technical Manual, Publication #91-75, Washington State Department of Ecology, February 1992.

Virginia Erosion and Sedimentation Control Handbook, Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation, 1991.

Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency, November 1988.



Description and Purpose

Wind erosion or dust control consists of applying water or other chemical dust suppressants as necessary to prevent or alleviate dust nuisance generated by construction activities. Covering small stockpiles or areas is an alternative to applying water or other dust palliatives.

California's Mediterranean climate, with a short "wet" season and a typically long, hot "dry" season, allows the soils to thoroughly dry out. During the dry season, construction activities are at their peak, and disturbed and exposed areas are increasingly subject to wind erosion, sediment tracking, and dust generated by construction equipment. Site conditions and climate can make dust control more of an erosion problem than water-based erosion. Additionally, many local agencies, including Air Quality Management Districts, require dust control and/or dust control permits in order to comply with local nuisance laws, opacity laws (visibility impairment) and the requirements of the Clean Air Act. Wind erosion control is required to be implemented at all construction sites greater than 1 acre by the General Permit.

Suitable Applications

Most BMPs that provide protection against water-based erosion will also protect against wind-based erosion and dust control requirements required by other agencies will generally meet wind erosion control requirements for water quality protection. Wind erosion control BMPs are suitable during the following construction activities:

Categories

EC	Erosion Control	
SE	Sediment Control	☒
TC	Tracking Control	
WE	Wind Erosion Control	☒
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

- ☒ **Primary Category**
- ☒ **Secondary Category**

Targeted Constituents

Sediment	☒
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

EC-5 Soil Binders

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- Construction vehicle traffic on unpaved roads
- Drilling and blasting activities
- Soils and debris storage piles
- Batch drop from front-end loaders
- Areas with unstabilized soil
- Final grading/site stabilization

Limitations

- Watering prevents dust only for a short period (generally less than a few hours) and should be applied daily (or more often) to be effective.
- Over watering may cause erosion and track-out.
- Oil or oil-treated subgrade should not be used for dust control because the oil may migrate into drainageways and/or seep into the soil.
- Chemical dust suppression agents may have potential environmental impacts. Selected chemical dust control agents should be environmentally benign.
- Effectiveness of controls depends on soil, temperature, humidity, wind velocity and traffic.
- Chemical dust suppression agents should not be used within 100 feet of wetlands or water bodies.
- Chemically treated subgrades may make the soil water repellant, interfering with long-term infiltration and the vegetation/re-vegetation of the site. Some chemical dust suppressants may be subject to freezing and may contain solvents and should be handled properly.
- In compacted areas, watering and other liquid dust control measures may wash sediment or other constituents into the drainage system.
- If the soil surface has minimal natural moisture, the affected area may need to be pre-wetted so that chemical dust control agents can uniformly penetrate the soil surface.

Implementation

Dust Control Practices

Dust control BMPs generally stabilize exposed surfaces and minimize activities that suspend or track dust particles. The following table presents dust control practices that can be applied to varying site conditions that could potentially cause dust. For heavily traveled and disturbed areas, wet suppression (watering), chemical dust suppression, gravel asphalt surfacing, temporary gravel construction entrances, equipment wash-out areas, and haul truck covers can be employed as dust control applications. Permanent or temporary vegetation and mulching can be employed for areas of occasional or no construction traffic. Preventive measures include

minimizing surface areas to be disturbed, limiting onsite vehicle traffic to 15 mph or less, and controlling the number and activity of vehicles on a site at any given time.

Chemical dust suppressants include: mulch and fiber based dust palliatives (e.g. paper mulch with gypsum binder), salts and brines (e.g. calcium chloride, magnesium chloride), non-petroleum based organics (e.g. vegetable oil, lignosulfonate), petroleum based organics (e.g. asphalt emulsion, dust oils, petroleum resins), synthetic polymers (e.g. polyvinyl acetate, vinyl, acrylic), clay additives (e.g. bentonite, montmorillonite) and electrochemical products (e.g. enzymes, ionic products).

Site Condition	Dust Control Practices							
	Permanent Vegetation	Mulching	Wet Suppression (Watering)	Chemical Dust Suppression	Gravel or Asphalt	Temporary Gravel Construction Entrances/Equipment Wash Down	Synthetic Covers	Minimize Extent of Disturbed Area
Disturbed Areas not Subject to Traffic	X	X	X	X	X			X
Disturbed Areas Subject to Traffic			X	X	X	X		X
Material Stockpiles		X	X	X			X	X
Demolition			X			X	X	
Clearing/Excavation			X	X				X
Truck Traffic on Unpaved Roads			X	X	X	X	X	
Tracking					X	X		

Additional preventive measures include:

- Schedule construction activities to minimize exposed area (see EC-1, Scheduling).
- Quickly treat exposed soils using water, mulching, chemical dust suppressants, or stone/gravel layering.
- Identify and stabilize key access points prior to commencement of construction.
- Minimize the impact of dust by anticipating the direction of prevailing winds.
- Restrict construction traffic to stabilized roadways within the project site, as practicable.
- Water should be applied by means of pressure-type distributors or pipelines equipped with a spray system or hoses and nozzles that will ensure even distribution.
- All distribution equipment should be equipped with a positive means of shutoff.
- Unless water is applied by means of pipelines, at least one mobile unit should be available at all times to apply water or dust palliative to the project.
- If reclaimed waste water is used, the sources and discharge must meet California Department of Health Services water reclamation criteria and the Regional Water Quality

Control Board (RWQCB) requirements. Non-potable water should not be conveyed in tanks or drain pipes that will be used to convey potable water and there should be no connection between potable and non-potable supplies. Non-potable tanks, pipes, and other conveyances should be marked, "NON-POTABLE WATER - DO NOT DRINK."

- Pave or chemically stabilize access points where unpaved traffic surfaces adjoin paved roads.
- Provide covers for haul trucks transporting materials that contribute to dust.
- Provide for rapid clean up of sediments deposited on paved roads. Furnish stabilized construction road entrances and wheel wash areas.
- Stabilize inactive areas of construction sites using temporary vegetation or chemical stabilization methods.

For chemical stabilization, there are many products available for chemically stabilizing gravel roadways and stockpiles. If chemical stabilization is used, the chemicals should not create any adverse effects on stormwater, plant life, or groundwater and should meet all applicable regulatory requirements.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities.
- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Check areas protected to ensure coverage.
- Most water-based dust control measures require frequent application, often daily or even multiple times per day. Obtain vendor or independent information on longevity of chemical dust suppressants.

References and Additional Resources

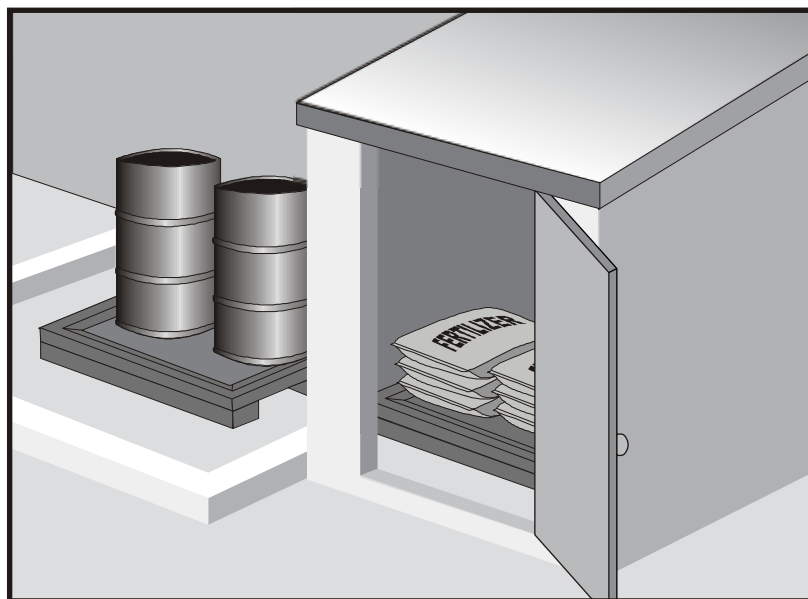
Best Management Practices and Erosion Control Manual for Construction Sites, Flood Control District of Maricopa County, Arizona, September 1992.

California Air Pollution Control Laws, California Air Resources Board, updated annually.

Construction Manual, Chapter 4, Section 10, "Dust Control"; Section 17, "Watering"; and Section 18, "Dust Palliative", California Department of Transportation (Caltrans), July 2001.

Construction Site Best Management Practices (BMPs) Manual, CTSW-RT-24-425.11.1, California Department of Transportation (Caltrans), March 2024.

Prospects for Attaining the State Ambient Air Quality Standards for Suspended Particulate Matter (PM₁₀), Visibility Reducing Particles, Sulfates, Lead, and Hydrogen Sulfide, California Air Resources Board, April 1991.



Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☒

Legend:

- ☒ **Primary Category**
- ☒ **Secondary Category**

Description and Purpose

Prevent, reduce, or eliminate the discharge of pollutants from material delivery and storage to the stormwater system or watercourses by minimizing the storage of hazardous materials onsite, storing materials in watertight containers and/or a completely enclosed designated area, installing secondary containment, conducting regular inspections, and training employees and subcontractors.

This best management practice covers only material delivery and storage. For other information on materials, see WM-2, Material Use, or WM-4, Spill Prevention and Control. For information on wastes, see the waste management BMPs in this section.

Suitable Applications

These procedures are suitable for use at all construction sites with delivery and storage of the following materials:

- Soil stabilizers and binders
- Pesticides and herbicides
- Fertilizers
- Detergents
- Plaster
- Petroleum products such as fuel, oil, and grease

Targeted Constituents

Sediment	☒
Nutrients	☒
Trash	☒
Metals	☒
Bacteria	
Oil and Grease	☒
Organics	☒

Potential Alternatives

None

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- Asphalt and concrete components
- Hazardous chemicals such as acids, lime, glues, adhesives, paints, solvents, and curing compounds
- Concrete compounds
- Other materials that may be detrimental if released to the environment

Limitations

- Space limitation may preclude indoor storage.
- Storage sheds often must meet building and fire code requirements.

Implementation

The following steps should be taken to minimize risk:

- Chemicals must be stored in water tight containers with appropriate secondary containment or in a storage shed.
- When a material storage area is located on bare soil, the area should be lined and bermed.
- Use containment pallets or other practical and available solutions, such as storing materials within newly constructed buildings or garages, to meet material storage requirements.
- Stack erodible landscape material on pallets and cover when not in use.
- Contain all fertilizers and other landscape materials when not in use.
- Temporary storage areas should be located away from vehicular traffic.
- Material Safety Data Sheets (MSDS) should be available on-site for all materials stored that have the potential to effect water quality.
- Construction site areas should be designated for material delivery and storage.
- Material delivery and storage areas should be located away from waterways, if possible.
 - Avoid transport near drainage paths or waterways.
 - Surround with earth berms or other appropriate containment BMP. See EC-9, Earth Dikes and Drainage Swales.
 - Place in an area that will be paved.
- Storage of reactive, ignitable, or flammable liquids must comply with the fire codes of your area. Contact the local Fire Marshal to review site materials, quantities, and proposed storage area to determine specific requirements. See the Flammable and Combustible Liquid Code, NFPA30.
- An up to date inventory of materials delivered and stored onsite should be kept.

- Hazardous materials storage onsite should be minimized.
- Hazardous materials should be handled as infrequently as possible.
- Keep ample spill cleanup supplies appropriate for the materials being stored. Ensure that cleanup supplies are in a conspicuous, labeled area.
- Employees and subcontractors should be trained on the proper material delivery and storage practices.
- Employees trained in emergency spill cleanup procedures must be present when dangerous materials or liquid chemicals are unloaded.
- If significant residual materials remain on the ground after construction is complete, properly remove and dispose of materials and any contaminated soil. See WM-7, Contaminated Soil Management. If the area is to be paved, pave as soon as materials are removed to stabilize the soil.

Material Storage Areas and Practices

- Liquids, petroleum products, and substances listed in 40 CFR Parts 110, 117, or 302 should be stored in approved containers and drums and should not be overfilled. Containers and drums should be placed in temporary containment facilities for storage.
- A temporary containment facility should provide for a spill containment volume able to contain precipitation from a 25-year storm event, plus the greater of 10% of the aggregate volume of all containers or 100% of the capacity of the largest container within its boundary, whichever is greater.
- A temporary containment facility should be impervious to the materials stored therein for a minimum contact time of 72 hours.
- A temporary containment facility should be maintained free of accumulated rainwater and spills. In the event of spills or leaks, accumulated rainwater and spills should be collected and placed into drums. These liquids should be handled as a hazardous waste unless testing determines them to be non-hazardous. All collected liquids or non-hazardous liquids should be sent to an approved disposal site.
- Sufficient separation should be provided between stored containers to allow for spill cleanup and emergency response access.
- Incompatible materials, such as chlorine and ammonia, should not be stored in the same temporary containment facility.
- Materials should be covered prior to, and during rain events.
- Materials should be stored in their original containers and the original product labels should be maintained in place in a legible condition. Damaged or otherwise illegible labels should be replaced immediately.

- Bagged and boxed materials should be stored on pallets and should not be allowed to accumulate on the ground. To provide protection from wind and rain throughout the rainy season, bagged and boxed materials should be covered during non-working days and prior to and during rain events.
- Stockpiles should be protected in accordance with WM-3, Stockpile Management.
- Materials should be stored indoors within existing structures or completely enclosed storage sheds when available.
- Proper storage instructions should be posted at all times in an open and conspicuous location.
- An ample supply of appropriate spill clean up material should be kept near storage areas.
- Also see WM-6, Hazardous Waste Management, for storing of hazardous wastes.

Material Delivery Practices

- Keep an accurate, up-to-date inventory of material delivered and stored onsite.
- Arrange for employees trained in emergency spill cleanup procedures to be present when dangerous materials or liquid chemicals are unloaded.

Spill Cleanup

- Contain and clean up any spill immediately.
- Properly remove and dispose of any hazardous materials or contaminated soil if significant residual materials remain on the ground after construction is complete. See WM-7, Contaminated Soil Management.
- See WM-4, Spill Prevention and Control, for spills of chemicals and/or hazardous materials.
- If spills or leaks of materials occur that are not contained and could discharge to surface waters, non-visible sampling of site discharge may be required. Refer to the General Permit or to your project specific Construction Site Monitoring Plan to determine if and where sampling is required.

Inspection and Maintenance

- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Keep storage areas clean and well organized, including a current list of all materials onsite.
- Inspect labels on containers for legibility and accuracy.
- Repair or replace perimeter controls, containment structures, covers, and liners as needed to maintain proper function.

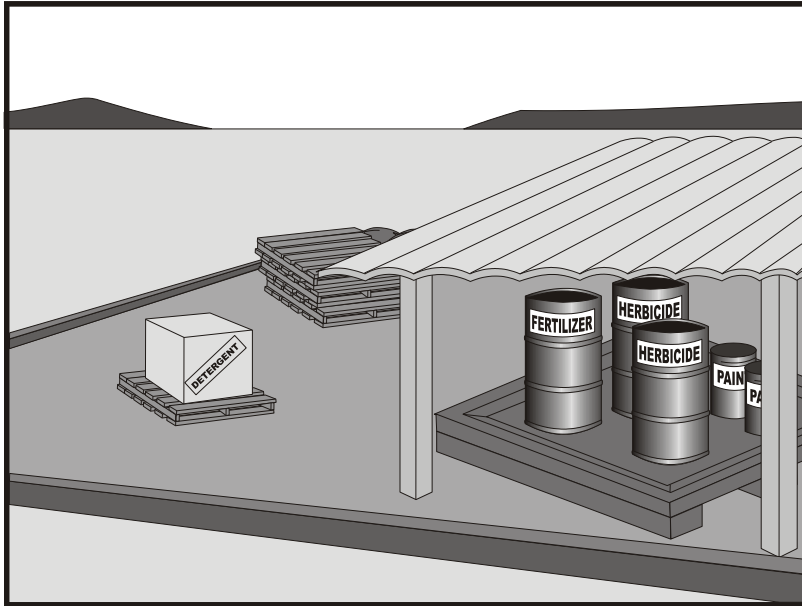
References and Additional Resources

Construction Site Best Management Practices (BMPs) Manual, CTSW-RT-24-425.11.1, California Department of Transportation (Caltrans), March 2024.

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance, Working Group Working Paper; USEPA, April 1992.

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.



Description and Purpose

Prevent or reduce the discharge of pollutants to the storm drain system or watercourses from material use by using alternative products, minimizing hazardous material use onsite, and training employees and subcontractors.

Suitable Applications

This BMP is suitable for use at all construction projects. These procedures apply when the following materials are used or prepared onsite:

- Pesticides and herbicides
- Fertilizers
- Detergents
- Petroleum products such as fuel, oil, and grease
- Asphalt and other concrete components
- Other hazardous chemicals such as acids, lime, glues, adhesives, paints, solvents, and curing compounds
- Other materials that may be detrimental if released to the environment

Limitations

Safer alternative building and construction products may not be available or suitable in every instance.

Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☒

Legend:

- ☒ **Primary Category**
- ☒ **Secondary Category**

Targeted Constituents

Sediment	☒
Nutrients	☒
Trash	☒
Metals	☒
Bacteria	
Oil and Grease	☒
Organics	☒

Potential Alternatives

None

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Implementation

The following steps should be taken to minimize risk:

- Minimize use of hazardous materials onsite.
- Follow manufacturer instructions regarding uses, protective equipment, ventilation, flammability, and mixing of chemicals.
- Train personnel who use pesticides. The California Department of Pesticide Regulation and county agricultural commissioners license pesticide dealers, certify pesticide applicators, and conduct onsite inspections.
- The preferred method of termiticide application is soil injection near the existing or proposed structure foundation/slab; however, if not feasible, soil drench application of termiticides should follow EPA label guidelines and the following recommendations (most of which are applicable to most pesticide applications):
 - Do not treat soil that is water-saturated or frozen.
 - Application shall not commence within 24-hours of a predicted precipitation event with a 40% or greater probability. Weather tracking must be performed on a daily basis prior to termiticide application and during the period of termiticide application.
 - Do not allow treatment chemicals to runoff from the target area. Apply proper quantity to prevent excess runoff. Provide containment for and divert stormwater from application areas using berms or diversion ditches during application.
 - Dry season: Do not apply within 10 feet of storm drains. Do not apply within 25 feet of aquatic habitats (such as, but not limited to, lakes; reservoirs; rivers; permanent streams; marshes or ponds; estuaries; and commercial fish farm ponds).
 - Wet season: Do not apply within 50 feet of storm drains or aquatic habitats (such as, but not limited to, lakes; reservoirs; rivers; permanent streams; marshes or ponds; estuaries; and commercial fish farm ponds) unless a vegetative buffer is present (if so, refer to dry season requirements).
 - Do not make on-grade applications when sustained wind speeds are above 10 mph (at application site) at nozzle end height.
 - Cover treatment site prior to a rain event in order to prevent run-off of the pesticide into non-target areas. The treated area should be limited to a size that can be backfilled and/or covered by the end of the work shift. Backfilling or covering of the treated area shall be done by the end of the same work shift in which the application is made.
 - The applicator must either cover the soil him/herself or provide written notification of the above requirement to the contractor on site and to the person commissioning the application (if different than the contractor). If notice is provided to the contractor or the person commissioning the application, then they are responsible under the Federal Insecticide Fungicide, and Rodenticide Act (FIFRA) to ensure that: 1) if the concrete slab cannot be poured over the treated soil within 24 hours of application, the treated soil is

covered with a waterproof covering (such as polyethylene sheeting), and 2) the treated soil is covered if precipitation is predicted to occur before the concrete slab is scheduled to be poured.

- Do not over-apply fertilizers, herbicides, and pesticides. Prepare only the amount needed. Follow the recommended usage instructions. Over-application is expensive and environmentally harmful. Unless on steep slopes, till fertilizers into the soil rather than hydraulic application. Apply surface dressings in several smaller applications, as opposed to one large application, to allow time for infiltration and to avoid excess material being carried offsite by runoff. Do not apply these chemicals before predicted rainfall.
- Train employees and subcontractors in proper material use.
- Supply Material Safety Data Sheets (MSDS) for all materials.
- Dispose of latex paint and paint cans, used brushes, rags, absorbent materials, and drop cloths, when thoroughly dry and are no longer hazardous, with other construction debris.
- Do not remove the original product label; it contains important safety and disposal information. Use the entire product before disposing of the container.
- Mix paint indoors or in a containment area. Never clean paintbrushes or rinse paint containers into a street, gutter, storm drain, or watercourse. Dispose of any paint thinners, residue, and sludge(s) that cannot be recycled, as hazardous waste.
- For water-based paint, clean brushes to the extent practicable, and rinse to a drain leading to a sanitary sewer where permitted or contain for proper disposal off site. For oil-based paints, clean brushes to the extent practicable, and filter and reuse thinners and solvents.
- Use recycled and less hazardous products when practical. Recycle residual paints, solvents, non-treated lumber, and other materials.
- Use materials only where and when needed to complete the construction activity. Use safer alternative materials as much as possible. Reduce or eliminate use of hazardous materials onsite when practical.
- Document the location, time, chemicals applied, and applicator's name and qualifications.
- Keep an ample supply of spill clean up material near use areas. Train employees in spill clean up procedures.
- Avoid exposing applied materials to rainfall and runoff unless sufficient time has been allowed for them to dry.
- Discontinue use of erodible landscape material within 2 days prior to a forecasted rain event and materials should be covered and/or bermed.
- Provide containment for material use areas such as masons' areas or paint mixing/preparation areas to prevent materials/pollutants from entering stormwater.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities.
- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Ensure employees and subcontractors throughout the job are using appropriate practices.

References and Additional Resources

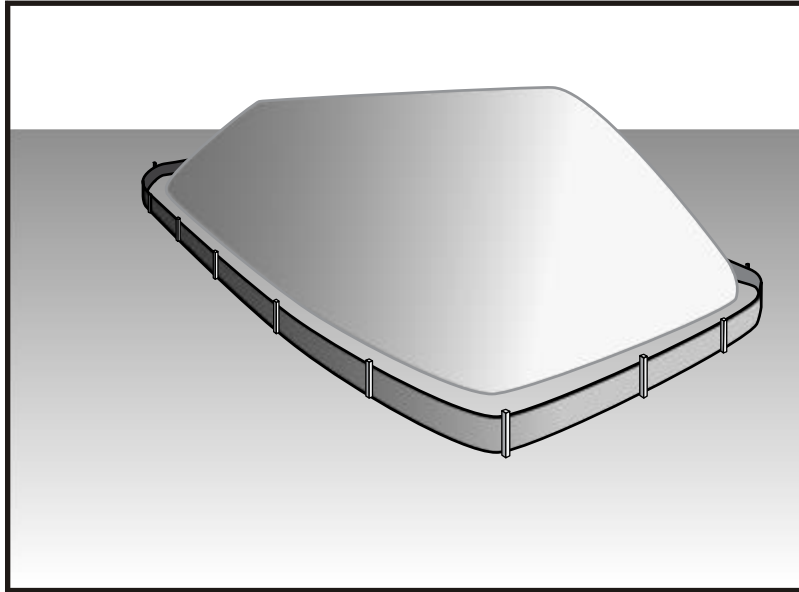
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Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance, Working Group Working Paper; USEPA, April 1992.

Comments on Risk Assessments Risk Reduction Options for Cypermethrin: Docket No. OPP-2005-0293; California Stormwater Quality Association (CASQA) letter to USEPA, 2006. Environmental Hazard and General Labeling for Pyrethroid Non-Agricultural Outdoor Products, EPA-HQ-OPP-2008-0331-0021; USEPA, 2008.

Construction Site Best Management Practices (BMPs) Manual, CTSW-RT-24-425.11.1, California Department of Transportation (Caltrans), March 2024.

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.



Description and Purpose

Stockpile management procedures and practices are designed to reduce or eliminate air and stormwater pollution from stockpiles of soil, soil amendments, sand, paving materials such as Portland cement concrete (PCC) rubble, asphalt concrete (AC), asphalt concrete rubble, aggregate base, aggregate sub base or pre-mixed aggregate, asphalt minder (so called “cold mix” asphalt), and pressure treated wood.

Suitable Applications

Implement in all projects that stockpile soil and other loose materials.

Limitations

- Plastic sheeting as a stockpile protection is temporary and hard to manage in windy conditions. Where plastic is used, consider use of plastic tarps with nylon reinforcement which may be more durable than standard sheeting.
- Plastic sheeting can increase runoff volume due to lack of infiltration and potentially cause perimeter control failure.
- Plastic sheeting breaks down faster in sunlight.
- The use of Plastic materials and photodegradable plastics should be avoided.

