Overview Summary
Construction Stormwater Regulations in California

Kennedy/Jenks Consultants
Overview Summary
Construction Stormwater Regulations in California

• Welcome
• Introduction
• Relevance of the Topic
Learning Objectives

- Regulatory History
- Risked-Based Permitting
- Core Technical Components of California Construction General Permit Coverage
- Administrative Components of California Construction General Permit Coverage
- Implementation Strategies and Illustrative Examples
First, some historical context for discussing the current construction stormwater regulations in California…
Regulatory Background and Climate

- **Clean Water Act**
  - 1972 - prohibited discharges of pollutants from point sources
  - 1987 - defined industrial/municipal storm water discharges as point sources

- **Federal EPA Regulations**
  - 1990 Phase I Regulations
  - 1999 Phase II Regulations

- **State Implementation**
  - Storm Water NPDES Permits
  - Municipal, Industrial, Construction Activities

- **Municipal Permitting**
  - Large, Small, and Non-traditional MS4s
The Main California Stormwater Regulatory Agency

- **State Board**
  - Statewide policy
  - Support regional boards
  - Review petitions

- **Nine Regional Boards**
  - Result of the Porter-Cologne Act
  - Organized by basin
  - Exercise rulemaking and regulatory activities

Region 1: North Coast
Region 2: San Francisco Bay
Region 3: Central Coast
Region 4: Los Angeles
Region 5: Central Valley
Region 6: Lahontan
Region 7: Colorado River Basin
Region 8: Santa Ana
Region 9: San Diego
California Permit: How did we get here?

- Three Storm Water General Permits in California:
  - 2003, 2013 Small Municipal (Phase II)
  - 1997, 2014 Industrial
  - 1999 Construction

- 2005 SWRCB Blue Ribbon Panel:
  - Question: Are NELs for storm water feasible?


- Construction General Permit
  - Adopted September 2, 2009
  - Effective July 1, 2010
  - Amended in 2010 and 2012
Enforcement Activity

- **USEPA Enforcement:**
  - Walmart: $1M + $3M Fines
  - Homebuilders: Centex, KB Homes, Pulte, and Richmond American
    $4.3M Civil Penalties
  - USEPA vs. Pflueger (Florida):
    $2M penalties, $5.5M damages, and $4.4M fine, 10 felony counts

- **CA Water Board Enforcement**
  - Escondido, CA: $1.2M ACL to JRMC Real Estate, City also fined.
  - Roseville, CA: $500,000 to JMC Homes
  - Region 2 RWQCB: $982,350 ACL for Construction related discharges; $26,250 ACL for Industrial SW discharge
Introducing the permit, general requirements, and applicability (since you might want to make sure the permit is needed for your project)…
When is the Permit Required?

- Construction Activity greater than or equal to one acre
- Construction activity that disturbs greater than one acre if the activity is part of a larger development plan (i.e. phase of a development)
- Construction activity on land currently used for agriculture.
- LUPs, Oil & Gas, and Upland Dredge Spoils
When is the Permit NOT Required?

- **Maintenance Operations:** “To maintain original line and grade, hydraulic capacity, or original purpose of facility.”

- Land disturbances solely related to agriculture operations (leveling, soil preparation, etc.)

- Sites between 1 to 5 acres that can demonstrate a rainfall erosivity factor greater than 5.
Permissible Non-Stormwater Discharges

- Include the Following Types:
  - Dechlorinated potable water from hydrant and pipe flushing
  - Irrigation for erosion control
  - Uncontaminated groundwater from dewatering
  - Water for dust control

- Must comply with:
  - BMPs in SWPPP
  - NALs/NELs
  - Not cause/ contribute to violation
Overview of Permit Requirements

- Legally Responsible Person
- Traditional Projects vs. Linear Underground/Overhead Projects
- Project Risks Levels:
  - Numeric Action Levels and Numeric Effluent Limitations
  - Risk-based monitoring requirements and posting requirements
- Permit Registration Documents
- BMP Requirements (minimum best management practices)
- Post-Construction Storm Water Performance Standards for Non-Phase 1/Phase 2 MS4s
- Qualifications/Training
<table>
<thead>
<tr>
<th>Project Type</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional</td>
<td>Site Preparation: Clearing, grading, grubbing, and excavation</td>
</tr>
<tr>
<td>Linear Underground/Overhead Project (LUP)</td>
<td>Residential/commercial/industrial development and redevelopment</td>
</tr>
<tr>
<td></td>
<td>Underground utility mark-out/potholing</td>
</tr>
<tr>
<td></td>
<td>Concrete/asphalt cutting, removal and repair</td>
</tr>
<tr>
<td></td>
<td>Trenching</td>
</tr>
<tr>
<td></td>
<td>Boring and drilling</td>
</tr>
<tr>
<td></td>
<td>Stockpile/borrow locations</td>
</tr>
</tbody>
</table>
Permit Application/Implementation

