Evaluation of Storm Water Data Reports for Fiscal Year 2013/2014

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List of Abbreviations

BMP	best management practice
CGP	Construction General Permit
DPP	design pollution prevention
FY	fiscal year
GSRDs	gross solids removal device
HQ	Headquarters
NPDES	National Pollutant Discharge Elimination System
PE	project engineer
PPDG	Project Planning and Design Guide
PS&E	Plans, Specifications, and Estimate
QA/QC	quality assurance/quality control
RUSLE2	Revised Universal Soil Loss Equation 2
RWQCB	Regional Water Quality Control Board
SMARTS	Storm Water Multi Application and Report Tracking System
SWC	Storm Water Coordinator
SWDR	Storm Water Data Report
WQV/WQF	Water Quality Volume/Water Quality Flow

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1. Background

This report summarizes the independent quality assurance/quality control (QA/QC) reviews on Storm Water Data Reports (SWDRs) prepared by Caltrans District staff. The SWDRs evaluated for this 2014 report were prepared during the previous fiscal year (i.e., fiscal year [FY] 2012/13). The reviews were performed to evaluate whether the SWDRs have been prepared in accordance with the Project Planning and Design Guide (PPDG), which facilitates compliance with the Caltrans National Pollutant Discharge Elimination System (NPDES) Permit (Order No.1999-06-DWQ, NPDES No. CAS00003), the 2003 Storm Water Management Plan (July 2012 Revision), and the Construction General Permit (CGP) (Order No. 2009-009-DWQ, NPDES No. CAS000002).

In general, a SWDR is required for every project. Depending on the extent of soil disturbance and degree of storm water impacts, a "Long Form" or a "Short Form" SWDR is required. Projects that do not have the potential to create storm water impacts, and have little or no soil disturbance may utilize the "Short Form" SWDR.

The reviews included in this report have been conducted on SWDRs that District staff submitted to Headquarters (HQ) for evaluation. The information provided in the SWDRs has been evaluated to determine if there are areas of the stormwater evaluation process that can be improved. Ratings were solely based on the information provided to HQ at the time of the review. If information was missing, the reports were rated accordingly.

It should be noted that a rating of "Poor" does not necessarily mean that the project is out of compliance.

1.1 SWDR Reviews Comparison: 2009-2014

To evaluate the trend of SWDR reviews over the years, Figure 1-1 compares the results of SWDR reviews in 10 categories from 2009 through 2014 to come up with an Overall Review rating. The comparison chart generally shows that SWDRs have become more standardized over the years, as indicated by the increased percentage of "Outstanding/Acceptable" rankings and the decreased percentage of "Poor" rankings across the majority of review categories. This standardization is the expected result of updating the report preparation guidance documents, publishing example SWDR reports, statewide training on SWDR preparation, as well as support through the on-line PPDG training. The reports are becoming more complete, consistent, and streamlined throughout the state.

In a majority of the categories, reviews in 2014 (i.e., FY 2012/13 SWDRs) have had a slight decrease in "Outstanding/Acceptable" rankings. After Caltrans updated the PPDG in 2010, reviews of SWDRs for the 2011 and 2012 reports (reviews of FY 2010/11 and FY 2011/12 SWDRs, respectively) allowed some leniency of implementing the new requirements under the updated PPDG. For the FY 2012/13 SWDRs reviewed in this report, SWDRs were expected to fully meet the 2010 PPDG requirements (e.g., RUSLE 2 outputs and Storm Water Multi Application and Report Tracking System [SMARTS] forms). This shift has resulted in a trend of slightly lower overall rankings.