Implementation

Protection of stockpiles is a year-round requirement. To properly manage stockpiles:

Treat Categories

EC	Erosion Control	
SE	Sediment Control	☒
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☒
WM	Waste Management and Materials Pollution Control	☒

Legend:

- ☒ **Primary Category**
- ☒ **Secondary Category**

Targeted Constituents

Sediment	☒
Nutrients	☒
Trash	☒
Metals	☒
Bacteria	
Oil and Grease	☒
Organics	☒

Potential Alternatives

None

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- On larger sites, a minimum of 50 ft separation from concentrated flows of stormwater, drainage courses, and inlets is recommended.
- After 14 days of inactivity, a stockpile is non-active and requires further protection described below. All stockpiles are required to be protected as non-active stockpiles immediately if they are not scheduled to be used within 14 days.
- Protect all stockpiles from stormwater run-on using temporary perimeter sediment barriers such as compost berms (SE-13), temporary silt dikes (SE-12), fiber rolls (SE-5), silt fences (SE-1), sandbags (SE-8), gravel bags (SE-6), or biofilter bags (SE-14). Refer to the individual fact sheet for each of these controls for installation information.
- Implement wind erosion control practices as appropriate on all stockpiled material. For specific information, see WE-1, Wind Erosion Control.
- Manage stockpiles of contaminated soil in accordance with WM-7, Contaminated Soil Management.
- Place bagged materials on pallets and under cover.
- Ensure that stockpile coverings are installed securely to protect from wind and rain.
- Some plastic covers withstand weather and sunlight better than others. Select cover materials or methods based on anticipated duration of use.

Protection of Non-Active Stockpiles

A stockpile is considered non-active if it either is not used for 14 days or if it is scheduled not to be used for 14 days or more. Stockpiles need to be protected immediately if they are not scheduled to be used within 14 days. Non-active stockpiles of the identified materials should be protected as follows:

Soil stockpiles

- Soil stockpiles should be covered or protected with soil stabilization measures and a temporary perimeter sediment barrier at all times.
- Temporary vegetation should be considered for topsoil piles that will be stockpiled for extended periods.

Stockpiles of Portland cement concrete rubble, asphalt concrete, asphalt concrete rubble, aggregate base, or aggregate sub base

- Stockpiles should be covered and protected with a temporary perimeter sediment barrier at all times.

Stockpiles of “cold mix”

- Cold mix stockpiles should be placed on and covered with plastic sheeting or comparable material at all times and surrounded by a berm.

Stockpiles of fly ash, stucco, hydrated lime

- Stockpiles of materials that may raise the pH of runoff (i.e., basic materials) should be covered with plastic and surrounded by a berm.

Stockpiles/Storage of treated wood

- Treated wood should be covered with plastic sheeting or comparable material at all times and surrounded by a berm.

Protection of Active Stockpiles

A stockpile is active when it is being used or is scheduled to be used within 14 days of the previous use. Active stockpiles of the identified materials should be protected as follows:

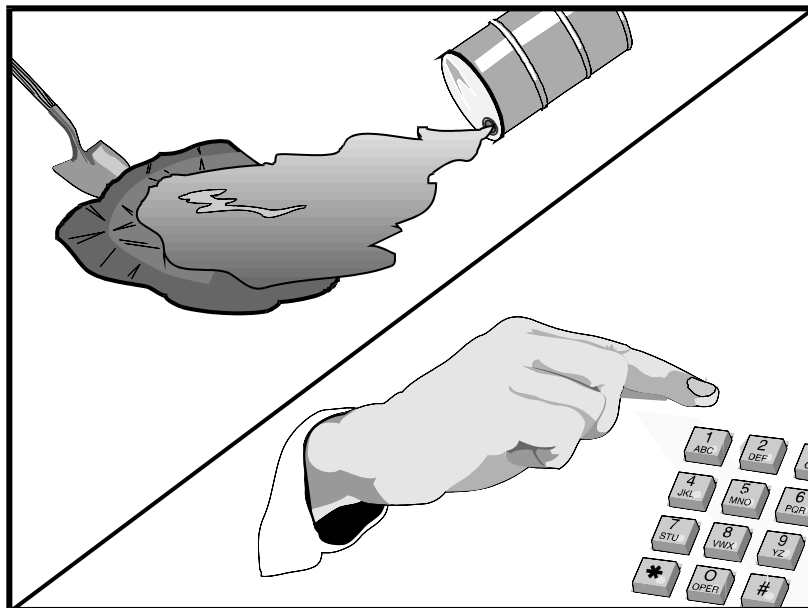
- All stockpiles should be covered and protected with a temporary linear sediment barrier prior to the onset of precipitation.
- Stockpiles of “cold mix” and treated wood, and basic materials should be placed on and covered with plastic sheeting or comparable material and surrounded by a berm prior to the onset of precipitation.
- The downstream perimeter of an active stockpile should be protected with a linear sediment barrier or berm and runoff should be diverted around or away from the stockpile on the upstream perimeter.

Inspection and Maintenance

- Stockpiles must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- It may be necessary to inspect stockpiles covered with plastic sheeting more frequently during certain conditions (for example, high winds or extreme heat).
- Repair and/or replace perimeter controls and covers as needed to keep them functioning properly.
- Sediment shall be removed when it reaches one-third of the barrier height.

References and Additional Resources

Construction Site Best Management Practices (BMPs) Manual, CTSW-RT-24-425.11.1, California Department of Transportation (Caltrans), March 2024.



Description and Purpose

Prevent or reduce the discharge of pollutants to drainage systems or watercourses from leaks and spills by reducing the chance for spills, stopping the source of spills, containing and cleaning up spills, properly disposing of spill materials, and training employees.

This best management practice covers only spill prevention and control. However, WM-1, Materials Delivery and Storage, and WM-2, Material Use, also contain useful information, particularly on spill prevention. For information on wastes, see the waste management BMP factsheets.

Suitable Applications

This BMP is suitable for all construction projects. Spill control procedures are implemented anytime chemicals or hazardous substances are used or stored on the construction site, including the following materials:

- Soil stabilizers/binders
- Active treatment chemicals and/or flocculants
- Passive treatment flocculants
- Demolition debris that may include asbestos-containing materials, mercury containing devices, lead-based paint, and polychlorinated biphenyls (PCBs) in building materials
- Dust palliatives

Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☒
WM	Waste Management and Materials Pollution Control	☒

Legend:

- ☒ **Primary Objective**
- ☒ **Secondary Objective**

Targeted Constituents

Sediment	☒
Nutrients	☒
Trash	☒
Metals	☒
Bacteria	
Oil and Grease	☒
Organics	☒

Potential Alternatives

None

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- Herbicides
- Growth inhibitors
- Fertilizers
- Deicing/anti-icing chemicals
- Fuels
- Lubricants
- Other petroleum distillates

Limitations

- In some cases, it may be necessary to use a contracted specialty spill cleanup company.
- This BMP applies to all spills occurring at the project site.
- Procedures and practices presented in this BMP are general. Identify site specific practices for the materials used or stored onsite.

Implementation

The following steps will help reduce the stormwater impacts of leaks and spills:

Education

- Be aware that different materials pollute in different amounts. Make sure that each employee knows what a “significant spill” is for each material they use, and what is the appropriate response for “significant” and “insignificant” spills.
- Educate employees, contractors, and subcontractors on potential dangers to humans and the environment from spills and leaks.
- Hold regular meetings to discuss and reinforce appropriate disposal procedures (incorporate into regular safety meetings).
- Establish a continuing education program to indoctrinate new employees.
- Train on-site personnel assigned to spill and leak prevention and response.
- Have QSP, contractor’s superintendent, or representative oversee and enforce proper spill prevention and control measures.

General Measures

- To the extent that the work can be accomplished safely, immediately contain and clean-up spills of oil, petroleum products, substances listed under 40 CFR parts 110,117, and 302, and sanitary and septic wastes.
- Prevent exposure of stored materials in accordance with WM-1, Material Delivery and Storage.

- Store chemicals, hazardous materials, and hazardous wastes in watertight containers with appropriate secondary containment to prevent any spillage or leakage or store in a completely enclosed storage area and protect from vandalism.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Train employees in spill prevention and cleanup.
- Designate responsible individuals to oversee and enforce control measures.
- Spills should be covered and protected from stormwater runoff during rainfall to the extent that it doesn't compromise clean up activities.
- Do not bury or wash spills with water.
- Store and dispose of used clean up materials, contaminated materials, and recovered spill material that is no longer suitable for the intended purpose in conformance with the provisions in applicable BMPs.
- Do not allow water used for cleaning and decontamination to enter storm drains or watercourses. Collect and dispose of contaminated water in accordance with WM-10, Liquid Waste Management.
- Contain water overflow or minor water spillage and do not allow it to discharge into drainage facilities or watercourses.
- Place proper storage, cleanup, and spill reporting instructions for hazardous materials stored or used on the project site in an open, conspicuous, and accessible location.
- When employing active treatment, store and use the chemicals and flocculants in accordance with SE-14, Active Treatment, and the site-specific Active Treatment Plan.
- When employing passive treatment, store and use the flocculants in accordance with SE-15, Passive Treatment, and the site-specific Passive Treatment Plan.
- Keep waste storage areas clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Perimeter controls, containment structures, covers, and liners should be repaired or replaced as needed to maintain proper function.

Cleanup

- Clean up leaks and spills immediately.
- Use a rag for small spills on paved surfaces, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to either a certified laundry (rags) or disposed of as hazardous waste.
- Never hose down or bury dry material spills. Clean up as much of the material as possible and dispose of it properly. See the waste management BMPs in this section for specific information.

Minor Spills

- Minor spills typically involve small quantities of oil, gasoline, paint, etc., which can be controlled by the first responder at the discovery of the spill.
- Use absorbent materials on small spills rather than hosing down or burying the spill.
- Absorbent materials should be promptly removed and disposed of properly.
- Follow the practice below for a minor spill:
 - Contain the spread of the spill.
 - Recover spilled materials.
 - Clean the contaminated area and properly dispose of contaminated materials.

Semi-Significant Spills

- Semi-significant spills still can be controlled by the first responder along with the aid of other personnel such as laborers and the foreman, etc. This response may require the cessation of all other activities.
- Spills should be cleaned up immediately:
 - Contain spread of the spill.
 - Notify the project foreman immediately.
 - If the spill occurs on paved or impermeable surfaces, clean up using "dry" methods (absorbent materials, cat litter, and/or rags). Contain the spill by encircling with absorbent materials and do not let the spill spread widely.
 - If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.
 - If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff.

Significant/Hazardous Spills

- For significant or hazardous spills that cannot be controlled by personnel in the immediate vicinity, the following steps should be taken:
 - Notify the local emergency response by calling 911.
 - In addition, follow the site spill response plan to notify other agencies and the owner's representatives. It is the contractor's responsibility to have all emergency phone numbers at the construction site.
 - Notify the Governor's Office of Emergency Services Warning Center, (800) 852-7550.

- For spills of federal reportable quantities, in conformance with the requirements in 40 CFR parts 110,119, and 302, the contractor should notify the National Response Center at (800) 424-8802.
- Notification should first be made by telephone and followed up with a written report.
- The services of a spill contractor or a Haz-Mat team should be obtained immediately. Construction personnel should not attempt to clean up until the appropriate and qualified staff have arrived at the job site.
- Other agencies which may need to be consulted include, but are not limited to, the Fire Department, the Public Works Department, County Health Department, the Coast Guard, the Highway Patrol, the City/County Police Department, Department of Toxic Substances, California Division of Oil and Gas, Cal/OSHA, etc.

Reporting

- Federal regulations require that any significant oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hours).

BMPs for specific activities

Vehicle and Equipment Maintenance

- If maintenance must occur onsite, use a designated area and a secondary containment, located away from drainage courses, to prevent the runoff of stormwater and the runoff of spills.
- Minimize washing of vehicles and equipment at the project site. When onsite washing is necessary follow NS-8 Vehicle and Equipment Cleaning to capture and contain wash water for proper disposal in accordance with federal, state, and local regulations.
- Regularly inspect onsite vehicles and equipment for leaks and repair immediately.
- Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.
- Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- Place drip pans or absorbent materials under paving equipment when not in use.
- Use absorbent materials on small spills rather than hosing down or burying the spill. Remove the absorbent materials promptly and dispose of properly.
- Promptly transfer used fluids to the proper waste or recycling drums. Do not leave full drip pans or other open containers lying around.
- Oil filters disposed of in trashcans or dumpsters can leak oil and pollute stormwater. Place the oil filter in a funnel over a waste oil-recycling drum to drain excess oil before disposal. Recycle the oil filters. Ask the oil supplier or recycler about recycling oil filters.

- Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Vehicle and Equipment Fueling

- If fueling must occur onsite, use designated areas, located away from drainage courses, to prevent the runoff of stormwater and the runoff of spills.
- Discourage “topping off” of fuel tanks.
- Always use secondary containment, such as a drain pan, when fueling to catch spills/ leaks.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. At a minimum, inspect BMPs weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur.
- Keep ample supplies of spill control and cleanup materials onsite, near storage, unloading, and maintenance areas.
- Update your spill prevention and control plan and stock cleanup materials as changes occur in the types of chemicals onsite.

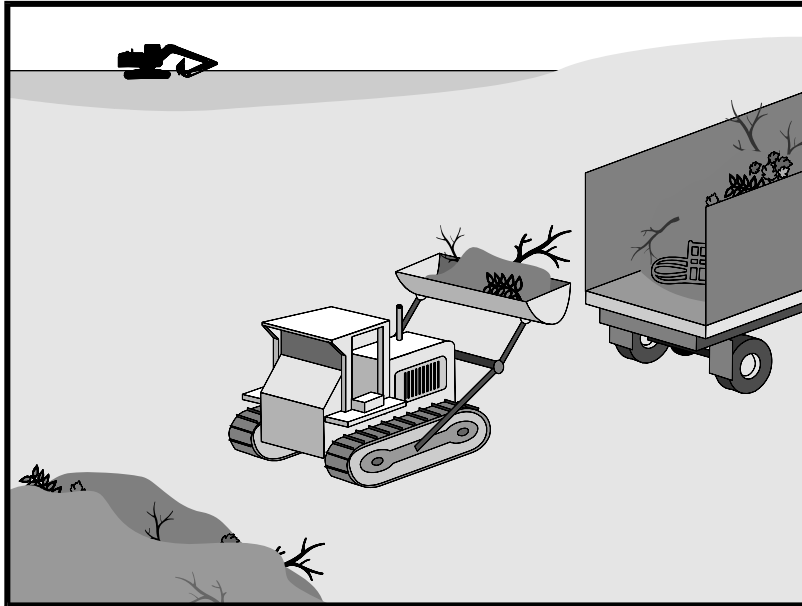
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Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.



Description and Purpose

Solid waste management procedures and practices are designed to prevent or reduce the discharge of pollutants to stormwater from solid or construction waste by providing designated waste collection areas and containers, arranging for regular disposal, and training employees and subcontractors.

Suitable Applications

This BMP is suitable for construction sites where the following wastes are generated or stored:

- Solid waste generated from trees and shrubs removed during land clearing, demolition of existing structures (rubble), and building construction
- Packaging materials including wood, paper, and plastic
- Scrap or surplus building materials including scrap metals, rubber, plastic, glass pieces, and masonry products
- Non-hazardous debris and waste products resulting from demolition activities
- Waste products or waste generated from active and passive treatment activities. Verify with the manufacturer's specifications that materials are non-hazardous.
- Domestic wastes including food containers such as beverage cans, coffee cups, paper bags, plastic wrappers, and cigarettes

Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☒

Legend:

- ☒ **Primary Objective**
- ☒ **Secondary Objective**

Targeted Constituents

Sediment	☒
Nutrients	☒
Trash	☒
Metals	☒
Bacteria	
Oil and Grease	☒
Organics	☒

Potential Alternatives

None

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- Construction wastes including brick, mortar, timber, steel and metal scraps, pipe and electrical cuttings, non-hazardous equipment parts, styrofoam and other materials used to transport and package construction materials
- Landscape wastes, including vegetative material, plant containers, and packaging materials

Limitations

Manage hazardous wastes in accordance with WM-6, Hazardous Waste Management. Test wastes to determine whether they are hazardous or non-hazardous.

Implementation

The following steps will help keep a clean site and reduce stormwater pollution:

- Select designated waste collection areas onsite.
- Inform trash-hauling contractors that you will accept only watertight dumpsters for onsite use.
- Inspect dumpsters for leaks and repair any dumpster that is not watertight.
- Locate dumpsters and trash containers in a covered area or in a secondary containment.
- Provide an adequate number of dumpsters and trash containers with lids or covers.
- Cover waste dumpsters and trash containers at the end of each work day and when it is raining.
- Plan for additional dumpsters and trash containers and more frequent pickup during the demolition phase of construction.
- Collect site trash daily, especially during rainy and windy conditions.
- Properly dispose of litter promptly since erosion and sediment control devices tend to collect litter.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters and trash containers designated for construction debris.
- Do not hose out dumpsters on the construction site. Leave dumpster cleaning to the trash hauling contractor.
- Arrange for regular waste collection before dumpsters and trash containers overflow.
- Immediately clean up leaks and spills from dumpsters and trash containers.
- Make sure that construction waste is collected, removed, and disposed of only at authorized disposal sites.

Education

- Have the QSP, contractor's superintendent, or representative oversee and enforce proper solid waste management procedures and practices.
- Instruct employees, contractors, and subcontractors on identification of solid waste and hazardous waste.
- Educate employees, contractors, and subcontractors on solid waste storage and disposal procedures.
- Hold regular meetings to discuss and reinforce disposal procedures (incorporate into regular safety meetings).
- Require that employees, contractors, and subcontractors follow solid waste handling and storage procedures.
- Prohibit littering by employees, contractors, subcontractors, and visitors.
- Minimize production of solid waste materials wherever possible.

Collection, Storage, and Disposal

- Prohibit littering on the project site.
- Prioritize removal of litter and debris from drainage grates, trash racks, and ditch lines to prevent clogging of the storm drainage system.
- Provide trash receptacles in the contractor's yard, field trailer areas, and at locations where workers congregate for lunch and break periods.
- Collect litter from work areas and place in watertight dumpsters at least weekly, regardless of whether the litter was generated by the contractor, the public, or others.
- Do not place collected litter and debris in or next to drain inlets, stormwater drainage systems, or watercourses.
- Provide dumpsters of sufficient size and number to contain the solid waste generated by the project.
- Arrange for removal of full dumpsters for proper disposal by a licensed trash hauling contractor.
- Remove construction and/or demolition debris and waste from the site at least every two weeks or more frequently as needed.
- Store or stack construction material visible to the public in an orderly manner.
- Prevent stormwater run-on from contacting stored solid waste through the use of berms, dikes, or other temporary diversion structures or through the use of measures to elevate waste from site surfaces.

- Locate solid waste storage areas at least 50 ft from drainage facilities and watercourses and locate these areas outside of areas prone to flooding or ponding.
- Use tarps or other means to securely cover landscaping waste not stored in watertight dumpsters.
- Segregate potentially hazardous waste from non-hazardous construction site waste.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.
- For disposal of hazardous waste, see WM-6, Hazardous Waste Management. Have hazardous waste hauled by a licensed hauler to an appropriate disposal and/or recycling facility.
- Salvage or recycle useful vegetation debris, packaging and surplus building materials when practical. For example, trees and shrubs from land clearing can be used as a brush barrier, or converted into wood chips, then used as mulch. Recycle wood pallets, cardboard boxes, and construction scraps.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. At a minimum, inspect BMPs weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur.
- Inspect construction waste areas regularly.
- Arrange for regular waste collection.

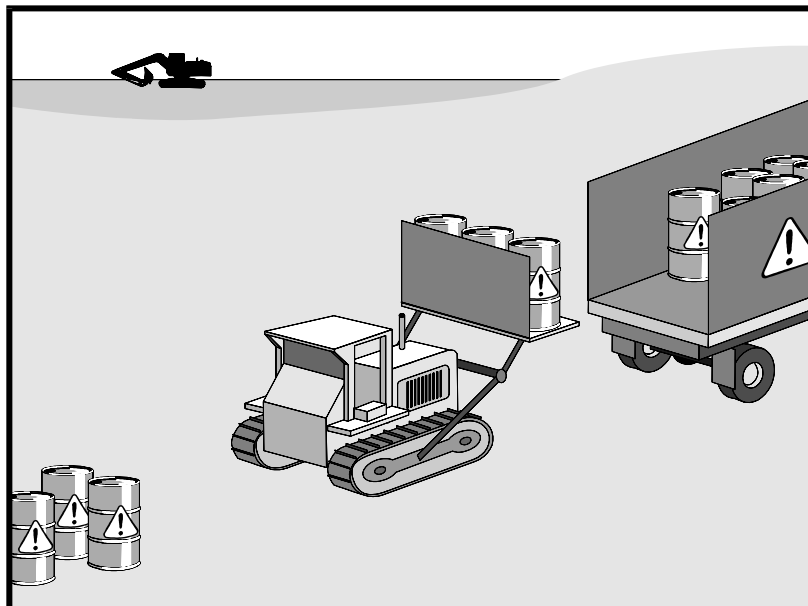
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Processes, Procedures and Methods to Control Pollution Resulting from All Construction Activity, 430/9-73-007, USEPA, 1973.

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.



Description and Purpose

Prevent or reduce the discharge of pollutants to stormwater from hazardous waste through proper material use, waste disposal, and training of employees and subcontractors.

Suitable Applications

This best management practice (BMP) applies to all construction projects. Hazardous waste management practices are implemented on construction projects that generate waste from the use of:

- Petroleum Products
- Concrete Curing Compounds
- Palliatives
- Septic Wastes
- Stains
- Wood Preservatives
- Asphalt Products
- Pesticides
- Acids
- Paints
- Solvents
- Roofing Tar
- Any materials deemed a hazardous waste in California, Title 22 Division 4.5, or listed in 40 CFR Parts 110, 117, 261, or 302

Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☒
WM	Waste Management and Materials Pollution Control	☒

Legend:

- ☒ **Primary Objective**
- ☒ **Secondary Objective**

Targeted Constituents

Sediment	
Nutrients	☒
Trash	☒
Metals	☒
Bacteria	☒
Oil and Grease	☒
Organics	☒

Potential Alternatives

None

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In addition, construction projects that include demolition of existing structures may contain hazardous materials and wastes, which must be disposed of in accordance with federal, state, and local regulations. These hazardous wastes include, but are not limited to:

- Sandblasting grit mixed with lead-, cadmium-, or chromium-based paints
- Asbestos
- Mercury containing devices
- Polychlorinated biphenyls (PCBs) found in older transformers or building materials like caulk

Limitations

- Hazardous waste that cannot be reused or recycled must be disposed of by a licensed hazardous waste hauler.
- Nothing in this BMP relieves the contractor from responsibility for compliance with federal, state, and local laws regarding storage, handling, transportation, and disposal of hazardous wastes.
- This BMP does not cover aerially deposited lead (ADL) soils. For ADL soils refer to WM-7, Contaminated Soil Management.

Implementation

The following steps will help reduce stormwater pollution from hazardous wastes:

Material Use

- Wastes should be stored in sealed containers constructed of a suitable material and should be labeled as required by Title 22 CCR, Division 4.5 and 49 CFR Parts 172, 173, 178, and 179.
- All hazardous waste should be stored, transported, and disposed as required in Title 22 CCR, Division 4.5 and 49 CFR 261-263.
- Waste containers should be stored in temporary containment facilities that should comply with the following requirements:
 - Temporary containment facilities should provide for a spill containment volume equal to 1.5 times the volume of all containers able to contain precipitation from a 25-year storm event, plus the greater of 10% of the aggregate volume of all containers or 100% of the capacity of the largest tank within its boundary, whichever is greater.
 - Temporary containment facilities should be impervious to the materials stored there for a minimum contact time of 72 hours.
 - Temporary containment facilities should be maintained free of accumulated rainwater and spills. In the event of spills or leaks, accumulated rainwater and spills should be placed into drums after each rainfall. These liquids should be handled as a hazardous waste unless testing determines them to be non-hazardous. Non-hazardous liquids should be sent to an approved disposal site.