- Determine Risk Level
- Calculate Post-Construction Storm Water Balance
- Develop SWPPP
- Implement SWPPP
After figuring out if the permit applies to your project, the risk determination is the next most important step in the compliance process…
Risk Determination - Overview

- **Sediment Risk**: Amount of sediment that can be discharged given the project location

- **Receiving Water Risk**: Based on whether project drains to a sediment-sensitive waterbody

- **Attachment 1 Worksheet to Determine Project Risk**:
  - Three levels for traditional projects
  - Three Types for LUPs
Risk Determination – Sediment Risk

- Based on Revised Universal Soil Loss Equation (RUSLE)
  \[ A = R \times K \times LS \times C \times P \]

- Determination Methods:
  - EPA Rainfall Erosivity Calculator and GIS Map
  - EPA Rainfall Erosivity Calculator and Individual Data

- Results:
  - Soil loss < 15 tons/acre = Low risk.
  - Soil loss from 15 to 75 = Medium risk.
  - Soil loss > 75 acres = High risk.
Rainfall-Runoff Erosivity Factor

\[ A = R \times K \times LS \times C \times P \]

- **GIS Map Method**
  - Download from Water Board website

- **Individual Site Data**
  - Latitude/Longitude
  - Duration
Soil Erodibility Factor

\[ A = R \times K \times LS \times C \times P \]

- **GIS Map Method**
  - Download from Water Board website

- **Individual Site Data**
  - Soils Report
  - Lookup literature values based on soil type
Length-Slope Factor

\[ A = R \times K \times LS \times C \times P \]

- **GIS Map Method**
  - Download from Water Board website

- **Individual Site Data**
  - Survey Topography
  - Calculate
Risk Determination – Receiving Water Risk

- Project is High risk if it drains to a waterbody meeting at least one of the following criteria:
  - On 303(d) list for sediment impaired waterbodies
  - Has a EPA-approved Total Maximum Daily Load implementation plan for sediment
  - Has the beneficial uses of COLD, SPAWN, and MIGRATORY

<table>
<thead>
<tr>
<th>WATER BODY NAME</th>
<th>On 303d List</th>
<th>Sediment Impaired</th>
<th>Spawn, Cold, Migratory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sacramento River (portions)</td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>Smith River</td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>Lower Klamath River</td>
<td>Y</td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>Eel River</td>
<td>Y</td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>San Francisquito Creek</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>

- Water Board Interactive Map
High-Risk Receiving Waters

- 303(d) list for sediment impaired waterbodies

- For smaller water bodies, follow drainage to nearest listed water body
High-Risk Watersheds

- Hydrologic Unit Code (HUC) Level 12 Watersheds
- Projects in these watersheds are considered to have a high receiving water risk
### Combined Risk Level Matrix – Standard Projects

<table>
<thead>
<tr>
<th>REceiving Water Risk</th>
<th>Sediment Risk</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>LOW</td>
<td>Level 1</td>
<td>Level 2</td>
<td></td>
</tr>
<tr>
<td>HIGH</td>
<td>HIGH</td>
<td>Level 2</td>
<td>Level 3</td>
<td></td>
</tr>
</tbody>
</table>
LUP Risk Type Determination

- Type 1: Project in existing roadway or adjacent to roadway
- Type 2: Project through a green field with onsite stockpiles
- Type 3: Project through or near an area of sensitive resources
- Attachment A.1: Flowcharts to determine type
LUP Risk Type Determination – Flow Chart

