

NOT-RUSLE2 GUIDANCE- Interim

June 15, 2011

This interim guidance covers RUSLE2 Erosion Prediction for SWDR documentation, final stabilization certification, NOT filing, etc. based upon sediment risk. This guidance was developed in response to Action Item 10-15 from the Project Design Storm Water Advisory Team (PD SWAT) meeting of May 11, 2010. Expect final guidance, possibly from Landscape Architecture Program, before November 1, 2011.

Summary

The purpose of this guidance is to assist District design staff on ensuring and documenting final stabilization on a per-project basis. Demonstrating final stabilization is required for filing the Notice of Termination (NOT) to conclude coverage under the Construction General Permit (CGP).

Final stabilization, as described in the NOT section of the CGP requires that the project site will not pose any additional sediment discharge risk than it did prior to beginning project construction.

To assist Construction staff in filing NOTs, the Project Engineer (PE) must coordinate the preparation of final stabilization documentation. This will usually involve consultation with the District Landscape Architect and the District/Regional NPDES Coordinator. This guidance includes:

- 1) Appropriate approaches for documentation based upon project conditions and sediment risk level. This documentation will be included in the project's Storm Water Data Report (SWDR).
- 2) Selection of methods to demonstrate project final stabilization. The CGP provides three options for documenting final stabilization to terminate coverage. Methods will be described below and summarized in a Method Demonstration Form (MDF). The MDF will be included in the SWDR.
- 3) Inspection and certification guidelines for Design staff to assess final stabilization prior to completion of construction. This includes providing the Resident Engineer (RE) with a memo following a site inspection.

Currently, the RE signs "Section VI. Certification" on the Caltrans Notice of Completion of Construction (NOCC) for termination of permit coverage. When the Caltrans NPDES Permit is approved, the CGP NOT requirements will be implemented. The methods described in this guidance can be used to fulfill both the current NOCC and future NOT requirements.

The benefits to Caltrans include:

- 1) Streamlined NOTs. As the NOT process in the new CGP's is perceived as quite onerous, including documentation in the project's SWDR will assist Construction staff in expediting the NOT to release cover under the permit.
- 2) Preferential Consideration. As many projects located in arid and semi-arid areas pose a low risk to water quality, Caltrans will enjoy a substantial benefit by proposing a "Custom Method A". This is appropriate since these projects rely on seeding in conjunction with transitional measures like hydromulching or degradable erosion control blankets to provide soil cover consisting of grass and forbs within 3 years.

Demonstrating Final Stabilization

Demonstrating final stabilization is described in the CGP as a condition for terminating permit coverage. Conditions for terminating coverage and methods for demonstrating final stabilization are described below.

CGP Conditions for Termination of Coverage:

The CGP lists the conditions for terminating permit coverage under Section II.D.1-3. This section lists the three methods for demonstrating final stabilization. Project conditions and sediment risk will determine which of the methods are appropriate.

Out of the three methods for documenting final stabilization, RUSLE2 is expected to be the primary method.

CGP risk level is based upon a combination of risk for sediment loss and receiving water sensitivity with low risk projects categorized as Risk Level 1 to high risk projects at Risk Level 3. It is reasonable to expect an increased effort to document final stabilization for higher risk projects than for low risk projects. Within this guidance, selections are made based upon sediment risk ranging from low to medium to high.

The following excerpt is from the CGP's "Conditions for Termination of Coverage," Section II.D. (3):

The NOT must demonstrate through photos, RUSLE or RUSLE2, or results of testing and analysis that the site meets all of the conditions above (Section II.D.1) and the final stabilization condition (Section II.D.1a) is attained by one of the following methods:

- a) "70% final cover method," no computational proof required.*
- b) "RUSLE or RUSLE2 method," computational proof required.*
- c) "Custom method," the discharger shall demonstrate in some other manner that (a) or (b), above, that the site complies with the "final stabilization" requirement in Section II.D.1.a.*

From Section II.D.1.a:

For purposes of "final stabilization," the site will not pose any additional sediment discharge risk than it did prior to the commencement of construction activity.