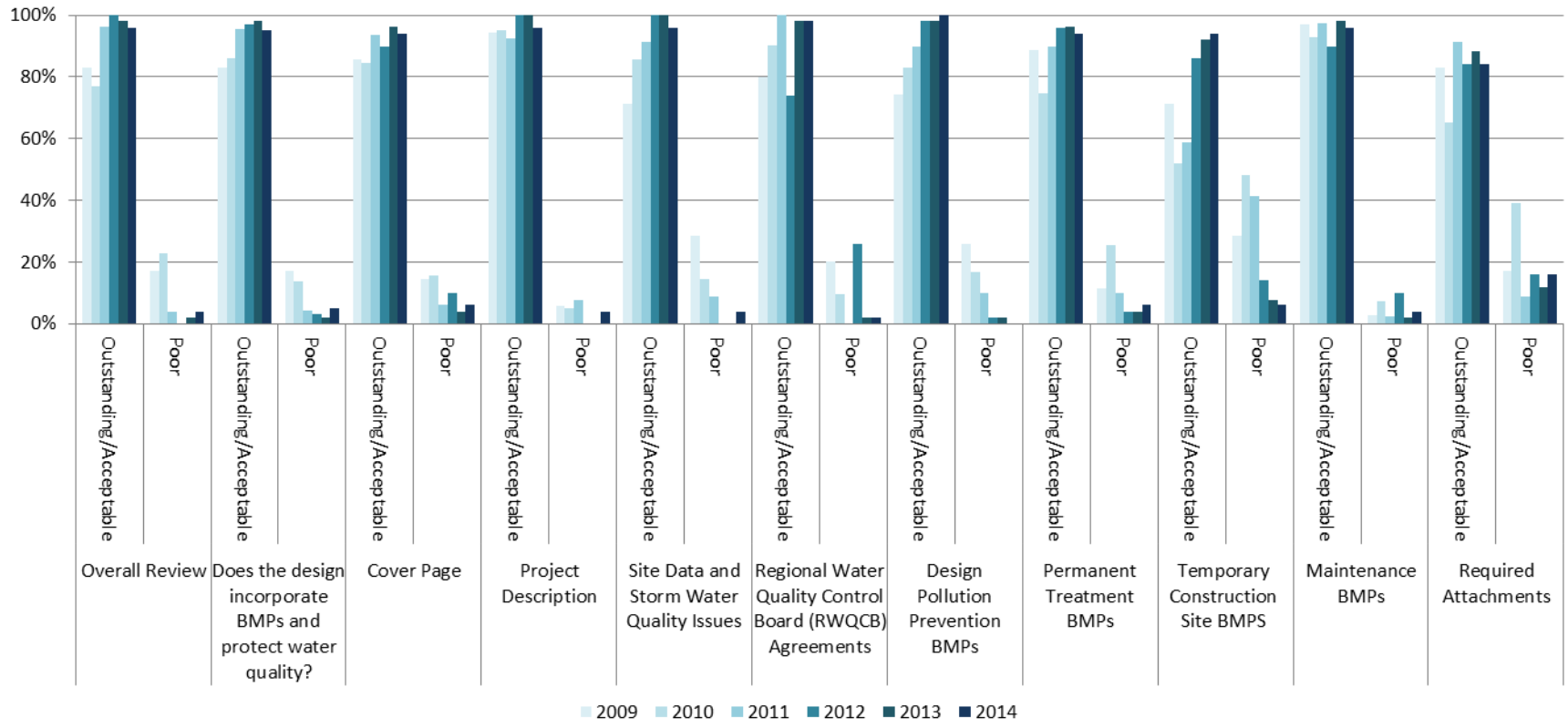

Figure 1-1. SWDR Review Rankings by Category (2009-2014)

2. Overview of Fiscal Year 2013/14 Findings

This section summarizes the independent QA/QC reviews conducted in fiscal year (FY) 2013/14 on a total of 50 SWDRs prepared during FY 2012/13. Review of the information provided shows that 96 percent of the SWDRs prepared by or for Caltrans, based on this sampling, conform to the requirements.