**ATTACHMENT A.1**
LUP Project Type Determination

- Will ≥ 70% of the construction activity occur on paved surfaces? **Yes**
  - Will areas disturbed be returned to pre-construction conditions or equivalent condition at the end of the day? **Yes**
    - Will ≥ 50% of the construction activity occur within the non-paved shoulders or land immediately adjacent to paved surfaces? **No**
      - No
      - Yes
        - Will areas disturbed be returned to pre-construction conditions or equivalent condition at the end of the day? **Yes**
          - Will areas of established vegetation disturbed by the construction be stabilized and revegetated by the end of the project? **Yes**
            - No
            - Yes
              - This is a Project Type 1 LUP
  - Yes
    - No
      - Yes
        - Will the construction activity occur on unpaved angled roads, including their shoulders or land immediately adjacent to them? **No**
          - No
          - Yes
            - Is in the project area or project section area located within a Sediment Sensitive Watershed? **Yes**
              - Receiving Water Risk: “LOW”
  - No

**ATTACHMENT A.1**
LUP Project Area or Project Section Area Type Determination

- Is the project area or project section area located within the flood plain or flood prone area ( riparian zone of a sensitive receiving water body)? **No**
  - Yes
    - Receiving Water Risk: “HIGH”
      - Calculate the Sediment Risk Based on the Attachment C Risk Factor Worksheet
        - Project Sediment Risk:
          - “LOW”: ≤ 15 tons/acre
          - “MEDIUM”: ≥ 15 and ≤ 75 tons/acre, or
          - “HIGH”: ≥ 75 tons/acre

*See Definition of Terms*
## Combined Risk Level Matrix – LUP Projects

<table>
<thead>
<tr>
<th>Receiving Water Risk</th>
<th>Sediment Risk</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Type 1</td>
</tr>
<tr>
<td><strong>Low</strong></td>
<td>Low</td>
<td>Type 1</td>
</tr>
<tr>
<td><strong>Medium</strong></td>
<td>Medium</td>
<td>Type 2</td>
</tr>
<tr>
<td><strong>High</strong></td>
<td>High</td>
<td>Type 3</td>
</tr>
</tbody>
</table>

- **Low** sediment risk level is associated with Type 1 for all receiving water risk levels.
- **Medium** sediment risk level is associated with Type 2 for the **Low** and **Medium** receiving water risk levels, and Type 3 for the **High** receiving water risk level.
- **High** sediment risk level is associated with Type 3 for the **High** receiving water risk level.
Requirements for Stormwater Pollution Prevention

Although all projects must include a minimum suite of compliance activities, increased risk levels include expanding compliance activities...
Baseline Requirements for all Risk Levels

- Good Site Management “Housekeeping”
- Non-Storm Water Management
- Erosion Control
- Sediment Control
- Run-on and Run-off Control
- Inspection, Maintenance and Repair
- Monitoring, Sampling and Reporting
Additional Requirements for Higher Risk Levels

- Rain Event Action Plan (REAP):
  - Requires sites to develop and implement a REAP to protect all exposed portions of the site within 48 hours prior to any likely precipitation event, over 50% probability.

- Additional measures above baseline requirements
BMP Requirements

- Specified as part of General Permit
- Previously only required with SWPPP or were suggested by guidance
- BMP requirements for Risk Levels 1, 2, and 3 in Attachments C, D, and E.
- BMP Requirements for LUP are in Attachment A
- Permit allows active treatment systems (ATS) for Risk Level 3
## Rain Event Action Plan (REAP) 
### Grading and Land Development Phase

Preparation of land for utility installation and vertical building including clearing and grubbing, demolition, blasting or rock crushing, if necessary, and soil excavation and mass grading. This form is to be reviewed and completed by the qualified SWPPP practitioner within 48 hours prior to a rain event during the Grading and Land Development Phase.

**Site Information:**
- Site Name, City and Zip Code
- Risk Level 2
- Risk Level 3

**Site Storm Water Manager Information:**
- Name, Company and Emergency Phone Number (24/7)

**Erosion and Sediment Control Provider – Labor Force Contracted for the Site:**
- Name, Company and Emergency Phone Number (24/7)