Prescribed Methods to Demonstrate Final Stabilization

The CGP allows three methods for demonstrating final stabilization: a) 70% final cover, b) RUSLE or RUSLE2, and c) custom. For each method, recommendations for use on Caltrans projects are described following an explanation of each method.

a) 70% Final Cover Method:

While there is no mention of the "70% final cover method" under (CGP) Traditional Construction Sites, there is a description under Linear Underground/Overhead Projects (LUPs).

The LUP description is similar to the description in the Environmental Protection Agency's (EPA) NPDES permit and as such, Caltrans will use the definition in the EPA NPDES Permit.

The following is an excerpt from the EPA/EPA NPDES General Permit for Large and Small Construction Activities, January 21, 2005. It describes "final stabilization" and how the percentage of vegetation is calculated:

http://www.epa.gov/npdes/pubs/cgp2003_entirepermit.pdf

"Final Stabilization" means that:

1. *All soil disturbing activities at the site have been completed and either of the two following criteria are met:*
 - a) *A uniform (e.g., evenly distributed, without large bare areas) perennial vegetative cover with a density of 70 percent of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or*
 - b) *Equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.*
2. *When background native vegetation will cover less than 100 percent of the ground (e.g., arid areas, beaches), the 70 percent coverage criteria is adjusted as follows: if the native vegetation covers 50 percent of the ground, 70 percent of 50 percent ($0.70 \times 0.50 = 0.35$) would require 35 percent total cover for final stabilization. On a beach with no natural vegetation, no stabilization is required.*

The 70% Final Cover Method is not appropriate for the majority of Caltrans roadway construction projects as Caltrans prefers to close out construction projects before vegetation is established. Keeping contracts open and contractors available for the additional year or years needed for vegetation to mature is not considered a wise use of funds and resources. However, the 70% Final Cover Method can still be used under specific project conditions.

Recommendation:

Use 70% Final Cover Method if one or more apply: (See Table 1)

- 1) All of the DSA will be covered with permanent, non-degradable materials such as rock.
- 2) There is no existing vegetation. That is, the background native vegetation has 0.0% cover such as in rocky areas or beaches.

Do not use the 70% Final Cover Method if there are areas within the project that will be vegetated and that vegetation cannot be documented as fully established at project closeout.

b) RUSLE or RUSLE2 Method:

While the CGP designates this method as "RUSLE or RUSLE2", it appears in this guidance as "Caltrans RUSLE2 Method" since it relies solely upon the Caltrans RUSLE2 software. This method uses the software to compare post construction to pre-construction erosion rates using climate, soils, topography, and permanent BMP data.

Recommendation:

Use the Caltrans RUSLE2 Method for the following: (See Table 1)

- 1) All sediment risk (low, medium, and high) projects located outside of an arid or semi-arid areas. That is, project locations receive an average annual rainfall of more than 20 inches. For these projects, final stabilization consists of vegetating DSA.
- 2) Use Caltrans RUSLE2 Method for projects located inside of an arid or semi-arid area. Where final stabilization consists of vegetating DSA and either:
 - 1) Sediment risk is high
 - 2) Sediment risk is medium but the Project Development Team has opted to use Caltrans RUSLE2 Method instead of Custom Method A.

To use this method, Design staff must input values into Caltrans RUSLE2 and obtain results for a typical slope within the project for both the pre-construction and post-construction conditions. For success, the results must indicate that the erosion rate for the completed project condition was less than or equal to the erosion rate prior to beginning construction work. These Caltrans RUSLE2 calculations must be included in the PS&E phase SWDR.

c) **Custom Method A – Arid/Semi-Arid:**

The CGP allows for permittees to create alternative approaches for demonstrating final soil stabilization. An alternative “Custom Method” must be different from the other listed methods and must be compelling on its own merits. Caltrans has developed Custom Method A to be used in arid/semi-arid areas. Other custom methods may be considered, but must be developed and coordinated with the Office of Stormwater Management – Design. .

Custom Method A is based upon an approach accepted by the EPA for final stabilization.