- Sufficient separation should be provided between stored containers to allow for spill cleanup and emergency response access.
- Incompatible materials, such as chlorine and ammonia, should not be stored in the same temporary containment facility.
- Throughout the rainy season, temporary containment facilities should be covered during non-working days, and prior to rain events. Covered facilities may include use of plastic tarps for small facilities or constructed roofs with overhangs.
- Drums should not be overfilled, and wastes should not be mixed.
- Unless watertight, containers of dry waste should be stored on pallets.
- Do not over-apply herbicides and pesticides. Prepare only the amount needed. Follow the recommended usage instructions. Over application is expensive and environmentally harmful. Apply surface dressings in several smaller applications, as opposed to one large application. Allow time for infiltration and avoid excess material being carried offsite by runoff. Do not apply these chemicals just before it rains. People applying pesticides must be certified in accordance with federal and state regulations.
- Paint brushes and equipment for water and oil-based paints should be cleaned within a contained area and should not be allowed to contaminate site soils, watercourses, or drainage systems. Waste paints, thinners, solvents, residues, and sludges that cannot be recycled or reused should be disposed of as hazardous waste. When thoroughly dry, latex paint and paint cans, used brushes, rags, absorbent materials, and drop cloths should be disposed of as solid waste.
- Do not clean out brushes or rinse paint containers into the dirt, street, gutter, storm drain, or stream. “Paint out” brushes as much as possible. Rinse water-based paints to the sanitary sewer. Filter and reuse thinners and solvents. Dispose of excess oil-based paints and sludge as hazardous waste.
- The following actions should be taken with respect to temporary containment:
 - Ensure that adequate hazardous waste storage volume is available.
 - Ensure that hazardous waste collection containers are conveniently located.
 - Designate hazardous waste storage areas onsite away from storm drains or watercourses and away from moving vehicles and equipment to prevent accidental spills.
 - Minimize production or generation of hazardous materials and hazardous waste on the job site.
 - Use containment berms in fueling and maintenance areas and where the potential for spills is high.
 - Segregate potentially hazardous waste from non-hazardous construction site debris.

- Keep liquid or semi-liquid hazardous waste in appropriate containers (closed drums or similar) and under cover.
- Clearly label all hazardous waste containers with the waste being stored and the date of accumulation.
- Place hazardous waste containers in secondary containment.
- Do not allow potentially hazardous waste materials to accumulate on the ground.
- Do not mix wastes.
- Use all of the product before disposing of the container.
- Do not remove the original product label; it contains important safety and disposal information.

Waste Recycling Disposal

- Select designated hazardous waste collection areas onsite.
- Hazardous materials and wastes should be stored in covered containers and protected from vandalism.
- Place hazardous waste containers in secondary containment.
- Do not mix wastes, this can cause chemical reactions, making recycling impossible and complicating disposal.
- Recycle any useful materials such as used oil or water-based paint.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.
- Arrange for regular waste collection before containers overflow.
- Make sure that hazardous waste (e.g., excess oil-based paint and sludge) is collected, removed, and disposed of only at authorized disposal areas.

Disposal Procedures

- Waste should be disposed of by a licensed hazardous waste transporter at an authorized and licensed disposal facility or recycling facility utilizing properly completed Uniform Hazardous Waste Manifest forms.
- A Department of Health Services certified laboratory should sample waste to determine the appropriate disposal facility.
- Properly dispose of rainwater in secondary containment that may have mixed with hazardous waste.

- Attention is directed to "Hazardous Material", "Contaminated Material", and "Aerially Deposited Lead" of the contract documents regarding the handling and disposal of hazardous materials.

Education

- Educate employees, contractors, and subcontractors on hazardous waste storage and disposal procedures.
- Educate employees, contractors, and subcontractors on potential dangers to humans and the environment from hazardous wastes.
- Instruct employees, contractors, and subcontractors on safety procedures for common construction site hazardous wastes.
- Instruct employees, contractors, and subcontractors in identification of hazardous and solid waste.
- Hold regular meetings to discuss and reinforce hazardous waste management procedures (incorporate into regular safety meetings).
- The contractor's superintendent or representative should oversee and enforce proper hazardous waste management procedures and practices.
- Make sure that hazardous waste is collected, removed, and disposed of only at authorized disposal areas.
- Warning signs should be placed in areas recently treated with chemicals.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- If a container does spill, clean up immediately.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. At a minimum, BMPs are to be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur
- Collect hazardous waste regularly.
- A foreman or construction supervisor should monitor onsite hazardous waste storage and disposal procedures.
- Keep waste storage areas clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored.

- Repair and replace perimeter controls, containment structures, covers, and liners as needed to maintain proper function.
- Clean up hazardous spills in conformance with the applicable Safety Data Sheet (SDS) and the spill response plan.
- Notify the appropriate local, state, and federal agencies of the spill (see WM-4)
 - Notify the National Response Center, at (800) 424-8802 of spills of federal reportable quantities in conformance with the requirements in 40 CFR parts 110, 117, and 302.
- Notify the Governor's Office of Emergency Services Warning Center at (800) 852-7550. Obtain and maintain copies of hazardous waste manifests.

References and Additional Resources

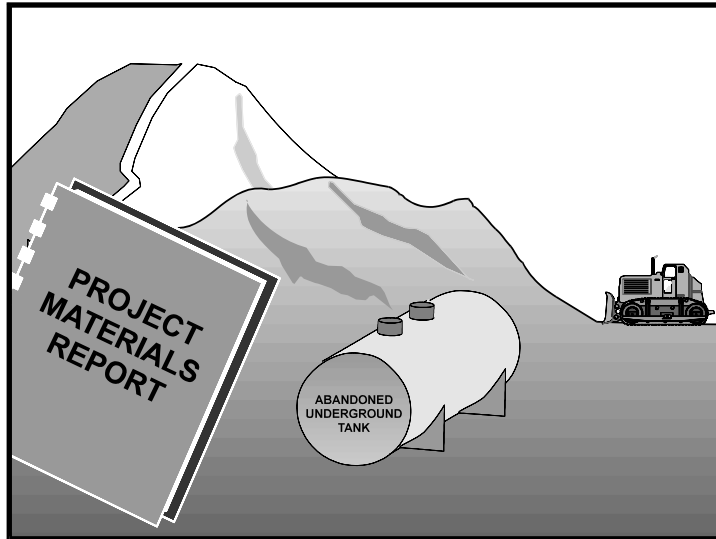
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Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☒

Legend:

- ☒ **Primary Objective**
- ☒ **Secondary Objective**

Description and Purpose

Prevent or reduce the discharge of pollutants to stormwater from contaminated soil and highly acidic or alkaline soils by conducting pre-construction surveys, inspecting excavations regularly, and remediating contaminated soil promptly.

Suitable Applications

Contaminated soil management is implemented on construction projects in highly urbanized or industrial areas where soil contamination may have occurred due to spills, illicit discharges, aerial deposition, past use and leaks from underground storage tanks.

Limitations

Contaminated soils that cannot be treated onsite must be disposed of offsite by a licensed hazardous waste hauler. The presence of contaminated soil may indicate contaminated water as well. See NS-2, Dewatering Operations, for more information.

The procedures and practices presented in this BMP are general. The contractor should identify appropriate practices and procedures for the specific contaminants known to exist or discovered onsite.

Implementation

Most owners and developers conduct pre-construction environmental assessments as a matter of routine. Contaminated soils are often identified during project planning and development with known locations identified in the plans, specifications and in the SWPPP. The contractor should review applicable reports and investigate appropriate call-outs in the

Targeted Constituents

Sediment	
Nutrients	☒
Trash	☒
Metals	☒
Bacteria	☒
Oil and Grease	☒
Organics	☒

Potential Alternatives

None

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plans, specifications, and SWPPP. Recent court rulings holding contractors liable for cleanup costs when they unknowingly move contaminated soil highlight the need for contractors to confirm a site assessment is completed before earth moving begins.

The following steps will help reduce stormwater pollution from contaminated soil:

- Conduct thorough, pre-construction inspections of the site and review documents related to the site. If inspection or reviews indicated presence of contaminated soils, develop a plan before starting work.
- Look for contaminated soil as evidenced by discoloration, odors, differences in soil properties, abandoned underground tanks or pipes, or buried debris.
- Prevent leaks and spills. Contaminated soil can be expensive to treat and dispose of properly. However, addressing the problem before construction is much less expensive than after the structures are in place.
- The contractor may further identify contaminated soils by investigating:
 - Past site uses and activities
 - Detected or undetected spills and leaks
 - Acid or alkaline solutions from exposed soil or rock formations high in acid or alkaline forming elements
 - Contaminated soil as evidenced by discoloration, odors, differences in soil properties, abandoned underground tanks or pipes, or buried debris.
 - Suspected soils should be tested at a certified laboratory.

Education

- Have employees and subcontractors complete a safety training program which meets 29 CFR 1910.120 and 8 CCR 5192 covering the potential hazards as identified, prior to performing any excavation work at the locations containing material classified as hazardous.
- Educate employees and subcontractors in identification of contaminated soil and on contaminated soil handling and disposal procedures.
- Hold regular meetings to discuss and reinforce disposal procedures (incorporate into regular safety meetings).

Handling Procedures for Material with Aerially Deposited Lead (ADL)

- Materials from areas designated as containing (ADL) may, if allowed by the contract special provisions, be excavated, transported, and used in the construction of embankments and/or backfill.
- Excavation, transportation, and placement operations should result in no visible dust.
- Caution should be exercised to prevent spillage of lead containing material during transport.

- Quality should be monitored during excavation of soils contaminated with lead.

Handling Procedures for Contaminated Soils

- Minimize onsite storage. Contaminated soil should be disposed of properly in accordance with all applicable regulations. All hazardous waste storage will comply with the requirements in Title 22, CCR, Sections 66265.250 to 66265.260.
- Test suspected soils at an approved certified laboratory.
- Work with the local regulatory agencies to develop options for treatment or disposal if the soil is contaminated.
- Avoid temporary stockpiling of contaminated soils or hazardous material.
- Take the following precautions if temporary stockpiling is necessary:
 - Cover the stockpile with plastic sheeting or tarps.
 - Install a berm around the stockpile to prevent runoff from leaving the area.
 - Do not stockpile in or near storm drains or watercourses.
- Remove contaminated material and hazardous material on exteriors of transport vehicles and place either into the current transport vehicle or into the excavation prior to the vehicle leaving the exclusion zone.
- Monitor the air quality continuously during excavation operations at all locations containing hazardous material.
- Procure all permits and licenses, pay all charges and fees, and give all notices necessary and incident to the due and lawful prosecution of the work, including registration for transporting vehicles carrying the contaminated material and the hazardous material.
- Collect water from decontamination procedures and treat or dispose of it at an appropriate disposal site.
- Collect non-reusable protective equipment, once used by any personnel, and dispose of at an appropriate disposal site.
- Install temporary security fence to surround and secure the exclusion zone. Remove fencing when no longer needed.
- Excavate, transport, and dispose of contaminated material and hazardous material in accordance with the rules and regulations of the following agencies (the specifications of these agencies supersede the procedures outlined in this BMP):
 - United States Department of Transportation (USDOT)
 - United States Environmental Protection Agency (USEPA)
 - California Environmental Protection Agency (CAL-EPA)

- California Division of Occupation Safety and Health Administration (CAL-OSHA)
- Local regulatory agencies

Procedures for Underground Storage Tank Removals

- Prior to commencing tank removal operations, obtain the required underground storage tank removal permits and approval from the federal, state, and local agencies that have jurisdiction over such work.
- To determine if it contains hazardous substances, arrange to have tested, any liquid or sludge found in the underground tank prior to its removal.
- Following the tank removal, take soil samples beneath the excavated tank and perform analysis as required by the local agency representative(s).
- The underground storage tank, any liquid or sludge found within the tank, and all contaminated substances and hazardous substances removed during the tank removal and transported to disposal facilities permitted to accept such waste.

Water Control

- All necessary precautions and preventive measures should be taken to prevent the flow of water, including ground water, from mixing with hazardous substances or underground storage tank excavations. Such preventative measures may consist of, but are not limited to, berms, cofferdams, grout curtains, freeze walls, and seal course concrete or any combination thereof.
- If water does enter an excavation and becomes contaminated, such water, when necessary to proceed with the work, should be discharged to clean, closed top, watertight transportable holding tanks, treated, and disposed of in accordance with federal, state, and local laws.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Arrange for contractor's Water Pollution Control Manager, foreman, and/or construction supervisor to monitor onsite contaminated soil storage and disposal procedures.
- Monitor air quality continuously during excavation operations at all locations containing hazardous material.
- Coordinate contaminated soils and hazardous substances/waste management with the appropriate federal, state, and local agencies.
- Implement WM-4, Spill Prevention and Control, to prevent leaks and spills as much as possible.

References and Additional Resources

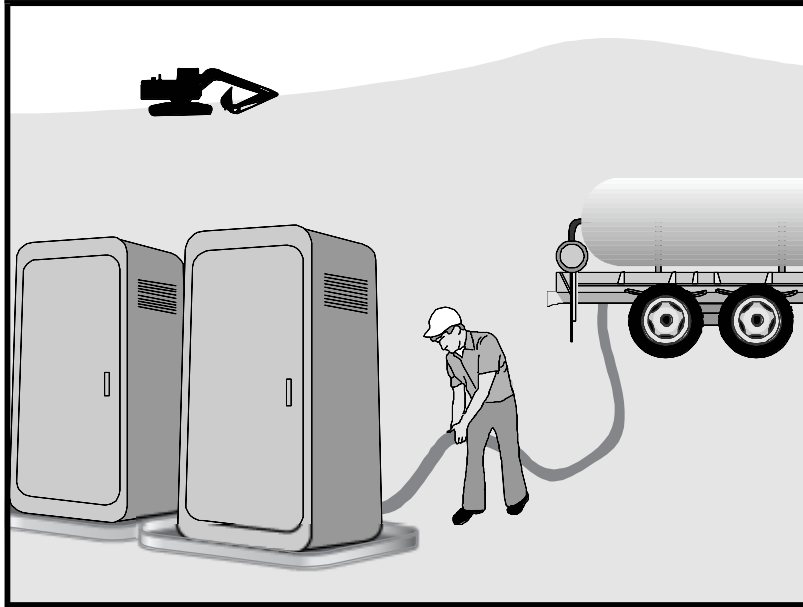
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Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.

Sanitary/Septic Waste Management WM-9



Description and Purpose

Proper sanitary and septic waste management prevent the discharge of pollutants to stormwater from sanitary and septic waste by providing convenient, well-maintained facilities, and arranging for regular service and disposal.

Suitable Applications

Sanitary septic waste management practices are suitable for use at all construction sites that use temporary or portable sanitary and septic waste systems.

Limitations

None identified.

Implementation

Sanitary or septic wastes should be treated or disposed of in accordance with state and local requirements. In many cases, one contract with a local facility supplier will be all that it takes to make sure sanitary wastes are properly disposed.

Storage and Disposal Procedures

- Temporary sanitary facilities should be located away from drainage facilities, watercourses, and from traffic circulation. If site conditions allow, place portable facilities a minimum of 50 feet from drainage conveyances and traffic areas. When subjected to high winds or risk of high winds, temporary sanitary facilities should be secured to prevent overturning.

Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☒

Legend:

- ☒ Primary Category
- ☒ Secondary Category

Targeted Constituents

Sediment	
Nutrients	☒
Trash	☒
Metals	
Bacteria	☒
Oil and Grease	
Organics	☒

Potential Alternatives

None

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Sanitary/Septic Waste Management WM-9

- Temporary sanitary facilities must be equipped with containment to prevent discharge of pollutants to the stormwater drainage system of the receiving water.
- Consider safety as well as environmental implications before placing temporary sanitary facilities.
- Wastewater should not be discharged or buried within the project site.
- Sanitary and septic systems that discharge directly into sanitary sewer systems, where permissible, should comply with the local health agency, city, county, and sewer district requirements.
- Only reputable, licensed sanitary and septic waste haulers should be used.
- Sanitary facilities should be located in a convenient location.
- Temporary septic systems should treat wastes to appropriate levels before discharging.
- If using an onsite disposal system (OSDS), such as a septic system, local health agency requirements must be followed.
- Temporary sanitary facilities that discharge to the sanitary sewer system should be properly connected to avoid illicit discharges.
- Sanitary and septic facilities should be maintained in good working order by a licensed service.
- Regular waste collection by a licensed hauler should be arranged before facilities overflow.
- If a spill does occur from a temporary sanitary facility, follow federal, state and local regulations for containment and clean-up.

Education

- Educate employees, subcontractors, and suppliers on sanitary and septic waste storage and disposal procedures.
- Educate employees, subcontractors, and suppliers of potential dangers to humans and the environment from sanitary and septic wastes.
- Instruct employees, subcontractors, and suppliers in identification of sanitary and septic waste.
- Hold regular meetings to discuss and reinforce the use of sanitary facilities (incorporate into regular safety meetings).
- Establish a continuing education program to indoctrinate new employees.

Inspection and Maintenance

- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected

Sanitary/Septic Waste Management WM-9

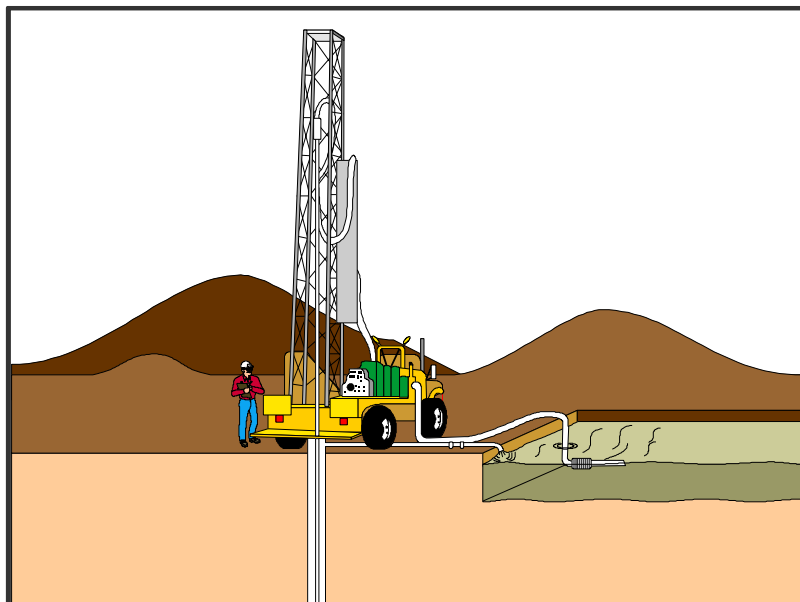
weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.

- Arrange for regular waste collection.
- If high winds are expected, portable sanitary facilities must be secured with spikes or weighed down to prevent over turning.
- If spills or leaks from sanitary or septic facilities occur that are not contained and discharge from the site, non-visible sampling of site discharge may be required. Refer to the General Permit or to your project specific Construction Site Monitoring Plan to determine if and where sampling is required.

References and Additional Resources

Construction Site Best Management Practices (BMPs) Manual, CTSW-RT-24-425.11.1, California Department of Transportation (Caltrans), March 2024.

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.



Description and Purpose

Liquid waste management includes procedures and practices to prevent discharge of pollutants to the storm drain system or to watercourses as a result of the creation, collection, and disposal of non-hazardous liquid wastes.

Suitable Applications

Liquid waste management is applicable to construction projects that generate any of the following non-hazardous by-products, residuals, or wastes:

- Drilling slurries and drilling fluids
- Grease-free and oil-free wastewater and rinse water
- Dredgings
- Other non-stormwater liquid discharges not permitted by separate permits

Limitations

- Disposal of some liquid wastes may be subject to specific laws and regulations or to requirements of other permits secured for the construction project (e.g., NPDES permits, Army Corps permits, Coastal Commission permits, etc.).

Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☒

Legend:

- ☒ **Primary Objective**
- ☒ **Secondary Objective**

Targeted Constituents

Sediment	☒
Nutrients	☒
Trash	☒
Metals	☒
Bacteria	
Oil and Grease	☒
Organics	

Potential Alternatives

None

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- Liquid waste management does not apply to dewatering operations (NS-2 Dewatering Operations), solid waste management (WM-5, Solid Waste Management), hazardous wastes (WM-6, Hazardous Waste Management), or concrete slurry residue (WM-8, Concrete Waste Management).
- Typical permitted non-stormwater discharges can include: water line flushing; landscape irrigation; diverted stream flows; rising ground waters; uncontaminated pumped ground water; discharges from potable water sources; foundation drains; irrigation water; springs; water from crawl space pumps; footing drains; lawn watering; flows from riparian habitats and wetlands; and discharges or flows from emergency fire fighting activities.

Implementation

General Practices

- Instruct employees and subcontractors how to safely differentiate between non-hazardous liquid waste and potential or known hazardous liquid waste.
- Instruct employees, subcontractors, and suppliers that it is unacceptable for any liquid waste to enter any storm drainage device, waterway, or receiving water.
- Educate employees and subcontractors on liquid waste generating activities and liquid waste storage and disposal procedures.
- Hold regular meetings to discuss and reinforce disposal procedures (incorporate into regular safety meetings).
- Verify which non-stormwater discharges are permitted by the statewide NPDES permit; different regions might have different requirements not outlined in this permit.
- Apply NS-8, Vehicle and Equipment Cleaning for managing wash water and rinse water from vehicle and equipment cleaning operations.

Containing Liquid Wastes

- Drilling residue and drilling fluids should not be allowed to enter storm drains and watercourses and should be disposed of.
- If an appropriate location is available, drilling residue and drilling fluids that are exempt under Title 23, CCR § 2511(g) may be dried by infiltration and evaporation in a containment facility constructed in conformance with the provisions concerning the Temporary Concrete Washout Facilities detailed in WM-8, Concrete Waste Management.
- Liquid wastes generated as part of an operational procedure, such as water-laden dredged material and drilling mud, should be contained and not allowed to flow into drainage channels or receiving waters prior to treatment.
- Liquid wastes should be contained in a controlled area such as a holding pit, sediment basin, roll-off bin, or portable tank.
- Containment devices must be structurally sound and leak free.

- Containment devices must be of sufficient quantity or volume to completely contain the liquid wastes generated.
- Precautions should be taken to avoid spills or accidental releases of contained liquid wastes. Apply the education measures and spill response procedures outlined in WM-4, Spill Prevention and Control.
- Containment areas or devices should not be located where accidental release of the contained liquid can threaten health or safety or discharge to water bodies, channels, or storm drains.

Capturing Liquid Wastes

- Capture all liquid wastes that have the potential to affect the storm drainage system (such as wash water and rinse water from cleaning walls or pavement), before they run off a surface.
- Do not allow liquid wastes to flow or discharge uncontrolled. Use temporary dikes or berms to intercept flows and direct them to a containment area or device for capture.
- Use a sediment trap (SE-3, Sediment Trap) for capturing and treating sediment laden liquid waste or capture in a containment device and allow sediment to settle.

Disposing of Liquid Wastes

- A typical method to handle liquid waste is to dewater the contained liquid waste, using procedures such as described in NS-2, Dewatering Operations, and SE-2, Sediment Basin, and dispose of resulting solids per WM-5, Solid Waste Management.
- Methods of disposal for some liquid wastes may be prescribed in Water Quality Reports, NPDES permits, Environmental Impact Reports, 401 or 404 permits, and local agency discharge permits, etc. Review the SWPPP to see if disposal methods are identified.
- Liquid wastes, such as from dredged material, may require testing and certification whether it is hazardous or not before a disposal method can be determined.
- For disposal of hazardous waste, see WM-6, Hazardous Waste Management.
- If necessary, further treat liquid wastes prior to disposal. Treatment may include, though is not limited to, sedimentation, filtration, and chemical neutralization.

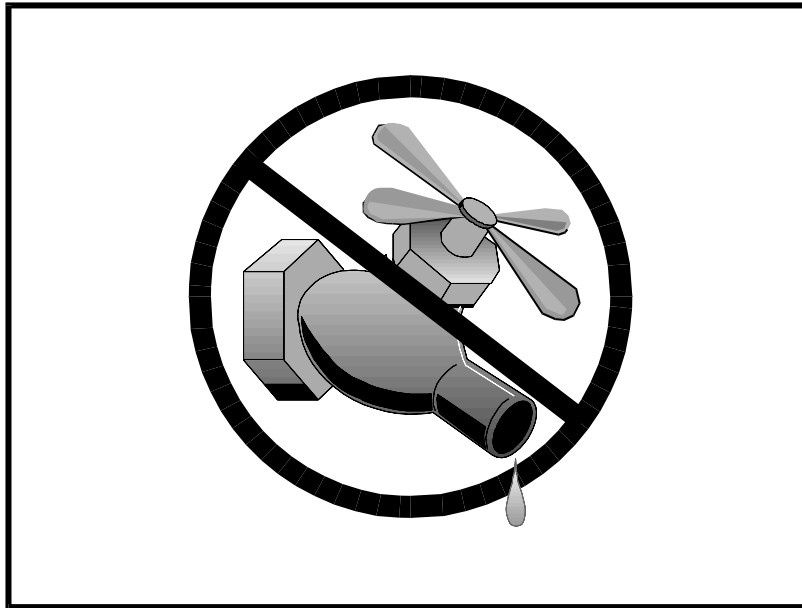
Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur.