**Storm Water Sampling Agent Information:**
- Name, Company and Emergency Phone Number (24/7)

### Activities Associated with Land Surface Development

<table>
<thead>
<tr>
<th>Activity</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demolition</td>
<td>check all boxes below</td>
</tr>
<tr>
<td>Vegetation Removal</td>
<td></td>
</tr>
<tr>
<td>Rough Grade</td>
<td></td>
</tr>
<tr>
<td>Finishing Grade</td>
<td></td>
</tr>
<tr>
<td>Soils Soil Revetement</td>
<td></td>
</tr>
<tr>
<td>Soil Testing</td>
<td></td>
</tr>
<tr>
<td>Rock Crushing</td>
<td></td>
</tr>
<tr>
<td>Vegetation Harvesting</td>
<td></td>
</tr>
<tr>
<td>Equipment Maintenance/Fueling</td>
<td></td>
</tr>
<tr>
<td>Material Delivery/Storage</td>
<td></td>
</tr>
</tbody>
</table>

### Trades Active on Site During Land Surface Development

<table>
<thead>
<tr>
<th>Trade or Activity</th>
<th>Suggested action(s) to review before rain event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information &amp; Scheduling</td>
<td>Inform trade supervisors of predicted rain</td>
</tr>
<tr>
<td></td>
<td>Check scheduled activities and rescheduled as needed</td>
</tr>
<tr>
<td></td>
<td>Alert erosion/sediment control provider</td>
</tr>
<tr>
<td></td>
<td>Alert sample collection contractor (if applicable)</td>
</tr>
<tr>
<td></td>
<td>Schedule staff for extended rain inspections (including weekends &amp; holidays)</td>
</tr>
<tr>
<td></td>
<td>Check Erosion and Sediment Control (ESC) material stock</td>
</tr>
<tr>
<td></td>
<td>Review BMP map</td>
</tr>
<tr>
<td></td>
<td>Material storage areas</td>
</tr>
<tr>
<td></td>
<td>Material under cover or in sheds (ex: treated woods and metals)</td>
</tr>
<tr>
<td></td>
<td>Perimeter control around stockpiles</td>
</tr>
<tr>
<td></td>
<td>Other:</td>
</tr>
<tr>
<td>Waste Management Areas</td>
<td>Dumpsters closed</td>
</tr>
<tr>
<td></td>
<td>Drain holes plugged</td>
</tr>
<tr>
<td></td>
<td>Recycling bins covered</td>
</tr>
<tr>
<td></td>
<td>Sanitary stations bermed and protected from tipping</td>
</tr>
<tr>
<td></td>
<td>Other:</td>
</tr>
<tr>
<td>Trade Operations</td>
<td>Exterior operations shut downs for event (ex: no concrete pours or paving)</td>
</tr>
<tr>
<td></td>
<td>Do not apply soil treatments (ex: fertilizer) within 24 hours of event</td>
</tr>
<tr>
<td></td>
<td>Materials and equipment (ex: tools) properly stored and covered</td>
</tr>
<tr>
<td></td>
<td>Waste and debris disposed in covered dumpsters or removed from site</td>
</tr>
<tr>
<td></td>
<td>Trenches and excavations protected</td>
</tr>
<tr>
<td></td>
<td>Site controls around disturbed areas</td>
</tr>
<tr>
<td></td>
<td>Street and home fencing and repair areas</td>
</tr>
<tr>
<td></td>
<td>Other:</td>
</tr>
<tr>
<td>Site ESC BMPs</td>
<td>Adequate capacity in sediment basins and traps</td>
</tr>
<tr>
<td></td>
<td>Site perimeter in place</td>
</tr>
<tr>
<td></td>
<td>Catch basin and drop inlet protection in place</td>
</tr>
<tr>
<td></td>
<td>Deploy temporary erosion control on inoperative areas</td>
</tr>
<tr>
<td></td>
<td>Deploy temporary perimeter control around disturbed areas or stockpiles</td>
</tr>
<tr>
<td></td>
<td>Sweep roads; stabilize site ingress and egres points</td>
</tr>
<tr>
<td></td>
<td>Other:</td>
</tr>
<tr>
<td>Concrete barrow out area</td>
<td>Adequate capacity for runoff</td>
</tr>
<tr>
<td></td>
<td>Cover wash-cut bins</td>
</tr>
<tr>
<td></td>
<td>Other:</td>
</tr>
</tbody>
</table>

### Trade Contractor Information Provided

- Educational Material Handout
- Tailgate Meetings
- Training Workshop
- Contractual Language
- Fines and Penalties
- Site Storm Water Manager Signature
- Use ink please

I certify under penalty of law that this Rain Event Action Plan (REAP) will be performed in accordance with the General Permit by me or under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person who manages the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.
Numeric Limits – Two Types of Limits

- **Numeric Action Level (NAL)**
  - Warning:
    - Assists in evaluating effectiveness of BMPs.
    - Exceeding NALs requires implementation of additional BMPs and revised SWPPP.