The SWDRs reviewed were based on projects at the Plans, Specifications, and Estimates (PS&E) phase and were primarily Long Forms. Eleven of the 50 SWDRs reviewed used a Short Form, and the remaining 39 SWDRs were Long Forms. In addition to an overall review of SWDRs, another focus was to confirm that Districts are using the current T-1 Checklist and including requirements based on project risk level.

The SWDRs evaluated showed the following general trends:

- The reports are concise.
- In most Districts, project engineers (PEs)[1] have included quantities in the SWDR narrative sections and costs in the supplemental attachments.
- PEs are using the current PPDG and incorporating the requirements into the reports and cost estimates (e.g., Storm Water Sampling and Analysis, Additional Water Pollution Control, Rain Event Action Plan, Storm Water Annual Report, etc.).
- PEs are documenting use of the design tools created by Caltrans for their use (e.g., the Infiltration Tool).

Validating the final soil stabilization design compared to the original conditions is described in Section 8.1.10 of the PPDG and supported within the CGP. One validation method involves using the Revised Universal Soil Loss Equation 2 (RUSLE2) computer program to estimate soil erosion loss and sediment transport in natural and disturbed construction sites. If this method is used, the RUSLE2 summary sheet must be provided with the SWDR at PS&E. Five of the SWDRs reviewed utilized RUSLE2 to document the basis of soil stabilization and attached the summary sheet. Validating final soil stabilization continues to be an important area to be documented during design and represents an area for future improvement.

When designing best management practices (BMPs), the PE should aim to treat 100 percent of the water quality volume/water quality flow (WQV/WQF) from the net new impervious area. Of the 24 reports that were required to provide treatment, nine documented that 100 percent of the WQV/WQF will be treated by the project BMPs in the narrative. Based on information reviewed, the following BMPs were used to treat 100 percent of the WQV/WQF:

- Biostrips (4 reports).
- Bioswales (7reports).
- Combination of Biostrips and Bioswales (2 reports).
- Infiltration Basin (6 reports).
- Detention Basin (1 report).
- Gross Solids Removal Device GSRDs (1 report).

Fifteen of the reports reviewed were not able to treat 100 percent of the WQV/WQF.

[1] Use of PE in this report is based on a registered engineer or landscape architect, as identified on the cover page of the SWDR.

At this time, a draft version of the Infiltration Calculation Tool is available to PEs through the Caltrans website. While it is not a requirement, this tool can be used to calculate the total amount of water infiltrated through project BMPs. In the new Caltrans Permit, documentation of infiltration will be required, and this tool can be used to meet this requirement. Of the reports reviewed, six of the reports documented use of the tool.

Some of the reports included several statements throughout the narrative regarding requirements that "would be" met. These general statements are used to describe both design and construction project requirements. Since the project is in the PS&E phase, the project requirements are not hypothetical, and the PE should write the report to reflect that actions are to be implemented.

The reports have been evaluated against information expected in 10 categories that comprise a fully developed SWDR. Rating summaries and general recommendations are included in the following sections for each category of evaluation.

Table 2-1 summarizes ratings for each of the review categories further presented in Tables 3-1 through Table 3-11 of this report. The Overall Review is based on the other 10 categories.

Table 2-1. Summary of All Ratings

Category	Percentage of Reports By Rating		
	Outstanding	Acceptable	Poor
Overall Review	4%	92%	4%
Does the design incorporate BMPs and protect water quality	6%	89%	5%
Cover Page	0%	94%	6%
Project Description	4%	92%	4%
Site Data and Storm Water Quality Issues	6%	90%	4%
Regional Water Quality Control Board (RWQCB) Agreements	4%	94%	2%
Design Pollution Prevention BMPs	2%	98%	0%
Permanent Treatment BMPs	6%	88%	6%
Temporary Construction Site BMPs	10%	84%	6%
Maintenance BMPs	4%	92%	4%
Required Attachments	6%	78%	16%

3. FY 2013/14 Findings by Review Category

The results of the FY 2013/14 report evaluations by category are summarized in the following subsections.