The following excerpt is from the EPA’s NPDES General Permit for Large and Small Construction Activities, January 21, 2005:

3. *In arid and semi-arid areas only, all soil disturbing activities at the site have been completed and both of the following criteria have been met:*
 - a) *Temporary erosion control measures (e.g., degradable rolled erosion control product) are selected, designed, and installed along with an appropriate seed base to provide erosion control for at least three years without active maintenance by you,*
 - b) *The temporary erosion control measures are selected, designed, and installed to achieve 70 percent vegetative coverage within three years.*

EPA provides these descriptions:

Arid: average annual rainfall from 0 to 10 inches

Semi-arid: average annual rainfall from 10 to 20 inches

Rainfall maps reveal that much of California is arid or semi-arid. This is especially true for the Central Valley and the non-mountainous areas of Southern California. This mapping is available at:

http://education.usgs.gov/california/maps/california_precipitation&relief&water1.htm

Recommendation:

Use Custom Method A for projects with all of the following: (See Table 1)

- 1) Low and medium sediment risk. The PDT may decide to use Caltrans RUSLE2 method for some medium sediment risk projects.
- 2) Located in arid (0 to 10 inches of annual rainfall) or semi-arid (10 to 20 inches of annual rainfall) areas.
- 3) Permanent revegetation will be accomplished by seeding. This will typically be a mix of grasses and forbs.
- 4) Permanent revegetation is designed to achieve 70 percent cover within 3 years.
- 5) Permanent, but degradable, erosion control measures are designed to function until vegetation is established. For example, hydromulch and erosion control blankets will provide protection without maintenance while the seed develops into vegetative cover.

Long-Term Maintenance Plan:

One of the CGP's requirements for the NOT is the existence of a long-term maintenance plan. The SWRCB's concept for this plan is described in a footnote to Section II.D:

For the purposes of this requirement a long-term maintenance plan will be designed for a minimum of five years, and will describe procedures to ensure that the post-construction storm water management measures are adequately maintained.

The Caltrans Division of Maintenance fulfills this requirement as it is responsible for the care and upkeep of State highways. In addition to managing the roadsides, Maintenance also maintains treatment BMPs, manages potential stormwater pollution from accidental spills, illicit connections, illegal discharges, and illegal dumping within the right-of way, and conducts periodic erosion inspections of vegetated slopes.

During slope inspections, members of the Maintenance Inspection and Slope Stabilization Team (MISST) periodically inspect vegetated slopes and determine the need for remedial measures. The MISST uses a field-tested slope inspection form that employs a weighted point system to identify the severity and complexity of the slope erosion problem. MISST inspects the slopes on recently completed projects and approximately 20 percent of the slopes in each District annually, based upon shoulder miles.

As a result of the inspections, minor, inexpensive slope problems are corrected by Maintenance crews. When complex slope problems are identified, a District multi-disciplinary roadside review team considers solutions and provides recommendations for slope repair projects.

Maintenance slope inspections are required by the Caltrans Storm Water Management Plan, Section 5.3.4 and results are described in the Annual Report.

Breakdown by Sediment Risk and Method

Use Table 1 to select method based upon project conditions and sediment risk. Record the selected method and selection criteria in the project’s SWDR.

Table 1 - Preferred Method¹ by Project Conditions and Sediment Risk

Project Conditions	Low Risk	Medium Risk	High Risk
No background vegetation present in pre-developed site (e.g., beach), or All DSA will be covered with non-degradable materials (gravel, rock, gabions, geotextiles, paving)	70% Final Cover	70% Final Cover	70% Final Cover
Located inside an arid/semi-arid region and DSA will be vegetated	Custom A	Custom A or RUSLE2	RUSLE2
Located outside of an arid/semi-arid region and DSA will be vegetated	RUSLE2	RUSLE2	RUSLE2

It’s anticipated that roughly half the projects will use RUSLE2 and half will use Custom Method A. Only a very small number of projects will use the 70% Cover Method.

NOT Documentation

This guidance addresses NOT requirements of the new CGP and is supplementary to the Project Planning and Design Guide (PPDG). See Appendix 1, Tables A-1, A-2, and A-3 for methods and documentation based upon sediment risk and project conditions. Explanations are provided below:

SWDR Narrative:

Since the Storm Water Data Report (SWDR) documents all project design decisions related to stormwater, it is appropriate to expand the text to incorporate the new CGP requirements. In addition to the explanation of the permanent BMPs in sections 4 and 5, all projects must include text similar to the following in their SWDR:

Final Stabilization will be achieved through the implementation of the permanent erosion control and/or revegetation strategy. This strategy includes the installation of non-degradable materials, seeding and plant materials, and the removal of temporary construction site BMPs.. Upon project completion, the site is not expected to pose any additional sediment discharge risk than it did prior to the commencement of construction activity.