- **Numeric Effluent Limitation (NEL)**
  - Violation:
    - Exceeding NELs violates General Permit. Discharger shall report results electronically within 5 days.
    - Compliant Storm: 5-year, 24-hour storm

*Applies to Level/Type 2 and 3
**Applies to Active Treatment Systems
Numeric Limits – Two Constituents of Concern

- **pH:**
  - NAL under 6.5 or over 8.5
  - NEL under 6.0 or over 9.0

- **Turbidity:**
  - NAL of 250 NTU
  - NEL of 500 NTU
### Monitoring and Sampling Requirements

#### Traditional Project

<table>
<thead>
<tr>
<th>Risk Level</th>
<th>Visual Inspections</th>
<th>Sample Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quarterly Non-SW Discharge</td>
<td>Pre-Storm Event</td>
</tr>
<tr>
<td>1</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

#### Linear Underground/Overhead Project

<table>
<thead>
<tr>
<th>Type</th>
<th>Visual Inspections</th>
<th>Sample Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Daily Site BMP Pre-storm Event</td>
<td>Daily Storm BMP</td>
</tr>
<tr>
<td>1</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

All projects must submit annual monitoring reports.
Visual and Non-visible Monitoring

- **Visual:**
  - Identify whether BMPs were effective or not
  - Qualified rain event = ½-inch or more

- **Non-Visible:**
  - Required when exposure of construction materials cause discharge affecting water quality
  - Materials may include:
    - Cement, fly ash
    - Herbicides, pesticides, fertilizers
  - Most effective way to avoid sampling requirements is to avoid exposure of construction materials to stormwater.
LUP Monitoring Requirements

- **Type 1:**
  - Daily visual inspections of BMPs during construction activities.
  - Discontinue inspections when stabilization achieved.
  - Submit Photographs.

- **Types 2 and 3:**
  - Daily visual inspections of BMPs during construction and before/after storms
  - Discontinue inspections when stabilization achieved.
  - Resources must be available for rapid response to failures/emergencies.
  - Inspection logs maintained in SWPPP.
  - Submit Photographs.
  - Sampling required for visible and non-visible pollutants.
Post-Construction Performance Standards

- Implement BMPs to reduce pollutants that are reasonably foreseeable after construction
- Required for sites not covered by a Phase I or Phase II MS4 NPDES permit.

- LUP projects are not subject to these standards.
- A means of providing stormwater treatment for runoff from small, frequent (e.g. 2-yr return interval) storms
- Smaller storms carry higher pollutant loads
- Customized to the site and pollutant
Post-Construction Performance Standards

- Use Non-Structural Controls Where Feasible
- Non-Structural/LID Practices Available for Crediting
  - Porous Pavement
  - Tree Planting
  - Downspout Disconnection
  - Impervious Area Disconnection
  - Green Roof
  - Stream Buffer
  - Vegetated Swales
  - Rain Barrels and Cisterns
  - Landscaping Soil Quality
### Post-Construction Water Balance Calculator

#### Project Information

- **Project Name:** Optional
- **Watershed Identification (WID):** Optional
- **Sub-Site Name:** Optional

#### Stormwater Management

- **Existing Stormwater Management:** Enter
- **Proposed Development Stormwater Management:** Enter

#### Runoff Volume

- **Pre-Project Runoff Volume:** Enter
- **Project-Related Runoff Volume Increase:** Enter
- **Project-Related Runoff Volume Increase with Credits:** Enter

#### Credits

<table>
<thead>
<tr>
<th>Credits</th>
<th>Acres</th>
<th>Square Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Porous Pavement</td>
<td>0.00</td>
<td>0</td>
</tr>
<tr>
<td>Tree Planting</td>
<td>0.00</td>
<td>0</td>
</tr>
<tr>
<td>Downspout Disconnection</td>
<td>0.00</td>
<td>0</td>
</tr>
<tr>
<td>Impervious Area Disconnection</td>
<td>0.00</td>
<td>0</td>
</tr>
<tr>
<td>Green Roof</td>
<td>0.00</td>
<td>0</td>
</tr>
<tr>
<td>Stream Buffer</td>
<td>0.00</td>
<td>0</td>
</tr>
<tr>
<td>Vegetated Swales</td>
<td>0.00</td>
<td>0</td>
</tr>
<tr>
<td>Subtotal</td>
<td>0.00</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Total Runoff Volume Reduction