- Remove deposited solids in containment areas and capturing devices as needed and at the completion of the task. Dispose of any solids as described in WM-5, Solid Waste Management.
- Inspect containment areas and capturing devices and repair as needed.

References and Additional Resources

Construction Site Best Management Practices (BMPs) Manual, CTSW-RT-24-425.11.1, California Department of Transportation (Caltrans), March 2024.



Description and Purpose

Water conservation practices are activities that use water during the construction of a project in a manner that avoids causing erosion and the transport of pollutants offsite. These practices can reduce or eliminate non-stormwater discharges.

Suitable Applications

Water conservation practices are suitable for all construction sites where water is used, including piped water, metered water, trucked water, and water from a reservoir.

Limitations

- None identified.

Implementation

- Keep water equipment in good working condition.
- Stabilize water truck filling area.
- Repair water leaks promptly.
- Washing of vehicles and equipment on the construction site is discouraged.
- Avoid using water to clean construction areas. If water must be used for cleaning or surface preparation, surface should be swept and vacuumed first to remove dirt. This will minimize amount of water required.

Categories

EC	Erosion Control	☒
SE	Sediment Control	☒
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☒
WM	Waste Management and Materials Pollution Control	

Legend:

- ☒ **Primary Objective**
- ☒ **Secondary Objective**

Targeted Constituents

Sediment	☒
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

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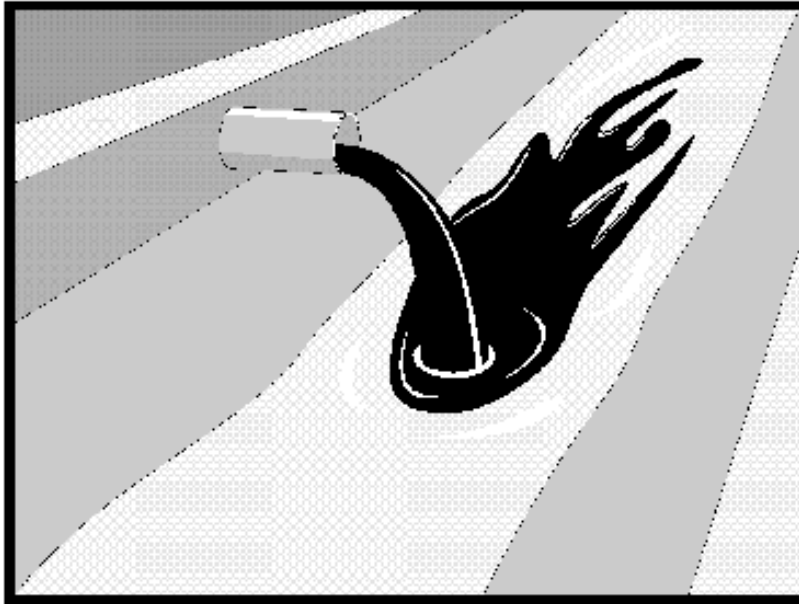
- Direct construction water runoff to areas where it can soak into the ground or be collected and used.
- Authorized non-stormwater discharges to the storm drain system, channels, or receiving waters are acceptable with the implementation of appropriate BMPs.
- Lock water tank valves to prevent unauthorized use.

Inspection and Maintenance

- Inspect and verify that activity based BMPs are in place prior to the commencement of authorized non-stormwater discharges.
- Inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges are occurring.
- Repair water equipment as needed to prevent unintended discharges.
 - Water trucks
 - Water reservoirs (water buffalos)
 - Irrigation systems
 - Hydrant connections

References and Additional Resources

Construction Site Best Management Practices (BMPs) Manual, CTSW-RT-24-425.11.1, California Department of Transportation (Caltrans), March 2024.



Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☒
WM	Waste Management and Materials Pollution Control	

Legend:

- ☒ **Primary Objective**
- ☒ **Secondary Objective**

Targeted Constituents

Sediment	
Nutrients	☒
Trash	☒
Metals	☒
Bacteria	☒
Oil and Grease	☒
Organics	☒

Potential Alternatives

None

Description and Purpose

Procedures and practices designed for construction contractors to recognize illicit connections or illegally dumped or discharged materials on a construction site and report incidents.

Suitable Applications

This best management practice (BMP) applies to all construction projects. Illicit connection/discharge and reporting is applicable anytime an illicit connection or discharge is discovered, or illegally dumped material is found on the construction site.

Limitations

Illicit connections and illegal discharges or dumping, for the purposes of this BMP, refer to discharges and dumping caused by parties other than the contractor. If pre-existing hazardous materials or wastes are known to exist onsite, they should be identified in the SWPPP and handled as set forth in the SWPPP.

Implementation

Planning

- Review the SWPPP. Pre-existing areas of contamination should be identified and documented in the SWPPP.
- Inspect site before beginning the job for evidence of illicit connections, illegal dumping or discharges. Document any pre-existing conditions and notify the owner.

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- Inspect site regularly during project execution for evidence of illicit connections, illegal dumping or discharges.
- Observe site perimeter for evidence for potential of illicitly discharged or illegally dumped material, which may enter the job site.

Identification of Illicit Connections and Illegal Dumping or Discharges

- **General** – unlabeled and unidentifiable material should be treated as hazardous.
- **Solids** - Look for debris, or rubbish piles. Solid waste dumping often occurs on roadways with light traffic loads or in areas not easily visible from the traveled way.
- **Liquids** - signs of illegal liquid dumping or discharge can include:
 - Visible signs of staining or unusual colors to the pavement or surrounding adjacent soils
 - Pungent odors coming from the drainage systems
 - Discoloration or oily substances in the water or stains and residues detained within ditches, channels or drain boxes
 - Abnormal water flow during the dry weather season
- **Urban Areas** - Evidence of illicit connections or illegal discharges is typically detected at storm drain outfall locations or at manholes. Signs of an illicit connection or illegal discharge can include:
 - Abnormal water flow during the dry weather season
 - Unusual flows in sub drain systems used for dewatering
 - Pungent odors coming from the drainage systems
 - Discoloration or oily substances in the water or stains and residues detained within ditches, channels or drain boxes
 - Excessive sediment deposits, particularly adjacent to or near active offsite construction projects
- **Rural Areas** - Illicit connections or illegal discharges involving irrigation drainage ditches are detected by visual inspections. Signs of an illicit discharge can include:
 - Abnormal water flow during the non-irrigation season
 - Non-standard junction structures
 - Broken concrete or other disturbances at or near junction structures

Reporting

Notify the owner of any illicit connections and illegal dumping or discharge incidents at the time of discovery. For illicit connections or discharges to the storm drain system, notify the local stormwater management agency. For illegal dumping, notify the local law enforcement agency.

Cleanup and Removal

The responsibility for cleanup and removal of illicit or illegal dumping or discharges will vary by location. Contact the local stormwater management agency for further information.

Inspection and Maintenance

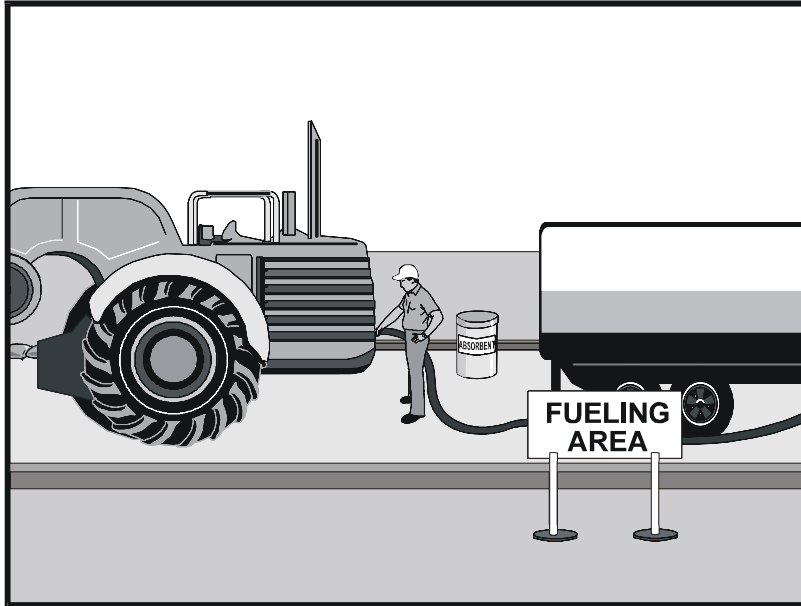
- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Inspect the site regularly to check for any illegal dumping or discharge.
- Prohibit employees and subcontractors from disposing of non-job-related debris or materials at the construction site.
- Notify the owner of any illicit connections and illegal dumping or discharge incidents at the time of discovery.

References and Additional Resources

Construction Site Best Management Practices (BMPs) Manual, CTSW-RT-24-425.11.1, California Department of Transportation (Caltrans), March 2024.

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.



Description and Purpose

Vehicle equipment fueling procedures and practices are designed to prevent fuel spills and leaks and reduce or eliminate contamination of stormwater. This can be accomplished by using offsite facilities, fueling in designated areas only, enclosing or covering stored fuel, implementing spill controls, and training employees and subcontractors in proper fueling procedures.

Suitable Applications

These procedures are suitable on all construction sites where vehicle and equipment fueling takes place.

Limitations

Onsite vehicle and equipment fueling should only be used where it is impractical to send vehicles and equipment offsite for fueling. Sending vehicles and equipment offsite should be done in conjunction with TC-1, Stabilized Construction Entrance/ Exit.

Implementation

- Use offsite fueling stations as much as possible. These businesses are better equipped to handle fuel and spills properly. Performing this work offsite can also be economical by eliminating the need for a separate fueling area at a site.
- Discourage “topping-off” of fuel tanks.

Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☒
WM	Waste Management and Materials Pollution Control	

Legend:

- ☒ **Primary Objective**
- ☒ **Secondary Objective**

Targeted Constituents

Sediment	
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	☒
Organics	

Potential Alternatives

None

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- Absorbent spill cleanup materials and spill kits should be available in fueling areas and on fueling trucks and should be disposed of properly after use.
- Drip pans or absorbent pads should be used during vehicle and equipment fueling, unless the fueling is performed over an impermeable surface in a dedicated fueling area.
- Use absorbent materials on small spills. Do not hose down or bury the spill. Remove the adsorbent materials promptly and dispose of properly.
- Avoid mobile fueling of mobile construction equipment around the site; rather, transport the equipment to designated fueling areas. With the exception of tracked equipment such as bulldozers and large excavators, most vehicles should be able to travel to a designated area with little lost time.
- Train employees and subcontractors in proper fueling and cleanup procedures.
- When fueling must take place onsite, designate an area away from drainage courses to be used. Fueling areas should be identified in the SWPPP.
- Dedicated fueling areas should be protected from stormwater runoff and should be located at least 50 ft away from downstream drainage facilities and watercourses. Fueling must be performed on level-grade areas.
- Protect fueling areas with berms and dikes to prevent runoff, and to contain spills.
- Nozzles used in vehicle and equipment fueling should be equipped with an automatic shutoff to control drips. Fueling operations should not be left unattended.
- Use vapor recovery nozzles to help control drips as well as air pollution where required by Air Quality Management Districts (AQMD).
- Federal, state, and local requirements should be observed for any stationary above ground storage tanks.

Inspection and Maintenance

- Inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Vehicles and equipment should be inspected each day of use for leaks. Leaks should be repaired immediately, or problem vehicles or equipment should be removed from the project site.
- Keep ample supplies of spill cleanup materials onsite.
- Immediately clean up spills and properly dispose of contaminated soil and cleanup materials.

References and Additional Resources

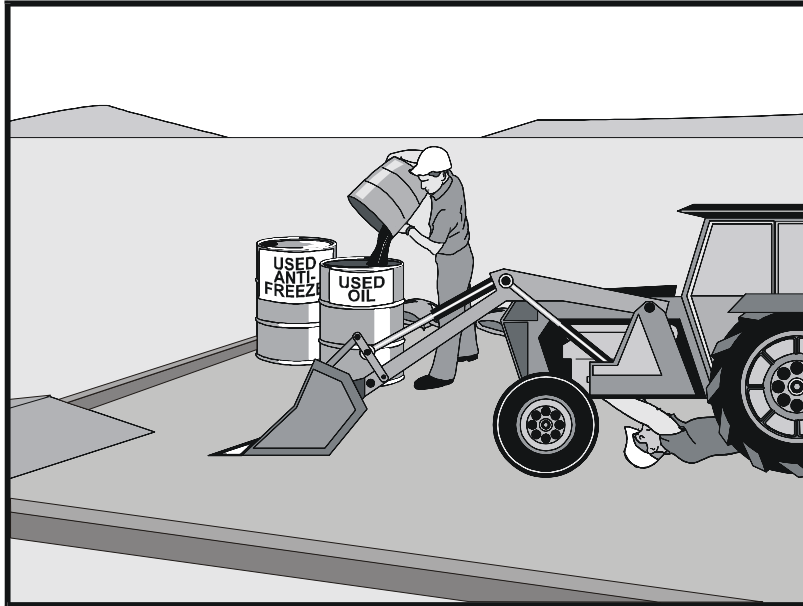
Construction Site Best Management Practices (BMPs) Manual, CTSW-RT-24-425.11.1, California Department of Transportation (Caltrans), March 2024.

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance, Working Group Working Paper; USEPA, April 1992.

Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

Vehicle & Equipment Maintenance NS-10



Description and Purpose

Prevent or reduce the contamination of stormwater resulting from vehicle and equipment maintenance by running a “dry and clean site”. The best option would be to perform maintenance activities at an offsite facility. If this option is not available then work should be performed in designated areas only, while providing cover for materials stored outside, checking for leaks and spills, and containing and cleaning up spills immediately. Employees and subcontractors must be trained in proper procedures.

Suitable Applications

These procedures are suitable on all construction projects where an onsite yard area is necessary for storage and maintenance of heavy equipment and vehicles.

Limitations

Onsite vehicle and equipment maintenance should only be used where it is impractical to send vehicles and equipment offsite for maintenance and repair. Sending vehicles/equipment offsite should be done in conjunction with TC-1, Stabilized Construction Entrance/Exit.

Outdoor vehicle or equipment maintenance is a potentially significant source of stormwater pollution. Activities that can contaminate stormwater include engine repair and service, changing or replacement of fluids, and outdoor equipment storage and parking (engine fluid leaks). For further information on vehicle or equipment servicing, see NS-8,

Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☒
WM	Waste Management and Materials Pollution Control	

Legend:

- ☒ Primary Objective
- ☒ Secondary Objective

Targeted Constituents

Sediment	
Nutrients	☒
Trash	☒
Metals	
Bacteria	
Oil and Grease	☒
Organics	☒

Potential Alternatives

None

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Vehicle & Equipment Maintenance NS-10

Vehicle and Equipment Cleaning, and NS-9, Vehicle and Equipment Fueling.

Implementation

- Use offsite repair shops as much as possible. These businesses are better equipped to handle vehicle fluids and spills properly. Performing this work offsite can also be economical by eliminating the need for a separate maintenance area.
- If maintenance must occur onsite, use designated areas, located away from drainage courses. Dedicated maintenance areas should be protected from stormwater runoff and should be located at least 50 ft from downstream drainage facilities and watercourses.
- Drip pans or absorbent pads should be used during vehicle and equipment maintenance work that involves fluids, unless the maintenance work is performed over an impermeable surface in a dedicated maintenance area.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- All fueling trucks and fueling areas are required to have spill kits and/or use other spill protection devices.
- Use adsorbent materials on small spills. Remove the absorbent materials promptly and dispose of properly.
- Inspect onsite vehicles and equipment daily at startup for leaks, and repair immediately.
- Keep vehicles and equipment clean; do not allow excessive build-up of oil and grease.
- Segregate and recycle wastes, such as greases, used oil or oil filters, antifreeze, cleaning solutions, automotive batteries, hydraulic and transmission fluids. Provide secondary containment and covers for these materials if stored onsite.
- Train employees and subcontractors in proper maintenance and spill cleanup procedures.
- Drip pans or plastic sheeting should be placed under all vehicles and equipment placed on docks, barges, or other structures over water bodies when the vehicle or equipment is planned to be idle for more than 1 hour.
- For long-term projects, consider using portable tents or covers over maintenance areas if maintenance cannot be performed offsite.
- Consider use of new, alternative greases and lubricants, such as adhesive greases, for chassis lubrication and fifth-wheel lubrication.
- Properly dispose of used oils, fluids, lubricants, and spill cleanup materials.
- Do not place used oil in a dumpster or pour into a storm drain or watercourse.
- Properly dispose of or recycle used batteries.
- Do not bury used tires.

Vehicle & Equipment Maintenance NS-10

- Repair leaks of fluids and oil immediately.

Listed below is further information if you must perform vehicle or equipment maintenance onsite.

Safer Alternative Products

- Consider products that are less toxic or hazardous than regular products. These products are often sold under an “environmentally friendly” label.
- Consider use of grease substitutes for lubrication of truck fifth-wheels. Follow manufacturers label for details on specific uses.
- Consider use of plastic friction plates on truck fifth-wheels in lieu of grease. Follow manufacturers label for details on specific uses.

Waste Reduction

Parts are often cleaned using solvents such as trichloroethylene, trichloroethane, or methylene chloride. Many of these cleaners are listed in California Toxic Rule as priority pollutants. These materials are harmful and must not contaminate stormwater. They must be disposed of as a hazardous waste. Reducing the number of solvents makes recycling easier and reduces hazardous waste management costs. Often, one solvent can perform a job as well as two different solvents. Also, if possible, eliminate or reduce the amount of hazardous materials and waste by substituting non-hazardous or less hazardous materials. For example, replace chlorinated organic solvents with non-chlorinated solvents. Non-chlorinated solvents like kerosene or mineral spirits are less toxic and less expensive to dispose of properly. Check the list of active ingredients to see whether it contains chlorinated solvents. The “chlor” term indicates that the solvent is chlorinated. Also, try substituting a wire brush for solvents to clean parts.

Recycling and Disposal

Separating wastes allows for easier recycling and may reduce disposal costs. Keep hazardous wastes separate, do not mix used oil solvents, and keep chlorinated solvents (like, -trichloroethane) separate from non-chlorinated solvents (like kerosene and mineral spirits). Promptly transfer used fluids to the proper waste or recycling drums. Don’t leave full drip pans or other open containers lying around. Provide cover and secondary containment until these materials can be removed from the site.

Oil filters can be recycled. Ask your oil supplier or recycler about recycling oil filters.

Do not dispose of extra paints and coatings by dumping liquid onto the ground or throwing it into dumpsters. Allow coatings to dry or harden before disposal into covered dumpsters.

Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries, even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs

Vehicle & Equipment Maintenance NS-10

in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.

- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Keep ample supplies of spill cleanup materials onsite.
- Maintain waste fluid containers in leak proof condition.
- Vehicles and equipment should be inspected on each day of use. Leaks should be repaired immediately, or the problem vehicle(s) or equipment should be removed from the project site.
- Inspect equipment for damaged hoses and leaky gaskets routinely. Repair or replace as needed.

References and Additional Resources

Construction Site Best Management Practices (BMPs) Manual, CTSW-RT-24-425.11.1, California Department of Transportation (Caltrans), March 2024.

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Coastal Nonpoint Pollution Control Program; Program Development and Approval Guidance, Working Group, Working Paper; USEPA, April 1992.

Appendix H

BMP Inspection Form

BMP INSPECTION REPORT

Date and Time of Inspection:			Date Report Written:		
Inspection Type: (Circle one)	Weekly <i>Complete Parts I, II, III and VII</i>	Pre-Qualifying Precipitation Event (QPE) <i>Complete Parts I, II, III, IV and VII</i>	During QPE <i>Complete Parts I, II, III, V, and VII</i>	Post-QPE <i>Complete Parts I, II, III, VI and VII</i>	<i>Inactive Project Complete Parts I, II, III and VII</i>

Part I. General Information

Site Information			
Construction Site Name:			
Construction stage and completed activities:			Approximate area of site that is exposed:
Photos Taken: (Circle one)	Yes	No	Photo Reference IDs:
Weather			
Estimate storm beginning: (date and time)		Estimate storm duration: (hours)	
Estimate time since last storm: (days or hours)		Rain gauge reading and location: (in)	
Is a "Qualifying Precipitation Event" predicted or did one occur (i.e., any weather pattern with a 50% chance of 0.5" or more within a 24-hr period when 0.5" has been forecast and continues on subsequent 24-hour periods when 0.25" of precipitation or more is forecast)? (Y/N) If yes, summarize forecast:			
Exception Documentation (explanation required if inspection could not be conducted). Visual inspections are not required outside of business hours or during dangerous weather conditions such as electrical storms, flooding, and high winds above 40 miles per hour.			
Inspector Information			
Inspector Name:			Inspector Title:
Inspector Certification:			Date:

Part II. BMP Observations. Describe deficiencies in Part III.

Minimum BMPs for Risk Level ____ Sites	Adequately designed, implemented and effective (yes, no, N/A)	Action Required (yes/no)	Action Implemented (Date)
Good Housekeeping for Construction Materials			
Inventory of products (excluding materials designed to be outdoors)			
Stockpiled construction materials not actively in use are covered and bermed			
All chemicals are stored in watertight containers with appropriate secondary containment, or in a completely enclosed storage shed			
Construction materials are minimally exposed to precipitation			
BMPs preventing the off-site tracking of materials are implemented and properly effective			
Good Housekeeping for Waste Management			
Wash/rinse water and materials are prevented from being disposed into the storm drain system			
Portable toilets are contained to prevent discharges of waste			
Sanitation facilities are clean and with no apparent for leaks and spills			
Equipment is in place to cover waste disposal containers at the end of business day and during rain events			
Discharges from waste disposal containers are prevented from discharging to the storm drain system / receiving water			
Stockpiled waste material is securely protected from wind and rain if not actively in use			
Procedures are in place for addressing hazardous and non-hazardous spills			
Appropriate spill response personnel are assigned and trained			
Equipment and materials for cleanup of spills is available onsite			
Washout areas (e.g., concrete) are contained appropriately to prevent discharge or infiltration into the underlying soil			
Good Housekeeping for Vehicle Storage and Maintenance			
Measures are in place to prevent oil, grease, or fuel from leaking into the ground, storm drains, or surface waters			
All equipment or vehicles are fueled, maintained, and stored in a designated area with appropriate BMPs			
Vehicle and equipment leaks are cleaned immediately and disposed of properly			
Part II. BMP Observations Continued. Describe deficiencies in Part III.			
Minimum BMPs for Risk Level 1 Sites	Adequately designed, implemented and effective (yes, no, N/A)	Action Required (yes/no)	Action Implemented (Date)

Good Housekeeping for Landscape Materials			
Stockpiled landscape materials such as mulches and topsoil are contained and covered when not actively in use			
Erodible landscape material has not been applied 2 days before a forecasted rain event or during an event			
Erodible landscape materials are applied at quantities and rates in accordance with manufacturer recommendations			
Bagged erodible landscape materials are stored on pallets and covered			
Good Housekeeping for Air Deposition of Site Materials			
Good housekeeping measures are implemented onsite to control the air deposition of site materials and from site operations			
Non-Stormwater Management			
Non-Stormwater discharges are properly controlled			
Vehicles are washed in a manner to prevent non-stormwater discharges to surface waters or drainage systems			
Streets are cleaned in a manner to prevent unauthorized non-stormwater discharges to surface waters or drainage systems.			
Erosion Controls			
Wind erosion controls are effectively implemented			
Effective soil cover is provided for disturbed areas inactive (i.e., not scheduled to be disturbed for 14 days) as well as finished slopes, open space, utility backfill, and completed lots			
The use of plastic materials is limited in cases when a more sustainable, environmentally friendly alternative exists.			
Sediment Controls			
Perimeter controls are established and effective at controlling erosion and sediment discharges from the site			
Entrances and exits are stabilized to control erosion and sediment discharges from the site			
Sediment basins are properly maintained			
Inspect immediate access roads prior to forecasted precipitation			
Linear sediment control along toe of slope, face of slope and at grade breaks (Risk Level 2 & 3 Only)			
Limit construction activity to and from site to entrances and exits that employ effective controls to prevent offsite tracking (Risk Level 2 & 3 Only)			
Ensure all storm, drain inlets and perimeter controls, runoff control BMPs and pollutants controls at entrances and exits are maintained and protected from activities that reduce their effectiveness (Risk Level 2 & 3 Only)			
Run-On and Run-Off Controls			
Run-on to the site is effectively managed and directed away from all disturbed areas.			
Other			

Are the project SWPPP and BMP plan up to date, available onsite and being properly implemented?			
Is the posting of the project's unique WDID number, waiver identification number, and site and project contact information publicly accessible?			