If Caltrans RUSLE2 is used to document final stabilization, include:

Caltrans RUSLE2 software was used to evaluate soil loss and sediment delivery for the permanent erosion control and vegetative BMPs used on the project. This evaluation of the project slopes provides computational proof indicating final stabilization. Please see attached Method Demonstration Form (RUSLE2).

If Caltrans Custom Method A is used to document final stabilization, include and edit as appropriate:

This project uses Custom Method A as all of the following apply:

- 1) Low and medium sediment risk.*
- 2) Located in arid (0 to 10 inches of annual rainfall) or semi-arid (10 to 20 inches of annual rainfall) areas.*
- 3) Permanent revegetation is designed to achieve 70 percent cover within 3 years.*
- 4) Permanent, but degradable, erosion control measures are designed to function until vegetation is established.*
- 5) DSA has been hydroseeded with tackifier, fiber mulch, and seed consisting of an environmentally appropriate mix of grasses and forbs.*

This project uses an EPA accepted approach to demonstrate final stabilization. Consequently, the site will not pose any additional sediment discharge risk than it did prior to the commencement of construction activity. Please see attached Method Demonstration Form (Custom Method A)

Method Demonstration Form (MDF):

To assist Construction staff in certifying and filing the project's NOT, Design staff must prepare a single page summary capturing the NOT final stabilization information. The Method Demonstration Form (MDF) will be included in the PS&E phase SWDR as an attachment. This page should describe the method for demonstrating final stabilization.

- 1) If the 70% Final Cover Method is used, define the method, its source (USEPA), and why it applies (no native background vegetation or complete DSA cover with non-degradable materials).
- 2) If RUSLE2 is used, provide runs showing that the post construction condition generates no more sediment than the pre-construction condition.
- 3) If the Custom Method A is used, define the method, its source (USEPA), and provide the project's location in an arid/semi-arid region, the use of seeding and transitional BMPs to achieve at least 70% vegetation in 3 years.

See Appendix 2 for Method Demonstration Form examples.

Erosion Control & Revegetation Report:

Since the CGP's risk level determination process categorizes projects based upon potential sediment discharge and receiving water sensitivity, it is anticipated that greater scrutiny will be placed upon projects that have a higher risk level. Consequently, more information than what is currently provided in the SWDRs or the MDF explaining strategies for soil stabilization, sediment control, permanent revegetation is justified. To accomplish this task, prepare an Erosion Control and Revegetation Report as an attachment to the SWDR.

Design staff must prepare an Erosion Control and Revegetation Report for projects assessed as high **sediment** risk. The Project Development Team (PDT) may require an Erosion Control and Revegetation Report for projects with a medium sediment risk.

Erosion Control and Revegetation Report should include:

- 1) Strategies for achieving final stabilization. If several strategies are needed to meet project challenges, describe final stabilization for each.
- 2) RUSLE2 evaluations for the pre-construction slopes and the post-construction slopes and a comparison showing the sediment loss for each. Evaluated slopes may vary from typical to severe and may need additional RUSLE2 evaluations if conditions vary throughout the project (steepness, soil type, etc.)
- 3) An explanation of revegetation strategies if establishment takes several years.
- 4) An explanation if final establishment relies on a natural transition from grasses and forbs to perennials and shrubs.
- 5) A RUSLE2 analysis of temporary soil stabilization and sediment control BMPs used to control sediment loss on project slopes. Also include a rationale for the selection of a Maximum Allowable Erosion Rate (MAER) as a performance goal for evaluating temporary construction site BMPs.
- 6) A description of the reference site if one was selected as a model for developing the revegetation strategy.