3.1 Overall Review Rating

Table 3-1 summarizes the overall results of the 50 reviewed reports.

Table 3-1. Summary of Overall Review Ratings

Category	Rating		
	Outstanding	Acceptable	Poor
No. of Reports Receiving Score	2	46	2
Percentage of Reports Receiving Score	4%	92%	4%

The "Outstanding" ratings were associated with reports that provided most of the required information in a clear and concise manner with backup data to substantiate the statements in the narrative. In general, most of the SWDRs reviewed were consistent among the various Caltrans districts, particularly in regard to narratives for the project description, completion of checklists, and consideration of all types of BMPs.

The "Poor" ratings were based on incomplete narratives and attachments and the SWDR referenced a separate project report for almost all required information but failed to attach the referenced report.

General Recommendations – Overall the SWDR process works well. In order to increase the level of consistency throughout various Caltrans districts, Caltrans has provided training to PEs related to the proper methods for preparing SWDRs and current requirements of the PPDG. The Design SWC should verify that the information contained in all SWDRs is incorporated into the corresponding project PS&E documents. The Design SWC should understand all general recommendations for each review category identified in this report.

3.2 Does the Design Incorporate BMPs and Protect Water Quality

Table 3-2 incorporate BMPs and protect water quality.

Table 3-2. Summary Ranking of Designs that Incorporate BMPs and Protect Water Quality

Category	Rating		
	Outstanding	Acceptable	Poor
No. of Reports Receiving Score	3	45	2
Percentage of Reports Receiving Score	6%	89%	5%

The "Outstanding" ratings were assigned to SWDRs that considered all applicable BMPs in detail and provided backup data to substantiate the statements in the narrative.

The "Poor" ratings were based on incomplete consideration and documentation of treatment BMPs for the project.

General Recommendations – The Design SWC should verify that the PE is correctly and completely documenting design decisions in the SWDR narrative.

3.3 Cover Page Information Rating

Table 3-3 summarizes SWDR review results related to cover pages.

Table 3-3. Summary of Cover Page Ratings

Category	Rating		
	Outstanding	Acceptable	Poor
No. of Reports Receiving Score	0	47	3
Percentage of Reports Receiving Score	0%	94%	6%

The "Poor" ratings were based on cover sheets that were missing significant or critical information, including the PEs stamp at PS&E.

General Recommendations – The Design SWC should be the last person signing the cover page. It is the responsibility of the Design SWC to ensure other disciplines have reviewed and approved the content of the SWDR specific to their area of expertise and concern, including the design approach, prior to signing the SWDR.

3.4 Project Description Information Rating

Table 3-4 summarizes SWDR review results related to project descriptions.

Table 3-4. Summary of Project Description Information Ratings

Category	Rating		
	Outstanding	Acceptable	Poor
No. of Reports Receiving Score	2	46	2
Percentage of Reports Receiving Score	4%	92%	4%

The "Outstanding" ratings were assigned to SWDRs with complete and concise project descriptions.

The "Poor" ratings were based on incomplete or incorrect documentation of pertinent project information.

General Recommendations –PEs are to refrain from using the term 'reworked areas' and are to use the term 'redevelopment' instead to be consistent with the permit. Design SWC should continue to verify that complete, concise narratives are included with the SWDRs prior to approval.

3.5 Site Data and Storm Water Quality Issues Information Rating

Table 3-5 summarizes SWDR review results related to site data and storm water quality issues.

Table 3-5. Summary of Site Data and Storm Water Quality Issues Ratings

Category	Rating		
	Outstanding	Acceptable	Poor
No. of Reports Receiving Score	3	45	2
Percentage of Reports Receiving Score	6%	90%	4%

The "Outstanding" ratings were based on all pertinent information being provided in the narrative, along with substantiation or a source for most statements.

The "Poor" ratings were based on missing or incomplete documentation of pertinent site data to be considered in design.

General Recommendations – Design SWC should continue to verify that complete narratives are included with the SWDRs prior to approval.