Part III. Descriptions of BMP Deficiencies		
Deficiency	Repairs Implemented: Note - Repairs must begin within 72 hours of identification and, complete repairs as soon as possible.	
	Start Date	Action
1.		
2.		
3.		
4.		

Part IV. Additional Pre-QPE Observations. Note the presence or absence of floating and suspended materials, sheen, discoloration, turbidity, odors, and source(s) of pollutants(s).	
	Yes, No, N/A
Do stormwater storage and containment areas have adequate freeboard? If no, complete Part III.	
Are drainage areas free of spills, leaks, or uncontrolled pollutant sources? If no, complete Part VII and describe below.	
Notes:	
Are stormwater storage and containment areas free of leaks? If no, complete Parts III and/or VII and describe below.	
Notes:	

Part V. Additional During-QPE Observations. If BMPs cannot be inspected during inclement weather, list the results of visual inspections at all relevant outfalls, discharge points, and downstream locations. Note odors or visible sheen on the surface of discharges. Complete Part VII (Corrective Actions) as needed.	
Outfall, Discharge Point, or Other Downstream Location	
Location	Description
Location	Description
Location	Description

Location	Description
----------	-------------

Part VI. Additional Post-QPE Observations. Visually observe (inspect) stormwater discharges at all discharge locations within 96 hours after each qualifying precipitation event, and observe (inspect) the discharge of stored or contained stormwater that is derived from and discharged subsequent to a qualifying precipitation event producing precipitation of ½ inch or more at the time of discharge. Complete Part VII (Corrective Actions) as needed.

Discharge Location, Storage or Containment Area	Visual Observation

Part VII. Additional Corrective Actions Required. Identify additional corrective actions not included with BMP Deficiencies (Part III) above. Note if SWPPP change is required.

Required Actions	Implementation Date

Appendix I

Training Forms

Contractor Personnel Training Log

Stormwater Management Training Log and Documentation

Project Name: _____

WDID #: _____

Stormwater Management Topic: (check as appropriate)

- | | |
|---|--|
| ☐ Good Housekeeping BMPs | ☐ Erosion Control BMPs |
| ☐ Sediment Control BMPs | ☐ Tracking Control |
| ☐ Non-Stormwater Management BMPs | ☐ Waste Management & Pollution Control BMPs |
| ☐ BMP Implementation Activities | ☐ Advanced BMPs |
| ☐ Identification of QSPs and QSP Delegates | |

Training Objective: _____

Date: _____ Instructor: _____

Training Length (hours): _____

Attendee Roster (Attach additional forms if necessary)

Name	Company	Phone

QSP Delegate Training Log

Stormwater Management Training Log and Documentation

Project Name: _____

WDID #: _____

QSP Delegate Name: _____

Delegated Responsibilities:

- ☐ Stormwater Visual Inspections
- ☐ Sampling
- ☐ BMP Inspections
- ☐ BMP Maintenance and Repair

Foundational Training

Topic	Date Completed	QSP Trainer
☐ Roles and Responsibilities		
☐ Forecast Information		
☐ Documentation and Reporting Procedures		

Site-Specific Training

Topic	Date Completed	QSP Trainer
☐ Visual Inspections		
☐ Sample Collection Procedures		
☐ Sample Reporting Procedures		
☐ BMP Implementation		

As needed, attach proof of external training (e.g., course completion certificates, credentials for the QSP Delegate).

Appendix J

Responsible Parties

Identification of QSP and QSP Delegates

Project Name: Ridge Cut Erosion Repair - Phase 2

WDID #: 5A57CR00225

The following are QSPs and QSP Delegates associated with this project

Name of Personnel ⁽¹⁾	QSP Number, or state "Delegate"	Company	Date
Sean Pritchard	84256	KSN Inc.	June 9, 2026

(1) If additional QSPs or QSP Delegates are required on the job site add additional lines

Appendix K

Contractors and Subcontractors

The 2022 CGP Section V requires that the SWPPP include a list of names of all contractors, subcontractors, and other individuals who will be directed by the QSP.

Contractor Name:	
Title:	
Contractor Company:	
Address	
Phone Number:	
Phone Number (24/7)	
[Add additional rows, if needed]	

Appendix L

Calculations

 An official website of the United States government

MENU

National Pollutant Discharge Elimination System (NPDES)

CONTACT US

SHARE   

Rainfall Erosivity Factor Calculator for Small Construction

Introduction

EPA's stormwater regulations allow NPDES permitting authorities to waive NPDES permitting requirements for stormwater discharges from small construction sites if:

- the construction site disturbs less than five acres, and
- the rainfall erosivity factor ("R" in the revised universal soil loss equation, or RUSLE) value is less than five during the period of construction activity.

If your small construction project is located in an area where EPA is the permitting authority and your R factor is less than five, you qualify for a low erosivity waiver (LEW) from NPDES stormwater permitting. If your small construction project does not qualify for a waiver, then NPDES stormwater permit coverage is required. Follow the steps below to calculate your R-Factor.

LEW certifications are submitted through the NPDES eReporting Tool or "CGP-NeT". Several states that are authorized to implement the NPDES permitting program also accept LEWs. Check with your state NPDES permitting authority for more information.

- Submit your LEW through EPA's eReporting Tool <<https://www.epa.gov/npdes/submitted-notice-intent-noi-notice-termination-not-or-low-erosivity-waiver-lew-under>>



- List of states, Indian country, and territories where EPA is the permitting authority (pdf) <<https://www.epa.gov/system/files/documents/2022-01/2022-cgp-final-appendix-b-areas-of-permit-cover.pdf>>
- Construction Rainfall Erosivity Waiver Fact Sheet <<https://www.epa.gov/npdes/construction-rainfall-erosivity-waiver-fact-sheet>>
- Small Construction Waivers and Instructions (pdf) <<https://www.epa.gov/system/files/documents/2022-01/2022-cgp-final-appendix-c-waivers.pdf>>

The R-factor calculation can also be integrated directly into custom applications using the R-Factor web service <<https://epa.gov/api-docs/>>.

Steps to Calculate an R Factor for your Small Construction Project

- 1 Select the estimated start and end dates of construction by clicking the calendar icons below and using the dropdown calendar. The period of construction activity begins at initial earth disturbance and ends with final stabilization.

Start Date:

08/03/2026

End Date:

10/02/2026

- 2 Locate your small construction project by entering the address in the search box or by clicking on the map.

Location:

-121.69246227410234 , 38.74757280520

Search





3 Click the "Calculate R Factor" button below.

Calculate R Factor

Facility Information

Start Date: 08/03/2026	Latitude: 38.7476
End Date: 10/02/2026	Longitude: -121.6925

Calculation Results

Rainfall erosivity factor (R Factor) = 0.982

A rainfall erosivity factor of less than 5.0 has been calculated for your site and period of construction. If you are located in an area where EPA is the permitting authority (pdf) <<https://www.epa.gov/system/files/documents/2022-01/2022-cgp-final-appendix-b-areas-of-permit-cover.pdf>>, you can submit a LEW through EPA's NPDES eReporting Tool (NeT) <<https://www.epa.gov/npdes/submitted-notice-intent-noi-notice-termination-not-or-low->

erosivity-waiver-lew-under>. Otherwise, contact your state permitting authority to determine if you are eligible for a waiver from NPDES permitting requirements.

If you submitted a LEW through EPA's NeT and your construction activity ultimately extends past the project completion date you specified above, you must recalculate the R factor using the original start date and a new project completion date. If the recalculated R factor is still less than 5.0, you must submit a modification to your LEW through NeT before the end of the original construction period. If the new R factor is 5.0 or greater, you must submit a Notice of Intent (NOI) instead to be covered by the Construction General Permit (CGP) before the original project completion date.

For questions or comments, email EPA's CGP staff at cgp@epa.gov.



Discover

•

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<<https://www.epa.gov/aboutepa/epa-hotlines>>

FOIA Requests

<<https://www.epa.gov/foia>>

EPA www Web Snapshot

<<https://www.epa.gov/home/wwwepagov-snapshots>>

Grants

<<https://www.epa.gov/grants>>

No FEAR Act Data

<<https://www.epa.gov/oc/r/whistleblower-protections-epa-and-how-they-relate-non-disclosure-agreements-signed-epa>>

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<<https://www.epa.gov/web-policies-and-procedures/plain-writing>>

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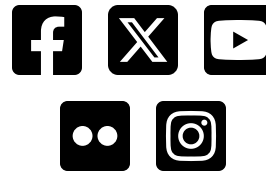
White House

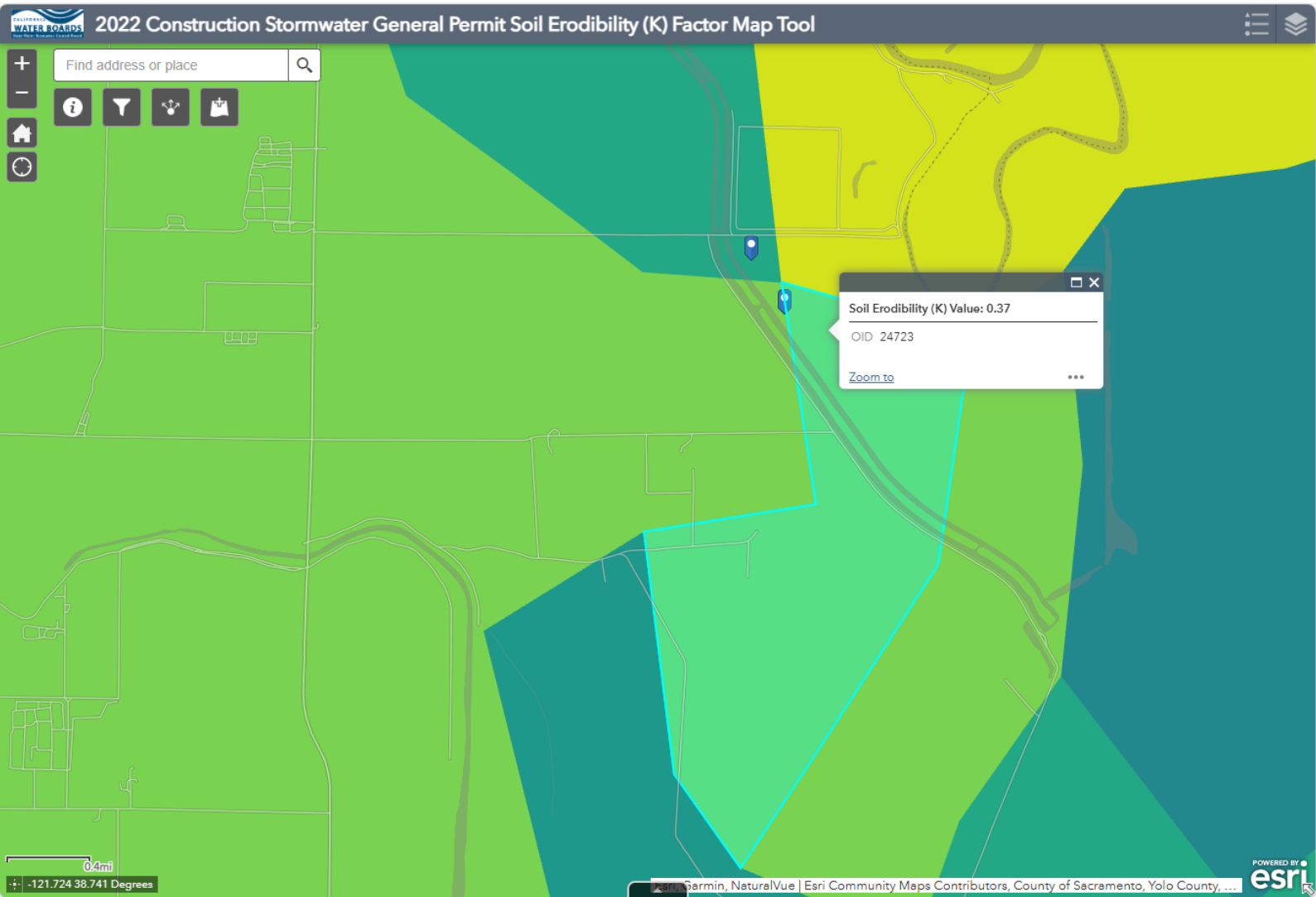
<<https://www.whitehouse.gov/>>

Frequent Questions

<<https://www.epa.gov/aboutepa/frequent-questions-specific-epa-programsttopics>>

Follow.

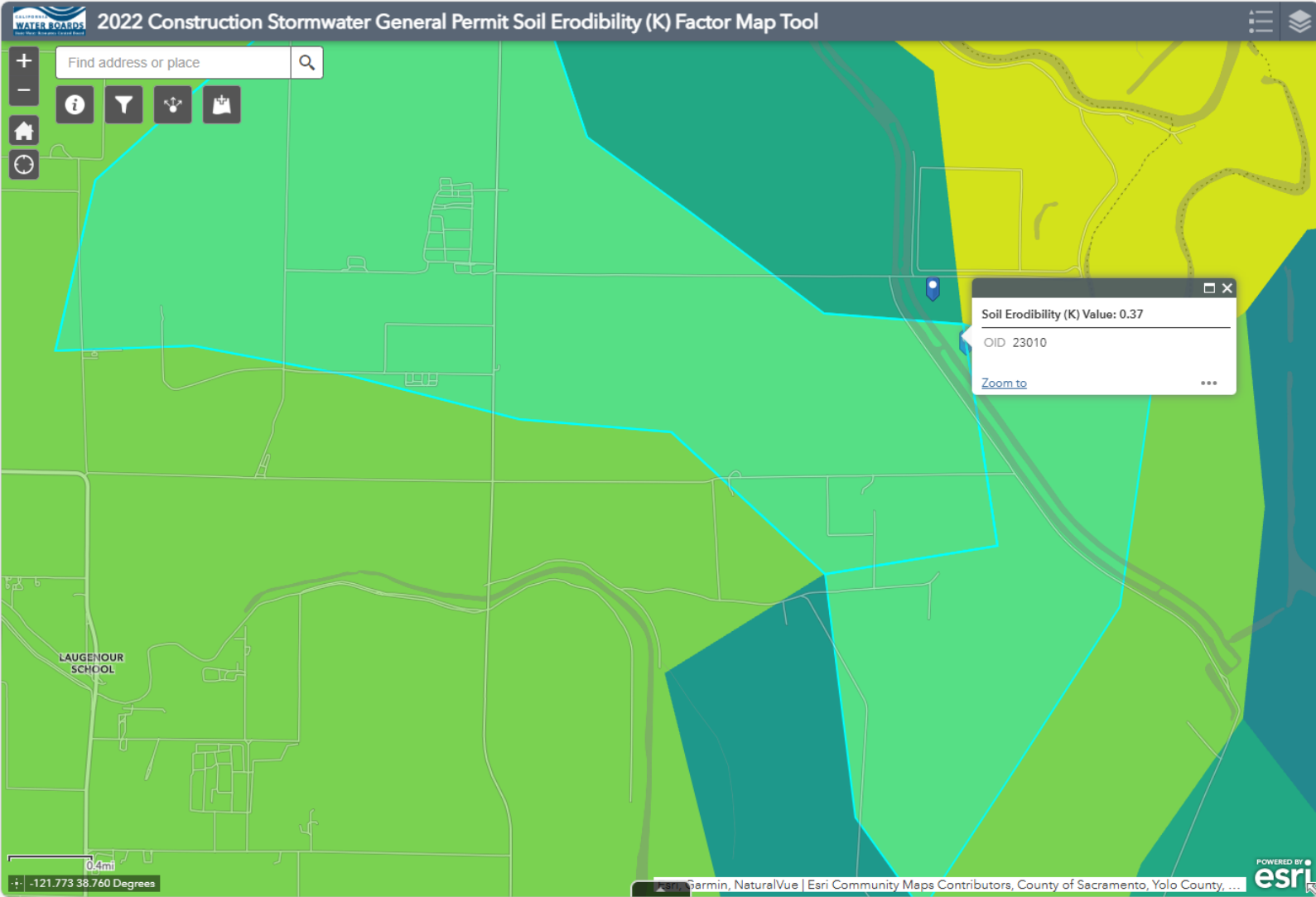




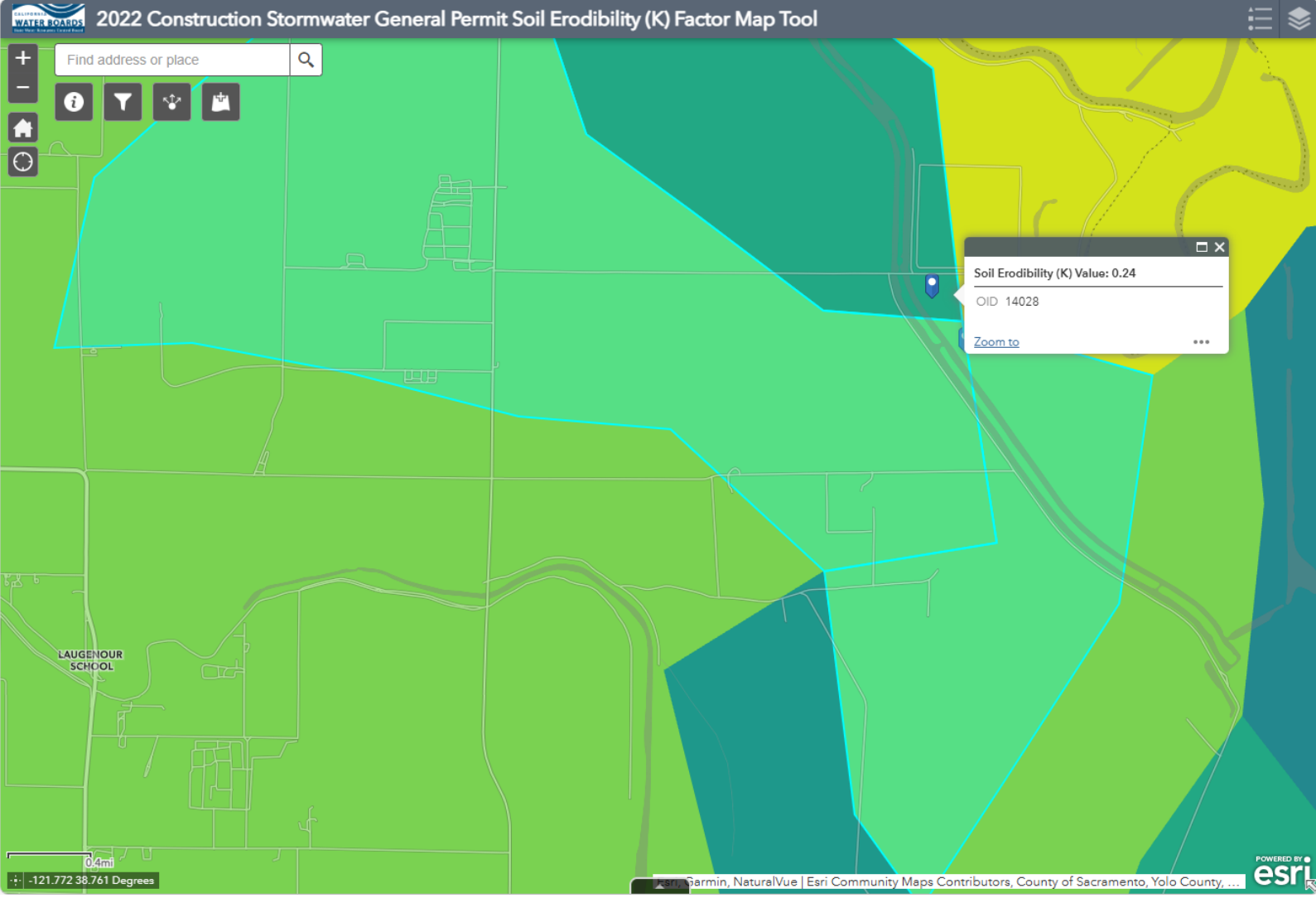
[K Factor](#)