The RUSLE2 training course and the Erosion Prediction Procedure (EPP) is a useful resource for preparing an Erosion Control and Revegetation Report. These are available from the Office of Storm Water Management Design at:

<http://www.dot.ca.gov/hq/oppd/stormwtr/rusle2.htm>

Site Visits for Final Stabilization Documentation

Design staff, such as the Project Landscape Architect (PLA), should inspect project sites and review final stabilization prior to completion of construction for projects assessed as high **sediment** risk. The PDT may use other factors to require site visits for documenting final stabilization. Design staff will prepare a Final Stabilization Memo summarizing the findings that will assist the RE in certifying final stabilization required for filing the NOT.

Final Stabilization Memo:

It's important that sites chosen to document the pre-construction condition match as closely as possible with the location of the sites photographed at post-construction in order to document final stabilization and provide an accurate comparison.

In considering, selecting, and photographing representative sites for pre- and post-construction documentation consider the following factors:

At Pre-Construction

- 1) Do the sites accurately reflect the magnitude and scope of the proposed project? The distance from each site and vantage point of the photos should take into account post-construction final grading.
- 2) Do the sites represent the various cut and fill slopes?

- 3) For projects with long linear segments (more than 1000 feet) of continuous cut or fill, a regular interval of 500 feet for photo documentation is recommended.

At Post-Construction

- 1) Does the distance from each site and vantage point of the photos match pre-construction documentation?
- 2) Do the sites represent the various BMPs implemented on the project? This should include vegetative and non-vegetative practices.
- 3) Do the photos accurately convey that all disturbed areas are stabilized?

Documentation at post-construction for “final stabilization” should include a project site map, summary narrative from erosion control report (if applicable), and pertinent Notification of Construction information (NOC). Photo documentation for pre-and post-construction project locations should be dated, clearly identified as to vantage point, and numbered on the project site map. Photos should include appropriate captions and be accurately cross referenced to the site map.

Roles and Responsibilities

Project Engineer:

The Project Engineer (PE) is responsible for developing the project and documenting stormwater issues in the SWDR according to the Project Planning and Design Guide (PPDG). However, it is expected that the following tasks will be delegated to a functional unit such as the Project Landscape Architect (PLA) or District Landscape Architect:

- 1) Determine at 60% PS&E milestone which of the preferred methods shall be used to determine “final stabilization” for terminating coverage under the CGP.
- 2) Provide text for the SWDR describing final stabilization.
- 3) Provide the MDF as an attachment to the SWDR. Verify that this documentation states the method (70% Cover, RUSLE2, Custom A, etc.) that demonstrates final stabilization is achieved.
- 4) If required by project conditions or considered appropriate by the PDT, provide an Erosion Control & Revegetation Report.
- 5) Perform site visits at pre-construction and before contract close out to document slope conditions and installation of permanent BMPs necessary for final stabilization.

Project Landscape Architect:

The Project Landscape Architect (PLA) is responsible for the following tasks. In the absence of a PLA, the District Landscape Architect is responsible.

- 1) If required by project conditions or considered appropriate by the PDT, the PLA shall provide a Final Stabilization Memo to the RE. The memo will be based upon site visits and have attached final stabilization documentation, stating that the project site will pose no more sediment discharge risk than it did before construction activities began.

- 2) Review the SWDR and verify that the permanent BMP strategy is consistent with the Department's policy on sustainable roadside design. This may include providing SWDR text.
- 3) Review the SWDR and verify that the processes described in the SWDR for final stabilization are achievable.
- 4) Ensure that the SWDR contains text for proposed erosion control, revegetation, and vegetative components of treatment BMPs and design pollution prevention BMPs.
- 5) Using best professional judgment, it is reasonable to expect that the project site will not pose any additional sediment discharge risk than it did prior to beginning project construction.
- 6) Verify that estimates for performing erosion control, revegetation, and vegetative components of permanent BMPs are adequate for the work described.
- 7) If it is not reasonable to expect vegetative final stabilization to occur on portions of the project, verify that alternative methods are used. This may include coordination with other units for rock slope protection, retaining walls, channel lining, etc.

Resident Engineer:

Filing the NOT requires certification that final stabilization has been achieved. The information provided by the PLA and the SWDR will assist the RE in filing the NOT/NOCC. The RE signs the NOCC/NOT certifying that final stabilization requirements of the CGP have been met and documented.