- **Subtotal Runoff Volume Reduction Credit:** Enter
- **Rain Barrels/Cisterns:** Enter
- **Soil Quality:** Enter

#### Credits Summary

- **Total Credits Achieved:** Enter

---

*You have achieved your minimum requirements.*

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*Kennedy/Jenks Consultants*
Beyond the requirements necessary to prevent stormwater pollution, there a number of administrative requirements work noting…
## Legally Responsible Person

<table>
<thead>
<tr>
<th>Property Type</th>
<th>LRP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Land/Utility</td>
<td>Property owner or designee</td>
</tr>
<tr>
<td>Public Land/Utility</td>
<td>Principal Executive Officer, ranking elected official, or designee</td>
</tr>
</tbody>
</table>
Responsibilities of LRP

- Approved signatory authorization (designee) must be posted online

- Must include certification statement signed by LRP in Permit Registration Documents (PRD)

J. Certification

Any person signing documents under Section IV.I above, shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."
SWPPP Qualifications

- Preparation by Qualified SWPPP Developer (QSD)
- Implementation by Qualified SWPPP Practitioner (QSP)
- QSD and QSP must attend a State Water Board sponsored or approved training course by September 2, 2011.

<table>
<thead>
<tr>
<th>Certification/Title</th>
<th>Registered By</th>
<th>QSD/QSP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional Civil Engineer</td>
<td>California</td>
<td>Both</td>
</tr>
<tr>
<td>Professional Geologist or Engineering Geologist</td>
<td>California</td>
<td>Both</td>
</tr>
<tr>
<td>Landscape Architect</td>
<td>California</td>
<td>Both</td>
</tr>
<tr>
<td>Professional Hydrologist</td>
<td>American Institute of Hydrology</td>
<td>Both</td>
</tr>
<tr>
<td>Erosion, Sediment and Storm Water Inspector</td>
<td>Certified Professional in Erosion and Sediment Control, Inc. (CPESC)</td>
<td>QSP</td>
</tr>
<tr>
<td>Certified Inspector of Sediment and Erosion Control (CISEC)</td>
<td>Certified Inspector of Sediment and Erosion Control, Inc.</td>
<td>QSP</td>
</tr>
<tr>
<td>Certified Erosion, Sediment, Storm Water Inspector (CESSWI)</td>
<td>CPESC, inc</td>
<td>QSP</td>
</tr>
<tr>
<td>Certified Professional in Storm Water Quality (CPSWQ)</td>
<td>CPESC, inc</td>
<td>Both</td>
</tr>
<tr>
<td>Certified Professional Soil Scientist/Classifier (CPSS/C)</td>
<td>Soil Science Society of America</td>
<td>Both</td>
</tr>
</tbody>
</table>
Permit Registration Documents

- Notice of Intent (NOI)
- Risk Assessment
- Site Map
- SWPPP
- Fee
- LRP Certification
- Post-Construction Water Balance: Sites not covered by MS4 Phase I or II (Appendix 2)
- Active Treatment System (ATS)* Plan, if utilizing

* Available to Level 3
Following is an outline of a common implementation strategy a few example projects wherein the strategy was employed with success…
Implementation Strategy

- Limit project duration to dry season
- Reduce construction schedule
- Template SWPPP in contract documents
- Contractor customizes template with construction phasing, stockpile location, etc
- Completed SWPPP review during submittal review
- Update SWPPP as needed
Example 1 – Pipeline Installation

<table>
<thead>
<tr>
<th>CP</th>
<th>Length (LF)</th>
<th>Construction Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6,500</td>
<td>Open Trench</td>
</tr>
<tr>
<td>2</td>
<td>1,800</td>
<td>Trenchless &amp; Open Trench</td>
</tr>
<tr>
<td>3</td>
<td>3,200</td>
<td>Trenchless &amp; Open Trench</td>
</tr>
<tr>
<td>4</td>
<td>1,900</td>
<td>Trenchless</td>
</tr>
<tr>
<td>5</td>
<td>900</td>
<td>Open Trench</td>
</tr>
<tr>
<td>6</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total 14,600</td>
<td>Trenchless Length = 6,000 (41% of total)</td>
</tr>
</tbody>
</table>