3.6 RWQCB Agreements Information Rating

Table 3-6 summarizes SWDR review results related to RWQCB agreements.

Table 3-6. Summary of RWQCB Agreements Ratings

Category	Rating		
	Outstanding	Acceptable	Poor
No. of Reports Receiving Score	2	47	1
Percentage of Reports Receiving Score	4%	94%	2%

The "Outstanding" ratings were based on complete documentation of both coordination with the RWQCB and specific agreements that pertain to the project.

The "Poor" rating is based on missing information related to RWQCB understanding/agreements; it is unclear from the narrative whether or not coordination with RWQCB occurred.

General Recommendations – Design SWC should continue to be diligent in identifying and documenting agreements with RWQCBs including documenting when the project requires BMPs for permit compliance that are in addition to the CGP.

3.7 Design Pollution Prevention BMPs Information Rating

Table 3-7 summarizes SWDR review results related to Design Pollution Prevention BMPs.

Table 3-7. Summary of Design Pollution Prevention BMPs Ratings

Category	Rating		
	Outstanding	Acceptable	Poor
No. of Reports Receiving Score	1	49	0
Percentage of Reports Receiving Score	2%	98%	0%

The "Outstanding" rating was based on a well-documented design pollution prevention (DPP) approach which included taking qualitative credit for utilizing existing vegetation.

Eight of the reports reviewed documented qualitative infiltration treatment credit including the use of landscaped areas and existing vegetated areas.

General Recommendations – Continue to document the BMPs strategy in the narrative including the documentation of qualitative infiltration treatment credits for DPP BMPs. Design SWCs need to ensure that appropriate elements of this section are addressed in SWDRs, including: validation of final soil stabilization design, downstream effects based on drainage reports, and emphasis on infiltration and its qualitative benefits.

3.8 Permanent Treatment BMPs Information Rating

Table 3-8 summarizes SWDR review results related to Treatment BMPs.

Table 3-8. Summary of Treatment BMPs Ratings

Category	Rating		
	Outstanding	Acceptable	Poor
No. of Reports Receiving Score	3	44	3
Percentage of Reports Receiving Score	6%	88%	6%

The three "Outstanding" ratings were based on reports that fully considered and documented consideration of all applicable Treatment BMPs along with complete documentation of the Treatment BMPs design approach.

The "Poor" ratings were based on incomplete consideration and/or documentation of Treatment BMPs. None of the SWDRs ranked "Poor" documented if 100 percent of the WQV/WQF would be treated by the selected BMPs. All applicable Treatment BMPs must be considered, unless deemed infeasible by the findings of the T-1 Checklists.

General Recommendations – PEs should continue to document Treatment BMPs strategies in the narrative. All reports requiring Treatment BMPs must use the T-1 Checklist; as such Design SWCs need to ensure that the T-1 Checklist is being used correctly prior to signing SWDRs.

PEs must document the percentage of WQV/WQF to be treated by the preferred BMPs and justify the BMPs strategy if treatment is to be less than 100 percent. A tool has been developed to assist PEs with

completing calculations to answer infiltration questions within the T-1 Checklist; however, this tool is not required to be used. If the tool is not used, then the PE will need to use computations or other supporting information that can reliably answer the infiltration questions to complete the T-1 Checklist.

3.9 Temporary Construction Site BMPs Information Rating

Table 3-9 summarizes SWDR review results related to Temporary Construction Site BMPs.

Table 3-9. Summary of Temporary Construction Site BMPs Ratings

Category	Rating		
	Outstanding	Acceptable	Poor
No. of Reports Receiving Score	5	42	3
Percentage of Reports Receiving Score	10%	84%	6%

The "Outstanding" ratings were based on all required information being thorough and clearly presented. These reports included complete documentation of the Construction Site BMPs strategy and coordination with the Construction SWC. The narrative identified quantities, and the supplemental attachment included associated costs for items required by the PPDG (e.g. Storm Water Sampling and Analysis, Additional Water Pollution Control, Rain Event Action Plan, Storm Water Annual Report, monitoring locations, etc.)