By filing an NOT, the RE ensures the following:

- 1) The NOT is filed within 90 days of construction completion.
- 2) Final stabilization is achievable.
- 3) There is no risk of discharging construction-related pollutants.
- 4) A long-term maintenance plan is in place.
- 5) All temporary BMPs that are no longer needed have been removed from site.
- 6) All construction-related materials and equipment have been removed from site.
- 7) A method for demonstrating final stabilization has been identified.

Division of Maintenance:

District Maintenance responsibilities related to the CGP and construction projects:

- 1) Conduct MISST inspections of slopes from recently completed construction projects.
- 2) Conduct annual MISST inspections of 20% of the Districts roadside slopes.

APPENDIX 1

Additions to SWDR and documentation to assist in NOT filing.

Table A-1 – Low Sediment Risk

Project Conditions	SWDR Narrative	Method Demonstration Form	Additional Documentation
No background vegetation present in pre-developed site (e.g., beach)	Describe "Final Stabilization" Provide native background vegetation cover percentage (0%)	SWDR Attachment Give method: 70% Final Cover Describe how "Final Stabilization" is achieved	EC/Reveg Report (Not Required) Site Inspection Memo (Not Required)
All DSA covered with non-degradable materials (gravel, rock, gabions, geotextiles)	Describe "Final Stabilization" Describe final cover with non-degradable materials	SWDR Attachment Give method: 70% Final Cover Describe how "Final Stabilization" is achieved per method	EC/Reveg Report (Not Required) Site Inspection Memo (Not Required)
Located inside an arid/semi-arid region and DSA will be vegetated	Describe "Final Stabilization" Describe how 70% vegetation will occur in 3 years using seeding with hydromulch or RECPs.	SWDR Attachment Give method: Custom A Describe how "Final Stabilization" is achieved per method	EC/Reveg Report (Not Required) Site Inspection Memo (Not Required)
Located outside of an arid/semi-arid region and DSA will be vegetated	Describe "Final Stabilization" Describe how "Final Stabilization" is achieved per using selected permanent BMPs. Mention verification using RUSLE2.	SWDR Attachment Give method: RUSLE2 Calcs Provide RUSLE2 calcs for a typical slope showing no increase in sediment discharge for pre to post conditions.	EC/Reveg Report (Not Required) Site Inspection Memo (Not Required)

Table A-2 – Medium Sediment Risk

Project Conditions	SWDR Narrative	Method Demonstration Form	Additional Documentation
No background vegetation present in pre-developed site (e.g., beach)	Describe “Final Stabilization” Provide native background vegetation cover percentage (0%)	SWDR Attachment Give method: 70% Final Cover Describe how “Final Stabilization” is achieved	EC/Reveg Report (Not Required) Site Inspection Memo (Not Required)
All DSA covered with non-degradable materials (gravel, rock, gabions, geotextiles)	Describe “Final Stabilization” Describe final cover with non-degradable materials	SWDR Attachment Give method: 70% Final Cover Describe how “Final Stabilization” is achieved per method	EC/Reveg Report (Not Required) Site Inspection Memo (Not Required)
Located inside an arid/semi-arid region and DSA will be vegetated	Describe “Final Stabilization” Describe how 70% vegetation will occur in 3 years using seeding with hydromulch or RECPs. (Enhance documentation if necessary as decided by PDT)	SWDR Attachment Give method: Custom A Describe how “Final Stabilization” is achieved per method. (Enhance to RUSLE2 method if necessary as decided by PDT)	EC/Reveg Report (Not Required) Site Inspection Memo (Not Required) (Enhance to High Sediment Risk documentation if necessary as decided by PDT)
Located outside of an arid/semi-arid region and DSA will be vegetated	Describe “Final Stabilization” Describe how “Final Stabilization” is achieved per using selected permanent BMPs. Mention verification using RUSLE2. (Enhance docs if necessary)	SWDR Attachment Give method: RUSLE2 Calcs Provide RUSLE2 calcs for a typical slope showing no increase in sediment discharge for pre to post conditions. (Enhance docs if necessary)	EC/Reveg Report (Not Required) Site Inspection Memo (Not Required) (Enhance to High Sediment Risk documentation if necessary as decided by PDT)