0.33

K=0.37



K=0.37

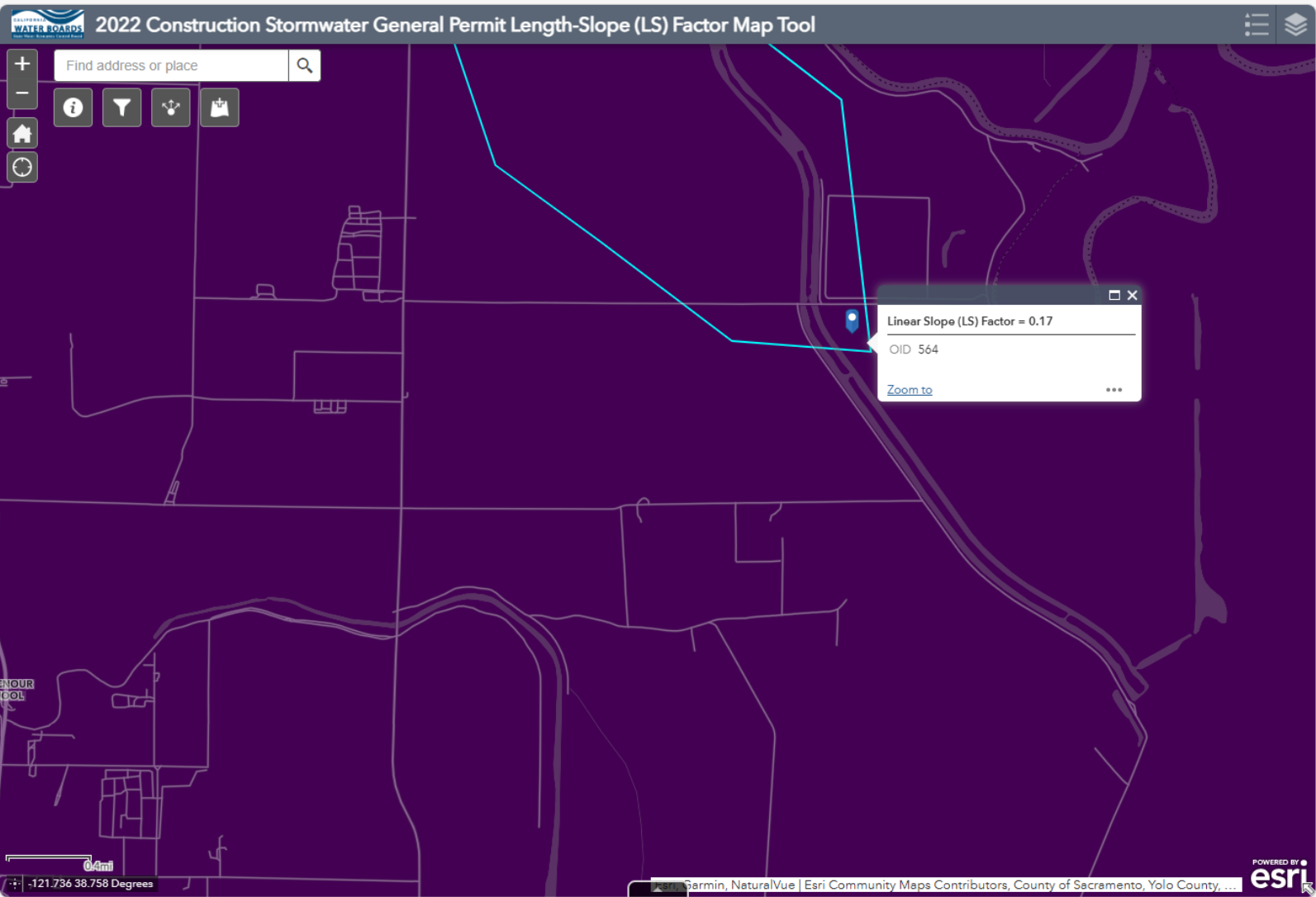


K=0.24

1/3 site for each zone

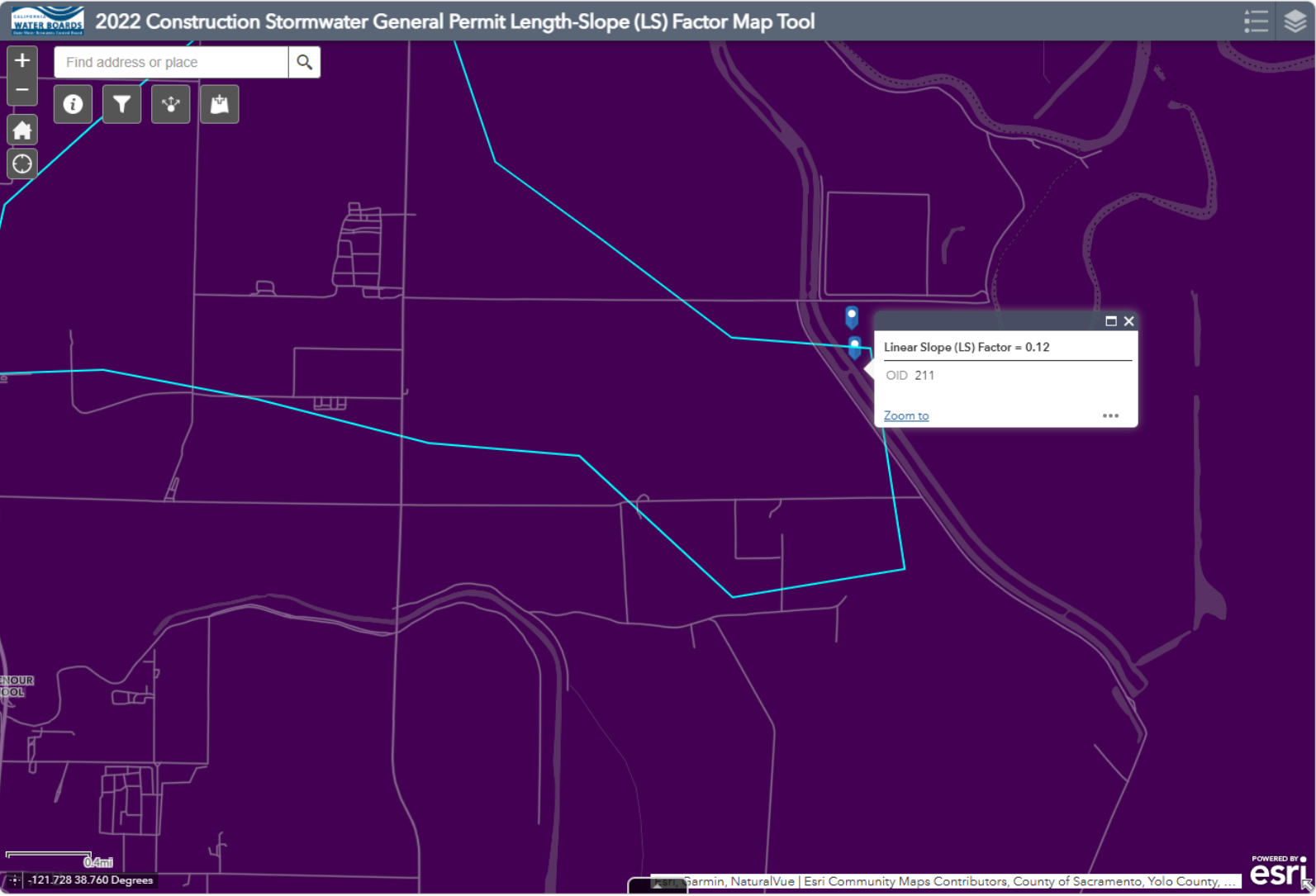
$0.37+0.37+0.24=0.98$

$0.98/3= 0.33(0.3266)$

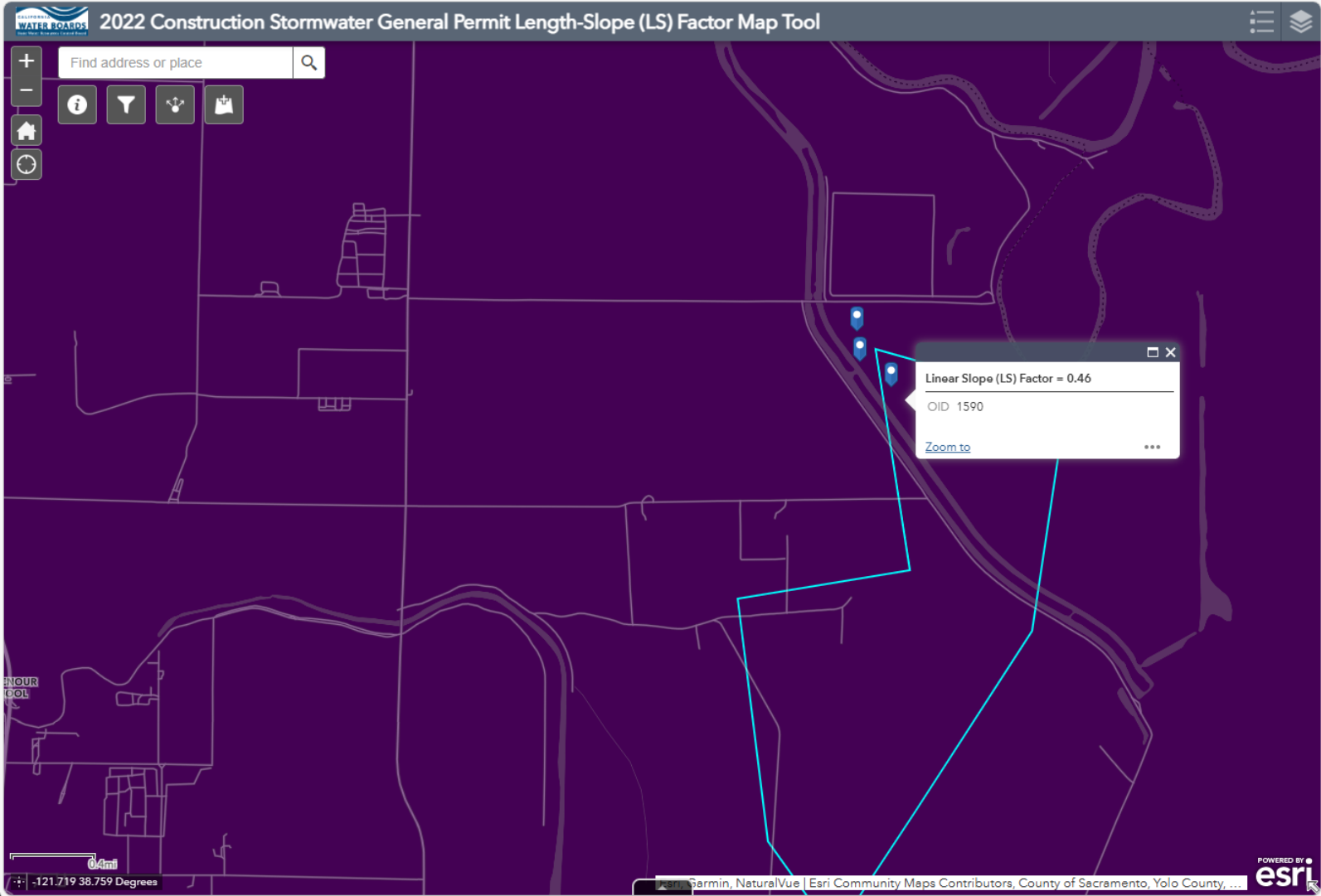


[LS Factor](#)

LS= 0.17



LS=0.12



LS=0.46

Final California 2024 Integrated Report (303(d) List/305(b) Report)

Supporting Information

Regional Board 5 - Central Valley Region

Water Body Name:Knights Landing Ridge Cut (Yolo County)

Water Body ID:CAR5202100020080708170311

Water Body Type:River & Stream

DECISION ID135059

Knights Landing Ridge Cut (Yolo County)

Region 5

Pollutant:Chloride

Final Listing Decision:Do Not List on 303(d) list (TMDL required list)

Last Listing Cycle's Final Listing Decision:New Decision

Revision StatusRevised

Impairment from Pollutant or Pollution:Pollutant

Regional Board Conclusion:

During the 2024 Cycle LOEs were updated due to a reassessment of data based on the Central Valley Water Board CV-SALTS Secondary MCL Policy.

Readily available data for this water body have been considered. Although this water body is designated with the Municipal and Domestic Supply beneficial use (MUN), no decision has been made regarding beneficial use support due to a lack of clarity in the status of this water body under the Clean Water Act and the Navigable Waters Protection Rule. A decision regarding the beneficial use support of this water body will be made during a future Integrated Report cycle if it is determined that this water body is classified as a Water of the United States under the Navigable Waters Protection Rule.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because of a lack of clarity in the status of this water body under the Clean Water Act and the Navigable Waters Protection Rule.

State Board Review of Regional Board Conclusion and Recommendation:

State Board Decision Recommendation:

After review of the available data and information, SWRCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because it cannot be determined if applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 135059, Chloride

Knights Landing Ridge Cut (Yolo County)

Region 5

LOE ID:312760

Pollutant:Chloride

LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed STORET data for Knights Landing Ridge Cut (Yolo County) to determine beneficial use support and results are as follows: 0 of 1 samples exceeded the upper limit of the range for Chloride. Additionally, 0 of the 1 samples fall within the range, and 1 of 1 samples fall below the threshold.
Data Reference:	WQX data for the 2020/2022 integrated report in Region 5.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL that is incorporated by reference into the Water Quality Control Plan for the Sacramento and San Joaquin River Basins specifies a range for chloride of 250 - 500 mg/L assessed as an annual average.
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins; Fifth Edition. Revised May 2018 (with approved amendments)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at 1 monitoring site: CALWR_WQX-A0D84761435 (Ridge Cut Slough at Knights Landing).
Temporal Representation:	The samples were collected between the dates of 2014-12-22 and 2014-12-22
Environmental Conditions:	
QAPP Information:	STORET
QAPP Information Reference(s):	This is a placeholder reference for data that was collected after QAPP requirements were developed, but exempt from the requirements.

DECISION ID 146864

Region 5

Knights Landing Ridge Cut (Yolo County)

Pollutant:	Simazine
Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: Readily available data for this water body have been considered. Although this water body is designated with the Municipal and Domestic Supply beneficial use (MUN), no decision has been made regarding beneficial use support due to a lack of clarity in the status of this water body under the Clean Water Act and the Navigable Waters Protection Rule. A decision regarding the beneficial

use support of this water body will be made during a future Integrated Report cycle if it is determined that this water body is classified as a Water of the United States under the Navigable Waters Protection Rule.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because of a lack of clarity in the status of this water body under the Clean Water Act and the Navigable Waters Protection Rule.

State Board Review of Regional Board Conclusion and Recommendation:

State Board Decision Recommendation: After review of this Regional Board decision, SWRCB staff recommend the decision be approved by the State Board.

**Line of Evidence (LOE) for Decision ID 146864, Simazine
Knights Landing Ridge Cut (Yolo County)**

Region 5

LOE ID:	292550
Pollutant:	Simazine
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed USGS California Water Science Center data for Knights Landing Ridge Cut (Yolo County) to determine beneficial use support and results are as follows: 0 of 2 samples exceeded the water quality threshold for Simazine.
Data Reference:	WQ data from the federal Water Quality Portal (WQP) assembled for the 2024 Integrated Report in Region 5.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Primary Maximum Contaminant Level for Simazine incorporated by reference in the Water Quality Control Plan for the Sacramento and San Joaquin River Basins is 0.004 mg/L.
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins; Fifth Edition. Revised May 2018 (with approved amendments)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at 1 monitoring site: USGS-384737121433201 (KNIGHTS LANDING RIDGE CUT A KNIGHTS LANDING CA).
Temporal Representation:	The samples were collected between the dates of 2017-06-29 and 2017-07-13
Environmental Conditions:	

QAPP Information:

SWRCB. 2018. This is a placeholder reference for data that was collected after QAPP requirements were developed, but exempt from the requirements..

QAPP Information Reference(s):

[This is a placeholder reference for data that was collected after QAPP requirements were developed, but exempt from the requirements.](#)

DECISION ID

153977

Region 5

Knights Landing Ridge Cut (Yolo County)

Pollutant:

Specific Conductivity

Final Listing Decision:

Do Not List on 303(d) list (TMDL required list)

Last Listing Cycle's Final Listing Decision:

New Decision

Revision Status

Revised

Impairment from Pollutant or Pollution:

Pollutant

Regional Board Conclusion:

Readily available data for this water body have been considered. Although this water body is designated with the Municipal and Domestic Supply beneficial use (MUN), no decision has been made regarding beneficial use support due to a lack of clarity in the status of this water body under the Clean Water Act and the Navigable Waters Protection Rule. A decision regarding the beneficial use support of this water body will be made during a future Integrated Report cycle if it is determined that this water body is classified as a Water of the United States under the Navigable Waters Protection Rule.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because of a lack of clarity in the status of this water body under the Clean Water Act and the Navigable Waters Protection Rule.

State Board Review of Regional Board Conclusion and Recommendation:

State Board Decision Recommendation: After review of the available data and information, SWRCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because it cannot be determined if applicable water quality standards are not being exceeded.

Line of Evidence (LOE) for Decision ID 153977, Specific Conductivity

Region 5

Knights Landing Ridge Cut (Yolo County)

LOE ID:

313538

Pollutant:

Specific Conductivity

LOE Subgroup:

Pollutant-Water

Matrix:

Water

Fraction:

Total

Beneficial Use:

Municipal & Domestic Supply

Number of Samples:

2

Number of Exceedances:

0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed USGS California Water Science Center data for Knights Landing Ridge Cut (Yolo County) to determine beneficial use support and results are as follows: 0 of 2 samples exceeded the upper limit of the range for SpecificConductivity. Additionally, 0 of the 2 samples fall within the range, and 2 of 2 samples fall below the threshold.
Data Reference:	WQ data from the federal Water Quality Portal (WQP) assembled for the 2024 Integrated Report in Region 5.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL that is incorporated by reference into the Water Quality Control Plan for the Sacramento and San Joaquin River Basins specifies a range for specific conductance of 900 - 1600 uS/cm assessed as an annual average.
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins; Fifth Edition. Revised May 2018 (with approved amendments)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at 1 monitoring site: USGS-384737121433201 (KNIGHTS LANDING RIDGE CUT A KNIGHTS LANDING CA).
Temporal Representation:	The samples were collected between the dates of 2017-11-01 and 2018-10-25
Environmental Conditions:	
QAPP Information:	SWRCB. 2018. This is a placeholder reference for data that was collected after QAPP requirements were developed, but exempt from the requirements..
QAPP Information Reference(s):	This is a placeholder reference for data that was collected after QAPP requirements were developed, but exempt from the requirements.

DECISION ID	135060	Region 5
Knights Landing Ridge Cut (Yolo County)		
Pollutant:	Sulfates	
Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)	
Last Listing Cycle's Final Listing Decision:	New Decision	
Revision Status	Revised	
Impairment from Pollutant or Pollution:	Pollutant	
Regional Board Conclusion:	During the 2024 Cycle LOEs were updated due to a reassessment of data based on the Central Valley Water Board CV-SALTS Secondary MCL Policy.	
	Readily available data for this water body have been considered. Although this water body is designated with the Municipal and Domestic Supply beneficial use (MUN), no decision has been made regarding beneficial use support due to a lack of clarity in the status of this water body under the Clean Water Act and the Navigable Waters Protection Rule. A decision regarding the beneficial use support of this water body will be made during a future Integrated Report cycle if it is determined that this water body is classified as a Water of the United States under the Navigable Waters Protection Rule.	
Regional Board Decision Recommendation:	After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because of a lack of clarity in the status of this water body under the Clean Water Act and the	

**State Board Review of Regional Board
Conclusion and Recommendation:**

State Board Decision Recommendation: After review of the available data and information, SWRCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because it cannot be determined if applicable water quality standards are not being exceeded.

**Line of Evidence (LOE) for Decision ID 135060, Sulfates
Knights Landing Ridge Cut (Yolo County)**

Region 5

LOE ID:	313173
Pollutant:	Sulfates
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed STORET data for Knights Landing Ridge Cut (Yolo County) to determine beneficial use support and results are as follows: 0 of 1 samples exceeded the upper limit of the range for Sulfate. Additionally, 0 of the 1 samples fall within the range, and 1 of 1 samples fall below the threshold.
Data Reference:	WQX data for the 2020/2022 integrated report in Region 5.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL that is incorporated by reference into the Water Quality Control Plan for the Sacramento and San Joaquin River Basins specifies a range for sulfate of 250 - 500 mg/L assessed as an annual average.
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins; Fifth Edition. Revised May 2018 (with approved amendments)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at 1 monitoring site: CALWR_WQX-A0D84761435 (Ridge Cut Slough at Knights Landing).
Temporal Representation:	The samples were collected between the dates of 2014-12-22 and 2014-12-22
Environmental Conditions:	
QAPP Information:	STORET
QAPP Information Reference(s):	This is a placeholder reference for data that was collected after QAPP requirements were developed, but exempt from the requirements.

DECISION ID

153222

Region 5

Knights Landing Ridge Cut (Yolo County)

Pollutant: Thiobencarb
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2020)
Revision Status: Revised
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: Readily available data for this water body have not been used to determine standards attainment. No decision has been made regarding beneficial use support due to a lack of clarity in the status of this water body under the Clean Water Act and the Navigable Waters Protection Rule. A decision regarding the beneficial use support of this water body will be made during a future Integrated Report cycle if it is determined that this water body is classified as a Water of the United States under the Navigable Waters Protection Rule.

During the 2024 Cycle LOEs were updated due to a reassessment of data based on the Central Valley Water Board CV-SALTS Secondary MCL Policy.

Regional Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because of a lack of clarity in the status of this water body under the Clean Water Act and the Navigable Waters Protection Rule.

State Board Review of Regional Board Conclusion and Recommendation:

State Board Decision Recommendation: After review of this Regional Board decision, SWRCB staff recommend the decision be approved by the State Board.

Line of Evidence (LOE) for Decision ID 153222, Thiobencarb

Region 5

Knights Landing Ridge Cut (Yolo County)

LOE ID: 312848
Pollutant: Thiobencarb
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Dissolved
Beneficial Use: Municipal & Domestic Supply
Number of Samples: 1
Number of Exceedances: 0

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Water Board staff assessed SFCWA YoloBypassFoodWeb data for Knights Landing Ridge Cut (Yolo County) to determine beneficial use support and results are as follows: 0 of 1 samples exceeded the water quality threshold for

Data Reference:	Thiobencarb. Water data for the 2020/2022 integrated report in Region 5.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary Maximum Contaminant Level for thiobencarb by reference in the Water Quality Control Plan for the Sacramento and San Joaquin River Basins is 0.001 mg/L assessed as an annual average.
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins; Fifth Edition. Revised May 2018 (with approved amendments)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at 1 monitoring site: SFCWA-RCS (Near KNIGHTS LANDING RIDGE CUT A KNIGHTS LANDING CA).
Temporal Representation:	The samples were collected between the dates of 2016-07-28 and 2016-07-28
Environmental Conditions:	
QAPP Information:	San Francisco Estuary Institute (SFEI). 2016. Delta Regional Monitoring Program Quality Assurance Program Plan (Delta RMP QAPP 2015).
QAPP Information Reference(s):	Delta Regional Monitoring Program Quality Assurance Program Plan (Delta RMP QAPP 2015).

**Line of Evidence (LOE) for Decision ID 153222, Thiobencarb
Knights Landing Ridge Cut (Yolo County)**

Region 5

LOE ID:	313340
Pollutant:	Thiobencarb
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed USGS California Water Science Center data for Knights Landing Ridge Cut (Yolo County) to determine beneficial use support and results are as follows: 0 of 3 samples exceeded the water quality threshold for Thiobencarb.
Data Reference:	WQ data from the federal Water Quality Portal (WQP) assembled for the 2024 Integrated Report in Region 5.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary Maximum Contaminant Level for thiobencarb by reference in the Water Quality Control Plan for the Sacramento and San Joaquin River Basins is 0.001 mg/L assessed as an annual average.
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins; Fifth Edition. Revised May 2018 (with approved amendments)

Evaluation Guideline:

Guideline Reference:

Spatial Representation:

The samples were collected at 1 monitoring site: USGS-384737121433201 (KNIGHTS LANDING RIDGE CUT A KNIGHTS LANDING CA).

Temporal Representation:

The samples were collected between the dates of 2016-07-28 and 2018-09-04

Environmental Conditions:

QAPP Information:

SWRCB. 2018. This is a placeholder reference for data that was collected after QAPP requirements were developed, but exempt from the requirements..

QAPP Information Reference(s):

[This is a placeholder reference for data that was collected after QAPP requirements were developed, but exempt from the requirements.](#)

DECISION ID

135061

Region 5

Knights Landing Ridge Cut (Yolo County)

Pollutant:

Total Dissolved Solids

Final Listing Decision:

Do Not List on 303(d) list (TMDL required list)

Last Listing Cycle's Final Listing

New Decision

Decision:

Revision Status

Revised

Impairment from Pollutant or Pollution:

Pollutant

Regional Board Conclusion:

Readily available data for this water body have been considered. Although this water body is designated with the Municipal and Domestic Supply beneficial use (MUN), no decision has been made regarding beneficial use support due to a lack of clarity in the status of this water body under the Clean Water Act and the Navigable Waters Protection Rule. A decision regarding the beneficial use support of this water body will be made during a future Integrated Report cycle if it is determined that this water body is classified as a Water of the United States under the Navigable Waters Protection Rule.

Regional Board Decision

Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

State Board Review of Regional Board

Conclusion and Recommendation:

State Board Decision Recommendation: After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because of a lack of clarity in the status of this water body under the Clean Water Act and the Navigable Waters Protection Rule.

Line of Evidence (LOE) for Decision ID 135061, Total Dissolved Solids

Region 5

Knights Landing Ridge Cut (Yolo County)

LOE ID:

313228

Pollutant:

Total Dissolved Solids

LOE Subgroup:

Pollutant-Water

Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water Board staff assessed STORET data for Knights Landing Ridge Cut (Yolo County) to determine beneficial use support and results are as follows: 0 of 1 samples exceeded the upper limit of the range for Total Dissolved Solids. Additionally, 0 of the 1 samples fall within the range, and 1 of 1 samples fall below the threshold.
Data Reference:	WQX data for the 2020/2022 integrated report in Region 5.
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The California Secondary MCL that is incorporated by reference into the Water Quality Control Plan for the Sacramento and San Joaquin River Basins specifies a range for total dissolved solids of 500 - 1000 mg/L assessed as an annual average.
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins; Fifth Edition. Revised May 2018 (with approved amendments)
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected at 1 monitoring site: CALWR_WQX-A0D84761435 (Ridge Cut Slough at Knights Landing).
Temporal Representation:	The samples were collected between the dates of 2014-12-22 and 2014-12-22
Environmental Conditions:	
QAPP Information:	STORET
QAPP Information Reference(s):	This is a placeholder reference for data that was collected after QAPP requirements were developed, but exempt from the requirements.

DECISION ID 151619

Region 5

Knights Landing Ridge Cut (Yolo County)

Pollutant:	Temperature, water
Final Listing Decision:	List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	A Source Unknown
Expected TMDL Completion Date:	2038
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Of these lines of evidence, 1 are based on continuous monitoring data and 0 are based on grab sample data.

Continuous temperature data were used as the primary source of evidence for this assessment. A rolling 7-Day Average of Daily Maximum (7DADM) was calculated for all available data and a 7DADM is evaluated as a single sample. In the absence of natural or historical temperature data, the samples were compared against USEPA Region 10 recommended temperature requirements for each appropriate salmonid life stage present in the waterbody segment (Listing Policy Section 6.1.5.9).

A total of 853 of 1680 samples exceed the evaluation guideline (USEPA 2003) applied to protect the migration (MIGR) freshwater habitat beneficial use.

The evaluation guideline was applied during the smolt migration (20 degrees Celsius between March 15 – June 15) and adult migration (20 degrees Celsius between September 1 – December 31) salmonid life stages.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. 853 of 1680 samples exceed the MIGR evaluation guideline for the 7DADM and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

**Regional Board Decision
Recommendation:**

This decision was made by SWRCB staff.