The "Poor" ratings were based on the following missing information:

- Coordination and concurrence from the Construction Division.
- Identification or quantification of the items designated as separate bid items or as lump sum items, including items required for Risk Level 2 and 3 sites.
- Monitoring activities and locations for Risk Level 2 and 3 sites.

In general, PEs have done a good job clearly documenting the Construction Site BMPs strategy and coordination/concurrence from Construction personnel in the narrative.

General Recommendations – Continue to document Construction Site BMPs strategy, coordination, and concurrence with Construction. Design SWC should ensure PE is including information related to the CGP requirements in the narrative and in the quantities for construction site BMPs and monitoring (e.g., Storm Water Sampling and Analysis Day). Monitoring activities and locations must be documented in the report narrative or on project plans if plans are included as a supplemental attachment to the report.

3.10 Maintenance BMPs Information Rating

Table 3-10 summarizes SWDR review results related to Maintenance BMPs.

Table 3-10. Summary of Maintenance BMPs Ratings

Category	Rating		
	Outstanding	Acceptable	Poor
No. of Reports Receiving Score	2	46	2
Percentage of Reports Receiving Score	4%	92%	4%

The "Outstanding" ratings were based on clear and complete documentation of maintenance requirements, and of the coordination and concurrence effort.

The "Poor" ratings were based on narratives that stated that no stenciling will be performed, but didn't describe why.

General Recommendations – The Design SWC should ensure that the SWDR format is not compromised during its preparation. Design SWC should verify that complete narratives are included with the established SWDR format prior to approval and subsequent submittal to HQ for evaluation.

3.11 Required Attachments Information Rating

Table 3-11 summarizes SWDR review results related to required attachments.

Table 3-11. Summary of Required Attachments Ratings

Category	Rating		
	Outstanding	Acceptable	Poor
No. of Reports Receiving Score	3	39	8
Percentage of Reports Receiving Score	6%	78%	16%

The "Outstanding" ratings were based on SWDRs that provided complete and concise information on all of the required attachments.

In most cases, the "Poor" ratings were based on more than one of the following required attachments being incomplete or missing as follows:

- Construction Site BMPs Consideration Forms (3 reports).
- RUSLE2 Summary Sheet (6 reports).
- Risk Level Determination documentation (4 reports).
- Permanent Treatment BMPs summary spreadsheets (4 reports).
- Quantities for Construction Site BMPs (5 reports).
- SMARTS Form (5 reports)

Additionally, one report reviewed had no attachments and was rated "Poor".

Nineteen of the reports reviewed attached the SWDR Attachment for SMARTS input. This attachment was not a requirement until May 2012 and only applicable if the project requires coverage under the CGP.

It is important that the Design SWC verify that all applicable attachments are submitted to HQ to ensure a complete review. These quality assurance reviews are based on the project information provided at the time of the review, missing or incomplete data can lead to a "Poor" rating.

General Recommendations – Design SWC should note that as of the May 2012 PPDG update, the SMARTS form is now a required attachment. Also, Design SWC should verify that complete attachments are included with the SWDRs prior to approval and subsequent submittal to HQ for evaluation.

4. Summary

4.1 Stormwater Design Compliance Improvements

The ability to comply with stormwater design requirements continues to be improved by updating existing guidance, training curriculums for staff, and special provisions. Recent updates include the following:

- SWDR Workshops have been provided, emphasizing use of the revised T-1 Checklist, incorporation of descriptive narratives, and ensuring all BMPs categories are adequately evaluated.
- Example SWDRs have been developed to show sample language and the level of detail expected at each phase of a project. The examples were developed based on the July 2010 PPDG.
- PPDG Training, which is planned to be a self-paced internet (online) training that allows staff to obtain consistent and timely clarification on PPDG direction without having to rely upon other staff or the District/Regional SWC.
- Stormwater special provisions are revised periodically to reflect changes to regulatory requirements and to provide clarity for elements causing issues in the field.