**Legend**
- **EXISTING FM**
- CP1A
- CP1B
- CP2(N)
- CP2(S)
- CP3
- CP4
- CP5

*Kennedy/Jenks Consultants*
Example 1 – Risk Determination

**Sediment Risk Factor Worksheet**

<table>
<thead>
<tr>
<th>Entry</th>
<th>R Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor component of total storm kinetic energy (E) times the maximum 10-min intensity (I)(^{10}) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of £100 for storm events during a rainfall record of at least 22 years. &quot;Nonresident&quot; maps were developed based on R I 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.</td>
<td></td>
</tr>
</tbody>
</table>

http://pubs.usgs.gov/pwd/ksr/wskanet/plotfinder/rameter.txt

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

The soil-erosivity 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. Course-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 0.65 and can be as large as 0.95. Sub-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use site-specific data must be submitted.

\( K \) Factor Value: 0.72

**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 intensity 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

**Combined Risk Level Matrix**

<table>
<thead>
<tr>
<th>Receiving Water Risk</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Type 1</td>
<td>Type 1</td>
<td>Type 2</td>
</tr>
<tr>
<td>Medium</td>
<td>Type 1</td>
<td>Type 2</td>
<td>Type 3</td>
</tr>
<tr>
<td>High</td>
<td>Type 2</td>
<td>Type 3</td>
<td>Type 3</td>
</tr>
</tbody>
</table>

Project Sediment Risk: Low

Project RW Risk: Medium

Project Combined Type: Type 1
Example 1 – WPCDs for Pipe Installation

Notes:
Best management practices (BMPs) shall be installed in conformance with the following minimum requirements:
1. Biologically Sensitive Area - All vegetation to be protected in accordance with CASQA BMP Handbook (BMP EC-2).
2. Silt fence installed in accordance with CASQA BMP Handbook (BMP EC-1). Fiber rolls installed in accordance with CASQA BMP Handbook. Fiber rolls to be installed directly behind silt fence, (BMP SE-5). Fiber rolls and silt fence are shown offset for clarity.
3. This portion of the 45" FM will be installed using open trench methods.
4. The BMP's in the table to the right will be used throughout the site and in the contractor staging area. Silt fence and fiber rolls shall be installed around the perimeter of the contractor staging area in accordance with CASQA BMP Handbook (BMP SE-1 and BMP SE-5). Fiber rolls to be installed directly behind silt fence.
5. GSP shall evaluate the circumstances and determine if fiber rolls and silt fence should be installed at the toe of slope depending on condition of slope and water levels.
6. Stabilized construction entrance/exit and roadway in accordance with CASQA BMP Handbook (TC-1.2).

Legend:
- Temporary Construction Fence
- Fiber Rolls
- Silt Fence
- Flow Direction
- Straw Bale Barrier

<table>
<thead>
<tr>
<th>BMP</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WA-1</td>
<td>Material Delivery and Storage</td>
</tr>
<tr>
<td>WA-2</td>
<td>Material Use</td>
</tr>
<tr>
<td>WA-3</td>
<td>Stockpile Management</td>
</tr>
<tr>
<td>WA-4</td>
<td>Spill Prevention and Control</td>
</tr>
<tr>
<td>WA-5</td>
<td>Silt Waste Management</td>
</tr>
<tr>
<td>WA-6</td>
<td>Hazardous Waste Management</td>
</tr>
<tr>
<td>WA-7</td>
<td>Contaminated Soil Management</td>
</tr>
<tr>
<td>WA-8</td>
<td>Concrete Waste Management</td>
</tr>
</tbody>
</table>

BMPs for Pipe Installation

- 45-inch FM will be installed below existing rail-car bridge.
- Straw Bale Barriers will be installed in accordance with CASQA BMP Handbook (BMP SE-5) to protect abutment of bridge from erosion.
- GSP shall evaluate the circumstances and determine if erosion controls should be installed on the inside slopes of the levees near the open trench pipe installation work.
Example 2 – Ski Resort Snow Management Areas
Example 2 – BMPs in Restoration Area
Example 2 – BMP in Snow Stockpile Area
### Example 2 – Sampling and Analysis