**State Board Review of Regional Board
Conclusion and Recommendation:**

State Board Decision Recommendation: After review of the available data and information, SWRCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

**Line of Evidence (LOE) for Decision ID 151619, Temperature, water
Knights Landing Ridge Cut (Yolo County)**

Region 5

LOE ID:	307310
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Fish Migration
Number of Samples:	1680

Number of Exceedances:	853
Data and Information Type: Data Used to Assess Water Quality:	PHYSICAL/CHEMICAL MONITORING Data collected hourly from 1986 through 2019 at station RCS (RIDGE CUT SLOUGH AT KNIGHTS LANDING). The data was provided by staff at the CA Department of Water Resources for the Interagency Ecological Program. Only data from the smolt migration period, March 15 through June 15, and the adult migration period, September 1 through December 31, were assessed for this metric. The 7-DADM temperatures were computed for the contiguous 7-day periods available during this time frame. The 7-day average of maximum daily temperature exceeded the evaluation guideline during 853 of the 1680 7-day periods.
Data Reference:	Hourly water temperature from the San Francisco Estuary, 1986 - 2019
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses.
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins; Fifth Edition. Revised May 2018 (with approved amendments)
Evaluation Guideline:	A rolling 7-day average of daily maximum (7-DADM) temperature of 20 degrees Celsius is recommended by the USEPA for waterbodies that are used almost exclusively for migration during the period of summer maximum temperatures to protect migrating juveniles and adults from lethal temperatures (USEPA, 2003). This evaluation guideline was applied to both the smolt (March 15 - June 15) and adult (September 1 - December 31) migration periods.
Guideline Reference:	EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards. EPA 910-B-03-002. U.S. Environmental Protection Agency Region 10 Office of Water, Seattle, WA.
Spatial Representation:	Data collected from CA Department of Water Resources Station RCS (RIDGE CUT SLOUGH AT KNIGHTS LANDING).
Temporal Representation:	Data collected hourly from 1986 through 2019. Data from the smolt migration period, March 15 through June 15, and the adult migration period, September 1 through December 31, were assessed for this metric.
Environmental Conditions: QAPP Information:	The data were collected by the CA Department of Water Resources' Division of Environmental Services and were deemed by the DWR to be reliable and of sound quality. Information about the monitoring equipment used is available in the reference.
QAPP Information Reference(s):	California Department of Water Resources (CDWR) Continuous Temperature QAPP.

DECISION ID 74412

Region 5

Knights Landing Ridge Cut (Yolo County)

Pollutant:	Boron
Final Listing Decision:	Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision:	Delist from 303(d) list (TMDL required list)(2016)
Revision Status	Original
Reason for Delisting:	Flaws in original listing
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion:

This pollutant is being considered for placement on the CWA section 303(d) List under section 3.2 of the Listing Policy. Under section 3.2 a single line(s) of evidence are necessary to assess listing status.

Two lines of evidence are available in the administrative record to assess this pollutant. Four of six samples exceed the evaluation guideline.

Based on the readily available data and information, the weight of evidence indicates that there is insufficient justification for placing this water segment-pollutant combination on the CWA section 303(d) List.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Four of 6 available total Boron samples exceed the water quality objective and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

Regional Board Decision Recommendation:

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list. The readily available data and information is insufficient to determine, with the power and confidence of the Listing Policy, the applicable beneficial use support rating.

State Board Review of Regional Board Conclusion and Recommendation:

State Board Decision Recommendation: After review of this Regional Board decision, SWRCB staff recommend the decision be approved by the State Board.

**Line of Evidence (LOE) for Decision ID 74412, Boron
Knights Landing Ridge Cut (Yolo County)****Region 5**

LOE ID: 22275

Pollutant: Boron
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Dissolved

Beneficial Use: Agricultural Supply

Number of Samples: 6
Number of Exceedances: 4

Data and Information Type: PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality: Four of 6 samples collected from Knights Landing Ridge Cut between November 22 2003 and September 22 2004 contained dissolved Boron at concentrations that exceeded the evaluation guideline for Boron.

Data Reference: [Yolo Bypass Water Quality Management Plan Report. Prepared under CALFED Watershed Grant, Agreement # 4600001691 for the City of Woodland](#)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life (CVRWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Evaluation Guideline:	Boron levels should not exceed the Agricultural Water Quality Goal for Boron of 700 ug/L (Ayers and Westcott, 1985).
Guideline Reference:	Water Quality for Agriculture, Food and Agriculture Organization of the United Nations - Irrigation and Drainage Paper No. 29, Rev 1, Rome (1985).
Spatial Representation:	Samples were collected at the lower end of Knights Landing Ridge Cut.
Temporal Representation:	Samples were collected approximately bimonthly from November 22 2003 to September 22 2004. Knights Landing Ridge Cut extends from Colusa Basin Drain southeastward to the Yolo Bypass.
Environmental Conditions:	
QAPP Information:	Data quality: Good. Monitoring was conducted in accordance with the Quality Assurance Project Plan For Water Quality Monitoring For The Yolo Bypass Watershed Planning Project, 2003-2004
QAPP Information Reference(s):	

**Line of Evidence (LOE) for Decision ID 74412, Boron
Knights Landing Ridge Cut (Yolo County)**

Region 5

LOE ID:	22118
Pollutant:	Boron
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Agricultural Supply
Number of Samples:	6
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Four of 6 samples collected from Knights Landing Ridge Cut between November 22 2003 and September 22 2004 contained total Boron at concentrations that exceeded the evaluation guideline for Boron.
Data Reference:	Yolo Bypass Water Quality Management Plan Report. Prepared under CALFED Watershed Grant, Agreement # 4600001691 for the City of Woodland
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life (CVRWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Evaluation Guideline:	Boron levels should not exceed the Agricultural Water Quality Goal for Boron of 700 ug/L (Ayers and Westcott, 1985).
Guideline Reference:	Water Quality for Agriculture, Food and Agriculture Organization of the United Nations - Irrigation and Drainage Paper No. 29, Rev 1, Rome (1985).

Spatial Representation:	Samples were collected at the lower end of Knights Landing Ridge Cut.
Temporal Representation:	Samples were collected approximately bimonthly from November 22 2003 to September 22 2004. Knights Landing Ridge Cut extends from Colusa Basin Drain southeastward to the Yolo Bypass.
Environmental Conditions:	
QAPP Information:	Data quality: Good. Monitoring was conducted in accordance with the Quality Assurance Project Plan For Water Quality Monitoring For The Yolo Bypass Watershed Planning Project, 2003-2004
QAPP Information Reference(s):	

DECISION ID	73961	Region 5
Knights Landing Ridge Cut (Yolo County)		

Pollutant:	DDD (Dichlorodiphenyldichloroethane)
Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2016)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. No samples could be used in the assessment due to high reporting limits.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of the 6 samples could be used for the assessment due to high reporting limits.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

State Board Review of Regional Board Conclusion and Recommendation:

State Board Decision Recommendation: After review of this Regional Board decision, SWRCB staff recommend the decision be approved by the State Board.

Line of Evidence (LOE) for Decision ID 73961, DDD (Dichlorodiphenyldichloroethane)	Region 5
Knights Landing Ridge Cut (Yolo County)	

LOE ID:	23002
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Pollutant:	DDD (Dichlorodiphenyldichloroethane)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	0
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	- Six grab samples were collected from Ridge Cut between June 2004 and September 2004 over a 5-month period. The six water samples had a high Reporting Limit hence data could not be used in the analysis according to the Listing Policy Section 6.1.5.5 to determine whether they exceeded the California Toxic Rule/USEPA (CTR/USEPA) criteria limit of 0.00083 ug/L for DDD (2,4-DDD and 4,4-DDD) based on a human health carcinogenic risk level of 10-6 for consumption of water and aquatic organisms.
Data Reference:	Yolo Bypass Water Quality Management Plan Report. Prepared under CALFED Watershed Grant, Agreement # 4600001691 for the City of Woodland
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	- Sacramento/San Joaquin River Basin Plan (CVRWQCB, 2007a)Pesticides: Total identifiable persistent chlorinated hydrocarbon pesticides shall not be present in the water column at concentrations detectable within the accuracy of analytical methods approved by the Environmental Protection Agency or the Executive Officer.- California Toxics Rule Criteria (USEPA, 2000)Inland Surface Waters based on drinking water and aquatic organism consumption. The criteria are based on human health protection for carcinogenicity at 1-in-a-million risk level (30-day average) for DDD of 0.00083 ug/L.
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Objective/Criterion Reference:	Water Quality Standards 2000. Establishment of numeric criteria for priority toxic pollutants for the State of California: Rules and regulations. Federal Register Vol. 65, No. 97. Washington, D.C.: Environmental Protection Agency.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from an input channel along Ridge Cut in Yolo County, California.
Temporal Representation:	Samples were collected between November 2003 and September 2004 on these dates 11/22/2003 and then 04/23, 6/26, 8/20 and 9/22 in 2004.
Environmental Conditions:	
QAPP Information:	Data quality: Good. Monitoring was conducted in accordance with the Quality Assurance Project Plan For Water Quality Monitoring For The Yolo Bypass Watershed Planning Project, 2003-2004
QAPP Information Reference(s):	

DECISION ID 73584
Knights Landing Ridge Cut (Yolo County)

Region 5

Pollutant: DDE (Dichlorodiphenyldichloroethylene)

Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2016)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. One lines of evidence are available in the administrative record to assess this pollutant. None of the samples exceed the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category. This conclusion is based on the staff findings that: 1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy. 2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. 3. None of 2 samples exceeded the California Toxic Rule/USEPA (CTR/USEPA) criteria limit of 0.00059 &#956;g/L for DDE based on a human health carcinogenic risk level of 10-6 for consumption of water and aquatic organisms and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. In addition, 8 of the samples had high reporting limit hence the data can not be used. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.
Regional Board Decision Recommendation:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.
State Board Review of Regional Board Conclusion and Recommendation:	
State Board Decision Recommendation:	After review of this Regional Board decision, SWRCB staff recommend the decision be approved by the State Board.

Line of Evidence (LOE) for Decision ID 73584, DDE (Dichlorodiphenyldichloroethylene)

Region 5

Knights Landing Ridge Cut (Yolo County)

LOE ID:	23014
Pollutant:	DDE (Dichlorodiphenyldichloroethylene)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	2
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	- Eleven grab samples were collected from Ridge Cut between November 2003 and September 2004 over a 5-month period. None of the available eleven water samples exceeded the California Toxic Rule/USEPA (CTR/USEPA) criteria limit of 0.00059 ug/L for DDE (2,4-DDE and 4,4-DDE) based on a human health carcinogenic risk level of 10 ⁻⁶ for consumption of water and aquatic organisms. - Nine water samples had a high Reporting Limit hence data could not be used in the analysis (Listing Policy Section 6.1.5.5).
Data Reference:	Yolo Bypass Water Quality Management Plan Report. Prepared under CALFED Watershed Grant, Agreement # 4600001691 for the City of Woodland
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	- Sacramento/San Joaquin River Basin Plan (CVRWQCB, 2007a)Pesticides: Total identifiable persistent chlorinated hydrocarbon pesticides shall not be present in the water column at concentrations detectable within the accuracy of analytical methods approved by the Environmental Protection Agency or the Executive Officer.- California Toxics Rule Criteria (USEPA, 2000)Inland Surface Waters based on drinking water and aquatic organism consumption. The criteria are based on human health protection for carcinogenicity at 1-in-a-million risk level (30-day average) for DDE of 0.00059 ug/L.
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Objective/Criterion Reference:	Water Quality Standards 2000. Establishment of numeric criteria for priority toxic pollutants for the State of California: Rules and regulations. Federal Register Vol. 65, No. 97. Washington, D.C.: Environmental Protection Agency.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from an input channel along Ridge Cut in Yolo County, California.
Temporal Representation:	Samples were collected between November 2003 and September 2004 on these dates 11/22/2003 and then 04/23, 6/26, 8/20 and 9/22 in 2004.
Environmental Conditions:	
QAPP Information:	Data quality: Good. Monitoring was conducted in accordance with the Quality Assurance Project Plan For Water Quality Monitoring For The Yolo Bypass Watershed Planning Project, 2003-2004
QAPP Information Reference(s):	

DECISION ID 73690

Region 5

Knights Landing Ridge Cut (Yolo County)

Pollutant:	DDT (Dichlorodiphenyltrichloroethane)
Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2016)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data or information was available during the 2014 Integrated Report cycle to reassess this water body segment and pollutant. The decision has not changed.

This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1

a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. None of the samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of 2 samples exceeded the California Toxic Rule/USEPA (CTR/USEPA) criteria limit of 0.00059 ug/L for DDT based on a human health carcinogenic risk level of 10⁻⁶ for consumption of water and aquatic organisms and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. In addition, 8 of the samples had high reporting limits hence the data could not be used in the assessment.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

**Regional Board Decision
Recommendation:**

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data or information was available during the 2014 Integrated Report cycle to reassess this water body segment and pollutant. The decision has not changed.

**State Board Review of Regional Board
Conclusion and Recommendation:**

State Board Decision Recommendation: After review of this Regional Board decision, SWRCB staff recommend the decision be approved by the State Board.

**Line of Evidence (LOE) for Decision ID 73690, DDT (Dichlorodiphenyltrichloroethane)
Knights Landing Ridge Cut (Yolo County)**

Region 5

LOE ID:	23015
Pollutant:	DDT (Dichlorodiphenyltrichloroethane)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	- Ten grab samples were collected from Ridge Cut between November 2003 and September 2004 over a 5-month period. None of the available ten water samples exceeded the California Toxic Rule/USEPA (CTR/USEPA) criteria limit of 0.00059 ug/L for DDT (2,4-DDT and 4,4-DDT) based on a human health carcinogenic risk level of 10 ⁻⁶ for consumption of water and aquatic organisms. - Eight water samples had a high Reporting Limit hence data could not be used in the analysis according to the Listing Policy Section 6.1.5.5.

Data Reference: [Yolo Bypass Water Quality Management Plan Report. Prepared under CALFED Watershed Grant, Agreement # 4600001691 for the City of Woodland](#)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: - Sacramento/San Joaquin River Basin Plan (CVRWQCB, 2007a)Pesticides: Total identifiable persistent chlorinated hydrocarbon pesticides shall not be present in the water column at concentrations detectable within the accuracy of analytical methods approved by the Environmental Protection Agency or the Executive Officer.- California Toxics Rule Criteria (USEPA, 2000)Inland Surface Waters based on drinking water and aquatic organism consumption. The criteria are based on human health protection for carcinogenicity at 1-in-a-million risk level (30-day average) for DDT of 0.00059 ug/L.

Objective/Criterion Reference: [Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed](#)

Objective/Criterion Reference: [Water Quality Standards 2000. Establishment of numeric criteria for priority toxic pollutants for the State of California: Rules and regulations. Federal Register Vol. 65, No. 97. Washington, D.C.: Environmental Protection Agency](#)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected from an input channel along Ridge Cut in Yolo County, California.
Temporal Representation: Samples were collected between November 2003 and September 2004 on these dates 11/22/2003 and then 04/23, 6/26, 8/20 and 9/22 in 2004.

Environmental Conditions:
QAPP Information: Data quality: Good. Monitoring was conducted in accordance with the Quality Assurance Project Plan For Water Quality Monitoring For The Yolo Bypass Watershed Planning Project, 2003-2004

QAPP Information Reference(s):

DECISION ID 74789

Region 5

Knights Landing Ridge Cut (Yolo County)

Pollutant: Indicator Bacteria
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: Do Not List on 303(d) list (TMDL required list)(2016)
Revision Status Original
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.
Two lines of evidence are available in the administrative record to assess this pollutant. Four of 12 water samples exceed the evaluation guidelines for either E. coli or fecal coliform.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.

3. Four of 12 water samples exceed the evaluation guidelines for either E. coli or fecal coliform, and this does not exceed the allowable frequency listed in Table 3.2 of the Listing Policy. 4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

State Board Review of Regional Board Conclusion and Recommendation:

State Board Decision Recommendation: After review of this Regional Board decision, SWRCB staff recommend the decision be approved by the State Board.

**Line of Evidence (LOE) for Decision ID 74789, Indicator Bacteria
Knights Landing Ridge Cut (Yolo County)**

Region 5

LOE ID:	22297
Pollutant:	Escherichia coli (E. coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	12
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	The Yolo Bypass Watershed Planning Program collected 14 samples from November 2003 to October 2004. Four of the 12 samples exceeded the evaluation objective.
Data Reference:	Yolo Bypass Water Quality Management Plan Report. Prepared under CALFED Watershed Grant, Agreement # 4600001691 for the City of Woodland
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. The objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances.
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Evaluation Guideline:	In waters designated for contact recreation (REC-1), the E. coli concentration, based on a minimum of not less than five samples equally spaced over a 30-day period, shall not exceed a geometric mean of 126 MPN/100 mL and shall not exceed 235 MPN /100 mL in any single sample.
Guideline Reference:	Ambient Water Quality Criteria for Bacteria - 1986. EPA440/5-84-002
Spatial Representation:	Samples were collected from Knight's Landing Ridge Cut.
Temporal Representation:	Sampling occurred from November 2003 to October 2004.

Environmental Conditions:

QAPP Information:

Data quality: Good. Monitoring was conducted in accordance with the Quality Assurance Project Plan For Water Quality Monitoring For The Yolo Bypass Watershed Planning Project, 2003-2004

QAPP Information Reference(s):

**Line of Evidence (LOE) for Decision ID 74789, Indicator Bacteria
Knights Landing Ridge Cut (Yolo County)**

Region 5

LOE ID: 22298

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 12
Number of Exceedances: 4

Data and Information Type: PATHOGEN MONITORING
Data Used to Assess Water Quality: The Yolo Bypass Watershed Planning Program collected 12 samples from November 2003 to October 2004. The geometric mean per month per site was calculated from the samples and 4 out of the 12 calculated geometric means exceeded the evaluation objective.

Data Reference: [Yolo Bypass Water Quality Management Plan Report. Prepared under CALFED Watershed Grant, Agreement # 4600001691 for the City of Woodland](#)

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion: In waters designated for contact recreation (REC-1), the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200/100 ml, nor shall more than ten percent of the total number of samples taken during any 30-day period exceed 400/100 ml.

Objective/Criterion Reference: [Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed](#)

Evaluation Guideline:
Guideline Reference:

Spatial Representation: Samples were collected at Knight's Landing Ridge Cut.
Temporal Representation: Sampling occurred from November 2003 to October 2004

Environmental Conditions:
QAPP Information:

Data quality: Good. Monitoring was conducted in accordance with the Quality Assurance Project Plan For Water Quality Monitoring For The Yolo Bypass Watershed Planning Project, 2003-2004

QAPP Information Reference(s):

Pollutant:	Selenium
Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2016)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This pollutant is being considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status.

One lines of evidence are available in the administrative record to assess this pollutant. None of the samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. None of 6 samples exceeded the California Toxics Rule (CTR) criterion and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data were assessed by the Regional Board for the current cycle. The decision has not changed.

State Board Review of Regional Board Conclusion and Recommendation:

State Board Decision Recommendation: After review of this Regional Board decision, SWRCB staff recommend the decision be approved by the State Board.

Line of Evidence (LOE) for Decision ID 75062, Selenium

Region 5

Knights Landing Ridge Cut (Yolo County)

LOE ID:	22316
Pollutant:	Selenium
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	6
Number of Exceedances:	0

Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Water samples were collected on 6 occasions and analyzed for total recoverable and dissolved Se. The range of concentrations in total recoverable samples was 0.97-5 ?g/L. Concentrations in the June and August total recoverable samples equaled the CTR criterion. The range of concentrations in dissolved samples was 0.7-6??g/L. The June dissolved sample exceeded the criterion (6 ?g/L).
Data Reference:	Yolo Bypass Water Quality Management Plan Report. Prepared under CALFED Watershed Grant, Agreement # 4600001691 for the City of Woodland
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	CTR criterion of 5 ug/L, total recoverable Se, for the protection of freshwater aquatic life (4-day average concentration to protect from extended period of exposure).
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Objective/Criterion Reference:	Water Quality Standards 2000. Establishment of numeric criteria for priority toxic pollutants for the State of California: Rules and regulations. Federal Register Vol. 65, No. 97. Washington, D.C.: Environmental Protection Agency.
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at one site, near the Yolo Bypass.
Temporal Representation:	Samples were collected on: 11/22/03, 1/23/04, 4/23/04, 6/26/04, 8/20/04, and 9/22/04.
Environmental Conditions:	
QAPP Information:	Data quality: Good. Monitoring was conducted in accordance with the Quality Assurance Project Plan For Water Quality Monitoring For The Yolo Bypass Watershed Planning Project, 2003-2004
QAPP Information Reference(s):	

DECISION ID	74346	Region 5
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Knights Landing Ridge Cut (Yolo County)

Pollutant:	Toxicity
Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision:	Do Not List on 303(d) list (TMDL required list)(2016)
Revision Status	Original
Impairment from Pollutant or Pollution:	Pollutant
Regional Board Conclusion:	This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data or information was available during the 2014 Integrated Report cycle to reassess this water body segment and pollutant. The decision has not changed. This pollutant was originally considered for placement on the section 303(d) list under section 3.1 of the Listing Policy. Under section 3.1 a single line of evidence is necessary to assess listing status. Four lines of evidence were available in the administrative record to assess this pollutant. One of the samples exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there was sufficient justification against placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion is based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. One of 18 samples tested with *Pimephales promelas* (Fathead Minnow, a vertebrate species) exceeded the narrative toxicity objective and this did not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. None of 19 samples tested with *Ceriodaphnia dubia* (an invertebrate species) exceeded the narrative toxicity objective and this did not exceed the allowable frequency listed in Table 3.1 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data or information was available during the 2014 Integrated Report cycle to reassess this water body segment and pollutant. The decision has not changed.

After review of the available data and information, RWQCB staff concludes that the water body-pollutant combination should not be placed on the section 303(d) list because applicable water quality standards are not being exceeded.

State Board Review of Regional Board Conclusion and Recommendation:

State Board Decision Recommendation: After review of this Regional Board decision, SWRCB staff recommend the decision be approved by the State Board.

**Line of Evidence (LOE) for Decision ID 74346, Toxicity
Knights Landing Ridge Cut (Yolo County)**

Region 5

LOE ID: 22299

Pollutant: Toxicity
LOE Subgroup: Toxicity
Matrix: Sediment
Fraction: Total

Beneficial Use: Warm Freshwater Habitat
Aquatic Life Use: Warm Freshwater Habitat

Number of Samples: 1
Number of Exceedances: 1

Data and Information Type: TOXICITY TESTING

Data Used to Assess Water Quality: A streambed sediment sample collected on 21 September 2004 was tested for toxicity (both survival and growth endpoints reported) using *Hyalella azteca* and *Chironomus tentans*.
Hyalella azteca - The sediment sample was found to have a significant effect to both survival and growth of *Hyalella azteca*. The mean percent survival was 87.5, which represented 90 percent of the control. The mean weight (mg, dry weight) was 0.13, which represented 87% of the control.
Chironomus tentans - The sediment sample was found to have a significant effect on survival of *Chironomus tentans*.