4.2 Conclusions and Recommendations

This evaluation has determined that the preparation of the reports is becoming standardized and streamlined. However, PEs continue to omit documentation of the basis to attain final stabilization when submitting for relief of coverage from the CGP. Design SWCs need to verify and reinforce inclusion of required attachments with the SWDR. While this annual evaluation has determined that improvements can still be made when documenting stormwater decisions in the SWDR process, Caltrans fulfills stormwater requirements by incorporating stormwater management strategies throughout project planning and design. Caltrans incorporates BMPs into the design phase for implementation into projects to protect water quality, and documents these steps through the preparation of their SWDRs. The reports reviewed adequately document the stormwater design processes and decisions made by the Caltrans designers at the final PS&E phase.

Based on the SWDR reviews conducted in this evaluation, the revisions to the PPDG and training curriculum, including revisions to special provisions, facilitate a consistent awareness of stormwater design requirements throughout the Caltrans district offices. It is recommended that the SWDR Workshop slides posted on the Caltrans website be updated to reflect new requirements on required attachments to the SWDRs. Consideration should be given to updating the PPDG and perhaps placing a note at the website where the example SWDRs are posted to define new requirements related to SWDR attachments.

In an effort to use terms consistent with the permit, PEs should refrain from using the term ‘reworked areas’. The PE is to use the term ‘redevelopment’ to describe replacement of impervious surface on an already developed site. Replacement of impervious surfaces includes any activity that removes impervious materials and exposes the underlying soils or pervious subgrade.

The following are specific areas of documentation that can be improved when preparing SWDRs:

- Address all updated requirements, including documenting planned monitoring activities and locations for Risk Level 2 and 3 sites.
- Provide information related to the method used for the validation of final soil stabilization and include documentation of validation for the project at the PS&E phase.

- The percentage of net WQV/WQF that will be treated by the preferred permanent Treatment BMPs and the percentage of net WQV/WQF that will be infiltrated needs to be justified and documented accordingly.

Continual reminders:

- Ensure that the Design SWC is last to sign the SWDR.
- Initialize and date the Construction Site BMPs Form and EDF.
- Do not include costs in the narrative (i.e., include costs in the attachments only).
- Describe RWQCB Agreements and other permits (as applicable).
- Include all required attachments at each phase of the project.

4.3 Next Steps

Caltrans NPDES Permit was re-issued on September 19, 2012 (Order No. 2012-0011-DWQ) and became effective on July 1, 2013, and all documents that relate to the NPDES Permit will be revised accordingly such as the SWMP, PPDG, special provisions, training programs, etc.

Additional clarification for the following items should be considered during the PPDG updates:

- Methods to validate final soil stabilization; perhaps consider renaming the RUSLE 2 Section in Chapter 8 of the PPDG to Final Soil Stabilization Validation. Add direction on how to validate final soil stabilization and restate when validation is required.
- Monitoring activities and locations; clarify requirements in Chapter 8 of the PPDG. Documentation of monitoring activities and planned locations is not being included in the SWDRs.
- SMARTS Form; consider adding a section in Chapter 8 of the PPDG explaining the SMARTS form, how it's used, and list the website to access the form.
- Short and Long Form Instructions; update to clarify when specific report attachments are required rather than just saying at PS&E.
- Define the process for tracking Treatment BMPs and the expectation for the Treatment BMP Summary Spreadsheet listed as a required attachment to the Long Form.
- Revisit T-1 Checklist to clarify the treatment requirements for WQV/WQF.

The T-1 Checklist tool and infiltration tool were finalized and made available to designers through the Caltrans website in 2013. These tools can help to minimize process related errors, provide automated accounting for treatment of the WQV/WQF, and provide an easy method to document specific compliance elements from the updated Caltrans NPDES Permit.