Table A-3 – High Sediment Risk

Project Conditions	SWDR Narrative	Method Demonstration Form	Additional Documentation
No background vegetation present in pre-developed site (e.g., beach)	Describe “Final Stabilization” Provide native background vegetation cover percentage (0%)	SWDR Attachment Give method: 70% Final Cover Describe how “Final Stabilization” is achieved	EC/Reveg Report (Not Required) Site Inspection Memo (Not Required)
All DSA covered with non-degradable materials (gravel, rock, gabions, geotextiles)	Describe “Final Stabilization” Describe final cover with non-degradable materials	SWDR Attachment Give method: 70% Final Cover Describe how “Final Stabilization” is achieved per method	EC/Reveg Report (Not Required) Site Inspection Memo (Not Required)
Located inside an arid/semi-arid region and DSA will be vegetated	Describe “Final Stabilization” Describe how “Final Stabilization” is achieved per using selected permanent BMPs. Mention verification using RUSLE2. Add RUSLE2 verification to discussion on BMP strategy for soil stabilization and sediment control.	SWDR Attachment Give method: RUSLE2 Calcs Provide RUSLE2 calcs for a typical and severe slopes showing no increase in sediment discharge for pre to post conditions.	Site Inspection Memo Provide an Erosion Control & Revegetation Report that relies on RUSLE2 calcs as a SWDR attachment. Include Pre/Post runs for severe and typical slopes. Describe revegetation strategy. Include MAER runs for temporary BMP strategy.
Located outside of an arid/semi-arid region and DSA will be vegetated	Describe “Final Stabilization” Describe how “Final Stabilization” is achieved per using selected permanent BMPs. Mention verification using RUSLE2. Add RUSLE2 verification to discussion on BMP strategy for soil stabilization and sediment control.	SWDR Attachment Give method: RUSLE2 Calcs Provide RUSLE2 calcs for a typical and severe slopes showing no increase in sediment discharge for pre to post conditions.	Site Inspection Memo Provide an Erosion Control & Revegetation Report that relies on RUSLE2 calcs as a SWDR attachment. Include Pre/Post runs for severe and typical slopes. Describe revegetation strategy. Include MAER runs for temporary BMP strategy.

APPENDIX 2

Method Demonstration Form Examples

Example MDFs provided for

- 1) 70% Cover Method
- 2) Caltrans RUSLE2
- 3) Custom Method A- Arid/Semi-Arid

METHOD DEMONSTRATION FORM

This form documents the selected method for demonstrating final stabilization as required under Section II.D., "Conditions for Termination of Coverage" of the Construction General Permit (Order No. 2009-0009-DWQ, NPDES No. CAS000002).

Project Description

Project EA/ID: 04-XXX001
Dist-County-Route: 04-Ala-580
Post Mile Limits: 22.8
Project Type: RSP Slope Repair

Project Risk Level: 2
Sediment Risk: Medium
Receiving Water: Low

70% Cover Method

Caltrans uses the following definition for "70% Cover method" from the Environmental Protections Agency's (EPA) NPDES General Permit for Large and Small Construction Activities, January 21, 2005 available at:

http://www.epa.gov/npdes/pubs/cgp2003_entirepermit.pdf

"Final Stabilization" means that:

All soil disturbing activities at the site have been completed and either of the two following criteria are met:

- a) A uniform (e.g., evenly distributed, without large bare areas) perennial vegetative cover with a density of 70 percent of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or*
- b) Equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.*

When background native vegetation will cover less than 100 percent of the ground (e.g., arid areas, beaches), the 70 percent coverage criteria is adjusted as follows: if the native vegetation covers 50 percent of the ground, 70 percent of 50 percent ($0.70 \times 0.50 = 0.35$) would require 35 percent total cover for final stabilization. On a beach with no natural vegetation, no stabilization is required.

This project has 1.2 acres of DSA with 0.8 acres of disturbance involved with regarding a slope slip-out and the remaining 0.4 acres of disturbance to grade a dirt access road to the slip-out. The entire slip-out area will be covered with rock slope protection (RSP) and the access road will be capped with gravel to provide future maintenance access.