#### Sampling Locations

<table>
<thead>
<tr>
<th>Sample ID</th>
<th>Site Location</th>
<th>Time</th>
<th>Turbidity</th>
<th>pH</th>
<th>Photo of sample location</th>
</tr>
</thead>
<tbody>
<tr>
<td>RO1</td>
<td>Site 2</td>
<td>13:20</td>
<td>.06 NTU</td>
<td>8.7</td>
<td><img src="image1" alt="Sample Location 1" /></td>
</tr>
<tr>
<td>A</td>
<td>Site 2</td>
<td>14:28</td>
<td>14.2 NTU</td>
<td>7.9</td>
<td><img src="image2" alt="Sample Location 2" /></td>
</tr>
<tr>
<td>C</td>
<td>Site 2</td>
<td>14:34</td>
<td>5.01 NTU</td>
<td>7.8</td>
<td><img src="image3" alt="Sample Location 3" /></td>
</tr>
</tbody>
</table>
Example 3 – Dredging and Dewatering Project
Example 3 – WPCD for Material Handling Area

Legend
- X
- Temporary Construction Fence (Type CL-3)
- Temporary Construction Fence (Type ESA)
- Fiber Roll
- Oil Fence

Notes
1. Berm will be installed in accordance with State of California Department of Transportation, Standard Plans, May 2006, Plan T25 (CAASB BMP-NE-1).
2. Berm will be installed in accordance with State of California Department of Transportation, Standard Plans, May 2006, Plan T25 (CAASB BMP-NE-1).
5. Berm will be installed in accordance with State of California Department of Transportation, Standard Plans, May 2006, Plan T25 (CAASB BMP-NE-1).
Example 3 – Material Handling Plan

Legend:
- Sump
- Dewatering Bags

Water Treatment Equipment Schedule

<table>
<thead>
<tr>
<th>ID</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Submersible Pump</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Sediment Conditioning Tank</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Sand/Media Filter</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Transfer Pump</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Bag Filter</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Organic/Clay/LaC Media Filter</td>
<td>2</td>
</tr>
</tbody>
</table>
Example 3 – Active Treatment System
Example 3 – Restoration Plan (Stabilization)

Legend:
- Grass and Soil Stabilization Vegetation (EC-2)
- Bare Soil (SE-4)
- Fiberglass Flow Roll (SE-6)
- Silt Fence (SE-1)
- Straw Bale Barrier (SE-6)
- Mulch (EC-6)
- Grass and Soil Stabilization Vegetation (EC-7) with Mulch (EC-8)
- Project Limits
- Water Surface Boundary
- Wetland Boundary
- Temporary Construction Fencing
- Temporary Construction Fencing (Type SSA)
- State of California Right-Of-Way

Notes:
1. Elevations shown are based on NAVD 88.
2. Soil topography restored to pre-construction contours and future planting areas re-compact
3. Erosion control measures SE-1, SE-6, and EC-7 shall be installed per CASQA’s Construction BMPs.
Example 3 – Restoration Plan (Planting)

Legend:
- Water Surface Boundary (6.3-ac)
- Willow and Oak Woodland / Coastal Scrub Plantings
- Previously Developed Area
- VMP Boundary
- Limits of Dredging (3.37-ac)
- Coastal Woodland Plantings

<table>
<thead>
<tr>
<th>Plant List A</th>
<th>Plant List B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lady fern (Athyrium felix-femina)</td>
<td>California rose (Rosa californica)</td>
</tr>
<tr>
<td>American daisy (Gomphrena globosa)</td>
<td>California wild rose (Rosa californica)</td>
</tr>
<tr>
<td>Rain lily (Lilium philadelphicum)</td>
<td></td>
</tr>
<tr>
<td>Wax myrtle (Myrica californica)</td>
<td></td>
</tr>
<tr>
<td>California blackberry (Rubus ursinus)</td>
<td></td>
</tr>
<tr>
<td>Water parsley (Oenothera suffrutescens)</td>
<td></td>
</tr>
<tr>
<td>Arrowleaf willow (Salix lasiolepis)</td>
<td></td>
</tr>
<tr>
<td>Shining willow (Salix lasiolepis)</td>
<td></td>
</tr>
</tbody>
</table>
Questions and Comments?