Data Reference:	The mean percent survival was 67.5, which represented 73% of the control. The sample did not have a significant effect on the growth of this species. The mean weight (mg, dry weight) was 0.8, which represented 98% of the control. The sediment sample was toxic and violated the narrative toxicity objective. Yolo Bypass Water Quality Management Plan Report. Prepared under CALFED Watershed Grant, Agreement # 4600001691 for the City of Woodland
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances. (CVRWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Evaluation Guideline:	Statistically significant difference from control sediment using 10-day (?) (report [LWA 2005] and QAPP (LWA 2003] do not state duration of test) Hyalella azteca and Chironomus tentans sediment toxicity tests. Both survival and growth endpoints were reported (LWA 2005).
Guideline Reference:	Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates, Second Edition. U.S. Environmental Protection Agency Office of Research and Development, Duluth, MI, U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-600/R-99/064
Spatial Representation:	The sample was collected from Knights Landing Ridge Cut near Road 17.
Temporal Representation:	The sample was collected on 21 September 2004.
Environmental Conditions:	
QAPP Information:	Data quality: Good. Monitoring was conducted in accordance with the Quality Assurance Project Plan For Water Quality Monitoring For The Yolo Bypass Watershed Planning Project, 2003-2004
QAPP Information Reference(s):	

Line of Evidence (LOE) for Decision ID 74346, Toxicity
Knights Landing Ridge Cut (Yolo County)

Region 5

LOE ID:	22314
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	None of the 15 samples tested with Pimephales promelas were toxic and violated the narrative toxicity objective.
Data Reference:	Revised Draft of the 2007 Review of the Monitoring Data for the Irrigated Lands Regulatory Conditional Waiver Program

[Monitoring and Reporting Program, Order Nos. R5-2003-0826, R5-2005-0833, and R5-2008-0005 for Coalition Groups Under Resolution No. R5-2003-0105, Conditional Waiver of Waste Discharge Requirements for Discharges From Irrigated Lands Within the Central Valley Region](#)

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances. (CVRWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Evaluation Guideline:	Statistically significant difference from control using a t-test with 4-day acute-style toxicity tests.
Guideline Reference:	Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition. U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-821-R-02-012
Spatial Representation:	Samples were collected from Knights Landing Ridge Cut, along the north and south sides of Road 16. The total number of samples from the north and south sides of Road 16 were eight and seven, respectively.
Temporal Representation:	Samples were collected on the following dates: 8 April 2003, 3 June 2003, 19 June 2003, 10 July 2003, 31 July 2003, 21 August 2003, 11 September 2003, and 2 October 2003. Samples were collected on both the north and south sides of Road 16 on all sampling dates, except 8 April 2003 during which only the north side was sampled.
Environmental Conditions:	
QAPP Information:	Data quality: Excellent. Monitoring was conducted in accordance with Central Valley Water Board Monitoring and Reporting Program (order number R5-2003-0826) requirements (CVRWQCB, 2003)
QAPP Information Reference(s):	Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition. EPA-821-R-02-012

**Line of Evidence (LOE) for Decision ID 74346, Toxicity
Knights Landing Ridge Cut (Yolo County)**

Region 5

LOE ID:	22296
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	4
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	None of the 4 samples tested with Ceriodaphnia dubia were toxic (survival endpoint) and violated the narrative toxicity objective.
Data Reference:	Yolo Bypass Water Quality Management Plan Report. Prepared under CALFED Watershed Grant, Agreement # 4600001691 for the City of Woodland

SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances. (CVRWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Evaluation Guideline:	Statistically significant difference from control using a t-test with 7-day chronic-style toxicity tests (only survival endpoint reported) (USEPA, 1994; LWA, 2005).
Guideline Reference:	Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fourth Edition. U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-821-R-02-013
Spatial Representation:	Samples were collected from Knights Landing Ridge Cut near Road 17.
Temporal Representation:	Samples were collected on the following dates: 23 January 2004, 23 April 2004, 20 August 2004, and 21 September 2004.
Environmental Conditions:	
QAPP Information:	Data quality: Good. Monitoring was conducted in accordance with the Quality Assurance Project Plan For Water Quality Monitoring For The Yolo Bypass Watershed Planning Project, 2003-2004
QAPP Information Reference(s):	

**Line of Evidence (LOE) for Decision ID 74346, Toxicity
Knights Landing Ridge Cut (Yolo County)**

Region 5

LOE ID:	22295
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	None of the 15 samples tested with Ceriodaphnia dubia were toxic and violated the narrative toxicity objective.
Data Reference:	Revised Draft of the 2007 Review of the Monitoring Data for the Irrigated Lands Regulatory Conditional Waiver Program Monitoring and Reporting Program, Order Nos. R5-2003-0826, R5-2005-0833, and R5-2008-0005 for Coalition Groups Under Resolution No. R5-2003-0105, Conditional Waiver of Waste Discharge Requirements for Discharges From Irrigated Lands Within the Central Valley Region

SWAMP Data: Non-SWAMP

Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances. (CVRWQCB, 2007).
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Evaluation Guideline:	Statistically significant difference from control using a t-test with 4-day acute-style toxicity tests.
Guideline Reference:	Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition, U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-821-R-02-012
Spatial Representation:	Samples were collected from Knights Landing Ridge Cut, along the north and south sides of Road 16. The total number of samples from the north and south sides of Road 16 were eight and seven, respectively.
Temporal Representation:	Samples were collected on the following dates: 8 April 2003, 3 June 2003, 19 June 2003, 10 July 2003, 31 July 2003, 21 August 2003, 11 September 2003, and 2 October 2003. Samples were collected on both the north and south sides of Road 16 on all sampling dates, except 8 April 2003 during which only the north side was sampled.
Environmental Conditions:	
QAPP Information:	Data quality: Excellent. Monitoring was conducted in accordance with Central Valley Water Board Monitoring and Reporting Program (order number R5-2003-0826) requirements (CVRWQCB, 2003)
QAPP Information Reference(s):	Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition. EPA-821-R-02-012

Line of Evidence (LOE) for Decision ID 74346, Toxicity
Knights Landing Ridge Cut (Yolo County)

Region 5

LOE ID:	22315
Pollutant:	Toxicity
LOE Subgroup:	Toxicity
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	3
Number of Exceedances:	1
Data and Information Type:	TOXICITY TESTING
Data Used to Assess Water Quality:	One of the 3 samples tested with Pimephales promelas was toxic (survival endpoint) and violated the narrative toxicity objective. The toxic sample (percent survival in parentheses) was collected on 23 April 2004 (72.5), 72.5% of control.
Data Reference:	Yolo Bypass Water Quality Management Plan Report. Prepared under CALFED Watershed Grant, Agreement # 4600001691 for the City of Woodland
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances. (CVRWQCB, 2007).

Objective/Criterion Reference: [Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed](#)

Evaluation Guideline: Statistically significant difference from control using a t-test with 7-day chronic-style toxicity tests (only survival endpoint reported) (USEPA, 1994; LWA, 2005).

Guideline Reference: [Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fourth Edition. U.S. Environmental Protection Agency Office of Water, Washington, DC EPA-821-R-02-013](#)

Spatial Representation: Samples were collected from Knights Landing Ridge Cut near Road 17.

Temporal Representation: Samples were collected on the following dates: 23 April 2004, 20 August 2004, and 21 September 2004.

Environmental Conditions:

QAPP Information: Data quality: Good. Monitoring was conducted in accordance with the Quality Assurance Project Plan For Water Quality Monitoring For The Yolo Bypass Watershed Planning Project, 2003-2004

QAPP Information Reference(s):

DECISION ID 73181

Region 5

Knights Landing Ridge Cut (Yolo County)

Pollutant: Oxygen, Dissolved
Final Listing Decision: List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2016)
Revision Status Original
Sources: A Source Unknown
Expected TMDL Completion Date: 2021
Impairment from Pollutant or Pollution: Pollutant

Regional Board Conclusion: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data or information was available during the 2014 Integrated Report cycle to reassess this water body segment and pollutant. The decision has not changed.

This pollutant was originally considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status.

One line of evidence is available in the administrative record to assess this pollutant. Six of the 15 available dissolved oxygen measurements exceeded the water quality objective for the Warm Freshwater Habitat beneficial use (WARM).

Based on the readily available data and information, the weight of evidence indicated that there was sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion was based on the staff findings that:

1. The data used satisfies the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfies the data quantity requirements of section 6.1.5 of the Policy.
3. Six of 15 samples fell below the minimum criterion (5 mg/L) for WARM, and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation:

This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data or information was available during the 2014 Integrated Report cycle to reassess this water body segment and pollutant. The decision has not changed.

State Board Review of Regional Board Conclusion and Recommendation:

State Board Decision Recommendation: After review of this Regional Board decision, SWRCB staff recommend the decision be approved by the State Board.

**Line of Evidence (LOE) for Decision ID 73181, Oxygen, Dissolved
Knights Landing Ridge Cut (Yolo County)**

Region 5

LOE ID:	22117
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Warm Freshwater Habitat
Aquatic Life Use:	Warm Freshwater Habitat
Number of Samples:	15
Number of Exceedances:	6
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	15 samples were taken from Knight Landing Ridge Cut from April to October 2003. 13 samples were below the minimum dissolved oxygen concentration (7 mg/L) and 6 samples were below 5 mg/L.
Data Reference:	Revised Draft of the 2007 Review of the Monitoring Data for the Irrigated Lands Regulatory Conditional Waiver Program , Monitoring and Reporting Program, Order Nos. R5-2003-0826, R5-2005-0833, and R5-2008-0005 for Coalition Groups Under Resolution No. R5-2003-0105, Conditional Waiver of Waste Discharge Requirements for Discharges From Irrigated Lands Within the Central Valley Region
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	Sacramento/San Joaquin River Basin Plan (CVRWQCB, 2007a)(SPWN) Spawning, Minimum Dissolved Oxygen concentration of 7mg/L;(WARM) Warm Freshwater habitat, Minimum Dissolved Oxygen concentration of 5mg/L
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected from Knights Landing Ridge Cut from North and South at Road 16.
Temporal Representation:	Samples were collected between April and October 2003 at bimonthly or monthly intervals.
Environmental Conditions:	

QAPP Information:

Data quality: Good. Monitoring was conducted in accordance with Central Valley Water Board Monitoring and Reporting Program (order number R5-2003-0826) requirements (CVRWQCB, 2003)

QAPP Information Reference(s):

DECISION ID 75120

Region 5

Knights Landing Ridge Cut (Yolo County)

Pollutant:	Salinity
Final Listing Decision:	List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision:	List on 303(d) list (TMDL required list)(2016)
Revision Status	Original
Sources:	A Source Unknown
Expected TMDL Completion Date:	2021
Impairment from Pollutant or Pollution:	Pollutant

Regional Board Conclusion: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data or information was available during the 2014 Integrated Report cycle to reassess this water body segment and pollutant. The decision has not changed.

This pollutant was originally considered for placement on the section 303(d) list under section 3.2 of the Listing Policy. Under section 3.2 a single line of evidence is necessary to assess listing status. Three lines of evidence were available in the administrative record to assess this pollutant. Eighteen of the samples exceeded the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there was sufficient justification in favor of placing this water segment-pollutant combination on the section 303(d) list in the Water Quality Limited Segments category.

This conclusion was based on the staff findings that:

1. The data used satisfied the data quality requirements of section 6.1.4 of the Policy.
2. The data used satisfied the data quantity requirements of section 6.1.5 of the Policy.
3. Eighteen of 33 samples exceeded the water quality objectives for electrical conductivity and total dissolved solids (collectively ¿salinity¿), and this exceeded the allowable frequency listed in Table 3.2 of the Listing Policy.
4. Pursuant to section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

Regional Board Decision Recommendation: This is a decision previously approved by the State Water Resources Control Board and the USEPA. No new data or information was available during the 2014 Integrated Report cycle to reassess this water body segment and pollutant. The decision has not changed.

State Board Review of Regional Board Conclusion and Recommendation:

State Board Decision Recommendation: After review of this Regional Board decision, SWRCB staff recommend the decision be approved by the State Board.

Line of Evidence (LOE) for Decision ID 75120, Salinity

Region 5

Knights Landing Ridge Cut (Yolo County)

LOE ID:	22278
Pollutant:	Salinity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	4
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Twelve measurements of Electrical Conductivity were taken from Knights Landing Ridge Cut between 2003 and 2004. Four of the 12 measurements exceed the California Secondary MCL for Electrical Conductivity in surface water.
Data Reference:	Yolo Bypass Water Quality Management Plan Report. Prepared under CALFED Watershed Grant, Agreement # 4600001691 for the City of Woodland
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The water quality objective used was the California Secondary MCL recommended level of 900 uS/cm. The Basin Plan includes chemical constituent water quality objectives that include (by reference) secondary maximum contaminant levels (MCLs) protective of MUN (CVRWQCB, 2007a). The secondary MCLs for electrical conductivity provide a range of values including a recommended level (900 uS/cm), an upper level (1600 uS/cm), and a short-term level (2200 uS/cm). The recommended concentration was used as it is intended to be protective of all drinking water uses. Though individual listing evaluations did not look at the water supply source serving the given geographic area, there are certain areas that receive supply waters (such as the Delta Mendota Canal) that at times may be elevated above the recommended level of the Secondary MCL. Where future information is made available to document this to be the case, these water bodies may be re-evaluated in future listing cycles. Electrical Conductivity levels should not exceed 900 uS/cm (CVRWQCB, 2007a).
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins, 4th ed
Objective/Criterion Reference:	California Code of Regulations, Title 22, Division 4, Chapter 15. Domestic Water Quality and Monitoring
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Electrical Conductivity was measured in Knights Landing Ridge Cut at Road 16, in Yolo County.
Temporal Representation:	Electrical Conductivity was measured monthly between November 2003 and October 2004. Knights Landing Ridge Cut extends southward from Colusa Basin Drain to Yolo Bypass.
Environmental Conditions:	
QAPP Information:	Data quality: Good. Monitoring was conducted in accordance with the Quality Assurance Project Plan For Water Quality Monitoring For The Yolo Bypass Watershed Planning Project, 2003-2004
QAPP Information Reference(s):	

Knights Landing Ridge Cut (Yolo County)

LOE ID:	22277
Pollutant:	Salinity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	6
Number of Exceedances:	3
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Six measurements were taken from Knights Landing Ridge Cut between 2003 and 2004. Three of the 6 samples exceed the California Secondary MCL for TDS in surface water.
Data Reference:	Yolo Bypass Water Quality Management Plan Report. Prepared under CALFED Watershed Grant, Agreement # 4600001691 for the City of Woodland
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The water quality objective used was the California Secondary MCL recommended level of 500 mg/L. The Basin Plan includes chemical constituent water quality objectives that include (by reference) secondary maximum contaminant levels (MCLs) protective of MUN (CVRWQCB, 2007a). The secondary MCLs for TDS provide a range of values including a recommended level (500 mg/L), upper level (1000 mg/L) and a short-term level (1500 mg/L). The recommended concentration was used as it is intended to be protective of all drinking water uses. Though individual listing evaluations did not look at the water supply source serving the given geographic area, there are certain areas that receive supply waters (such as the Delta Mendota Canal) that at times may be elevated above the recommended level of the secondary MCL. Where future information is made available to document this to be the case, these water bodies may be re-evaluated in future listing cycles. TDS levels should not exceed 500 mg/L (CVRWQCB, 2007a).
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins. 4th ed
Objective/Criterion Reference:	California Code of Regulations, Title 22, Division 4, Chapter 15. Domestic Water Quality and Monitoring
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	TDS was measured in Knights Landing Ridge Cut at Road 16, in Yolo County.
Temporal Representation:	TDS was measured between November 2003 and September 2004. Measurements were made at intervals ranging from monthly to quarterly. Knights Landing Ridge Cut extends southward Colusa Basin Drain to Yolo Bypass.
Environmental Conditions:	
QAPP Information:	Data quality: Good. Monitoring was conducted in accordance with the Quality Assurance Project Plan For Water Quality Monitoring For The Yolo Bypass Watershed Planning Project, 2003-2004
QAPP Information Reference(s):	

LOE ID:	22276
Pollutant:	Salinity
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	15
Number of Exceedances:	11
Data and Information Type:	PHYSICAL/CHEMICAL MONITORING
Data Used to Assess Water Quality:	Fifteen measurements of Specific Conductivity were taken from Knights Landing Ridge Cut in 2003. Eleven of the 15 measurements exceed the California Secondary MCL for Electrical Conductivity in surface water.
Data Reference:	Revised Draft of the 2007 Review of the Monitoring Data for the Irrigated Lands Regulatory Conditional Waiver Program , Monitoring and Reporting Program, Order Nos. R5-2003-0826, R5-2005-0833, and R5-2008-0005 for Coalition Groups Under Resolution No. R5-2003-0105, Conditional Waiver of Waste Discharge Requirements for Discharges From Irrigated Lands Within the Central Valley Region
SWAMP Data:	Non-SWAMP
Water Quality Objective/Criterion:	The water quality objective used was the California Secondary MCL recommended level of 900 uS/cm. The Basin Plan includes chemical constituent water quality objectives that include (by reference) secondary maximum contaminant levels (MCLs) protective of MUN (CVRWQCB, 2007a). The secondary MCLs for electrical conductivity provide a range of values including a recommended level (900 uS/cm), an upper level (1600 uS/cm), and a short-term level (2200 uS/cm). The recommended concentration was used as it is intended to be protective of all drinking water uses. Though individual listing evaluations did not look at the water supply source serving the given geographic area, there are certain areas that receive supply waters (such as the Delta Mendota Canal) that at times may be elevated above the recommended level of the Secondary MCL. Where future information is made available to document this to be the case, these water bodies may be re-evaluated in future listing cycles. Specific (Electrical) Conductivity levels should not exceed 900 uS/cm (CVRWQCB, 2007a).
Objective/Criterion Reference:	Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Sacramento and San Joaquin River Basins, 4th ed
Objective/Criterion Reference:	California Code of Regulations, Title 22, Division 4, Chapter 15. Domestic Water Quality and Monitoring
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Specific Conductivity was measured in Knights Landing Ridge Cut at Road 16, in Yolo County.
Temporal Representation:	Specific Conductivity was measured monthly or bimonthly between April and October 2003. Knights Landing Ridge Cut extends southward from Colusa Basin Drain to Yolo Bypass.
Environmental Conditions:	
QAPP Information:	Data quality: Good. Monitoring was conducted in accordance with Central Valley Water Board Monitoring and Reporting Program (order number R5-2003-0826) requirements (CVRWQCB, 2003)
QAPP Information Reference(s):	

Runoff Coefficient (C) Fact Sheet

What is It?

The runoff coefficient (C) is a dimensionless coefficient relating the amount of runoff to the amount of precipitation received. It is a larger value for areas with low infiltration and high runoff (pavement, steep gradient), and lower for permeable, well vegetated areas (forest, flat land).

Why is It Important?

It is important for flood control channel construction and for possible flood zone hazard delineation. A high runoff coefficient (C) value may indicate flash flooding areas during storms as water moves fast overland on its way to a river channel or a valley floor.

How is It Measured?

It is measured by determining the soil type, gradient, permeability and land use. The values are taken from the table below. The larger values correspond to higher runoff and lower infiltration.

Land Use	C	Land Use	C
Business: Downtown areas Neighborhood areas	0.70 - 0.95 0.50 - 0.70	Lawns:	
		Sandy soil, flat, 2%	0.05 - 0.10
		Sandy soil, avg., 2-7%	0.10 - 0.15
		Sandy soil, steep, 7%	0.15 - 0.20
		Heavy soil, flat, 2%	0.13 - 0.17
		Heavy soil, avg., 2-7%	0.18 - 0.22
Residential: Single-family areas Multi units, detached Munti units, attached Suburban	0.30 - 0.50 0.40 - 0.60 0.60 - 0.75 0.25 - 0.40	Heavy soil, steep, 7%	0.25 - 0.35
		Agricultural land:	
		<i>Bare packed soil</i>	
		*Smooth	0.30 - 0.60
		*Rough	0.20 - 0.50
		<i>Cultivated rows</i>	
		*Heavy soil, no crop	0.30 - 0.60
		*Heavy soil, with crop	0.20 - 0.50
		*Sandy soil, no crop	0.20 - 0.40
		*Sandy soil, with crop	0.10 - 0.25
		<i>Pasture</i>	
		*Heavy soil	0.15 - 0.45
		*Sandy soil	0.05 - 0.25
		Woodlands	0.05 - 0.25

AB roadway 0.35
grass levee slope 0.2

Industrial: Light areas Heavy areas	0.50 - 0.80 0.60 - 0.90	Streets: Asphaltic Concrete Brick	0.70 - 0.95 0.80 - 0.95 0.70 - 0.85
Parks, cemeteries	0.10 - 0.25	Unimproved areas	0.10 - 0.30
Playgrounds	0.20 - 0.35	Drives and walks	0.75 - 0.85
Railroad yard areas	0.20 - 0.40	Roofs	0.75 - 0.95

Note: The designer must use judgment to select the appropriate "C" value within the range. Generally, larger areas with permeable soils, flat slopes and dense vegetation should have the lowest "C" values. Smaller areas with dense soils, moderate to steep slopes, and sparse vegetation should assigned the highest "C" values.

<http://water.me.vccs.edu/courses/CIV246/table2b.htm> accessed 11/19/09

Appendix M

Weather Reports

The discharger must obtain the precipitation forecast information from the National Weather Service Forecast Office (<http://forecast.weather.gov>). A printed copy with the date and time of printing should be retained in this Appendix.

Appendix N

Monitoring Records

Place completed BMP Inspection Forms, photographic documentation, Effluent Sampling, Receiving Water, and Dewatering Field Logs, Monitoring Exceptions, NAL Exceedance Reports, and Receiving Water Monitoring Trigger Exceptions in this appendix.

Appendix O

Example Storm Event Monitoring Forms

Rain Gauge Log Sheet				
Construction Site Name:				
WDID #:				
Date (mm/dd/yy)	Time (24-hr)	Initials	Rainfall Depth (Inches)	Notes:

Risk Level 1, 2, 3
Visual Inspection Field Log Sheet

Date and Time of Inspection:				Report Date:	
Inspection Type:	☐ Weekly	☐ Pre Qualifying Precipitation Event (QPE)	☐ During QPE	☐ Post QPE	☐ Dewatering Discharge
Site Information					
Construction Site Name:					
Construction stage and completed activities:				Approximate area of exposed site:	
Weather and Observations					
Date Rain Predicted to Occur:			Predicted % chance of precipitation (PoP): Predicted quantity of precipitation (QPF):		
Estimate storm beginning: _____	Estimate storm duration: _____	Estimate time since last storm: _____	Rain gauge reading: _____		
(date and time)	(hrs)	(days or hrs)	(inches)		
Observations: If yes identify location					
Odors Yes ☐ No ☐					
Floating material Yes ☐ No ☐					
Suspended Material Yes ☐ No ☐					
Sheen Yes ☐ No ☐					
Discolorations Yes ☐ No ☐					
Turbidity Yes ☐ No ☐					
Site Inspections					
Outfalls or BMPs Evaluated			Deficiencies Noted		
(add additional sheets or attached detailed BMP Inspection Checklists)					
Photos Taken:	Yes ☐	No ☐	Photo Reference IDs:		
Corrective Actions Identified (note if SWPPP/REAP change is needed)					
Inspector Information					
Inspector Name:			Inspector Title:		
Signature:					Date:

**Risk Level 1, 2, 3
Effluent Sampling Field Log Sheets**

Construction Site Name:		Date:	Time Start:
Sampler:			
Sampling Event Type:	☐ Stormwater	☐ Dewatering Discharge	☐ Non-visible pollutant
Field Meter Calibration			
pH Meter ID No./Desc.: Calibration Date/Time:		Turbidity Meter ID No./Desc.: Calibration Date/Time:	
Field pH and Turbidity Measurements			
Discharge Location Description	pH	Turbidity	Time
Grab Samples Collected			
Discharge Location Description	Sample Type		Time
Additional Sampling Notes:			
Time End:			

Risk Level 3 Receiving Water Sampling Field Log Sheets			
Construction Site Name:		Date:	Time Start:
Sampler:			
Receiving Water Description and Observations			
Receiving Water Name/ID:			
Observations:			
Odors	Yes ☐	No ☐	
Floating material	Yes ☐	No ☐	
Suspended Material	Yes ☐	No ☐	
Sheen	Yes ☐	No ☐	
Discolorations	Yes ☐	No ☐	
Turbidity	Yes ☐	No ☐	
Field Meter Calibration			
pH Meter ID No./Desc.:		Turbidity Meter ID No./Desc.:	
Calibration Date/Time:		Calibration Date/Time:	
Field pH and Turbidity Measurements			
Upstream Location			
Type	Result	Time	Notes
pH			
Turbidity			
Downstream Location			
Type	Result	Time	Notes
pH			
Turbidity			
Additional Sampling Notes:			
Time End:			

NAL Exceedance Evaluation Summary Report		Page ____ of ____
Project Name		
Project WDID		
Project Location		
Date of Exceedance		
Type of Exceedance	NAL ☐ pH ☐ Turbidity ☐ Other (specify) _____	
Measurement or Analytical Method	☐ Field meter (Sensitivity: _____) ☐ Lab method (specify) _____ (Minimum Level: __) (MDL: _____)	
Calculated Daily Average	☐ pH _____ pH units ☐ Turbidity _____ NTU	
Rain Gauge Measurement	_____ inches	
Visual Observations on Day of Exceedance		

NAL Exceedance Evaluation Summary Report		Page ____ of ____
Description of BMPs in Place at Time of Event		
Initial Assessment of Cause		
Corrective Actions Taken (deployed after exceedance)		
Additional Corrective Actions Proposed		

Report Completed By _____
(Print Name, Title)

Signature _____

CHAIN-OF-CUSTODY**DATE:****Lab ID:**

DESTINATION LAB:							REQUESTED ANALYSIS				Notes:	
ATTN: ADDRESS: Office Phone: Cell Phone:												
SAMPLED BY:												
Contact:												
Project Name												
Client Sample ID	Sample Date	Sample Time	Sample Matrix	Container								
				#	Type	Pres.						
SENDER COMMENTS:							RELINQUISHED BY					
							Signature: _____ Print: _____ Company: _____ Date: _____ TIME: _____					
LABORATORY COMMENTS:							RECEIVED BY					
							Signature: _____ Print: _____ Company: _____ Date: _____ TIME: _____					

Appendix P

Field Meter Instructions

TO BE PROVIDED BY CONTRACTOR

Appendix Q

Supplemental Information

Appendix R

Active Treatment System and Passive Treatment Plans

NOT APPLICABLE

Appendix S

Construction General Permit

Copies of the Construction Stormwater General Permit may be downloaded from the State Water Board website at:

http://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.shtml.