Since all of the soil disturbance will be covered with permanent, non-degradable materials, the site will not pose any additional sediment discharge risk than it did prior to the commencement of construction activity.

Prepared by _____, title, date.

METHOD DEMONSTRATION FORM

This form documents the selected method for demonstrating final stabilization as required under Section II.D., "Conditions for Termination of Coverage" of the Construction General Permit (Order No. 2009-0009-DWQ, NPDES No. CAS000002).

Project Description

Project EA/ID: 01-262001	Project Risk Level: 3
Dist-County-Route: 01-MEN-101	Sediment Risk: High
Post Mile Limits: R43.1/R49.0 PM (KP R69.4/R78.9)	Receiving Water: High
Project Type: Major Construction- New Alignment	

Caltrans RUSLE2 Method

Caltrans RUSLE2 software was used to evaluate soil loss and sediment delivery for the project. Input criteria and results are summarized in the following tables.

Pre-Construction:

Soil Erodibility (K)	Climate/Rainfall (R)	Location
Ca\215 gravelly loam 35% K=0.32	USA\California\DIST-01\Mendocino County\CA_Mendocino_R48-52	STA "A" 103

Slope (Typical)		Management			Erosion/ Soil Loss (t/ac/yr)	Sediment Delivery (t/ac/yr)
Steepness (%)	Length (ft)	Soil Stab. BMP	Vegetation	Permeable Barriers		
33	25	None	Existing Grasses and forbs, medium stand	None	5.35	5.35

Post-Construction:

Soil Erodibility (K)	Climate/Rainfall (R)	Location
Ca\215 gravelly loam 35% K=0.32	USA\California\DIST-01\Mendocino County\CA_Mendocino_R48-52	STA "A" 103

Slope (Typical)		Management			Erosion/ Soil Loss (t/ac/yr)	Sediment Delivery (t/ac/yr)
Steepness (%)	Length (ft)	Soil Stab. BMP	Vegetation	Permeable Barriers		
33	25	1" Compost Blanket	Seeded Grasses and Forbs	Fiber roll, wattle 9 inch, 20 OC	4.66	3.92

The post-construction slope shows a decrease in both the erosion/soil loss and sediment delivery when compared to the pre-construction slope. This provides computational proof indicating final stabilization. Consequently, the site will not pose any additional sediment discharge risk than it did prior to the commencement of construction activity.

Prepared by _____, title, date.

METHOD DEMONSTRATION FORM

This form documents the selected method for demonstrating final stabilization as required under Section II.D., "Conditions for Termination of Coverage" of the Construction General Permit (Order No. 2009-0009-DWQ, NPDES No. CAS000002).

Project Description

Project EA/ID: 06-XXX001
Dist-County-Route: 06-KER-46
Post Mile Limits: 19.3/27.5
Project Type: Widening and Realignment

Project Risk Level: 1
Sediment Risk: Low
Receiving Water: Low
Average Annual Rainfall: 6 inches

Custom Method A Arid/Semi Arid

Custom Method A is based upon an approach accepted by the EPA for final stabilization as described in the NPDES General Permit for Large and Small Construction Activities, January 21, 2005:

In arid and semi-arid areas only, all soil disturbing activities at the site have been completed and both of the following criteria have been met:

- a) Temporary erosion control measures (e.g., degradable rolled erosion control product) are selected, designed, and installed along with an appropriate seed base to provide erosion control for at least three years without active maintenance by you,*
- b) The temporary erosion control measures are selected, designed, and installed to achieve 70 percent vegetative coverage within three years.*

This project uses Custom Method A as all of the following apply: Risk Level 1.

- 1) Located in arid (0 to 10 inches of annual rainfall) or semi-arid (10 to 20 inches of annual rainfall) areas.
- 2) Permanent revegetation is designed to achieve 70 percent cover within 3 years.
- 3) Permanent, but degradable, erosion control measures are designed to function until vegetation is established.
- 4) DSA has been hydroseeded with tackifier, fiber mulch, and seed consisting of an environmentally appropriate mix of grasses and forbs.

This project uses an EPA accepted approach to demonstrate final stabilization. Consequently, the site will not pose any additional sediment discharge risk than it did prior to the commencement of construction activity.

Prepared by _____, title, date.